

Learning from abroad

How other countries are scaling up residential flexibility, and what Belgian stakeholders can learn from it

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This document is a deliverable of the InterFlex project (Task 3.1, D3.1.2 — “Report on international lessons learned”), funded by the Energy Transition Fund of the Belgian federal government, managed by the FPS Economy, SMEs, Self-employed and Energy.



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This PDF is a static copy. The report was written as an [interactive website](#), and that is the recommended way to read it: you can show only the examples from the countries or for the Belgian stakeholders you select, open the sources behind each sentence, and see technical terms explained where they first appear.

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About this report

This report starts from an intuition shared by many who work on residential flexibility in Belgium: we tend to think within our own national bubble and look too little at what is happening in other Western countries. Ideas that are being discussed or piloted in Belgium have often been tried elsewhere already, sometimes for years and at large scale. Knowing what worked there, what did not and why can help Belgian stakeholders learn from the experience and the mistakes of others, and so help residential flexibility grow faster in Belgium.

The report is based on desk research on public sources, checked against primary documents wherever possible. Across eight themes, we looked for concrete examples of what countries in Europe, North America and Australia have done to make household electricity use more flexible: who did what, at what scale, with what effect, and why it worked or did not. Each example was selected with one question in mind: would a Belgian stakeholder working on residential flexibility miss something important by not knowing it?

Each chapter covers one theme. It opens with a chapter summary that draws the main storyline from the examples across countries and ends with what it means for Belgium. A box then shows where Belgium stands, and the chapter closes with the examples themselves: one card per example, explaining in more depth what happened, with its own lesson for Belgium. The executive summary brings together the main findings from all chapters and summarises the recommendations for Belgium. [Chapter 9](#) sets these recommendations out in full, together with the patterns that run through the report and the questions that remain open. The report is written for Belgian policymakers, regulators, grid operators, suppliers, aggregators and manufacturers.

A few tools help readers find their way. The [country profiles](#) at the end give essential background on each country in the report, with Belgium as the reference. Sources are cited with numbers in square brackets that refer to the [references](#) at the end. For every example, the calculations behind its figures, its sources and suggestions for further reading are collected in [Appendix C](#), and each example points to its entry there. Technical terms are marked on first use with a ⓘ symbol that leads to their explanation in the [dictionary](#) at the end. The interactive version of this report also lets readers show only the examples from selected countries, or only those relevant to selected Belgian stakeholders.

HOW THIS REPORT WAS MADE

This report was made with the help of generative AI, specifically Claude, developed by Anthropic. Claude supported the extensive desk research behind it, the drafting of the text, and its conversion into an interactive website that is easier to browse than a static report. The author, an energy economist with more than ten years of research experience on residential flexibility and electricity markets, set the scope and the selection criteria, scored and selected the examples, contributed his knowledge of the Belgian and international context, and reviewed and steered both content and writing through many rounds of detailed feedback. The aim of working this way was a report that is better than what either Claude or the author could have produced on their own.

The facts and figures in this report were checked against public sources with care, but on a best-effort basis and as they stood in October 2026. Rules, programmes and figures change quickly, and a report that covers this many countries cannot capture every nuance of each national context, so some details may be incomplete, out of date or open to a different reading. The examples and lessons are meant as input for discussion in Belgium, not as a final verdict on the countries or organisations involved. Readers who spot an error are warmly invited to let the author know, so that it can be corrected.

Executive summary

This report looks at what countries in Europe, North America and Australia have done to make household electricity use more flexible, what came of it, and what Belgian governments, regulators, grid operators and market parties can take from it. The first part of this summary sets out what other countries show, theme by theme. The second part summarises the recommendations for Belgium that [Chapter 9](#) sets out in full.

What other countries show

- 1. New network tariffs have small measured effects, and politics steps in when bills jump.** Where the effect of new household network tariffs has been measured, peaks fell by a few per cent, and by no more than about 7%. When a visible group saw its bill rise sharply, politicians stepped in: Slovenia's parliament passed an emergency law within weeks after households with solar panels faced network-bill increases of more than 200% (see [Chapter 1](#)).
- 2. What scales is a simple offer built around a device.** Where large groups were moved onto time-varying prices by default, in Spain and California, evaluations found little or no response. The contracts that are growing, as in Britain and the Netherlands, are sold around an electric car or a heat pump and rely on automatic control: in Britain, car tariffs accounted for nearly nine-tenths of the growth in households on smart time-of-use tariffs between July 2024 and July 2025 (see [Chapter 2](#)).
- 3. Crisis support can keep or remove the reward for shifting use.** Norway first based its support during the 2021-2022 energy crisis on the monthly average price, which kept households' reason to avoid expensive hours, and later on each hour, which largely removed it. Ireland instead caps the wholesale-linked part of dynamic contracts at €0.50 per kWh, a level the wholesale price rarely reaches (see [Chapter 2](#)).
- 4. Devices that respond on their own deliver; asking people to act delivers little.** In schemes that pay households to cut their use during peak events, a household that has to act itself delivers about 0.01 to 0.25 kW per event in Britain and California, and one where a device acts automatically about 1 to 5 kW. Enrolling households by default adds participants but not necessarily response: when California enrolled four million households in a peak reward, those at the largest utility cut about 0.03 kW each (see [Chapter 3](#)).
- 5. Buying household flexibility is routine for British grid operators, to postpone reinforcement.** Every British distribution grid operator buys flexibility in tenders and auctions. About 9 GW was under contract in 2024, far more than was used, and at the largest local market households supplied 23% of the flexible capacity. Under a shared method, flexibility is worth buying only up to what postponing reinforcement saves, so it bridges the time until reinforcement rather than replacing it. Elsewhere, buying flexibility from households is still at the trial stage or about to begin, as in the Netherlands in November 2026 (see [Chapter 4](#)).
- 6. Some countries simply require devices to be steerable, and it works where the infrastructure is already there.** France is moving part of the cheap hours of more than 11 million households from the night to the afternoon by regulatory decision, and water heaters wired to a switch in the smart meter follow automatically. Germany's rule that lets grid operators dim new heat pumps and chargers during moments of grid stress still depends on smart meters that few homes have. When many appliances respond to the same signal at once, they risk creating a new peak, so the countries that switch centrally stagger the start times (see [Chapter 5](#)).
- 7. New rooftop solar can be made controllable without touching existing systems.** Germany caps the exports of new systems, South Australia lets the grid operator lower the export limit only when the local grid is close to its limit, and several Australian states can switch off new inverters as a last resort. Built into new installations, these limits cost households little; for price signals on midday exports, no effect has been measured so far (see [Chapter 6](#)).

8. **Market access alone brings little household volume, and reserve income fades fast.** Five years after the United States ordered its wholesale markets to accept pooled home devices, those devices supplied only tens of megawatts. Once batteries rushed into Sweden's small reserve markets, prices fell by 80 to 90% within three years. For a home battery, the savings on its own household's bill are the steadiest part of its value. Offers that need equipment in hundreds of thousands of homes are hard to finance without a long, predictable payment. The first vehicle-to-grid offers, in Britain, France and Germany, combine a bidirectional charger and an electricity contract for one car maker's models, in Britain together with a leased car; none has yet published measured results (see [Chapter 7](#)).
9. **The meters are mostly there; what matters is whether data, prices and control signals flow by default.** Britain is moving every meter to settlement on measured half-hourly use, which gives every supplier a reason to help its customers shift, whatever contract it sells them. California publishes every time-varying rate in one public database that devices can read, and the Dutch grid operators have proposed a short list of five protocols that a home energy manager should speak. Germany shows what can happen when the meter itself is made very demanding: ten years on, only about 6% of metering points have one (see [Chapter 8](#)).

What this means for Belgium

Belgium already has many of the pieces that made flexibility grow elsewhere: digital meters in most Flemish homes, whose measured quarter-hourly values have been used in settlement between suppliers since 2026, a Flemish network tariff that charges for the monthly peak, an optional network tariff with time blocks in Wallonia, about 189,000 registered home batteries in Flanders, dynamic contracts on offer in all three regions, the first time-of-use contracts, rules that let independent aggregators sell flexibility, a shared platform to register flexibility providers (FlexHub), and a Flemish test market for congestion services. What it lacks is less the technology than the defaults, the offers and the measurement that put these pieces to work. [Chapter 9](#) turns the lessons of the chapters into twelve recommendations. In short, by group of actors:

- **Governments, federal and regional**, could design crisis protection that still gives households a reason to avoid expensive hours, before the duty to offer a dynamic contract reaches all Flemish suppliers in 2029, for instance support based on the monthly average price or a cap like Ireland's. In any future product rule or subsidy for home chargers, they could require off-peak default hours and a random start delay as well as steerability, and heat-pump premiums could require domestic hot water to be heated in the middle of the day. If a safety net under market-based flexibility is wanted, it could apply to new and replaced equipment only, with a guaranteed minimum, a payment and published interventions, as in Germany.
- **Regulators** could publish, before a new network tariff starts, who will pay more and who less, phase the change in and evaluate it a few years later with meter data and a household survey. When designing fixed time blocks, they could check whether new peaks appear at the start of cheap windows and build in a staggered start. Jointly, the federal and regional regulators could require one machine-readable format for contract prices and network tariffs. And regulators could measure what moves: track time-of-use and other new contracts as well as fixed, variable and dynamic ones, and include them in their price comparison tools, ask suppliers how much consumption their products actually shift, and have grid operators report their flexibility purchases as contracted capacity, energy used and euros per kW, with the household share.
- **Distribution grid operators** could publish, per congestion point and with one shared method, the price up to which flexibility is cheaper than reinforcement. For households, they could consider a published availability price per kW per year, sold through suppliers and aggregators, and complete the planned extension of FlexHub, the platform they share with Elia to record which flexibility provider serves which connection, to all flexibility products, including their own congestion services, so that a household signs up its devices once and can change provider as easily as it changes supplier.

- **The federal regulator and Elia** could publish each year, in aggregate and within the confidentiality rules, how much of the capacity contracted in the capacity auctions comes from household devices. For any household product at times of scarcity, Elia could pay per kW measured on the device and use competitive bids from the start.
- **Suppliers and aggregators** could sell control as the product: a low fixed price or a cheap window in return for steering the car, battery or heat pump, switched on by default in a contract the customer chooses, with clear terms and an easy override. Home-battery offers could rest on several sources of income, with the savings on the household's own bill as the foundation and reserve income presented as volatile.
- **Manufacturers and installers** could make every new heat pump, charger and inverter able to receive an external signal over an open standard, such as those on the Dutch short list, since Belgium buys its devices on the same market, and commission it with price-following control switched on and, for heat pumps, with domestic hot water heated in the middle of the day.

[Chapter 9](#) sets out each recommendation with the chapters it draws on, together with the patterns that run through the report.

Measured effects of new network tariffs are small, and politics steps in when bills jump

The network tariff is the part of a household's electricity bill that covers the cost of the grid infrastructure. It is set by the regulator and the grid operators, not by suppliers, and it is the one price signal that every household receives whichever contract it chooses. Across the countries in this report it makes up between a fifth and a half of what a household pays per kWh: about 21% in Slovenia, 23% in Denmark, 34% in Belgium, 40% in Sweden and 50% in Norway ([Figure 1.2](#)).^[1, C1] How strongly a network tariff can steer behaviour depends on that share and on how much the tariff itself varies, for example between cheap and expensive hours or between a low and a high peak.

Across Europe, regulators and grid operators are rewriting household network tariffs to reward lower peaks. Where the effect has been measured, peaks fell by a few per cent, and by no more than about 7%.^[2, pp. 6–7, 10, 15–17, 3–6] Where a visible group saw its bill jump, politicians stepped in, sometimes within weeks.^[7–9] Countries also differ in whether the new tariff applies to everyone or only to households that choose it. Some are adjusting their designs because fixed cheap hours risk creating a new peak when many devices switch on as soon as those hours begin.

Three designs in use

The new network tariffs follow three basic designs. The first charges each household for its own peak demand. Norway has done so for every household since July 2022, using wide price steps (for example 2–5 kW or 5–10 kW) based on the three highest hourly peaks of each month; Flanders, with its capacity tariff, has charged households per kW of their highest quarter-hour of the month since January 2023; and in 2022 Sweden's regulator ordered all its grid companies to introduce a peak-based charge by January 2027.^[2, pp. 6–7, 10, 15–17, 9–11] The second design varies the price per kWh by time of day. Most Danish grid companies charge about nine times as much per kWh between 5 and 9 pm in winter as at night, automatically for every customer, and the Netherlands plans a similar tariff for all households from 2029.^[12, 13, C2] Austria added a lighter variant in 2026: a 20% discount on the per-kWh network charge between 10 am and 4 pm from April to September, when solar output is highest.^[14, 15] In the third design, each household has a reserved level of power, which it either chooses itself or is given by the grid operator. Every Spanish household chooses how many kW to reserve, with a separate and almost free level for nights and weekends, and in Slovenia the grid operator sets each household's reserved power automatically for five time blocks, based on the household's own peaks of the previous year.^[16–18]

Measured effects are a few per cent

Few of these tariffs have been evaluated ([Figure 1.1](#)). Norway's regulator had its reform evaluated with national meter data in 2025: peaks had been affected only to a small degree.^[2, pp. 6–7, 10, 15–17] Ellevio, one of Sweden's three largest grid operators and the first of the three to introduce the peak charge, measured 2–3% lower peaks after a year.^[3] A Ghent University study of about 42,000 Flemish households found monthly household peaks about 3% lower on average and about 5% lower in homes with an electric car.^[4] In California, time-of-use prices that two utilities applied by default cut peak use by between 1 and 7%.^[5, 6] Forecasts made before a tariff starts are higher. In the Netherlands, a national programme on grid congestion, run jointly by government, regulator, grid companies and suppliers, estimated in advance that the planned tariff would lower peak load by 11%; Fluvius's scenarios for a Flemish time-of-use tariff showed 10–20%.^[19, 20] The studies use different measures and methods, so together they show a pattern rather than precise, comparable figures.

The effect comes mainly from households with devices whose electricity use they can move to other times. The Flemish study found only a small, statistically insignificant change in households without low-carbon technologies such as an electric car, home battery or heat pump.^[4] In Spain, 63% of households reserve more power than they use and 44% said at the end of 2023 that they ignore hourly price differences; in Norway, about half of the population does not know that its grid bill depends on its peak.^[2, pp. 6–7, 10, 15–17, 16] A network tariff therefore tends to work best through devices that respond on their own, which Chapters [2](#) and [3](#) look at more closely.

When bills jump, politics steps in

In several countries, a new network tariff met political resistance as soon as a visible group saw its bill rise. Slovenia moved every household to its five-block tariff in October 2024 without a transition phase.^[18] Households with solar panels saw their annual network bills rise by more than 200%.^[7, 8] Those bills had been low because the panels reduce how many kWh a household takes from the grid; but the panels do little for the winter evening peak, and the new tariff charges mainly for that peak.^[21] Parliament passed an emergency law unanimously within weeks, although the regulator and parliament's own legal service warned that it encroached on the regulator's independence.^[7, 8] In Sweden, the regulator's 2022 decision gave every grid company until January 2027 to introduce a peak-based charge; in March 2026, less than ten months before that deadline, the government stopped the obligation.^[9, C3] Norway postponed its reform by six months in 2021 and later extended the transition phase.^[10, 22]

A reform of the tariff structure does not raise what a grid operator collects in total. Its total revenue is capped by the regulator; the reform changes who pays how much.^[23] Public debate in parliaments and the media nevertheless often treated such reforms as a price rise, as in Sweden, and analyses of who would pay more and who less were often not published in advance. When Ellevio returned to its old tariff in June 2026, that brought it no extra revenue either.^[24]

Default or choice, and the risk of new peaks

Most of the countries in this chapter apply the new tariff to everyone: Norway, Denmark, Slovenia, Spain and, from 2029, the Netherlands.^[2, pp. 6–7, 10, 15–17, 12, 13, 16, 18] A tariff that applies to everyone reaches every household but risks the kind of political backlash described above; an opt-in tariff avoids that risk but, as [Chapter 3](#) shows for other optional schemes, tends to reach only a few per cent of households.

Fixed cheap blocks carry a risk of their own. Because the cheap hours start at the same moment for everyone, devices set to follow them, such as car chargers on a timer, can all switch on together and create a new peak. Research on electric-car charging has found such peaks at the start of cheap periods, and in one Danish neighbourhood with many electric cars, 76% of the moments when the local transformer was loaded beyond its capacity fell in the cheap night window.^[25, 26] One answer is to combine fixed cheap hours with a charge on each home's own peak. The peak charge gives every household a reason not to switch everything on at full power at once, while the fixed windows still point to the cheaper hours. Austria's draft rules for 2027 do this: they would charge each home for its highest quarter-hour of the month and, on top of that, keep fixed windows in which the per-kWh charge is lower.^[27]

What this means for Belgium

- **Regulators and grid operators** could build an evaluation into every new network tariff, with meter data and a survey, as Norway did.^[2, pp. 6–7, 10, 15–17] The Flemish capacity tariff has been assessed by Fluvius and by an independent university study; Wallonia's optional time blocks and Brussels' planned tariff could be evaluated in the same way from the start.^[4, 28–31]
- **Regulators and grid operators** could publish, before a tariff starts, who will pay more and who less, and phase in the change. Slovenia's softened tariff now brings in its winter prices step by step over

three winters.

- **Regulators** designing time blocks could check whether new peaks appear at the start of cheap windows, and consider combining blocks with a peak charge, as Austria plans.^[27]
- **Governments** may expect pressure when a visible group sees its bill rise, and could prepare for it with a published analysis of who pays more and who less, rather than with emergency changes.

HOW WE CALCULATED

C1 Network share = network component ÷ total household price per kWh (energy + network + taxes), Eurostat 2025, consumption band DC: Slovenia 21.3%, Denmark 23.1%, Belgium 33.8%, Sweden 39.7%, Norway 49.7%.

C2 Danish winter network rates: peak = 3 × the normal rate and night = 1/3 of the normal rate, so peak ÷ night = 3 ÷ (1/3) = 9 (Danish Utility Regulator, 2024).

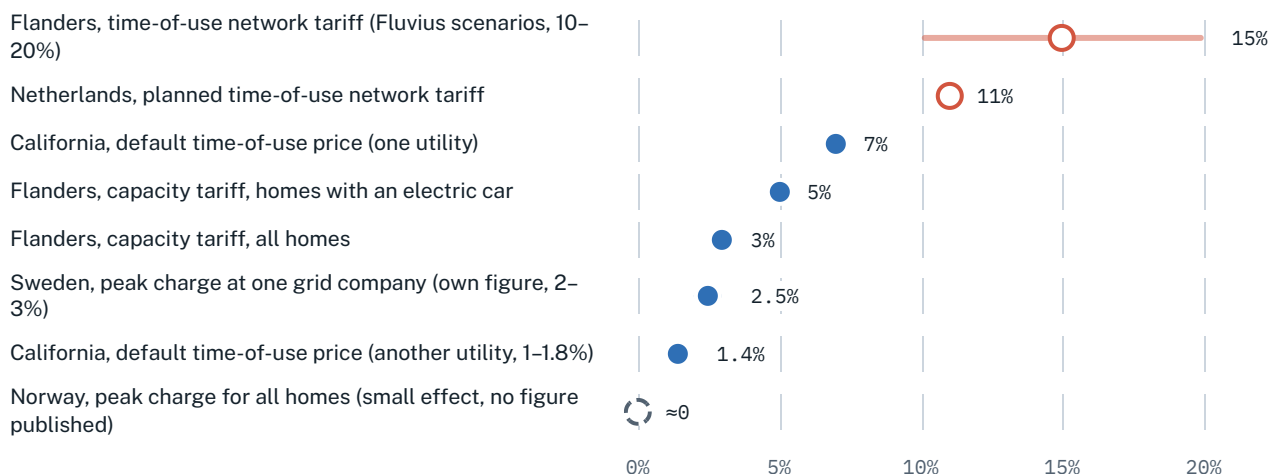
C3 Swedish government stopped the obligation on 13 March 2026; the deadline was 1 January 2027: 13 March 2026 to 1 January 2027 = 9 months and 19 days, so less than ten months.

FIGURE 1.1

Network tariffs have reduced measured household peaks by 0–7%; forecasts made in advance are higher

○ Forecast before the tariff started ● Measured after it started

⌚ Measured, no percentage published

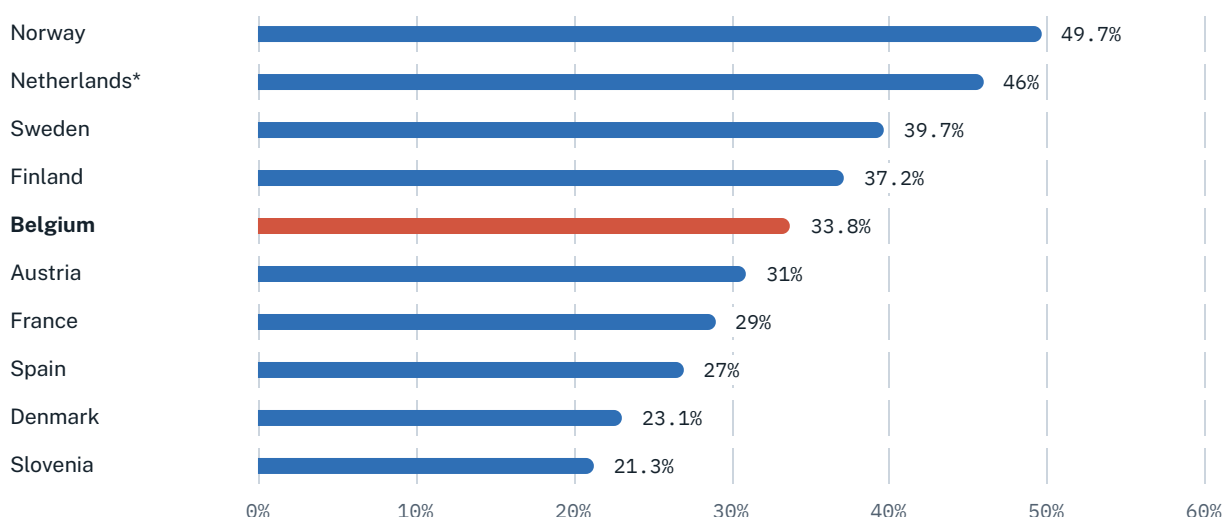


Forecasts concern the system peak, measurements mostly the household's own peak; capacity charges and time blocks are different instruments; the Californian figures are default retail prices that bundle network and energy; the Swedish figure is the grid operator's own.

SOURCES [2–6, 9, 19, 20]

FIGURE 1.2

Network costs are between a fifth and half of what a household pays per kWh



Share of network costs in the average household price, 2025, consumption band 2,500–4,999 kWh. *The Dutch share is inflated because a tax rebate makes net taxes negative; the Norwegian share is high because energy was cheap in 2025.

SOURCES [1]

TABLE 1.3

Most countries apply their household network tariff to everyone; few have measured what it does

WHERE	DESIGN	WHO IT APPLIES TO	MEASURED EFFECT
Norway	Monthly peak in kW steps, plus per-kWh charge cheaper at night	Mandatory since 2022	Peaks 'affected only to a small degree'
Sweden	Fuse size plus per-kWh; peak charge optional again since 2026	Obligation scrapped 2026	2–3% lower peaks at one grid company (own figure)
Denmark	Per-kWh by time of day; winter peak about 9× the night	Automatic at 27 of 36 grid companies	Not measured
Slovenia	Per kW of power set for five time blocks, plus per-kWh	Mandatory since 2024, softened 2025	Not measured
Spain	Per kW reserved by the household (two periods), per-kWh in three periods	Mandatory since 2021	63% reserve too much (survey)
Austria	Per-kWh plus flat fee; 20% midday summer discount; peak charge drafted for 2027	Automatic where quarter-hourly metering is switched on	Not yet measured
Netherlands	Planned: two-thirds per-kWh in time blocks, one-third fixed	Mandatory, planned for 2029	Forecast: 11% lower peak
Flanders	Monthly peak per kW (minimum 2.5 kW), plus per-kWh and fixed fee	Mandatory since 2023	About 3% lower peaks; 5% with an electric car
Wallonia	Per-kWh; five-block time-of-use option	Opt-in since 2026	Not measured
Brussels	Per-kWh (single or day/night) plus a fixed charge linked to connection capacity; a chosen-capacity charge and three time blocks are being prepared	No new design yet; planned only for smart-meter households that agree to share their data	Not applicable yet

SOURCES [2, 4, 7, 9, 12, 15, 16, 29–32]

WHERE BELGIUM STANDS

Belgium has three regional network tariffs for households, each set by the energy regulator of that region. In Flanders, the capacity tariff was due to start in January 2022 but was postponed twice, each time by six months, because the grid operator's market IT systems were not ready. In July 2022 the then Flemish energy minister took the regulator to the Brussels Court of Appeal to delay it further; the tariff started on 1 January 2023, and the court rejected the case in early 2023.

Since then, every Flemish household with a digital meter pays for its highest quarter-hour of each month (averaged over the last twelve months, with a minimum of 2.5 kW), on top of a per-kWh charge and a fixed fee; there is no time-of-day element. In 2026 the peak charge is about €49–57 per kW per year before VAT, depending on the area; in the regulator's price report, all network-use charges together made up about 18% of a typical household electricity bill. Two analyses of its effect exist. After the first year, Fluvius reported that the grid was used 8.3% more efficiently than in 2022. A Ghent University study of about 42,000 households finds monthly household peaks about 3% lower on average and about 5% lower in homes with an electric car, and only a small, statistically insignificant change in households without low-carbon technologies such as an electric car, home battery or heat pump; the two analyses use different measures and methods.

In 2025 Fluvius modelled adding time-of-use blocks and estimated that they could lower the system peak by 10–20%, but concluded that, for now, prices that vary by time of day should come from suppliers' energy contracts rather than from the network tariff. In October 2025 the Flemish regulator decided not to introduce time-of-use network charges, judging that the uncertain benefits did not outweigh the risks, complexity and cost, and asked Fluvius to study a time-dependent refinement of the capacity tariff instead.

Since January 2026, Walloon households with a communicating meter can opt into a network tariff with five time blocks. Brussels has no time-of-use or peak-based network charge yet: households pay per kWh plus a fixed charge linked to their connection capacity. A design with a capacity chosen by the household and three time blocks is being prepared, for households with a smart meter that agree to share their data; it is now expected in two steps, with the time blocks from 2030.

SOURCES [4, 11, 20, 28–31, 33–43] · Statement by statement: [p. 139](#)

Examples (8)



Norway

Norway charges every household for its monthly peak; an official evaluation found that peaks barely moved.

WHO	The national energy regulator set the rule; each of the 77 grid companies with household customers designs its own version
WHAT	Since July 2022 every Norwegian grid company must charge households partly by their peak demand: a household is placed in a price step (for example 2-5 kW or 5-10 kW) according to the average of the three highest hourly peaks of the month. On top of that comes a per-kWh charge, which most grid companies make cheaper at night. Both parts are fixed in advance, so the network tariff is not 'dynamic'; the dynamic part of a Norwegian bill is the supplier contract, where nearly all households pay the hourly wholesale price. In 2025 the regulator had the reform evaluated with national meter data, a survey of about 1,000 people and interviews with grid companies. Chapter 2 describes how, since late 2025, most southern Norwegian households have swapped that hourly price for a fixed state price.
SCALE	All Norwegian households (about 2.7 million) since 1 July 2022; 77 grid companies with household customers; evaluation published October 2025.
EFFECT ON THE SYSTEM	Measured, and close to nil: the evaluation concludes that peak loads 'have been affected only to a small degree', with adjustments 'without a clear effect on the load on the grid'. It gives no percentage.
EFFECT ON THE BILL	For a typical household in the 2-5 kW step, the peak-based part costs about NOK 1,530-2,400 a year (about €130-205). Only about half of the population knows that the grid bill depends on the peak.
WHY IT WORKED, OR DID NOT	The steps are wide, so ordinary changes in behaviour rarely move a household to a cheaper step; the charge is settled every month, so a summer peak costs as much as a winter one even when the grid has room to spare; and half of households do not know how the tariff works. The regulator now recommends 1 kW steps, a larger peak-based share and, in the longer run, a charge settled over the whole year that gives winter peaks more weight, tested first in voluntary pilots.

LESSON FOR BELGIUM Flanders also charges for the monthly peak, per kW rather than in wide steps, and shares two of Norway's weak points: every month counts the same, and many households do not know how the tariff works. Flanders has already evaluated its capacity tariff on meter data; Norway's recommendation to give winter peaks more weight, tested first in voluntary pilots, could inform the time-dependent refinement of the capacity tariff that the Flemish regulator asked Fluvius to study in 2025. Wallonia and Brussels do not charge households for their measured peak.

Regulator

Distribution grid operator

SOURCES [1, 2, 10, 22] · Numbers, source notes and further reading: [p. 140](#)

Slovenia put every household on a five-block peak network tariff at once; after one winter of bill shocks, parliament overrode the regulator.

WHO	The national energy regulator designed the tariff; the state grid operator, which runs both the transmission and the distribution grid, applies it; government and parliament later intervened
WHAT	Since October 2024 every Slovenian grid user pays the network tariff in five time blocks, with the most expensive block on winter working days at peak hours. In each block the household pays per kW for an 'agreed' quarter-hourly power that the grid operator sets automatically from the household's own measured peaks of the previous year, plus a smaller per-kWh charge; most network costs moved from kWh to kW. There was no opt-in and no phase-in. In the first winter the price per kW in the most expensive block was 3.75 times that in the next block.
SCALE	All grid users (about 880,000 household customers; 97% with a smart meter) since 1 October 2024; emergency law for January-February 2025; time blocks to be redrawn from 2027.
EFFECT ON THE SYSTEM	Not measured. No evaluation of the effect on peaks has been published; the design was changed before one could be made.
EFFECT ON THE BILL	Households with solar panels, with or without a heat pump, faced annual network bills more than 200% higher. Their bills started from a low base: solar panels cut kWh but not the winter evening peak, and the new tariff charges mainly for that peak. The emergency law lowered the price in the most expensive block to the level of the next block for two months, at a cost of about €19.5 million to the grid operator.
WHY IT WORKED, OR DID NOT	The tariff was cost-reflective, but it hit at once, without a transition phase, the households that electrification policy most wants to win, and many could not see the bill coming. Parliament passed the emergency law unanimously within weeks, although the regulator and parliament's own legal service warned that it encroached on the regulator's independence and might be unconstitutional. The regulator then softened the tariff itself: lower minimum powers, no penalty for exceeding the power the operator had set, and a phase-in of winter prices at 50%, 70% and 90% of their target over three winters.

LESSON FOR BELGIUM When a network tariff shifts money between households, regulators and distribution grid operators can publish beforehand who pays more and by how much, and phase in the change. Slovenia shows how quickly politicians can reverse an unpopular network tariff; in Flanders, the capacity tariff started on 1 January 2023, the date the regulator had set, despite a court case brought by the then energy minister. Wallonia's choice to make its five-block tariff optional, and Brussels' plan to apply time blocks only to households that agree to share their meter data, avoid that risk at the cost of reaching fewer homes.

Regulator

Distribution grid operator

Government

SOURCES [1, 7, 8, 18, 21, 44] · Numbers, source notes and further reading: p. 140



Sweden

Sweden ordered all grid companies to charge households for their peaks, then scrapped the order; Ellevio, one of Sweden's three largest grid companies and the first of them to introduce the charge, had measured 2-3% lower peaks.

WHO	The energy regulator imposed the obligation (2022); the government stopped it (March 2026); each grid company sets its own tariff within the regulator's rules
WHAT	In 2022 the Swedish regulator required all of the country's roughly 170 grid companies to add a charge based on each household's peak demand by January 2027. Ellevio, one of the three largest grid companies, started in January 2025, charging on the highest hourly peaks of each month for up to 40% of the grid bill. In March 2026 the government stopped the obligation, saying the tariffs were hard to understand and 'hit ordinary households too hard'; the regulator had to withdraw the rule by 30 June 2026 and has to propose a new model by April 2027. Ellevio returned on 1 June 2026 to its old charge based on fuse size plus kWh, and other grid companies dropped or paused their plans.
SCALE	About 170 grid companies; 30 to 50 used a peak-based charge before the stop; the obligation would have covered all households from 1 January 2027.
EFFECT ON THE SYSTEM	Measured at Ellevio: after almost a year, peaks were 2-3% lower, equivalent to room for about 10,000 extra houses without grid reinforcement.
EFFECT ON THE BILL	Revenue-neutral by design: the regulator caps each grid company's total revenue over a four-year period, so a new tariff shifts costs between customers rather than raising them, and the return to the old charge brings Ellevio no extra revenue either. More than 10% of Ellevio's customers changed their habits and 14% lowered their grid fee by spreading their use.
WHY IT WORKED, OR DID NOT	The measured effect was real but modest, and the public debate was about who pays more, with the tariff often portrayed as a price rise although the total collected stayed the same. Each grid company chose its own model, so neighbouring areas had different rules, which the government cited as unequal.

LESSON FOR BELGIUM A change in tariff structure alters who pays, not how much a distribution grid operator collects in total; Belgian regulators and grid operators can say so plainly and show beforehand how many households pay more or less, and by how much. In Sweden, public debate often treated the change as a price increase, and the government withdrew the obligation before it took full effect.

Regulator

Distribution grid operator

Government

SOURCES [3, 9, 23, 24, 45] · Numbers, source notes and further reading: [p. 141](#)

Most Danish grid companies charge nine times as much per kWh in the 5-9 pm winter peak as at night, for every customer; the effect has not been measured.

WHO	The grid companies, using a common model drawn up by their industry association and approved by the national utility regulator
WHAT	Most Danish grid companies charge households a per-kWh network tariff that depends on the hour: cheapest from midnight to 6 am, a normal rate during the day and late evening, and most expensive from 5 to 9 pm, the same hours across the country. In winter the peak rate is three times the normal rate and the night rate a third of it, so the peak costs about nine times the night; in summer the gap is much smaller (about 2.6 to 1). Every customer of these grid companies pays it automatically, and the supplier passes it on in a single bill.
SCALE	27 of 36 grid companies used a time-varying network tariff on 1 January 2024 (25 on the current model, 2 on an older one); 9 kept a flat rate.
EFFECT ON THE SYSTEM	Not measured: the regulator's 2024 review contains no estimate of how behaviour or the evening peak changed. A 2026 research case study of one residential area with many electric cars found that the tariff can also create new peaks: 76% of the moments when the local transformer was loaded beyond its capacity fell in the cheap night window, when many cars start charging at the same time.
EFFECT ON THE BILL	The network tariff is about 23% of the average household price (2025), so the 9:1 spread works on roughly a quarter of the bill. The regulator calculated that an electric-car owner who moves 400 kWh a month from the peak to the night saves up to DKK 775 a month in winter (about €104) and DKK 280 in summer (about €38), including VAT, at the grid company with the highest rates.
WHY IT WORKED, OR DID NOT	It is simple: fixed hours, the same nationwide, billed automatically on hourly meter data that every home has. Whether it changes behaviour has not been shown; for a household without a car, heat pump or battery the euro difference is small, and because the cheap window is identical for everyone, it can create new night-time peaks where many cars start charging as soon as the cheap window opens.

LESSON FOR BELGIUM Wallonia already offers an optional network tariff with time blocks and Brussels plans one from 2030; Flanders decided in 2025 not to add time blocks for now. A Belgian regulator using time blocks could borrow Denmark's simple, nationwide hours, plan a measured evaluation from the start, which Denmark lacks, and watch for new peaks when many devices switch on as the cheap window opens.

Distribution grid operator

Regulator

SOURCES [1, 12, 26] · Numbers, source notes and further reading: [p. 141](#)



Austria

Austria cut the per-kWh network charge by 20% around midday in summer, automatically for homes with quarter-hourly data, and plans a monthly peak charge from 2027.

WHO	The national energy regulator (E-Control), which sets network tariffs nationwide; grid companies such as Vienna's apply them
WHAT	From April to September 2026, Austrian households pay 20% less on the per-kWh part of their network charge between 10 am and 4 pm, when solar output peaks. No contract change is needed, but it only reaches homes whose smart meter records quarter-hourly values, which until now the customer had to switch on; at the end of 2024 that was about one meter in eight. Today an Austrian household network charge is mostly per kWh plus a flat yearly fee, with no charge on measured peaks. A draft from the regulator would add, from 2027, a charge on each home's highest quarter-hour of the month, keep the summer midday discount and add a cheaper night window in winter.
SCALE	Nationwide for households and small businesses on the low-voltage grid; 1.6 million smart meters in Vienna alone; quarter-hourly recording on 12.6% of meters at the end of 2024, to become the default for almost all homes from 2027.
EFFECT ON THE SYSTEM	Not measured; the first summer ended on 30 September 2026.
EFFECT ON THE BILL	Not reported in euros. The discount applies only to the per-kWh network part of the price, so the saving per kWh moved into the window is modest.
WHY IT WORKED, OR DID NOT	Simple, automatic and tied to an easy-to-remember moment (summer middays, when solar output is high), so there is nothing to choose. But because quarter-hourly recording was opt-in, most households could not benefit automatically in the first year; the tariff itself becomes a reason to switch the data on, and the new electricity law makes quarter-hourly data the default from 2027.

LESSON FOR BELGIUM Austria is heading for a monthly peak charge combined with fixed cheaper windows, applied by default. Flanders already has the peak charge and reads quarter-hourly peaks from every digital meter; the Austrian draft offers a worked example for the time-dependent refinement of the capacity tariff that the Flemish regulator asked Fluvius to study in 2025. Brussels is preparing a comparable mix of a capacity chosen by the household and time blocks, and Wallonia already offers optional time blocks.

Regulator

Distribution grid operator

SOURCES [1, 14, 15, 27, 46, 47] · Numbers, source notes and further reading: [p. 142](#)

The Netherlands plans to put every household on a time-of-use network tariff from 2029; the expected 11% lower peak is a forecast, not a measurement.

WHO	The grid companies' association (Netbeheer Nederland) proposed it; the national regulator (ACM) decides
WHAT	In May 2026 the Dutch grid companies jointly asked the national regulator to rewrite the household network tariff. Today it is a fixed yearly amount that depends only on the size of the connection; under the proposal about two-thirds would depend on how many kWh a household uses and when, and one-third would stay fixed. A day would have up to four price levels across five time blocks, with summer and winter versions, most expensive in the evening and cheapest around midday. It would apply to every household and small business without opt-in, and reach them through their supplier's bill; the planned start is January 2029.
SCALE	All small connections (households and small businesses); proposal published by the regulator on 13 May 2026; planned start 1 January 2029, or 1 January 2030 if national metering and data rules are not ready by 1 December 2026.
EFFECT ON THE SYSTEM	Not measured; the tariff does not exist yet. The expected 11% lower peak load, enough to make room for 700,000 extra homes or 500,000 charge points by 2030, is an advance estimate from the national grid-congestion programme of government, regulator, grid companies and suppliers (late 2025); the formal proposal gives no figure. Measured effects of comparable tariffs elsewhere are smaller: about 3% for the Flemish capacity tariff and 2-3% at one large Swedish grid company, and 1-2% to about 7% for default time-of-use prices at two Californian utilities.
EFFECT ON THE BILL	Not yet calculated publicly: the proposal contains no estimate of who pays more or less. Households that can move use away from the evening (timed car charging, a buffered heat pump, a home battery) stand to gain; households with fixed evening use pay more.
WHY IT WORKED, OR DID NOT	The design is simple (few blocks, fixed hours) and mandatory, which avoids the low uptake of optional tariffs. The main risk, raised by the study behind the proposal and by research on electric cars elsewhere, is that many devices automatically increase their consumption at the start of a cheap block and create new, larger peaks.

LESSON FOR BELGIUM Flanders and the Netherlands are approaching the same mix from opposite ends: Flanders charges for the peak without time blocks, while the Netherlands plans time blocks with a fixed remainder. Wallonia already offers time blocks as an option and Brussels plans them from 2030. The Dutch case also shows that an advance estimate can sit well above the effects measured elsewhere, which argues for planning a measured evaluation alongside any new design.

Regulator

Distribution grid operator

SOURCES [1, 13, 19, 25, 32, 48] · Numbers, source notes and further reading: [p. 142](#)



Spain

Every Spanish household chooses how many kW to reserve in its network tariff; most reserve too much, and almost nobody uses the separate, almost free level for nights.

WHO	The national regulator, which sets the network tariff, and the government, which sets the other regulated charges; suppliers pass both on unchanged
WHAT	Spain's network tariff for households, together with the other regulated charges set with it, has two parts, the same whatever supplier a household uses. The per-kWh part depends on the hour: in 2026 about 9.8 euro cents in the weekday peak, 2.9 cents in the shoulder hours and 0.3 cents at night and at weekends. The other part is a yearly charge per kW of power that the household itself reserves through its supplier and that the smart meter enforces by cutting the supply when it is exceeded. Since 2021 a household can reserve one level for weekday daytime (8 am to midnight, about €28 per kW per year, roughly half the Flemish capacity charge) and a higher one for nights and weekends (under €1 per kW per year), and can change the levels once a year.
SCALE	All households and small users up to 15 kW, about 30 million supply points, since June 2021; regulator survey of household behaviour at the end of 2023.
EFFECT ON THE SYSTEM	Not measured as an effect on peaks. A regulator survey measured behaviour: 63% of households reserve more daytime power than their actual peak, on average 1.11 kW too much (67% and 1.6 kW for nights and weekends); only 2.5% reserve different levels for the two periods; and 44% take no account of hourly price differences at all.
EFFECT ON THE BILL	Reserving 1.11 kW too much in the daytime period costs about €31 a year in network and regulated charges at 2026 prices (before taxes and supplier margin). Reserving more for nights and weekends costs almost nothing, so an electric-car owner could charge at night with a high limit while keeping a low daytime limit; very few do.
WHY IT WORKED, OR DID NOT	Choosing a kW level is a one-off decision that most households never revisit; because exceeding it cuts the power, people keep a safety margin; and the night setting only pays off for homes with a large night-time load. The per-kWh time differences are large, yet many households say they ignore them.

LESSON FOR BELGIUM Flanders charges for the measured monthly peak and Wallonia mainly per kWh, so households there do not choose a kW level. Brussels, however, is preparing a tariff in which households with a smart meter choose a capacity. Spain shows that households who must choose reserve too much and rarely revisit the choice, so a chosen-capacity design may need well-set starting levels, easy changes, or devices that keep use below the limit.

Regulator

Distribution grid operator

SOURCES [1, 16, 17, 33, 49] · Numbers, source notes and further reading: [p. 143](#)



Austria

Austria built thousands of energy communities on network discounts; the regulator's cost-benefit review found no grid relief, little lost network revenue and clear extra costs.

WHO	Households, firms and municipalities in energy communities; the national energy regulator (E-Control), which evaluated the scheme as the renewable-energy law requires, with data from grid operators
WHAT	Since 2021 Austrian households, firms and municipalities can form energy communities that share locally produced electricity, mostly solar, over the public grid, settled per quarter-hour on meter data. Each shared kWh gets a discount on the per-kWh network charge when members are close by (57% within the local grid, 28% regionally). The law required the regulator to check costs and benefits, and it did so in March 2024: network revenue forgone was about €110,000 a year against about €2.5 billion in total network revenue; grid operators reported clearly higher administration, IT and metering costs, but their request for €200 per participant per year was judged too high; and grid operators saw no grid relief so far.
SCALE	Analysis based on 396 communities with 3,760 metering points (mid-2023); about 3,800 renewable energy communities by mid-2025.
EFFECT ON THE SYSTEM	Measured at an early stage: grid operators observed no grid relief, on data covering only short periods.
EFFECT ON THE BILL	Members save part of the network charge and some levies on shared kWh: across all communities the network discount totalled about €110,000 in 2023. For a Vienna household sharing 1,200 kWh a year, an illustrative calculation puts the saving at about €57 a year.
WHY IT WORKED, OR DID NOT	Sharing happens in the billing, not physically on the grid: neighbours' solar output at midday is matched to their use on paper, so the grid sees little difference while billing and data work grows. A discount on kWh does not reward using the grid at better times.

LESSON FOR BELGIUM A cost-benefit study for the Flemish regulator (2023) reached the same conclusion as Austria's review: members use most power on winter evenings and produce most on summer middays, so sharing generally does not change what the grid operator must invest, and the study advised against network-tariff discounts for it. Flemish energy sharing leaves network charges and levies unchanged, so it avoids Austria's lost network revenue. Uptake is small: 0.28% of Flemish connection points took part at the end of 2024, and in the regulator's worked example two households lost €154 a year by sharing; only contracts without a supplier fee for sharing broke even, at the typical 24% of their solar output that households manage to share. The Brussels regulator commissioned a similar study in 2023; we found no comparable evaluation for Wallonia.

Government

Regulator

Distribution grid operator

SOURCES [50–56] · Numbers, source notes and further reading: [p. 144](#)

What scales is a simple offer built around a device, not exposure to hourly prices

The supplier contract sets the price of the energy itself, a little under half of the average Belgian household price per kWh in 2025; network charges, levies and taxes make up the rest (see [Chapter 1](#)).^[1, C4] A contract can reward flexible use in four ways: a dynamic price that follows the wholesale market; fixed cheap and expensive time blocks, known as time-of-use; a tariff built for households with one device, such as an electric car or a heat pump, sometimes called type of use; or an ordinary fixed or variable price plus a reward for letting the supplier steer a device. The forms can be combined: most British car tariffs, for instance, are aimed at car owners and also have a cheap night window.^[57, pp. 5–14]

On its own, a time-varying price rarely changes what households do: where large groups were moved onto such prices by default, in Spain and California, evaluations found little or no response.^[5, 58] The contracts that are growing, as in Britain and the Netherlands, are sold around a device, usually an electric car and sometimes a heat pump or home battery, and rely on automatic control of that device, whether the price is fixed or changes every hour. In Britain, car tariffs accounted for nearly nine-tenths of the increase in households on smart time-of-use tariffs between July 2024 and July 2025.^[59, pp. 3, 21, C5] Simple price differences, such as fixed cheap hours, matter mainly where people shift their use themselves.

A time-varying price on its own changes little

Since 2015, Spanish households that never choose a supplier offer have stayed on a regulated default tariff whose energy price follows the hourly wholesale market.^[58, 60] At the end of 2025, 27.4% of households were on it.^[61] Since 2024, a growing part of its price has been based on electricity bought months ahead, which smooths out the hourly swings.^[60] A study found that households on this tariff reacted to price changes no differently from households on fixed prices.^[58] From 2019, California moved several million households by default to a regulated time-of-use price covering both energy and network costs; at the first utility, about a quarter did not know they had been moved, and measured peak use fell by 1.0 to 1.8%.^[5, 62, 63, C6] A chosen contract does not guarantee a response either: in a Dutch survey, only 19% of heat-pump owners with a dynamic contract let the heat pump follow prices automatically.^[64]

When many households pay a price that follows the wholesale market, a sharp price rise can quickly become a political problem, as in Norway and Spain, and governments then step in to protect households.^[60, 65] How they do so decides whether households still have a reason to avoid expensive hours. Norway, where nearly all households pay the hourly spot price, first based its support during the 2021–2022 energy crisis on the monthly average price.^[65] That support did not depend on when a household used electricity, so moving use to cheaper hours still paid off. From September 2023 the support was based on each hour's price instead, which largely removed that reason.^[65] Since October 2025 households can also choose a flat state price, and by April 2026 about two-thirds of households in southern Norway had done so.^[65, 66] Ireland takes a different approach. Its energy regulator requires the five largest suppliers to offer a dynamic contract that keeps half-hourly prices but caps the part linked to the wholesale price at €0.50 per kWh.^[67, 68] From 2021 to 2023, a period that includes the 2022 price crisis, the wholesale price exceeded that level in only 0.6% of trading periods.^[67] The cap is also affordable for suppliers: above that level, Ireland's capacity market already pays them back the difference, so they are largely protected against such price spikes.^[67]

Automatic control does the work, whatever the price

Where flexible use has grown, the response mostly comes from devices that react on their own. The number of British households on smart time-of-use tariffs rose from 497,000 in July 2024 to 835,000 in July 2025; over that year car tariffs grew 84% and other smart tariffs 27%.^[59, pp. 3, 21] In many car tariffs the supplier

decides when the car charges: at the end of 2025, over 300,000 British households let their supplier steer a device, and by August 2026 one supplier alone did so for over half a million drivers.^[57, pp. 5–14, 69]

Software that steers a device can follow any price, so the price the household sees does not have to be simple. Dutch dynamic contracts often come with an app that steers a home battery or car on the hourly price; in other offers the household pays a fixed price and the software works in the background.^[70] A British car tariff gives the household one low night rate, while the supplier combines the cars of many customers and uses their flexibility in the electricity markets (see the box on Octopus).^[71, 72] A Finnish supplier offers heat-pump owners a cheaper fixed window only as long as its software partner is allowed to steer the heat pump; a large Dutch supplier pays customers on fixed and variable contracts for steering their home battery.^[73–75] Because the device responds without any effort from the household, the reward can be modest: in November 2025, energy in the Finnish contract's cheap window cost about 18% less than at other times of day.^[76, C7]

A few companies now sell the device, the steering and the contract together. The British supplier Octopus started from the contract and added the device: it designs and builds its own heat pump and sells it with a heat-pump tariff with cheap windows.^[77–79] The Dutch heat-pump maker Quatt went the other way: it had about 15,000 heat-pump systems running in Dutch homes in 2025 and added a home battery, its own energy management software and a dynamic electricity contract; the software steers the heat pump and the battery on the wholesale price.^[80, 81] We found few other companies that sell all three.

Simple prices matter most when people respond themselves

Contracts with simple, easy-to-understand price differences tend to be taken up faster. Simplicity matters mainly where people respond to the price themselves, not where software does it for them. With fixed cheap hours, a household knows in advance which hours are cheap and can set a charging timer or a thermostat schedule once to follow them. A British heat-pump tariff with three cheap windows a day and an expensive one from 4 to 7 pm halved measured evening use in 6,631 homes, averaged over all days, from about 0.9 to 0.45 kW, without raising daily use.^[79, 82, p. 31, C8]

The evidence is thin. For simple tariffs and steering, almost all figures on steered devices, shifted consumption and savings come from the companies themselves, while regulators mainly count how many households are on each type of contract.^[83, 84] The only large measured effect comes from a study run by Octopus's own research arm on customers who chose a specific heat-pump tariff.^[82, p. 31]

Why Flanders is behind the Netherlands and Britain

The share of Flemish households on a dynamic contract is rising fast from a very low base: 0.29% at the start of 2025, 0.89% in December and 1.36% in April 2026, against 8% in the Netherlands in July 2026.^[83, 85, pp. 10–12] Britain leads in device tariffs instead: 2.8% of households were on a smart time-of-use tariff in July 2025, 653,000 of them on a car tariff.^[59, pp. 3, 21]

The examples in this chapter point to three reasons. First, 34 dynamic products were on offer in Flanders at the end of 2025, but in a study of 1,014 Flemish households a dynamic contract brought, on average, neither a clear gain nor a clear loss; for a household without a device to steer, not switching can therefore be a reasonable choice.^[85, p. 10, 86] Second, a Belgian supplier can offer a discount only on the energy part of the price, while a British supplier sets one all-in price per kWh, network costs included: in Britain the supplier pays the network charges itself and is free to fold them into the price it sets.^[87–89] At night, the leading British car tariff charges 71% less than the capped standard rate; the reward of 1.5 euro cents per smart-charged kWh that two Belgian suppliers pay is about 4% of the price per kWh in a fixed contract in October 2026, before the capacity charge and fixed fees.^[71, 89–93, C9] Third, the suppliers that drove growth abroad sell the price together with software that does the steering: newer Dutch suppliers that pass on the wholesale price at cost for a fixed monthly fee, with an app that steers a battery or car, and British suppliers

such as Octopus that run their own steering platform.^[69, 70, 72, 94, 95] Such suppliers have only a small Belgian market share, and two large Belgian suppliers chose fixed time blocks instead.^[85, p. 24, 87, 88, 96, p. 4] Dutch households also have a specific reason to look at such offers now: net metering, which lets solar-panel owners offset the electricity they feed into the grid against what they take from it, ends on 1 January 2027.^[70, 97]

What this means for Belgium

- **Suppliers** could make steering itself the product: a low fixed price or a cheap window in return for permission to steer the car, battery or heat pump, building on today's smart-charging rewards.^[90–92] Under the Flemish capacity tariff, such steering may also need to limit charging power, so that it does not raise the household's monthly peak.^[98]
- **Manufacturers and installers** could make price-following control standard and, when they install a heat pump, set a schedule for fixed cheap windows.
- **Regulators** could extend the monthly count of fixed, variable and dynamic contracts to time-of-use and steering contracts, and support studies of how newer types of contract affect actual consumption profiles.^[84] Their price comparison tools, such as the Flemish V-test, could likewise include time-of-use contracts.^[99]
- **Governments and regulators** may expect little from moving households onto hourly prices by default. Before the Flemish duty to offer a dynamic contract reaches all suppliers in 2029, they could design crisis protection that still gives households a reason to avoid expensive hours, such as support based on the monthly average price, or a cap like Ireland's.^[67, 100]

HOW WE CALCULATED

C4 Energy and supply €0.1541 ÷ total €0.3536 per kWh (energy and supply €0.1541 + network €0.1196 + taxes and levies €0.0799), average Belgian household price, Eurostat 2025 ≈ 44%, a little under half.

C5 Ofgem counts for July 2024 and July 2025: households on car tariffs 354,000 → 653,000 (+299,000, +84%); households on all smart time-of-use tariffs 497,000 → 835,000 (+338,000); 299,000 ÷ 338,000 ≈ 88%, nearly nine-tenths of the increase.

C6 74% of the first utility's (SDG&E) customers knew they had been moved, so 100% – 74% = 26%, about a quarter, did not.

C7 Väre's launch prices for energy: $(8.28 - 6.78) \div 8.28$ euro cents per kWh = $1.5 \div 8.28 \approx 18\%$ less in the cheap window.

C8 Average use between 4 and 7 pm fell from 0.44 to about 0.22 kWh per half-hour; × 2 half-hours per hour ≈ 0.9 and 0.45 kW (NBER Working Paper 33036, Table 2).

C9 $(26.32p - 7.6p) \div 26.32p \approx 71\%$ below the capped standard rate (October 2026); 1.5 euro cents ÷ about 34.1 euro cents per kWh in Eneco's fixed contract (October 2026, before the capacity charge and fixed fees) ≈ 4%.

WHERE BELGIUM STANDS • PRICES AND CONTRACTS

In Flanders, 1.36% of households had a dynamic electricity contract in April 2026, up from 0.29% at the start of 2025 and 0.09% at the start of 2024; at the end of 2025, 18 suppliers offered 34 dynamic products. About three quarters of households pay a variable price that changes monthly and the remaining quarter has a fixed price. For Belgium as a whole, Elia counted about 11,000 dynamic contracts at the end of 2024. Two large suppliers launched time-of-use contracts with fixed cheap and expensive blocks instead; one had nearly 25,000 customers within a year. The Flemish regulator's price comparison tool, the V-test, sorts contracts into fixed, variable and dynamic, and in October 2026 it did not yet include these time-of-use contracts, although it can already calculate what a contract with a different price per time block would cost on a household's own quarter-hourly values. A Flemish study of 1,014 households found that a dynamic contract brings, on average, neither a clear gain nor a clear loss. Some suppliers also pay for permission to steer a device: one pays a reward for steering electric-car charging or a home battery on any of its contracts, while another pays a flexibility reward only with its market-indexed contract. A Flemish decree of July 2026 extends the duty to offer a dynamic contract to suppliers

with more than 50,000 customers in 2027 and to all suppliers in 2029. In June 2026, 5.9% of Flemish homes with a digital meter had their meter set so that the supplier receives quarter-hourly readings (known as SMR3); the supplier arranges this switch when a household signs a dynamic contract.

In Brussels, where one supplier serves 73% of households, the first dynamic offers appeared in March 2025 and three suppliers offered five of them at the end of 2025; at that point fewer than 5,000 households had a smart meter in the quarter-hourly regime that such a contract requires, and just over 1% of them had signed one. In Wallonia, the regulator's price comparison tool has listed dynamic offers since June 2025; they too require a communicating meter with its communication function switched on.

SOURCES [84–87, 90, 96, 99–106] · Statement by statement: p. 145

WHERE BELGIUM STANDS · DEVICE-BASED OFFERS

Belgian suppliers sell simple contracts that reward flexible use in three forms. First, two large suppliers sell contracts with fixed cheap hours: at night, and at weekends or on summer weekdays around midday. The first 8,000 customers of one of these contracts used 45% of their electricity in the cheapest hours, having moved about 15% of their consumption there since switching. Second, two suppliers pay 1.5 euro cents for every kWh of car charging that the customer allows them to schedule, on top of an ordinary fixed or variable contract. In October 2026 that is about 7% of the energy price in a fixed contract, or about 4% of the full price per kWh. A third supplier's app instead schedules charging in the cheapest hours of the customer's own contract; with its time-of-use contract, the super off-peak hours are up to 50% cheaper. Third, some offers give free energy in hours announced a day ahead, or pay a monthly reward to households that install a box so a partner can steer their battery or charger.

Two differences with Britain stand out. A Belgian supplier can discount only the energy part, a little under half of the average Belgian household price per kWh in 2025; network charges, levies and taxes make up the rest. And apart from the analysis of the first 8,000 customers mentioned above, we found no published figures from suppliers on how many devices they steer or how much consumption they shift.

In Brussels, one of these suppliers launched its time-of-use offer in October 2025, open only to households with a smart meter in the quarter-hourly regime. We found no public information on how widely these offers are available in Wallonia.

SOURCES [1, 85, 87, 88, 90–93, 98, 103, 107–111] · Statement by statement: p. 146

BOX

Who benefits from flexibility?

Flexibility can help households in three different ways, and each reaches different people.

First, it can make going electric affordable. In a British study of 6,600 heat-pump homes on a tariff with fixed cheap and expensive hours, households saved £318 (about €370) a year on average, most of it by shifting. Such savings depend on suppliers offering the right tariff: a British charity's model found that the best saving for a typical heat-pump home fell from £504 to £180 a year once the dedicated heat-pump tariffs in its comparison were withdrawn.

Second, households can save by reacting to prices themselves. Britain's energy regulator linked a survey to the meter data of about 1,000 homes. The quarter of homes with the largest potential could shift about 243 kWh a year, mostly by charging a car at night; half of all homes could shift less than a tenth of that. The homes with the smallest potential were more often rented and on lower incomes. Moving a quarter of laundry to off-peak hours saves an average household only about £10 a year.

Third, households can earn money by letting a third party sell their flexibility. In a British trial with 37,000 households, those in vulnerable situations took part as often as others, but car owners shifted more than three times the average. A few households on tight budgets cut essential use to earn rewards.

Headline figures such as 'up to £523 a year' are modelled best cases for well-equipped homes, not typical results. We found no Belgian data on who takes part in flexibility offers or who gains from them.

SOURCES [82, 112–115] · Statement by statement: [p. 146](#)

BOX

Octopus: what one supplier does at scale

One British supplier, Octopus Energy, shows what household flexibility can look like at scale. It supplies over 7.7 million British homes and 11 million worldwide. Most of its flexibility offers are built into its electricity tariffs rather than sold as separate contracts. Over half a million electric-car drivers let it decide when their car charges, in return for a night rate about 70% below the capped standard price. Heat-pump owners can choose fixed cheap and expensive hours. It also pays households to use less during peak events, and offers free electricity when wind is plentiful.

Three things make this possible. First, its own software platform, Kraken, handles billing and steers devices: over 2 GW of cars, home batteries and heat pumps in 2025. Kraken is also licensed to other suppliers, and Octopus sold a stake in it in late 2025 as a step towards separating it. Second, the company designs and installs its own heat pump and sells its own charger, so it controls the device as well as the price. Third, its research arm, the Centre for Net Zero, uses customer data to measure what its products achieve, as in the heat-pump tariff study in this chapter.

Two caveats apply. Its customers chose its products and are not typical households. And its tariffs rely on British rules that let a supplier set one all-in price per kWh, network costs included.

SOURCES [69, 71, 72, 78, 82, 89, 116, 117] · Statement by statement: [p. 147](#)

Examples (12)

Netherlands

One in twelve Dutch households now has a dynamic electricity contract, against about one in seventy-five in Flanders, and Dutch growth is still accelerating.

WHO	Electricity suppliers; the national energy regulator (ACM), which counts contracts every month and sets consumer-protection rules
WHAT	In the Netherlands, the energy regulator publishes every month how many households have a fixed, variable or dynamic electricity contract. Dynamic contracts, which pass on the hourly or quarter-hourly wholesale price, went from about 133,000 at the end of 2022 to 8% of households in July 2026, and net growth rose from 17,000 a month in March 2026 to 33,000 in June. Most are sold by newer suppliers that charge a flat monthly fee instead of a margin on each kWh, often together with an app that steers a home battery or electric car. A large incumbent supplier also lets customers keep a fixed or variable price and pays them a fixed monthly amount for letting it steer their home battery.
SCALE	8% of Dutch households on a dynamic electricity contract (July 2026); 651,000 dynamic electricity contracts on 1 June 2026; 55% of households on a fixed and 37% on a variable contract.
EFFECT ON THE SYSTEM	Not measured. The regulator counts contracts, not how much consumption moves. A Dutch survey of heat pump owners found that only 19% of those with a dynamic contract let the heat pump follow prices automatically (see the Dutch heat pump example in this chapter).
EFFECT ON THE BILL	Not reported for the Netherlands. In Flanders, a study of 1,014 households with a digital meter found that a dynamic contract brought, on average, neither a clear gain nor a clear loss; the outcome depended on each household's consumption and solar profile.
WHY IT WORKED, OR DID NOT	The end of net metering for solar panels on 1 January 2027, the boom in home batteries and near-universal smart meters with a port for real-time data all play a part, but none of them clearly sets the Netherlands apart from Flanders, which ended net metering for new solar panels earlier and also has digital meters with such a port. The clearest difference lies with suppliers: many Dutch suppliers build their whole offer around the dynamic price, selling it together with an app that steers a battery, car or heat pump and with help to use it well. The regulator also agreed with suppliers that they must explain the risks of a dynamic price clearly, so growth came with consumer protection rather than against it.

LESSON FOR BELGIUM Belgium already has the offer: at the end of 2025, 18 suppliers sold 34 dynamic products in Flanders and three suppliers offered five in Brussels, and Wallonia's price comparison tool lists dynamic offers. The Dutch experience suggests that uptake may follow when suppliers sell the dynamic price as part of a package, with automatic steering of a battery, car or heat pump and help to use the contract well.

Supplier

Regulator

SOURCES [64, 70, 75, 83, 85, 86, 94, 95, 97, 118] · Numbers, source notes and further reading: **p. 147**



Spain put a quarter of its households on an hourly price by default; they barely respond, and the government has since smoothed the price.

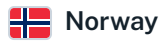
WHO	The national government sets the regulated default tariff; the energy regulator monitors the market
WHAT	Spanish households can choose any supplier, but those who never choose stay on a regulated default tariff whose energy price follows the hourly wholesale market; the formula is set by the government and only a few designated suppliers are allowed to sell it. At the end of 2025 that applied to 8.2 million households, 27.4% of the total, a share that keeps falling as people move to free-market offers. After the 2021-2022 price shock the government changed the formula: since 2024 a growing slice of the price is based on electricity bought months or a year ahead, which smooths out the hourly swings.
SCALE	8.2 million household consumers (27.4%) on the hourly-priced default tariff at the end of 2025; hourly pricing has been the default since 2015.
EFFECT ON THE SYSTEM	Not measured at system level. A study comparing households on the hourly default tariff with households on fixed prices found no difference in how they reacted to price changes. In a regulator survey in the second quarter of 2025, 48.6% of households said they take no account of hourly price differences at all, up from 44% at the end of 2023.
EFFECT ON THE BILL	No saving reported. In 2025, bills on the default tariff rose by about 13%, against about 3% for free-market contracts, because the default tariff passed on the rise in wholesale prices in full.
WHY IT WORKED, OR DID NOT	Most households on the default tariff never chose it: more than half do not know the difference between the regulated tariff and market offers, and 21.4% of free-market customers do not know what kind of price they pay. With no automation and modest gains, few people act on the hourly price; and when prices spiked, the government smoothed the price, which also weakened the hourly signal.

LESSON FOR BELGIUM Belgium does not put households on dynamic prices by default: Flanders is widening the duty to offer a dynamic contract, which EU law sets for suppliers with more than 200,000 customers, to all suppliers from 2029. Spain shows that putting households on an hourly price creates little flexibility on its own, and that a sharp price rise can lead the government to soften the price; more dynamic contracts in Belgium may deliver flexibility only with automatic steering, and with crisis protection that keeps the price signal.

Government

Regulator

SOURCES [58, 60, 61, 119] · Numbers, source notes and further reading: p. 148



Norway

Almost every Norwegian household pays the hourly spot price, yet since late 2025 most southern homes have chosen a flat state price on top of it.

WHO	The national government and parliament (crisis support and the state fixed price), paid out through grid operators
WHAT	Norwegian households choose freely among about 120 suppliers, and nearly all of them are on a contract that passes on the hourly wholesale price: 97.6% of household consumption in mid-2026. During the 2021-2022 price crisis the state began paying 90% of the price above a threshold, first based on the monthly average price, which kept the reason to avoid expensive hours, and from September 2023 based on each actual hour, which largely removed it. Since October 2025 households can also opt for a flat state price of 0.40 Norwegian kroner per kWh (about €0.034), settled through their grid bill, and by April 2026 about two-thirds of households in the south had done so. Households keep their spot contract: the grid company settles the difference between the spot price and the state price on the grid bill, which is why spot contracts still cover almost all household consumption.
SCALE	97.6% of household consumption on spot contracts (second quarter of 2026); about 1.4 million meters on the state fixed price, 60% of household meters in southern Norway (January 2026), about two-thirds by April 2026.
EFFECT ON THE SYSTEM	Not yet evaluated. A first analysis finds that households on the flat state price use a few per cent more electricity, mostly in the afternoon and evening peak.
EFFECT ON THE BILL	Households on the state price pay the same energy price whatever the hour, so shifting use no longer saves them anything on the energy part of the bill; only the grid tariff, which in most areas is cheaper at night and charges for the monthly peak, still rewards it.
WHY IT WORKED, OR DID NOT	Spot contracts became the norm long before the crisis, helped by decades of hourly market prices, hourly meters and a public comparison site that points people to spot deals. Norway's flexible hydropower also long kept prices within a day fairly flat, so a spot contract carried little risk. That changed as new interconnectors to Germany and Britain opened in 2020-2021: a 2026 study finds that the cable to Germany raised average prices and made them more volatile in southern Norway, with cheap hours getting cheaper and expensive hours much more expensive. Once prices rose sharply, the political answer was to protect households, and each new form of support weakened the price signal further; the flat state price, which many households chose, removes it entirely for the energy part.

LESSON FOR BELGIUM Norway's high share of spot contracts says little about a working price signal: most southern households now pay a flat state price instead. If Belgian governments need to shield households in a future crisis, Norway's first design, support based on the monthly average price, shows that protection can keep the reason to avoid expensive hours.

Government

Regulator

SOURCES [2, 65, 66, 120–122] · Numbers, source notes and further reading: [p. 148](#)

Ireland's regulator made the five biggest suppliers offer a dynamic contract whose wholesale-linked part can never exceed 50 cents per kWh.

WHO	The national energy regulator (CRU); the five suppliers with more than 200,000 customers each
WHAT	Under EU law every supplier with more than 200,000 customers must already offer a dynamic contract to customers with a smart meter; what Ireland's regulator added is a prescribed format and a price cap. The contract has three parts: a standing charge, a base rate per kWh set by the supplier, and a half-hourly rate that follows the day-ahead wholesale price but is capped at €0.50 per kWh. The five obliged suppliers had to launch by 1 June 2026; the regulator moved the date from October 2025 so that customers would start in spring and learn over the summer before facing winter prices.
SCALE	Five suppliers, each with more than 200,000 customers; open since June 2026 to the 2.1 million homes with a smart meter; no uptake figures published yet.
EFFECT ON THE SYSTEM	Not measured: the contracts are four months old and no uptake or response figures have been published.
EFFECT ON THE BILL	Not reported. The cap only matters in extreme hours: from 2021 to 2023, including the 2022 crisis, the wholesale price exceeded €0.50 per kWh in 0.6% of trading periods, with a peak of €0.71. Because suppliers add a sizeable flat base rate on top, the part of the bill that moves with the hour is limited.
WHY IT WORKED, OR DID NOT	The cap is affordable for suppliers because of Ireland's capacity market: when the wholesale price rises above the level of the cap, that market already pays suppliers back the difference. Their remaining exposure is therefore small unless extreme prices become frequent. The regulator accepted that suppliers will recover the cost of the cap and of less predictable demand through the standing charge and base rate, which dampens the price signal.

LESSON FOR BELGIUM A cap on the wholesale-linked part of a dynamic contract answers the main political objection to such contracts at limited cost, provided it is set where suppliers are already hedged. Belgian regulators could examine at what level such a cap could be set for Belgian households, and who would bear the cost of prices above it.

Regulator

Supplier

SOURCES [67, 68, 123–125] · Numbers, source notes and further reading: [p. 149](#)

California moved millions of households onto time-of-use prices by default; almost nobody left, a quarter did not notice, and peak use barely fell.

WHO	The state utility regulator and the large vertically integrated utilities; for comparison, the city-owned utility around Sacramento
WHAT	In California the large utilities own the grid and also sell the electricity, at one regulated retail price that covers both energy and delivery; from 2019 the state regulator had them move residential customers from a flat price to a time-of-use price by default. At the first utility to switch, about 99% stayed on a time-of-use price, but in a survey shortly after the switch only 74% knew they had been moved. A city-owned utility around Sacramento made the same move earlier with a much sharper evening price and got a far bigger response.
SCALE	About 602,000 households moved by the first utility in 2019; the two larger utilities followed in 2020-2022, together several million households. Sacramento: about 575,000 households.
EFFECT ON THE SYSTEM	Small. The official evaluation at the first utility measured a peak reduction of 0.007 to 0.014 kW per household (1.0% to 1.8%). At the Sacramento utility, where the peak price was more than double the off-peak price, peak-hour load fell by about 134 MW, roughly 7%, mostly because air conditioners ran less.
EFFECT ON THE BILL	Not reported as a bill change for the large utilities. In Sacramento, households paid 28 cents per kWh in the weekday evening peak against 12 cents overnight (about €0.24 and €0.10; previously a flat 13 cents), and set their thermostats about 0.6 °C higher during peak hours.
WHY IT WORKED, OR DID NOT	A default keeps people on the new price, but it does not make them notice or act: a quarter did not even know they had been moved, and the peak premium at the big utilities was modest. Where the price gap was larger and air conditioning offered an easy, largely automatic response, the effect was several times bigger.

LESSON FOR BELGIUM Belgium has no default time-of-use price: Wallonia's time-block network tariff is optional, Brussels plans time blocks from 2030, and Flanders decided in 2025 not to add them for now. If a default is ever considered, California shows that it keeps households on the new price but delivers little by itself; the size of the price gap, clear communication and devices that respond automatically decide the result.

Regulator

Distribution grid operator

Supplier

SOURCES [5, 6, 63, 126] · Numbers, source notes and further reading: [p. 149](#)

Ontario added an optional overnight price ten times cheaper than its weekday evening peak, aimed at households that charge an electric car.

WHO	The provincial government and the energy regulator (Ontario Energy Board), which sets the regulated price; local distribution companies, which bill it
WHAT	Most Ontario households buy electricity from their local distribution company at a commodity price set by the provincial regulator, unless they sign with a retailer; a time-of-use price is the default and a tiered price the alternative. Since May 2023 every distribution company must also offer a third, voluntary option with a very cheap night: 3.9 cents per kWh from 11 pm to 7 am, against 39.1 cents on weekdays from 4 to 9 pm. This follows a smart meter roll-out and mandatory time-of-use pricing between 2006 and 2014, which the province's Auditor General later found had cut the residential peak by only about 3%.
SCALE	Optional for all households on the regulated price (4.8 million smart meters); the number who chose it is not published.
EFFECT ON THE SYSTEM	Not measured. In setting prices, the regulator uses the actual consumption of customers who chose the option: 40% of their electricity overnight and 13% in the evening peak. These households chose the option themselves, often because they have an electric car, so the figures describe who signs up rather than a measured shift.
EFFECT ON THE BILL	Not reported. The overnight price is about €0.024 per kWh and the evening peak about €0.24 (at €1 = \$1.60), on the energy part of the bill only; delivery charges come on top.
WHY IT WORKED, OR DID NOT	The standard time-of-use price, the default since the meter roll-out, has a gap of about two to one between peak and night and relies on households responding by hand, which few did. The new option is voluntary and has a gap of ten to one, which suits people whose car can charge on a timer; such a strong incentive matters most while responding still takes effort.

LESSON FOR BELGIUM Belgian suppliers already sell time-of-use contracts: one large offer has its cheapest block up to 45% below its peak, on the energy part of the price. Ontario shows that a much larger gap, offered as an option to car owners, is a simple design; once devices respond automatically, a smaller gap may be enough.

Supplier

Regulator

SOURCES [127–131] · Numbers, source notes and further reading: [p. 149](#)

Only one in five Dutch heat pump owners with a dynamic contract lets the heat pump follow prices automatically.

WHO	A field study run for the Netherlands Enterprise Agency (RVO), the government agency that runs subsidy and innovation programmes, with the grid operators' and installers' associations
WHAT	A Dutch survey of 1,818 heat pump owners in existing homes, part of a field study of more than 6,000 homes, found that 26% already had a dynamic electricity contract and another 14% were considering one. Only 19% of those with a dynamic contract steer the heat pump smartly, against 6% of owners without one. 'Smart' here means the heat pump plans its own schedule around electricity prices or solar output, or an external energy management system does it; simply setting a timer was not reported as smart control.
SCALE	1,818 respondents (October 2025) within a study of more than 6,000 homes; 9.3% of all respondents use smart control.
EFFECT ON THE SYSTEM	Not measured: the survey asks what owners do, not how much load moves.
EFFECT ON THE BILL	Not reported.
WHY IT WORKED, OR DID NOT	Having the price is not the same as acting on it. Timing hot water for cheap hours is easy, but letting a heat pump optimise on each day's prices needs compatible hardware or software, a correct set-up, and an owner who accepts small swings in comfort; that is where most households stop.

LESSON FOR BELGIUM A dynamic contract does not by itself lead to steering. At least one heat-pump maker selling in Belgium already builds price-following control into some of its heat pumps; installers could switch such functions on when they install the heat pump, and suppliers could sell the contract together with the control.

Manufacturer & installer

Supplier

SOURCES [64, 132–134] · Numbers, source notes and further reading: p. 150

British households that leave a flat price mostly choose cheap device tariffs with supplier steering, not hourly prices: electric-car tariffs grew 84% in a year, other smart tariffs 27%.

WHO	Energy suppliers; the energy regulator (Ofgem), which counts households by type of tariff
WHAT	In Britain, most households that leave a flat price do not pick an hourly price. They pick a tariff for one device, usually the electric car: a low rate for a few night hours, and in many offers the supplier decides when the car charges. In the year to July 2025 the number of households on smart time-of-use tariffs rose from 497,000 to 835,000, and car tariffs drove almost all of that growth.
SCALE	835,000 households on smart time-of-use tariffs, 2.8% of the market (July 2025), of which 653,000 on car tariffs; over 300,000 households let a supplier steer a device (end of 2025); close to 1 million on car tariffs by mid-2026.
EFFECT ON THE SYSTEM	Not measured at system level. Over 300,000 households let their supplier steer a device automatically (end of 2025), and one supplier's platform steers over 2 GW of cars, batteries and heat pumps (2025). Heating lags far behind: about 15,000 households were on dedicated heating tariffs in 2025.
EFFECT ON THE BILL	Night rates for car charging ranged from 6.5p to 8.5p per kWh at the end of 2025; the market leader charges 7.6p in October 2026, about 70% below the capped standard rate of 26.32p (about 9 against 31 euro cents). The capped rate includes network costs and levies, so the discount applies to the full price per kWh.
WHY IT WORKED, OR DID NOT	The offer is simple: one cheap rate, fixed hours, no daily price watching, and the device does the work. Because a British supplier sets one all-in price per kWh, it can give a large night discount. Many households are unsure what they have: a third think their costs vary by time of day, but only half of them are on such a tariff.

LESSON FOR BELGIUM In Britain, households take up device tariffs with automatic steering rather than dynamic contracts. Belgian suppliers already offer parts of this, such as rewards for smart charging and contracts with fixed cheap hours; because they can discount only the energy part of the price, such offers may remain less generous than British ones.

Supplier

Regulator

Government

SOURCES [57, 59, 69, 71, 72, 89, 135, 136] · Numbers, source notes and further reading: [p. 150](#)

Over half a million British drivers let their supplier decide when the car charges, for a night rate about 70% below the standard price.

WHO	An energy supplier (Octopus Energy)
WHAT	A British supplier offers electric-car owners one low rate for the whole house during six night hours, plus extra charging slots that the supplier picks. The driver only says how much charge is needed and by when; the supplier starts and stops charging through the car maker's online connection or the home charger, and the driver can override it at the normal rate. Behind the fixed price, the supplier combines the cars of many customers and uses their flexibility in the electricity markets.
SCALE	Over 500,000 drivers (August 2026); the supplier holds 59% of British households on car tariffs, out of nearly 1 million (July 2026).
EFFECT ON THE SYSTEM	Not measured. The supplier's platform steers over 2 GW of cars, home batteries and heat pumps (September 2025); no figure has been published on how much evening peak the cars avoid. Steering works by switching charging on and off in time slots, not by limiting power continuously.
EFFECT ON THE BILL	Charging costs 7.6p per kWh in October 2026, against a capped standard rate of 26.32p (about 9 against 31 euro cents). Compared with running a petrol car, a driver covering 7,600 miles (about 12,200 km) a year saves about £850 (about €990).
WHY IT WORKED, OR DID NOT	The deal is simple: the customer gets a low, predictable price and does nothing; the supplier carries the price risk and does the steering. The supplier owns the whole chain of tariff, software and app, and can reach many cars without an extra box. British rules let it discount the full price per kWh, network costs included.

LESSON FOR BELGIUM Two Belgian suppliers already pay 1.5 euro cents per kWh for permission to steer the car, on top of an ordinary contract, and a third steers charging into the cheapest hours of the customer's own contract, such as its time-of-use contract with super off-peak hours up to 50% cheaper. The British model turns such a reward into the product itself. Under the Flemish capacity tariff, a supplier copying it may also need to manage charging power, not just the hours, so that steering does not raise the household's monthly peak.

Supplier

Manufacturer & installer

SOURCES [59, 69, 71, 72, 89–91, 98, 110, 135–137] · Numbers, source notes and further reading: [p. 151](#)

A heat-pump tariff with fixed cheap and expensive hours halved average evening use in 6,600 British homes, without raising daily consumption.

WHO	An energy supplier (Octopus Energy) and its research arm, the Centre for Net Zero
WHAT	A British supplier sells households with a heat pump or other electric heating a tariff with three cheap windows a day (early morning, early afternoon, late evening) and one expensive window from 4 to 7 pm. Households heat their homes a little more in the cheap hours, so the heat pump can run less in the evening while the stored heat keeps the house warm; most do this through a smart thermostat or the heat pump's own schedule, and some also time a home battery.
SCALE	6,631 households measured, December 2021 – June 2024; total customers on the tariff not published (about 15,000 households were on any British heating tariff in 2025).
EFFECT ON THE SYSTEM	Measured: between 4 and 7 pm, average use fell from 0.44 to about 0.22 kWh per half-hour, or from about 0.9 kW to 0.45 kW on average. Use in the morning and afternoon windows roughly doubled, and total daily use did not change. The effect was larger on colder days and in homes that lose more heat. These are averages over all homes and all days of the year, not the peak of one home on the coldest evening.
EFFECT ON THE BILL	Households saved on average £318 a year (about €370), 18% of their energy costs; £240 of that came from shifting. Today the cheap windows are 51% below the tariff's own day rate and the evening window 50% above it.
WHY IT WORKED, OR DID NOT	The hours are the same every day, so a thermostat schedule can follow them, and a heat pump in a reasonably insulated home can store heat in the building for a few hours. The households chose the tariff and are customers of one supplier, so the result shows what willing households can do, not what everyone would do.

LESSON FOR BELGIUM Belgian suppliers already market contracts with fixed cheap hours to heat-pump owners, among others. A version built around daily windows that a thermostat schedule can follow, set up by the installer when the heat pump is installed, could move heating demand out of the early evening; in the British study the effect was larger on colder days, the days that set the Belgian winter peak.

Supplier

Manufacturer & installer

SOURCES [57, 79, 82, 135, 138, 139] · Numbers, source notes and further reading: [p. 152](#)



Finland

A Finnish supplier gives heat-pump owners cheaper fixed hours, but only as long as it is allowed to steer the heat pump through the manufacturer's online service.

WHO	A Finnish energy supplier (Väre, since June 2026 part of Helen, Finland's largest electricity retailer) and a heat-pump steering software company (Kapacity.io)
WHAT	Since September 2025, a Finnish supplier offers heat-pump households a one- or two-year fixed contract with two price levels: cheaper from 11 pm to 7 am and from 1 to 4 pm, more expensive the rest of the day. The condition is that the supplier's software partner is allowed to steer the heat pump, through the manufacturer's online service or, in one network area, through the switch in the smart meter. Most internet-connected heat pumps need no extra box.
SCALE	Nearly 800 customers helped design it (2025); customer numbers not published; continued under the merged supplier since June 2026.
EFFECT ON THE SYSTEM	Not measured. No figures on shifted load have been published for this contract.
EFFECT ON THE BILL	In November 2025 the cheaper window cost 1.5 euro cents per kWh less (6.78 against 8.28 cents for energy only, about 18% less). The supplier estimates savings of €135 to €157 a year.
WHY IT WORKED, OR DID NOT	Simple prices plus automatic control remove the two hurdles that keep heat pumps from reacting to prices: watching prices and setting up the device. Steering through the manufacturer's online service keeps the cost low. Whether it scales is not yet known, because the supplier has not published customer numbers or results.

LESSON FOR BELGIUM A Belgian supplier could offer heat-pump owners a fixed time-window price that applies only while automatic steering is on; the price gap can stay modest if steering costs the customer no effort. The connections exist: at least one heat-pump maker's built-in function plans the heat pump around day-ahead prices for households with a dynamic contract, and the Antwerp start-up NOX connects heat pumps and other devices to the market through the apps of suppliers and manufacturers.

Supplier

Manufacturer & installer

SOURCES [73, 74, 76, 140–143] · Numbers, source notes and further reading: p. 152

In Britain, the households that can shift the most electricity use are car owners on higher incomes; half of homes can shift less than a tenth as much.

WHO	The energy regulator (Ofgem) and an energy charity (Centre for Sustainable Energy)
WHAT	Britain's energy regulator linked a household survey to the smart-meter data of about 1,000 homes to estimate how much each could shift. A charity funded by two network operators has tracked for seven years who can join flexibility offers and with what result. Both find that the gains go mainly to households with a car, solar panels or a battery.
SCALE	4,385 survey respondents, 1,085 with linked meter data (June 2025); a trial with 37,000 participants; programme running 2019-2026.
EFFECT ON THE SYSTEM	Not measured as a system effect. In a trial with 37,000 households, those in vulnerable situations took part as often as others, but car owners shifted more than three times the average.
EFFECT ON THE BILL	Estimated from survey and meter data: the quarter of households with the largest potential could each shift about 243 kWh a year, the quarter with the smallest almost nothing. Modelled best-case savings range from £38 a year (about €44) for a renter with a gas boiler and a prepayment meter to £523 (about €610) for a home with solar panels and an electric car.
WHY IT WORKED, OR DID NOT	Room to shift comes with devices, and devices come with income and home ownership. Renters often cannot choose their heating, and a small number of financially stretched households cut essential use to earn rewards.

LESSON FOR BELGIUM Belgian regulators and governments could start measuring who takes part in flexibility offers and who gains from them, by income and by whether households rent or own, before the gap becomes a political issue.

Regulator

Government

SOURCES [112–115] · Numbers, source notes and further reading: [p. 153](#)

When devices respond on their own, a peak event delivers ten to a hundred times more per household

Peak events are short periods, announced in advance, when electricity is scarce or the grid is close to its limit. Several countries pay households to cut their use during such events, which makes these schemes a direct test of how much a home can deliver when flexibility matters most. They take different forms: Britain's system operator pays households through their suppliers, North American utilities pay bill credits or a fee per device, and a Californian state agency pays aggregators for home batteries.^[144–148] France uses the price instead: households on its regulated tariff can choose a variant in which electricity in peak hours costs over four times as much on 22 'red' winter days.^[149, C10]

What a household delivers depends above all on who responds during an event: the household itself or a device. Where a person has to act, the effect measured against a control group in Britain and California is about 0.01 to 0.25 kW per household per event; where a device acts automatically, it is about 1 to 5 kW (Figure 3.1).^[146, 147, 150–153, C11] In California, signing up about four million households automatically, without asking them, added many participants but little response, because they still had to act themselves.^[145, 151] Schemes also differ in how they measure what a home delivered and in what they pay for it. Some are now ending as their budgets run out; others are taking on new roles.^[145, 154, 155]

Who acts matters more than who is enrolled

Québec offers the clearest comparison: most homes there heat with electricity, and one utility runs both kinds of scheme in the same winters (Figure 3.1).^[146] Households on a peak-event rate or bill credit, who must act themselves, cut about 0.8 kW per event; households whose thermostat turns the heating down automatically cut about 2.9 kW.^[146, C12] In a field experiment at a Canadian utility, households with automatic control cut about five times more than those that had to act themselves, and a smart device without automation did not help: those households cut no more than households acting by hand.^[156] Devices, climates and measurement methods differ between countries, so the exact figures differ too, but every comparison in this chapter points the same way.

Signing households up automatically is no substitute for automatic response. California signed up about four million households automatically for a scheme that paid \$2 for every kWh they saved at peak times.^[145, 151] At the largest participating utility they cut about 0.03 kW each, no more than they already cut in response to the state's public appeals to save electricity, while customers who had signed up themselves cut about eight times more.^[151, C13] Schemes that people must join themselves deliver more per home but tend to reach few homes: about 9% of customers at an Arizona utility signed up their thermostat, and about 5% of French households on the regulated tariff chose its red-day variant.^[147, 157, 158, C14] Offers can reach many more homes when a steered device comes with an electricity contract that customers choose anyway. A Texan supplier, for example, installs a free thermostat with certain electricity plans, and 70–80% of customers take part when the device is free and steering is part of the plan.^[159, 160]

How delivery is measured decides what is paid for

Britain and California paid households for each kWh they saved, measured against a baseline: an estimate of what each home would normally have used.^[150, 151] Because a household's use goes up and down from day to day anyway, such a baseline can reward these ordinary ups and downs as if they were effort. In 2022 the largest Californian utility paid out more than \$55 million in bill credits, mostly for chance dips below the estimate.^[151, 161] Home batteries avoid this problem, because a battery's own meter records exactly what it

discharged. New England's utilities pay battery owners per kW of average discharge over all events of a summer, and count a missed event as zero.^[162] For thermostats, heat pumps and whole homes, which have no such meter of their own, the most reliable way to know what was delivered is to compare participants with a similar group of households that did not take part, a so-called control group.

The price matters as much as the measurement. When Britain replaced the high fixed payment of its first two winters with competitive bids from suppliers and aggregators, the average accepted price fell from £3.10 to £0.21 per kWh, although each event then delivered less, about 89 MWh instead of 235 MWh.^[150, 163, C15]

What a kW is worth depends on what it must deliver

Schemes pay between about €17 and €350 per kW per year (Figure 3.2).^[C16] The gap is less surprising than it looks, because 'a kW' means something different in each scheme. Arizona's thermostats earn about €17 per kW a year for six or seven short events on the hottest afternoons of a summer.^[147, 164, C17] New England pays battery owners €195–350 per kW each summer for up to 60 events of two to three hours, measured on the battery, with a missed event counted as zero.^[162, 164, C18] The more often, the longer and the more reliably a kW must be delivered, the more a scheme tends to pay for it. For comparison, Belgium's capacity auctions of 2025 paid on average about €14 to €27 per derated kW per year, mostly to power plants, battery parks and industrial demand response.^[165, C19]

What households earn follows the same logic. People who must act themselves earn little: well under £1 per event in Britain in 2023-24, and €16–39 over a winter on Québec's bill credit.^[146, 150, 164, C20] A Massachusetts home whose battery took part earned about €900 for summer 2025.^[153, 164, C21] France's red-day variant works differently, because it is a tariff rather than a reward: in the 352 peak hours of the red days, electricity costs €0.56 per kWh more than on ordinary blue days, while on most other days it is cheaper than the standard regulated price.^[149, C22] It therefore tends to attract households that expect to manage on red days, for example by turning electric heating down or switching to another heat source.^[149]

Peak events keep a role for rare moments of scarcity

Do separate peak-event schemes still make sense once devices can easily follow hourly prices all year round? Several signs suggest that their role is changing, and in places shrinking. Britain's scheme has become a year-round balancing tool: it also pays people to use more electricity when there is a surplus, and from October 2026 it helps where the grid is congested.^[155] In France, the 22 red days are a fixed quota for each winter, and in 2025-26 they no longer matched the days when electricity was really scarce: by the end of February only 9 had been used, so the remaining 13 fell in a mild March.^[157] Budgets also run out: California stopped its household rewards after 2025, and its battery programme is expected to run out of money by the end of 2026.^[145, 154] Yet peak events still have a role where they deliver something that prices alone do not. In California's 2025 battery test, an independent analysis found that most of the 535 MW came on top of what the batteries would have done anyway: batteries that simply follow their owner's consumption or a time-of-use price would not have sent power to the grid at the hour when it was most needed.^[152] And Octopus Energy's research arm estimated that, at the high prices of the early winters, each £1 spent on Britain's scheme was worth only about £0.63 if the saved electricity is valued at what the system operator would otherwise have paid for balancing, but about £3 if each saved kWh is counted as a blackout avoided.^[150]

Peak events are therefore best seen as a form of insurance for the rare moments when electricity is really scarce. Everyday flexibility comes from network tariffs and supplier contracts (see Chapters 1 and 2). Where countries keep peak events, the examples in this chapter point to three design features: a device responds on its own, payment is based on what that device measurably delivered, and, to reach many homes, steering is switched on from the start, with an easy way for the household to override it. Automatic control already

works at scale where a law or a grid operator required it, as for French water heaters (see [Chapter 5](#)), or where a supplier sold it in a simple contract, as to more than 500,000 British car owners (see [Chapter 2](#)).^[69, 166]

What this means for Belgium

- **The federal regulator and Elia** could publish each year, in aggregate and within the confidentiality rules of the capacity mechanism, how much of the contracted capacity comes from household devices, and Elia and the federal government could consider using household devices, such as home batteries, as emergency capacity. Flanders alone had about 189,000 registered home batteries in September 2026, more than the number of batteries California discharged together in its 2025 test.^[152, 167, C23] There is no public information that home batteries take part in Belgium's capacity mechanism, whose contracted volume comes mostly from power plants, battery parks and industrial demand response.^[165]
- **Elia and the regulators**, if they design a peak-event product, could pay per kW measured on the device, use competitive bids from the start, and require a control group wherever a household baseline cannot be avoided.
- **Suppliers and aggregators** could sell thermostats and other devices together with the service that steers them, switched on by default in a contract the customer chooses, with clear terms at signing and an easy way to override the steering.
- **Regulators** offering an optional tariff, such as Wallonia's network tariff with five time blocks, face a trade-off.^[29] A tariff that households must choose themselves imposes nothing on anyone, but abroad such tariffs and schemes reached between a few per cent and a tenth of customers, and their effect was small where people had to respond by hand.^[147, 157, 158, C24]

HOW WE CALCULATED

C10 €0.7295 per kWh in red-day peak hours ÷ €0.1654 in blue-day peak hours (Tempo, prices from August 2026) ≈ 4.4.

C11 Where a person has to act, measured reductions per household per event: Britain 0.01 kW across all signed-up households and 0.21 kW for households that opted in to an event (winter 2023-24); California 0.03 kW for households enrolled automatically and 0.23 kW for those that enrolled themselves (2022). Where a device acts on its own: Arizona 125 MW ÷ 100,000 thermostats = 1.25 kW (utility maximum); Québec 103 MW ÷ about 35,000 homes ≈ 2.9 kW (winter 2023-24); California 535 MW ÷ more than 100,000 home batteries ≈ 5.3 kW at most (test event, July 2025); Massachusetts 28.9 MW ÷ 5,251 homes ≈ 5.5 kW (summer 2025).

C12 248 MW per peak event ÷ about 305,000 homes on the peak rate or bill credit ≈ 0.8 kW; 103 MW per event ÷ about 35,000 homes with the thermostat service ≈ 2.9 kW (Hydro-Québec, winter 2023-24).

C13 0.233 kW per self-enrolled customer ÷ 0.030 kW per auto-enrolled customer ≈ 7.8 (PG&E, 2022).

C14 100,000 thermostats ÷ about 1.1 million customers ≈ 9% (Arizona utility, 2025); about 900,000 subscribers to the red-day variant ÷ 19.37 million residential customers on the regulated tariff ≈ 4.6%, about 5% (France).

C15 £3,100/MWh = £3.10/kWh (2023-24) and £210/MWh = £0.21/kWh (2024-25); 3,759 MWh ÷ 16 events ≈ 235 MWh per event (2023-24) and 3,918 MWh ÷ 44 events ≈ 89 MWh per event (2024-25).

C16 Lowest in Figure 3.2 : Arizona, about €17 per kW per year; highest: New England, \$400 per kW ÷ 1.15 ≈ €350 per summer.

C17 125 MW ÷ 100,000 thermostats = 1.25 kW per thermostat; \$25 a year ÷ 1.25 kW = \$20 per kW ÷ 1.15 ≈ €17 (Arizona, 2025).

C18 \$225–400 per kW ÷ 1.15 ≈ €195–350 (New England).

C19 €14.1k per derated MW per year (auction for 2026-27) and €27.3k per derated MW per year (weighted average, auction for 2029-30) ≈ €14 and €27 per derated kW per year.

C20 Britain: 0.2146 kW per opted-in household over an event of about one hour ≈ 0.21 kWh × £1.75–4 per kWh ≈ £0.38–0.86 per event (2023-24). Québec: \$25–63 per winter ÷ 1.60 ≈ €16–39.

C21 \$5.4 million ÷ 5,251 battery homes ≈ \$1,030 ÷ 1.15 ≈ €900 (Massachusetts, summer 2025).

C22 €0.7295 – €0.1654 per kWh ≈ €0.56 per kWh (red-day vs blue-day peak hours, prices from August 2026); 22 red days × 16 peak hours (6 a.m.–10 p.m.) = 352 hours.

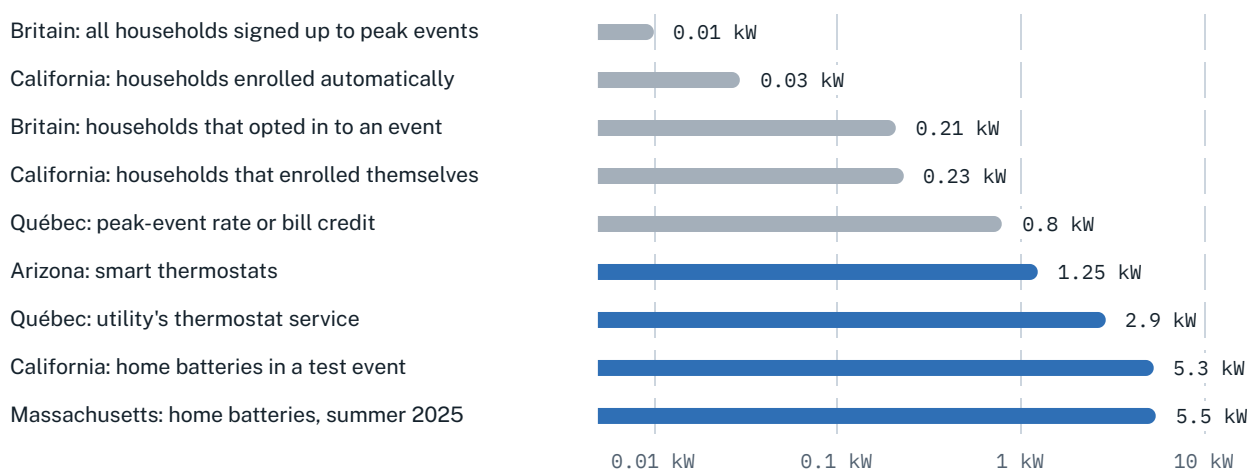
C23 About 189,100 registered home batteries in Flanders (15 September 2026, provisional) against more than 100,000 home batteries that discharged together in California's test event of July 2025.

C24 About 900,000 subscribers to the red-day variant ÷ 19.37 million residential customers on the regulated tariff ≈ 5% (France) to 100,000 thermostats ÷ about 1.1 million customers ≈ 9% (Arizona).

FIGURE 3.1

Per household, devices that act on their own deliver ten to a hundred times more than people asked to act

● A person has to act ● A device acts on its own



Average reduction per household per event, logarithmic scale. Britain and the California enrolment figures were measured against a control group, and the California and Massachusetts battery figures on the batteries themselves (Massachusetts: net summer capacity savings from preliminary programme figures, divided by the number of homes). The Québec figures are the utility's own averages per event; the Arizona figure is the utility's maximum ('up to'), not a measured average.

SOURCES [146, 147, 151–153, 168]

FIGURE 3.2

What one kW of household flexibility is paid ranges more than tenfold, from about €17 to €350 a year



Euro per kW per year or per season, midpoints where a range applies (New England: €195–350, shown at the midpoint); converted at €1 = 1.15 US dollars = 1.60 Canadian dollars = £0.86. Products differ in how often and how long the kW must be delivered. Arizona: the yearly fee divided by the utility's maximum of 1.25 kW per thermostat. Britain (national scheme): a research estimate for 2023-24. Belgium has no household scheme of this kind; its capacity auctions of 2025 paid on average about €14 to €27 per derated kW per year, mostly to power plants, battery parks and industrial demand response.

SOURCES [147, 148, 162, 168–171]

WHERE BELGIUM STANDS

We found no scheme in Belgium that pays households, event by event, to cut their use during announced peak events, and no supplier offering a critical-peak price; a 2024 research overview found none in Flanders. Instead, Belgian households get peak signals through their network tariffs, which apply all year rather than on announced days. Since 2023 the Flemish network tariff has charged each household for

its highest quarter-hourly peak of the month, and since January 2026 Walloon households with a communicating meter can ask their supplier for an optional network tariff with five time blocks. Households that sell their flexibility as a service do so through aggregators: 26 flexibility service providers are registered with the Flemish regulator, some of them steering home batteries. Fluvius tested buying flexibility from them in winter 2024-25 (89 activations, 1,304 kWh in total), ran a second test winter from December 2025 to April 2026, and has published the zones for a third, in winter 2026-27. Flanders alone had about 189,000 registered home batteries in September 2026; across Belgium, about 11,400 home batteries delivered flexibility to the market in 2024. Belgium's capacity mechanism is open to batteries and demand response, although batteries are derated, that is, counted at only part of their power, because they can deliver for only a few hours. The October 2025 auctions contracted 239 MW of demand response and 179 MW of new batteries (derated value) for 2029-30, at an average of about €27 per derated kW per year, at the low end of what the household schemes abroad pay (see [Figure 3.2](#)). The contracted volume comes mostly from power plants, large battery parks and industrial demand response; there is no public information that home batteries take part, and if any do, they are a very small fraction of the total.

Brussels is following a third route: its network tariff keeps the existing day/night split for now, and a tariff with a capacity chosen by the household and three time blocks is being prepared for households with a smart meter that agree to share their data; it is now expected in two steps, with the time blocks from 2030.

SOURCES [29-31, 165, 167, 172-179] · Statement by statement: [p. 154](#)

Examples (8)

United Kingdom

Britain pays households, through their suppliers, to cut their use at peak moments; replacing a high fixed price with competitive bids cut the cost per kWh by more than 90%.

WHO	Britain's electricity system operator, which buys the reductions from suppliers and aggregators; Ofgem, the British energy regulator, approves the rules
WHAT	In the energy-crisis winter of 2022-23, Britain's system operator began paying households with a smart meter, through their supplier or an aggregator, to use less electricity during announced peak hours, usually for an hour or two in the early evening. A household signs up once and then decides event by event whether to take part; its saving is measured against its own usual consumption. In the first two winters the operator effectively guaranteed a high price, and Octopus, one of the large suppliers, passed on £1.75 to £4 per kWh saved; since winter 2024-25 providers must bid, and the scheme has become a year-round balancing tool that now also pays people to use more power when there is a surplus.
SCALE	1.6 million households and businesses registered in winter 2022-23, 2.6 million in 2023-24 and 1.98 million in 2024-25; at most about 440,000 meters took part in any single event in 2024-25.
EFFECT ON THE SYSTEM	Measured. In winter 2023-24, 16 events delivered 3,759 MWh for £11.9 million; in 2024-25, 44 events delivered 3,918 MWh for £1.2 million, so about 89 MWh per event against about 235 MWh a year earlier. A study of 2.7 million Octopus customers in 2023-24, with a randomised control group, found that a household that opted in to an event cut its use by about 23%, or roughly 0.2 kW; averaged over everyone signed up, the cut was 0.01 kW per household.
EFFECT ON THE BILL	Small. At £1.75 to £4 per kWh and an average cut of about 0.2 kWh per event hour, a participating household earned well under £1 per event in 2023-24. In 2024-25 the system operator's average accepted price fell to £0.21 per kWh, so providers had far less to pass on to households.
WHY IT WORKED, OR DID NOT	The high fixed price attracted households quickly: 2.6 million sign-ups in two winters. But Octopus Energy's research arm found that, at those prices, each £1 spent was worth only about £0.63 to society when the saved electricity is valued at what the operator's ordinary balancing options would have cost, and about £3 only if each saved MWh is assumed to have prevented a blackout. Bidding brought the price down, but over 99% of registered participants still respond by hand, so each event delivers many small cuts.

LESSON FOR BELGIUM A peak reward can run through suppliers and aggregators, without a new public channel to households, and Belgium already has registered aggregators, some of which steer home batteries. A Belgian scheme could start with competitive bids rather than a generous fixed price, and be judged on what it costs in normal years rather than during an energy crisis.

Elia (transmission)

Supplier

Independent aggregator

SOURCES [144, 150, 155, 163] · Numbers, source notes and further reading: p. 154

California signed up four million households automatically for a \$2-per-kWh peak reward: they barely responded, while households that signed up themselves cut about eight times more.

WHO	California's utility regulator, which ordered the three large utilities to enrol their customers
WHAT	After rolling blackouts in 2020, California's regulator had the three big utilities enrol about four million households automatically, mostly families on the low-income discount, in an emergency peak-reward scheme for summer 2022. On a few event days announced by the utilities, anyone who used less than their own estimated normal consumption between 4 and 9 p.m. got a \$2 bill credit per kWh, with no penalty for using more. Only about 43,000 households had signed up of their own accord.
SCALE	About 4 million households enrolled automatically and about 43,000 by choice, across three utilities; 10 event days in summer 2022, none for households in 2023 and 2024.
EFFECT ON THE SYSTEM	Measured with a matched control group at the largest of the three utilities (about 1.5 million auto-enrolled customers): about 0.03 kW per household, or 1.6% of their load during events, no more than these households already cut in response to the state's public conservation appeals. Households that had signed up themselves cut 0.23 kW (10%). The evaluator concluded there was essentially no additional load reduction from auto-enrolment.
EFFECT ON THE BILL	The largest utility paid more than \$55 million in bill credits to about 1.6 million customers in 2022, roughly \$35 each on average, mostly for chance dips below each home's estimated normal use rather than deliberate effort.
WHY IT WORKED, OR DID NOT	Households that never chose the scheme mostly did not notice it or did not act, and paying against each home's own estimated baseline rewards normal day-to-day ups and downs as if they were savings. The reward was later halved to \$1 per kWh, no household events were called after 2022, and the regulator ended the household part after 2025.

LESSON FOR BELGIUM Signing households up automatically adds participants, but in California it added little response, because people still had to act by hand. A Belgian reward calculated against each household's own estimated normal use would need a control group, or it would risk paying for random day-to-day variation.

Government

Regulator

Supplier

SOURCES [145, 151, 161] · Numbers, source notes and further reading: [p. 155](#)

In electrically heated Québec, automatic thermostats cut about 3 kW per home at winter peaks, but the utility's own thermostat brand was its most expensive programme per kW.

WHO	Hydro-Québec, the province's state-owned utility, which generates, transports and sells electricity
WHAT	Most homes in Québec heat with electricity, so the power system peaks on cold winter mornings and evenings. The utility offers households two kinds of deal for up to 30 peak events per winter: an optional rate or bill credit that rewards them for using less during announced peak periods, which they must act on themselves, and its own smart-thermostat brand that turns the heating down automatically during events in exchange for small rewards.
SCALE	About 305,000 households on the peak-event rate or credit and about 35,000 on the thermostat service (winter 2023-24); Québec has about 9 million inhabitants.
EFFECT ON THE SYSTEM	In winter 2023-24 households on the peak-event rate or credit cut on average 248 MW per event (about 0.8 kW per home) and the thermostat service 103 MW per event (about 2.9 kW per home). For winter 2024-25 the utility reports a combined 2,330 MW of peak reduction from homes and businesses.
EFFECT ON THE BILL	Households on the bill-credit option saved \$25 (about €16) over the winter on average, \$63 (about €39) if they followed the utility's tips; thermostat users earned about \$135 (about €84) in rewards over 19 events, roughly \$7 per event (winter 2023-24).
WHY IT WORKED, OR DID NOT	Automatic control of electric heating delivers several times more per home than asking people to act. But building a consumer brand of its own was expensive: \$136 per kW in winter 2022-23, against \$60 or less for the utility's other demand-response programmes, partly because it delivered 10 MW instead of the 28 MW expected.

LESSON FOR BELGIUM For homes with electric heating, automatic control may be the most reliable source of winter-peak flexibility: in Québec it delivered several times more per home than asking people to act. In its early years, the utility's own thermostat brand was its most expensive programme per kW, a useful benchmark for any Belgian supplier or grid company considering building one.

Supplier

Independent aggregator

Manufacturer & installer

SOURCES [146, 169, 180] · Numbers, source notes and further reading: [p. 155](#)

American utilities turn down hundreds of thousands of smart thermostats on the hottest afternoons for about \$25 a year; what limits them is sign-up, not technology.

WHO	Electricity utilities (often publicly owned, or responsible for generation, grid and supply alike) and, in Texas, a retail supplier working with a smart-home company
WHAT	In Arizona, a public utility pays households \$50 to sign up their smart thermostat and \$25 a year to keep it in; six or seven times a summer it turns the air conditioning down for a few hours on exceptionally hot afternoons, and customers can override any event. In Texas, a large retail supplier and a smart-home company now install a thermostat free of charge for customers who pick an electricity plan that lets them shift the household's air-conditioning load.
SCALE	About 100,000 thermostats at the Arizona utility, out of about 1.1 million customers (2025); US utilities report 9.7 GW of residential demand response in total.
EFFECT ON THE SYSTEM	The Arizona utility's thermostats can reduce demand by up to 125 MW, about 1.25 kW per home. Nationally, utilities report 9.7 GW of potential peak reduction from households, about a third of all US demand response.
EFFECT ON THE BILL	\$50 once and \$25 a year per thermostat in Arizona (about €22 a year), plus whatever the household saves on cooling; in the Texas offer the free thermostat and installation are the main reward.
WHY IT WORKED, OR DID NOT	The device does the work and customers rarely notice, so a small yearly fee is enough. Enrolment is the limit: utilities that rely on people to opt in typically sign up only 3-5% of customers, while 70-80% take part when the device is free and steering is part of the electricity plan.

LESSON FOR BELGIUM Belgium's yearly peak comes from heating on exceptionally cold days rather than from air conditioning, so the closer Belgian equivalent is steering heat pumps on those days; growing summer cooling could be steered the same way. The broader lesson is about defaults: a free device with steering switched on by default can reach far more homes than a scheme people must actively join, a trade-off every Belgian opt-in tariff or contract faces.

Supplier

Manufacturer & installer

Distribution grid operator

SOURCES [147, 159, 160, 181, 182] · Numbers, source notes and further reading: [p. 156](#)



Germany

A German grid operator's app asking people to shift use delivered about 1 kWh per person per call; home chargers steered automatically shifted most of their charging sessions.

WHO	A German transmission system operator, with a supplier; later a pilot by several grid operators with an aggregator
WHAT	Since late 2022 one of Germany's four transmission system operators has run a free app that shows a regional traffic light and, on 'orange' days, asks people to shift their electricity use to relieve the grid. At first it could not tell whether anyone did; when a supplier added a prize draw and a partial bill refund, about 13,000 people said they shifted on two days in January 2025. In a 2025 pilot that turned the same signal into a price, home chargers steered automatically by an aggregator shifted more than 70% of their charging sessions, while drivers at public chargers who had to react themselves shifted at most 10%.
SCALE	100,000+ app downloads; about 13,000 responders per call (January 2025); about 500 automatically steered home chargers and 10,600 public-charger customers in the 2025 pilot.
EFFECT ON THE SYSTEM	About 28.5 MWh over two calls, roughly 1 kWh per responder per call. In the pilot, automation shifted over 70% of sessions and about 20% of the energy; manual response shifted at most 10% of sessions, and only at a discount of 20 cents per kWh.
EFFECT ON THE BILL	No published figure; the supplier offered a prize draw and a partial bill refund of undisclosed size.
WHY IT WORKED, OR DID NOT	Appeals rely on attention and goodwill, which tend to fade. The same signal delivered real volume only once devices could read it automatically, money was attached and software acted on it.

LESSON FOR BELGIUM A public appeal or traffic-light signal in Belgium, for scarcity or for grid congestion, is likely to deliver real volume only if devices or aggregators act on it automatically and money is attached.

Elia (transmission)

Distribution grid operator

Independent aggregator

SOURCES [183] · Numbers, source notes and further reading: [p. 156](#)

California pays aggregators to discharge home batteries in grid emergencies: in a 2025 test, over 100,000 batteries delivered 535 MW for two hours.

WHO	A California state agency (the energy commission), paying aggregators and battery companies from the state budget
WHAT	Since 2022 California has run a state-funded emergency programme that pays aggregators for home batteries they can discharge to the grid on summer evenings when electricity is scarce. Households keep using the battery for their own solar power and keep a reserve for back-up; when an event is called, the aggregator sends part of the stored energy to the grid between 4 and 9 p.m. In a test on 29 July 2025, two aggregators discharged more than 100,000 batteries at the same time.
SCALE	About 129,000 home batteries enrolled in 2025, within more than 1 GW of capacity in the programme; California has about 39 million inhabitants.
EFFECT ON THE SYSTEM	Measured: an average of 535 MW over two hours in the July 2025 test, most of it additional to what the batteries would otherwise have done, based on an independent analysis of five-minute battery data. The same consultancy estimates that over 2025-2028 the programme's benefits exceed its costs of \$196 million by \$28-206 million, so each dollar spent returns about \$1.1 to \$2.0. For comparison, California pays more than \$200 per kW per year for other emergency capacity, against \$62 (plus a performance bonus) for home batteries in this programme.
EFFECT ON THE BILL	The programme pays \$62.10 per kW per year, plus a 30% performance bonus, for a two-hour battery: roughly \$300-400 a year for a typical 5 kW home battery, split between aggregator and household in proportions that are not published.
WHY IT WORKED, OR DID NOT	Batteries are fast, precise and already paid for by their owners, and the battery's own data show exactly what it delivered, with a deduction for what it would normally have discharged. The weak point is funding: the state left the programme out of its 2025-26 budget, and it is expected to run out of money by the end of 2026.

LESSON FOR BELGIUM Home batteries can serve as emergency capacity: in California they cost less per kW than other emergency capacity. Belgium's capacity mechanism admits batteries and demand response through aggregation, but there is no public information that home batteries take part, while Flanders alone had about 189,000 registered home batteries in September 2026, more batteries than California dispatched in its 2025 test.

Elia (transmission)

Independent aggregator

Government

SOURCES [148, 152, 154, 165, 167, 175] · Numbers, source notes and further reading: [p. 157](#)

New England utilities pay home-battery owners a published \$225-400 per kW each summer, based on what the battery itself discharged, with no estimate of the household's normal use.

WHO	The electricity utilities of Massachusetts, Rhode Island and neighbouring states, within energy-efficiency plans approved by state regulators
WHAT	Since 2017-18, utilities in Massachusetts and Rhode Island have offered one standard deal to battery owners: let us discharge your battery during up to 60 summer afternoon peaks of two to three hours, and we pay a published price per kW. The battery's own meter records its average discharge during each event; the payment is based on the average over all events of the season, and a missed event simply counts as zero. The rate is fixed for five summers: \$400 per kW for those who joined before June 2024, \$225-275 for later joiners, \$200 from year six.
SCALE	In Massachusetts, 5,251 homes with a battery were paid \$5.4 million for summer 2025; the scheme also covers smart thermostats, which make up most residential participants.
EFFECT ON THE SYSTEM	Measured on the batteries themselves: about 28.9 MW of net summer capacity savings from home batteries in Massachusetts in summer 2025 (preliminary programme figures), about 5.5 kW per home, plus 10.9 MW from businesses. Whether some batteries would have discharged anyway is not corrected for.
EFFECT ON THE BILL	About \$1,000 per battery-owning home for summer 2025 in Massachusetts, on average; at \$275 per kW a 5-10 kW battery earns \$1,375-2,750 a year.
WHY IT WORKED, OR DID NOT	The deal is simple, published in advance and fixed for five years, and measuring the battery rather than the house avoids arguing about what the home would otherwise have used. The price is high because it reflects what the regional summer peak costs New England and because the states also want to encourage batteries.

LESSON FOR BELGIUM A Belgian scheme could copy the way payment is calculated: per kW of average measured discharge over all events, with a missed event counted as zero. The price level is specific to New England, where it reflects the cost of the regional summer peak and a policy to encourage batteries, and it is several times higher than other schemes in this report.

Distribution grid operator

Independent aggregator

Regulator

SOURCES [153, 162, 184] · Numbers, source notes and further reading: [p. 157](#)

Nearly a million French households chose a variant of the regulated tariff that costs over four times as much on 22 'red' winter days set by the grid operator.

WHO	The French energy regulator, which proposes the regulated tariff (the government sets it); the former monopoly supplier EDF and local utilities sell it; the transmission system operator RTE picks the red days
WHAT	France still has a regulated electricity price: households can buy from any supplier at market prices, but about 19 million stay on the regulated tariff, sold by the former monopoly EDF and local municipal utilities. Households on the regulated tariff can choose a variant that divides the year into 300 cheap 'blue', 43 middle 'white' and 22 expensive 'red' days; the national transmission system operator announces the colour the day before, based on expected demand and wind and solar output, and red days fall only on weekdays from November to March. Households must choose this variant themselves.
SCALE	About 200,000 customers in October 2022, 500,000 in October 2023 and about 900,000 to 1 million in 2025-26, out of about 19 million households on the regulated tariff.
EFFECT ON THE SYSTEM	Not measured per red day in recent years. The grid operator puts the household load reduction from this variant and an older, similar one at about 900 MW (2023). In winter 2025-26 the fixed quota did not match actual scarcity: only 9 red days had been used by the end of February, and the remaining 13 fell in a mild March.
EFFECT ON THE BILL	On a red day a kWh in peak hours (6 a.m. to 10 p.m.) costs about €0.73, against about €0.17 on a blue day (August 2026), a gap of €0.56 per kWh on 22 days a year. For a home using 6,000 kWh a year, the variant saves about €110 (8%) compared with the standard regulated price; homes that cut back more on red days save more.
WHY IT WORKED, OR DID NOT	It is a price, not a reward: households pay more on red days and less the rest of the year, and it is mainly chosen by those who expect to cope, typically homes that can turn electric heating down or switch to another heat source on those days. The 2022 energy crisis made it popular; winter 2025-26 showed that a fixed number of red days can end up on days when electricity is not really scarce, and in summer 2026 the regulator consulted on a monthly cap and a revised trigger, for a reform expected from 2027.

LESSON FOR BELGIUM A critical-peak price announced the day before sits between a day/night tariff and a fully dynamic contract, and in France close to a million households chose such a simple signal. A Belgian supplier offering one could tie the red days to actual stress on the power system rather than to a fixed number per year.

Supplier

Elia (transmission)

Regulator

SOURCES [149, 157, 158, 185, 186] · Numbers, source notes and further reading: [p. 158](#)

Buying household flexibility is routine for British grid operators, to postpone reinforcement rather than replace it

When a cable or substation of the local grid is close to its limit at busy times, the grid is said to be congested. The grid operator can then reinforce the grid, or it can buy flexibility: pay customers to use less electricity at the busiest moments, so that reinforcement can wait. That matters for households: heat pumps and electric-car chargers add to the evening peak on local grids, but like home batteries they can shift their use by an hour or two, and grid operators can pay for that flexibility.

Britain has done this for years and at scale.^[187] Every British distribution grid operator buys flexibility in tenders and auctions, and together they had about 9 GW under contract in 2024.^[188] Households supply a growing share: 23% of the flexible capacity at the largest local market, in London and the South East, in 2024/25.^[189] Elsewhere, buying flexibility from households is still at the trial stage or has only just begun, so this chapter looks mainly at Britain. There, far more is contracted than used, and what a household kilowatt earns depends on how the grid operator pays. Under the shared British method, flexibility is worth buying only while it costs less each year than what postponing reinforcement saves, so flexibility buys time before reinforcement rather than replacing it.^[190] Heat pumps can help at short winter peaks, but how much they can help in a freeze lasting several days has not been measured.^[191, 192]

Capacity under contract is far larger than the flexibility used

British grid operators report how many gigawatts of flexibility they have bought. Most of that is capacity under contract rather than flexibility actually used: about 9 GW was under contract in 2024, but only 22 GWh was called upon that year, the equivalent of using the contracted capacity at full power for about two and a half hours in the whole year.^[188, C25] In 2021/22, about three quarters of the volume tendered was for services that are called upon only after a fault on the grid.^[187, C26]

We found few reports that show four figures separately: the capacity under contract, the energy actually used, the price paid per kW and the share that comes from households. The national British figures do not show what households supply.^[188] The operators that do publish it count it differently, as a share of capacity or of new registrations, and prices are stated per MWh or per MW per hour rather than per kW per year, which makes them hard to compare with other schemes.^[189, 193, 194]

What a household kilowatt earns depends on how the grid operator pays

British operators pay mostly per MWh delivered when called upon, sometimes with a small fee for standing by, at prices set in tenders and auctions.^[193, 194] Averaged over all operators and products, a kilowatt was forecast to earn about £33 (€38) a year in 2023-24, paid to the aggregator or supplier, which keeps a share before anything reaches the household.^[164, 170, C27]

The Netherlands, where three grid operators start buying household flexibility in November 2026, chose a simpler design: a fixed, published price paid for being available rather than per use.^[171, 195, 196] It is €60 per kW per year for devices that can hold back for two hours, €90 for four hours and €120 for six ([Figure 4.1](#)).^[171] For comparison, Belgium's capacity auctions in 2025 paid on average about €14 to €27 per derated kW per year, mostly to power plants, battery parks and industrial demand response.^[165, C28] Recruiting households through suppliers and aggregators proved slow, though: a first, smaller phase, open to about 35,000 households, had drawn about 2,200 car chargers, 85 home batteries and 500 hybrid heat pumps by January 2026.^[197, 198]

Flexibility is worth what postponing reinforcement saves

Regulators often let grid operators earn a return on the cables and substations they own, but not on the services they buy from others.^[199, 200, p. 146] That gives operators a reason to build rather than buy flexibility services. Ofgem, the British energy regulator, weakens that bias by assessing both kinds of spending together, as one total.^[201] It also makes every operator publish where and why it buys flexibility, using one shared method to compare it with reinforcement.^[190, 202] Postponing a reinforcement by a year does not avoid its cost; it mainly saves the cost of tying up the capital for that year.^[190] Under the shared method, flexibility is therefore worth buying only while it costs less each year than that saving, which puts the ceiling well below the cost of the reinforcement itself.^[190]

In other words, flexibility mainly buys time. It can be most valuable where it is still unclear whether reinforcement will be needed at all, because waiting then avoids building grid capacity that may never be used. From 2028, Ofgem expects operators to weigh flexibility before committing to reinforcement, and will fund reinforcement whose need is less certain only once that need is confirmed.^[201]

Households join through aggregators, and Britain is making their devices easier to register

A typical home offers only a few kilowatts, less than the minimum offer of 10 kW or more per location that British grid operators ask, so aggregators and suppliers pool many homes into one offer.^[194] That route works: at one operator, 99% of new registrations in summer 2025 were household devices, mostly car chargers and heat pumps.^[193]

So far, each British flexibility market has had its own sign-up, so an aggregator that offers a heat pump to both its local grid operator and the national system operator registers it twice.^[203] From 2027, a shared register is due to let an aggregator sign a device up once for both local and national markets.^[203, 204] That matters most for households, because each home adds only a few kilowatts and every sign-up cost weighs on what it earns.

Heat pumps help at short winter peaks; a long freeze has not been measured

Over three winters, a British grid operator paid more than 1,000 heat pump households to turn their heating down in two-hour peak events on winter evenings.^[191, 205] The measured response grew as it got colder, from 0.4 kW per participating home above 7°C to 1.1 kW below 3°C, and 85% noticed no change in comfort or only a slight one, even in the coldest events.^[191] On an average event, 47% of participants turned their heating down.^[191] The trial never observed a severe winter, and a separate modelling study suggests that flexibility would barely reduce the network peak in a once-in-twenty-years winter (see the box 'Heat pumps in a long cold spell').^[192, 205] Heat pumps can thus be counted on for short peaks on cold evenings, but not yet for a freeze lasting several days, which is what determines how much grid capacity is needed.

What this means for Belgium

- **Regulators and grid operators** could report contracted capacity, energy used, price per kW and the household share separately. The Flemish regulator already reports the energy delivered in Fluvius's test market.^[206]
- **Regulators** in all three regions could ask grid operators to publish, for each congested part of the grid and with one shared method, the price up to which flexibility is cheaper than reinforcement: the yearly value of postponing the investment.
- **Grid operators** that want household flexibility could consider, alongside auctions such as those in Fluvius's test market, a published price per kW per year for being available, offered through suppliers and aggregators, and plan recruitment from the start.

- **Grid operators and Elia** already share FlexHub, which records which provider serves which connection for the services Elia buys and which they describe as the embryo of a Belgian flexibility information system. [207–209] They plan to open FlexHub to several requesting parties and all flexibility products [209, 210], congestion services included; completing that step could let a household sign a device up once and change provider much as it changes supplier.
- **Grid operators and Elia** could count on heat pump turn-downs for short evening peaks on cold days, as long as they allow for the fact that only some households take part in each peak event. For a freeze lasting several days, the quarter-hourly meter data that Fluvius has read as standard since 2026 could show how large the heat pump peak is. [211]

HOW WE CALCULATED

C25 22 GWh called upon ÷ 9 GW under contract ≈ 2.4 hours: the energy used in 2024 equals the contracted capacity running at full power for about two and a half hours over the whole year (ENA figures for 2024).

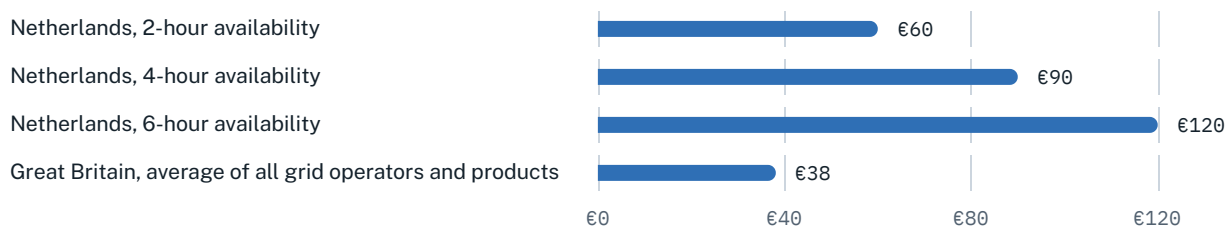
C26 Dynamic 1,584 MW + Restore 1,149 MW = 2,733 MW of 3,635 MW tendered in 2021/22 ≈ 75%.

C27 £33 per kW per year ÷ 0.86 ≈ €38 (Britain, estimate for 2023-24).

C28 Belgian capacity auctions of October 2025: €14.1k (one-year-ahead auction for 2026-27) and €27.3k (weighted average, auction for 2029-30) per derated MW per year = about €14–27 per derated kW per year.

FIGURE 4.1

Dutch grid operators pay €60 to €120 a year per kW of household flexibility, depending on how long it must be held



The Dutch prices are fixed availability payments for winter evening windows, paid to the supplier or aggregator; the British figure is a 2023 estimate by a market party covering availability and use (£33 at €1 = £0.86). Flanders publishes no price: providers in the congestion test market are paid what they bid. For comparison, Belgium's capacity auctions of 2025 paid on average about €14–27 per derated kW per year, for an adequacy product rather than a congestion service.

SOURCES [170, 171, 212]

WHERE BELGIUM STANDS

Belgian grid operators are still testing how to buy flexibility. Fluvius, the distribution grid operator in Flanders, opened a test market for congestion services in winter 2024-25, on a platform run by an external market operator. Providers bid a price for standing by and a price per activation and are paid what they bid; households can take part only through an aggregator. In that first test winter, four providers qualified and delivered 1.3 MWh in 89 activations, about 0.1% of the volume sought; the Flemish regulator saw this as a first proof that the model works, though only on a limited scale. The second test winter, from December 2025 to April 2026, covered 56 zones and tested both lower demand and higher feed-in from local generation. Fluvius has published the zones and product sheets for a third test winter, 2026-27. Outside the market, Fluvius called upon flexibility 129 times in 2024, for about 509 MWh. Businesses that cannot get a full connection can sign a flexible connection contract (1,242 files in August 2026); this is not offered to households. About 26 flexibility service providers are registered on the Flemish distribution grid. For the services Elia buys, the distribution grid operators of all three regions and Elia share a platform they built together, FlexHub, which they describe as the embryo of a Belgian flexibility information system. It records which provider serves which connection, keeps the registers of assets, mandates and meter data behind each service, offers one catalogue of baseline methods and calculates the volumes delivered, on which payments to providers rest; a provider onboards once for all

products. Since June 2026 homes on the low-voltage grid can take part in nearly all of the balancing services Elia buys. A provider can add a connection only after signing a flexibility agreement with its user, and when a household moves to another provider, the grid operator ends the previous provider's service, much as with a change of supplier. Fluvius's congestion tests do not use FlexHub but the external market operator's platform. The grid operators and Elia are preparing the next step: a FlexHub that several parties can use to request flexibility, for all flexibility products; that release is targeted for the first quarter of 2027. At a conference in September 2026 the grid operators said FlexHub would soon also serve congestion products (flexible connections, a local flexibility market and technical measures) and named scattered implementation by product and region as the main risk for the Belgian flexibility market. A draft European network code on demand response (March 2025) points towards a single flexibility information system per country.

In Wallonia, ORES has been preparing a local flexibility market. Brussels has no comparable scheme yet: in October 2025 the Brussels regulator found that the region's low-voltage grid still had a large capacity reserve, with an average load of 33% on transformers and 20% on cables, and said it would look at instruments such as flexible connections. The Brussels electricity ordinance requires the grid operator to buy any flexibility services through transparent, market-based procedures.

SOURCES [173, 178, 179, 200, 206–210, 212–218] · Statement by statement: p. 159

Heat pumps in a long cold spell

Steering a heat pump towards cheaper hours saves households money most of the year. The hard question is the few days that determine how much capacity the grid and the power system need: a freeze lasting several days. Then the heat pump has to work much harder, each unit of electricity yields less heat, and an electric backup heater may switch on. Flexibility is worth most then, but is it still there?

France shows how strongly electric heating drives the peak: in winter, national demand rises by about 2.4 GW for every degree the temperature drops. Québec, where most homes heat with electricity, lowered its winter peak by about 2.3 GW in 2024-25 through programmes for homes and businesses, in peak events of a few hours.

Recent measurements are reassuring, within limits. British monitoring of several hundred air-source heat pumps found that one unit of electricity gave 3.4 units of heat at 10°C, but only 2.3 at -5°C. A German study of up to 761 heat pumps in Bavaria, based on the manufacturer's operating data, examined the coldest three-to-four-day spells of 2021 and 2023, with average night temperatures of -12°C and -9°C. Across the fleet, heat pumps peaked at about 2 kW per home; backup heaters lifted that to 2.8 kW in 2021 and 2.2 kW in 2023, often because of morning hot-water programmes. Yet the compressors ran at a median of about 30% of full speed, which left room to shift some of their use. A British network trial with over 1,000 homes found that two-hour turn-downs delivered more when it was colder: about 1.1 kW per home below 3°C, against 0.4 kW above 7°C, though slightly fewer households took part on the coldest days.

We found no measurement of a once-in-twenty-years freeze; the British trial notes that it never observed one. Model estimates for that case suggest that flexibility would barely reduce the network peak. Over a year, backup heaters use only a small share of the electricity (1.3% in a German monitoring study of 77 heat pumps), but annual averages hide the coldest hours.

For Belgium, Elia already assumes that most heat pumps will not be flexible and add little to security of supply. Two numbers are missing from public Belgian data: the cold-spell peak per heat pump, backup heater included, and how much of it can be shifted. In Flanders, Fluvius has read quarter-hourly data from digital meters as standard since 2026, so the next long freeze can be measured there. The same data can help identify which homes have a heat pump, so that the analysis can be limited to the households that heat with one today. In Wallonia and Brussels, fewer than a third of meters were digital at the end of 2025. Installers and manufacturers have direct influence on two things that shape the cold-spell peak: how large the heat pump is, and when the backup heater and the hot-water cycle are allowed to run.

SOURCES [96, 175, 180, 191, 192, 205, 211, 219–231] · Statement by statement: [p. 160](#)

Examples (5)

Netherlands

Three Dutch grid operators publish a fixed price for household flexibility, €60 to €120 per kW per year, and buy it through suppliers.

WHO	Three regional distribution grid operators (Enexis, Liander and Stedin), buying through energy suppliers and other aggregators
WHAT	In the most congested parts of the central Netherlands, three distribution grid operators asked suppliers and aggregators in July 2026 to sign up home batteries, heat pumps and electric-car chargers that can be turned down at the winter evening peak. The price is fixed and public: €60 per kW per year if the devices can hold back for two hours, €90 for four hours and €120 for six, paid for being available rather than per use. The supplier or aggregator does the steering, puts the household's comfort first and decides how much of the payment it passes on. Delivery starts in November 2026.
SCALE	Target: 255 MW from 50,000–70,000 households in congested parts of Gelderland, Utrecht, Flevoland and eastern North Brabant (from November 2026). A first, smaller phase from mid-2025 was open to about 35,000 households in 21 areas.
EFFECT ON THE SYSTEM	Not measured yet for the new scheme. In the first phase, electric-car charging between 5 and 9 pm fell by 60% at one supplier in November 2025, compared with the month before. That phase had drawn about 2,200 electric-car chargers, 85 home batteries and roughly 500 hybrid heat pumps by January 2026.
EFFECT ON THE BILL	The grid operator pays the supplier or aggregator, not the household; what reaches the household differs by supplier, region and device. At the published price, one kilowatt held back for two hours is worth €60 a year before the supplier's share.
WHY IT WORKED, OR DID NOT	Too early to judge. In the first phase, recruitment was slow: it ran through suppliers' apps and offers, and only a few thousand devices joined. The pressure to make the new scheme work is high, because since July 2026 households in congested areas can also end up on a waiting list for a new or heavier connection.

LESSON FOR BELGIUM Fluvius already tests a market for congestion services in which households can take part through an aggregator, with auctions that pay each provider its own bid. A published price per kW per year for being available, offered through suppliers and aggregators, could be easier to explain to households. The Dutch first phase suggests planning for slow sign-up: low numbers in the first months are a reason to plan recruitment, not necessarily to drop the idea.

Distribution grid operator

Supplier

Regulator

SOURCES [171, 195–198, 232] · Numbers, source notes and further reading: p. 161

British grid operators buy flexibility routinely and households supply a growing share, but most contracted capacity is rarely called upon.

WHO	Britain's distribution grid operators, buying from aggregators and suppliers
WHAT	Each British distribution grid operator runs tenders and auctions in places where demand is close to the limit of a cable or substation. Providers offer to cut or shift demand there and are paid a fee for standing by, a fee for each unit of energy when called upon, or both, depending on the product. Households take part through an aggregator or supplier, often with electric-car chargers or heat pumps; a single home does not need to reach the minimum offer of 10 kW or more per location. In 2024 the operators together had about 9 GW under contract but called upon only 22 GWh, the equivalent of using that capacity at full power for about two and a half hours in the whole year.
SCALE	All British distribution operators, 2024: 31 GW tendered, 9 GW contracted, 22 GWh used. Largest local market (London and the South East), 2024/25: 450 MW in operation, 13 GWh used, about 177,000 devices registered, 23% of capacity from households.
EFFECT ON THE SYSTEM	Used volumes are modest: 22 GWh across Britain in 2024, 13 GWh at the largest local market in 2024/25. The operators estimate that flexibility saved consumers about £300 million (€350 million) in 2024 by postponing reinforcement.
EFFECT ON THE BILL	Small and variable. Average earnings were estimated at about £33 (€38) per kW per year across all operators for 2023-24, before the aggregator's share. Households that used more power when the local network had spare capacity earned £54 (€63) of free electricity in 2024/25 at one operator, about 44% of their yearly network charge.
WHY IT WORKED, OR DID NOT	The regulator lets operators spend on flexibility instead of grid reinforcement and makes them justify the choice with a common method (see the British example on comparing flexibility with reinforcement). All operators use the same standard products and contracts, entry thresholds are low and aggregators can offer household devices, which is how households got in.

LESSON FOR BELGIUM The Flemish regulator already reports the energy delivered in Fluvius's test market and in the grid operator's interventions outside it. As volumes grow, Belgian reports could keep capacity contracted, energy used and euros paid per kW apart, and show the share from households: the British headline figure of 9 GW is easily read as flexibility actually used, while only 22 GWh was called upon in 2024. In Britain, low entry thresholds and access for aggregators are what brought households in.

Distribution grid operator

Independent aggregator

Regulator

SOURCES [170, 187–189, 193, 194, 202, 215, 233] · Numbers, source notes and further reading: [p. 162](#)

Britain lets grid operators spend the same budget on grid reinforcement or on flexibility, and makes them check with one common method which is cheaper.

WHO	The national energy regulator (Ofgem), with the distribution grid operators and their association, the Energy Networks Association
WHAT	Where a grid operator earns a return on the grid assets it owns but not on the services it buys, it has a reason to build rather than buy flexibility services. Britain's regulator weakens that bias by judging spending on equipment and on services as one total, and since 2021 every operator must publish where and why it buys flexibility, using one shared method to compare it with reinforcement. That method sets a ceiling price. Postponing a reinforcement by a year does not avoid its cost; it mainly saves the cost of tying up the capital for that year. Flexibility is therefore worth buying only while it costs less each year than that saving, so it buys time rather than replacing grid reinforcement for good. For the period from 2028 the regulator expects operators to assess flexibility systematically before committing to grid reinforcement, and will fund less certain reinforcement only once the need is confirmed.
SCALE	All British distribution grid operators; common comparison method in use since 2021 (latest version September 2024); next price control period from April 2028.
EFFECT ON THE SYSTEM	Not measured. Contracted flexibility grew to about 9 GW in 2024, but no study isolates the effect of these rules from other drivers.
EFFECT ON THE BILL	Indirect and not quantified: households gain through lower network charges when flexibility is cheaper than reinforcement.
WHY IT WORKED, OR DID NOT	Judging all spending as one total means that an operator no longer loses a return when it buys a service instead of building, and the shared method makes each choice checkable by outsiders. The regulator is still tightening the rules for the next period, asking operators to weigh flexibility before reinforcement rather than only allowing it.

LESSON FOR BELGIUM The Flemish tariff methodology for 2025-2028 already lists flexibility services among the costs of managing the grid. Regulators in all three regions could go a step further and ask grid operators to publish, for each congested part of the grid, the price up to which flexibility is cheaper than reinforcement, calculated with one shared method. That ceiling reflects the yearly value of postponing an investment, not its full cost, so flexibility mainly bridges the time until reinforcement, or until it is clear whether reinforcement is needed at all.

Regulator

Distribution grid operator

SOURCES [188, 190, 199–201, 234] · Numbers, source notes and further reading: p. 162

Britain has made one body responsible for aligning its flexibility markets, starting with a shared register, due in 2027, that will let an aggregator sign a device up once for both local and national markets.

WHO	Ofgem, the national energy regulator, and Elexon, the body that already runs electricity settlement in Britain
WHAT	In Britain each local grid operator and the national system operator runs its own flexibility market, each with its own sign-up, products and data, so an aggregator with household devices has to register and prove them several times. In 2024 the regulator decided to give one neutral body, the organisation that already runs electricity settlement, the job of aligning these markets. Its first concrete deliverable is a shared register: an aggregator registers a device once with its network operator and can then offer it in both local and national markets, from 2027. Next come a common way for grid operators to send dispatch signals, one public data portal and standard product definitions.
SCALE	All British local and national flexibility markets; first phase of the shared register due by September 2027.
EFFECT ON THE SYSTEM	Not measured: the shared register is not yet live.
EFFECT ON THE BILL	Not quantified. The aim is to lower the cost of signing up small devices.
WHY IT WORKED, OR DID NOT	Too early to judge. The regulator gave the task to an existing neutral body with settlement data, and brought the register's launch forward by a year to 2027.

LESSON FOR BELGIUM Belgium already has a shared register for the services Elia buys: FlexHub, built by the distribution grid operators and Elia and used in all three regions. The grid operators describe it as the embryo of a Belgian flexibility information system. It records which flexibility service provider serves which connection, keeps the registers of assets, mandates and meter data behind each service, offers one catalogue of baseline methods and calculates the volumes delivered, so that a provider onboards once for all products. Since June 2026 homes on the low-voltage grid can take part in nearly all of Elia's balancing services, and when a household moves to another provider, the grid operator ends the previous provider's service, much as with a change of supplier. Fluvius's congestion tests run on a separate market platform. The grid operators and Elia plan to open FlexHub to several requesting parties and all flexibility products, congestion services included. Completing that step could let a household sign a device up once for both Elia's and the grid operator's services, and switch provider much as it switches supplier.

Distribution grid operator

Elia (transmission)

Regulator

SOURCES [203, 204, 207–210, 235–239] · Numbers, source notes and further reading: [p. 163](#)

A British grid operator's trial in over 1,000 heat pump homes: short turn-downs kept homes comfortable and delivered more on colder days.

WHO	A British distribution grid operator (National Grid Electricity Distribution), aggregators and heat pump households
WHAT	Over three winters (2022-2025), a British distribution grid operator paid more than 1,000 households with heat pumps, including vulnerable households, to turn their heating down for two-hour evening windows, up to three times a week. Households could join each peak event themselves or let an aggregator control the heat pump; both delivered useful flexibility. In the second winter, turn-downs averaged 0.6 kW per participating home, rising to 1.1 kW on days below 3°C, and 85% of participants noticed no change or only a slight change in comfort, even in the coldest events.
SCALE	Over 1,000 households, three winters (2022-2025); the coldest event averaged -1.4°C.
EFFECT ON THE SYSTEM	Measured per participating home (two-hour evening turn-downs, winter 2023-24): 0.4 kW above 7°C, 0.7 kW at 3-7°C, 1.1 kW below 3°C; slightly fewer households opted in on the coldest days, and on an average event 47% of participants turned their heating down. The trial never observed a severe winter. A separate desk study (2021-22) modelled a once-in-twenty-years winter and found that flexibility would barely reduce the network peak; see the box 'Heat pumps in a long cold spell'.
EFFECT ON THE BILL	Payment levels were not published; three payment models were tested, with payments per event, for availability and per use. 78% of participants were satisfied with taking part in both the grid operator's scheme and the national peak-event scheme.
WHY IT WORKED, OR DID NOT	It worked because the turn-downs were short and households chose per event whether to join; both households acting themselves and heat pumps controlled by an aggregator delivered useful flexibility. The limiting factor was participation: on an average event, fewer than half of the participants turned their heating down.

LESSON FOR BELGIUM Belgian grid operators could count on heat pump turn-downs for short evening peaks, also on cold days, as long as they allow for the fact that only some households take part in each peak event. For a freeze lasting several days there is no measurement either way. Elia already assumes that most heat pumps will not be flexible; the quarter-hourly meter data that Fluvius has read as standard since 2026 could show how large the heat pump peak is in a long cold spell.

Distribution grid operator

Elia (transmission)

Manufacturer & installer

SOURCES [191, 192, 205] · Numbers, source notes and further reading: [p. 163](#)

Some countries simply require devices to be steerable, and it works where the infrastructure is already there

Much household flexibility is organised one household at a time, through a contract with a supplier or aggregator. A law, a network tariff or a product rule can instead make appliances steerable in bulk. Some countries use such rules; others leave flexibility to contracts. The choice reflects different views of how far public rules should reach into people's homes, and may well follow political dividing lines. The examples in this chapter differ on three questions: who holds the switch, what happens by default, and whether the household can opt out and is paid for taking part ([Figure 5.1](#)).

Such rules work at scale where they can build on infrastructure that already exists. France is moving part of the cheap hours of more than 11 million households from the night to the afternoon by regulatory decision, and water heaters wired to a switch in the smart meter follow automatically.^[166, 240] Since 2024, German grid operators can dim new heat pumps, home chargers and home batteries during moments of grid stress, but the smart meters needed to do this remotely are still largely missing.^[241, 242] Britain has made every new home charger avoid the peak by default since 2022.^[243] Much of the older central control was set up to run appliances at night, when electricity used to be cheapest; with rooftop solar, the middle of the day is now often the cheapest time, so that control stays useful only if its hours move with it.^[166, 244] And when many appliances respond to the same signal at the same moment, they risk creating a new peak, which is why the countries that switch centrally spread the moment at which appliances switch on.^[245, 246] How much flexibility these rules actually deliver has rarely been measured.

Most rules come with a payment or a way out

Even where devices must be steerable, the requirement rarely stands alone. German grid operators can turn down any new heat pump, home charger or home battery above 4.2 kW when the local grid is close to its limit, but never below that level, and households cannot opt out.^[241] In return, the grid operator can no longer refuse or delay the connection, and the household pays €110 to €190 a year less in network charges.^[241] Switzerland is moving from imposed to paid control: under a law approved by referendum in 2024, the grid operator can use a household's flexibility only with the household's consent and against a published payment, except to avert a serious threat to the grid.^[247–249] Where nothing is paid, there is a way out. Every new British home charger leaves the factory set to charge outside the weekday peaks, but the owner can override those hours at any time.^[243]

Rules scale where the wiring is already there

France can re-time millions of water heaters with one regulatory decision because three things were in place: the cheap off-peak hours sit in a single national network tariff, one grid operator runs 95% of the distribution network, and about 7.8 million water heaters are wired to a switch in the smart meter that turns them on when those hours begin.^[166, 250, 251] The speed has a cost: households are informed rather than asked, and those whose water heater runs on its own timer must reset it or risk heating at peak prices.^[166, 252] Germany shows the reverse: by mid-2026 only 5.9% of its metering points had the smart meter that remote dimming depends on.^[242]

Control designed for the night must move to midday, or it is lost

Many of these central control systems are decades old.^[244, 253] They were set up to run water heaters and storage heaters at night, when demand was low and electricity was cheapest, and the cheap hours in tariffs were placed at night for the same reason.^[166, 244, 246] Since then, rooftop solar has changed the daily pattern:

on sunny days there is often more electricity around midday than the grid needs, and the middle of the day has become the cheapest time in many countries (see [Chapter 6](#)).^[166, 254] Control that still switches appliances on at night therefore misses the hours in which their flexibility is now worth most. Where the control is re-timed, it stays useful. France now lets up to three of its eight off-peak hours move to between 11 am and 5 pm, and Australian grid operators are moving the windows of separately metered water-heater circuits into solar hours.^[166, 244, 255]

Where control no longer fits the system, it is abandoned. In Switzerland, Winterthur's municipal utility will switch off its control signal at the end of 2027 because running the system is no longer economic.^[256, 257] In Australia, many solar owners have taken their water heater off the controlled circuit to run it on their own panels, often on their installer's advice: a 2023 assessment found 20–25% of the controlled load in South Australia inactive or disconnected, and about one in three solar installers in Queensland advising customers to make that change.^[244, 254] Whether flexibility is kept or lost is decided at installation as much as in the choice of contract.

A common signal needs a staggered start

When many devices respond to the same signal at once, they risk creating a new peak. Britain added its charger rules after a trial observed a surge in demand at 10 pm, when many drivers had set charging to start when a cheaper period began; every new home charger must now start each charge after a random delay of up to ten minutes.^[245, 258] Finnish grid operators switch on night-time loads in stages over at least an hour, as the national transmission system operator advised.^[246] Fixed time blocks in network tariffs or supplier contracts can carry the same risk (see [Chapters 1](#) and [2](#)).

Measured effects are scarce

Only one rule in this chapter has a measured effect at system level: Dutch grid operators have public chargers in congested areas turned down on weekday evenings by default.^[259] In Utrecht province, with 3,500 such charge points, this cut the 7 pm charging load to about half its expected level by late February 2026: 5.8 MW instead of 11.5 MW ([Figure 5.2](#)).^[260, 261] Two smaller tests also measured a shift. In a supplier's test with 237 French homes, water-heater use at 7 pm fell by 20%, about 0.3 kW per home, and in an Australian grid operator's trial an average 28% of daily water-heating load moved into solar hours.^[251, 255] For Germany's dimming, France's re-timed hours and Britain's charger defaults, no measured result has been published; for France there is only the grid operator's forecast that about 5 GW of consumption will move to the afternoon in the sunniest months.^[240, 262]

What this means for Belgium

- **Governments and regulators** that want a safety net under Belgium's market-based approach could study Germany's package: a right to dim large new appliances with a guaranteed minimum, a guaranteed connection, a lower network charge and published interventions.^[241, 263] Such a rule may be easier to introduce before congestion becomes widespread.
- **Governments** could attach default behaviour to future incentives for devices. Belgium's federal tax reduction for home chargers from 2021 to 2024 required a charger that could be steered, but no default behaviour; Britain built default off-peak hours and a random start delay into every new charger, at an estimated £40 (€47) of extra manufacturing cost per device.^[243, 258, 264, 265, C29] For heat pumps, regional premiums could likewise require domestic hot water to be heated in the middle of the day, when solar power is plentiful.
- **Regulators and grid operators in Flanders, Brussels and Wallonia** could follow what replaces the exclusive-night circuits, which have lost or are losing their tariff advantage in all three regions: whether

their appliances move to the solar hours, stay at night on a clock, or are no longer steered at all. ^[266–275] Switzerland shows that a working central channel can disappear before a market replacement exists. ^[257]

- **Regulators, suppliers and aggregators** that design the time blocks now appearing in Belgian network tariffs and supplier contracts could build in a staggered start from the outset, as Britain does per device and Finland per group of customers. ^[29–31, 87, 245, 246] Flemish and Walloon exclusive-night circuits are already switched on at different moments. ^[272, 276]
- **Manufacturers and installers** often decide whether a heat pump, water heater or charger stays steerable. Flexibility policy in all three regions could involve them from the start, as Flanders does in its public catalogue of energy managers, which the electrical sector's knowledge centre helps run. ^[277] They could also set new heat pumps to heat domestic hot water in the solar hours by default.

HOW WE CALCULATED

C29 £40 extra manufacturing cost per charger (UK government impact assessment) ÷ 0.86 £ per € ≈ €47 (conversion rate used throughout this report: €1 = £0.86).

FIGURE 5.1

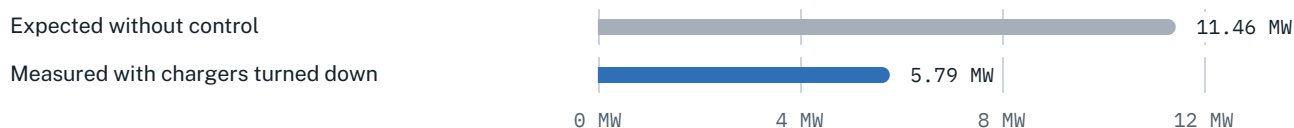
Who holds the switch: grid operator, meter, manufacturer or market

WHERE	WHO HOLDS THE SWITCH	DEFAULT	CAN THE HOUSEHOLD OPT OUT?	PAYMENT
Germany	grid operator via smart meter and control box	mandatory for new devices >4.2 kW	no opt-out	€110–190/yr network discount or 60% off per-kWh network charge
France (off-peak hours)	regulator sets the rules in the network tariff, grid operator fixes the hours; meter switch runs the water heater	default for >11m households with peak/off-peak	can change offer	cheaper off-peak price (≈4.9 euro cents per kWh gap on the regulated tariff)
France (water-heater service)	supplier reprogrammes meter switch	opt-in	yes	€27–45/yr credit
Finland	grid operator via relay required in new meters	night control under day/night network tariff; spot-price service opt-in	yes	not reported
Switzerland	grid operator by ripple control, now only with customer consent	existing control continues unless customer objects	yes	compensation required by law
Australia	grid operator via separate controlled-load circuit	opt-in for cheaper rate	yes (many solar owners leave)	cheaper rate
Netherlands (public charging)	grid operator via charge point operators	default in congested areas, 16:00–21:00	per-session opt-out at many points	none made public
Great Britain	manufacturer (product rule), then owner	default off-peak hours + random start delay	owner override	none
Belgium	household and market (energy manager via meter data port, supplier, aggregator)	no default; exclusive-night circuits have lost or are losing their tariff advantage (Flemish tariff ends on 1 January 2028)	—	via contracts

SOURCES [45, 166, 241, 243, 244, 246, 249, 257, 259, 266, 267, 278–280]

FIGURE 5.2

By late February 2026, turning down public chargers from 4 to 9 pm had halved the 7 pm charging load in Utrecht province



Charging load of 3,500 public chargers in Utrecht province at 19:00, late February 2026; in December the reduction was 24%.

SOURCES [260, 261]

WHERE BELGIUM STANDS

Belgium has no general rule that lets grid operators steer household appliances; flexibility is left to households, suppliers and aggregators. The main historical exception is the exclusive-night circuit: storage heaters and electric water heaters on a separate meter and circuit, powered mainly at night at a lower network tariff. It dates from a time when there was spare electricity and spare grid capacity at night. In Flanders the circuit is switched on between 22:00 and 23:45 and off between 06:00 and 08:00, with an afternoon top-up in some areas. The Flemish regulator has been phasing out its tariff advantage since 2021; the tariff disappears on 1 January 2028, and in late September 2026 Fluvius began writing to the households concerned, offering among other options a free clock so that their appliances keep working. Flanders chose a digital meter whose main task is to measure. To steer appliances, households can open a data port on the meter and connect an energy-management box to it. A public catalogue run by the Flemish Energy and Climate Agency, Fluvius and sector bodies lists such boxes; 33 of its 42 products must be installed by a professional. About 80% of Flemish homes and small businesses had a digital meter at the end of 2025; the rollout must be complete by mid-2029. From 2021 to 2024 a federal tax reduction for home chargers required a charger whose charging time and power could be steered by an energy-management system of the owner's choice. In December 2025 Flanders also adopted a legal framework for flexible grid connections in congested areas; so far it targets larger connections, not households.

Brussels is phasing out its remaining exclusive-night meters, about 4,000 in all: their rate has for some years been no cheaper than the night rate of a day/night meter, and the Brussels grid operator replaces them with a smart meter free of charge. Smart meters go first to Brussels homes with solar panels, a charging station or a home battery, and almost all residents should have one by the end of 2030. A technical rule approved by the Brussels regulator in 2024 allows 7.4 kW and 22 kW chargers on 400-volt networks only with a charging-management system, and requires power limiting on shared charging points whose total power exceeds the contractual power set by the grid operator. In Wallonia the exclusive-night circuit, usually powered from 22:00 to 07:00 or 21:00 to 06:00 depending on the substation, has had the same distribution tariff as the off-peak hours of a day/night meter since January 2026.

SOURCES [264–277, 281–287] · Statement by statement: p. 164

Examples (8)



Germany

Germany lets grid operators dim new heat pumps, home chargers and home batteries during moments of grid stress, and in return guarantees their connection and lowers their network charge.

WHO	The federal legislator set the principle in energy law; the national energy regulator, the Federal Network Agency (Bundesnetzagentur), designed the rules after two public consultations; local distribution grid operators apply them.
WHAT	Since January 2024, every new heat pump, home charger or home battery above 4.2 kW in Germany must be installed so that the grid operator can turn it down when the local grid is close to its limit, but never switch it off: at least 4.2 kW always stays available. In return, the grid operator can no longer refuse or delay the connection on the grounds that the local grid might not cope, and the household gets a lower network charge: a fixed discount, or 60% off the per-kWh network charge for a separately metered device. Since April 2025 the household can add a time-of-use network charge, with cheap and expensive windows that each grid operator sets once a year. The regulator first proposed a guaranteed minimum of 3.7 kW and raised it to 4.2 kW after consultation, so that heat pumps keep running and an electric car can still add about 50 km of range in two hours.
SCALE	All new controllable devices above 4.2 kW connected since 1 January 2024; the number registered is not published. By June 2026 only 5.9% of all German metering points had the smart meter that remote dimming needs.
EFFECT ON THE SYSTEM	Not measured. Since March 2025 grid operators must publish every intervention on a shared website, but no national total has been published. Remote dimming also depends on smart meters and control boxes that are still largely missing: only about a quarter of the connections that must get a smart meter had one by mid-2026.
EFFECT ON THE BILL	A fixed network-charge discount of €110 to €190 a year (including VAT), depending on the grid area, or 60% off the per-kWh network charge for a separately metered heat pump or charger. Savings from the optional time-of-use network charge depend on the area and are not reported nationally.
WHY IT WORKED, OR DID NOT	It was put in place before congestion became widespread, and it trades a right to dim for a guaranteed connection and a lower network charge, a balance between the interests of grid operators and households. Its weak point is execution: remote control depends on smart meters that Germany is installing slowly.

LESSON FOR BELGIUM Belgian grid operators have no general right to steer household appliances. Germany's package combines a right to dim large new appliances, a guaranteed minimum power, a guaranteed connection, a lower network charge and the publication of every intervention. It is a worked-out design that Belgian policymakers could study as a safety net under the market-based approach, not as a replacement for it. Such a rule may be easier to introduce before congestion becomes widespread.

Government

Regulator

Distribution grid operator

SOURCES [241, 242, 263, 288–291] · Numbers, source notes and further reading: p. 165

 Switzerland

A Swiss law gives households control over the flexibility of their own appliances, and one city utility is switching off its decades-old remote control of water heaters.

WHO	The federal legislator (a law approved by referendum in June 2024); local distribution grid operators decide whether to keep their remote-control systems.
WHAT	For decades Swiss grid operators have switched water heaters, storage heaters and heat pumps on and off by sending a signal through the distribution grid to a receiver in the meter cupboard, typically in exchange for a cheaper tariff. A new federal law, approved by referendum in 2024, says this flexibility belongs to the customer: the grid operator can use it only with the customer's consent and against a published payment, except to avert a serious threat to the grid. Existing control can continue unless the customer objects, but as more customers opt out the systems control fewer devices. Winterthur's municipal utility will switch its signal off at the end of 2027 because the system is no longer economic to run; it offers no compensation and advises customers to buy their own energy management system.
SCALE	One large grid operator alone runs more than 140,000 receivers, plus about 30,000 at partner grid operators (2022); no national total is published. Winterthur switches off on 31 December 2027.
EFFECT ON THE SYSTEM	Not measured. No figure is published for the load these systems shift, or for what is lost when they are switched off.
EFFECT ON THE BILL	Under the new law a household that allows control must be paid, usually through a lower network charge; one that objects pays the standard tariff. Where control is switched off, as in Winterthur, there is no compensation and owners pay for any rewiring themselves.
WHY IT WORKED, OR DID NOT	The law moves the decision from the grid operator to the household, which is consistent with a market for flexibility. But when too few customers stay in, a central system can stop paying for itself, and for a grid operator switching it off may be easier than negotiating contracts one by one.

LESSON FOR BELGIUM Giving households the right to their own flexibility does not by itself create a market for it, and a working central channel can disappear before a replacement exists. Belgium faces a similar moment: its exclusive-night circuits have lost or are losing their tariff advantage in Flanders, Brussels and Wallonia, and the Flemish tariff ends on 1 January 2028.

Government

Regulator

Distribution grid operator

SOURCES [247–249, 253, 256, 257, 292] · Numbers, source notes and further reading: [p. 165](#)

In France the meter itself can switch the water heater, so a supplier can steer millions of them without a home visit.

WHO	A supplier (Octopus Energy France), using a switch built into the national smart meter that the main distribution grid operator installed in almost every home.
WHAT	France's smart meter, installed by the main grid operator in about 96% of homes since 2015, has a built-in switch that turns an electric water heater on when the cheap off-peak hours start. In February 2026 the supplier Octopus began offering its customers a free service that reprogrammes that switch up to a day ahead, so the water heater runs when power is cheap or plentiful rather than at fixed times. Nothing has to be installed: the household gives consent and can switch the water heater on manually at any time. In a spring 2025 test with 237 homes, water-heater use at the 7 pm peak fell by 20%, about 0.3 kW per home.
SCALE	About 7.8 million of France's 15 million homes with an electric hot-water tank already have it wired to the meter's switch (February 2026).
EFFECT ON THE SYSTEM	Measured in a pilot with 237 homes: 20% less water-heater use at 7 pm, about 0.3 kW per home. For all compatible homes, Octopus forecasts 780 MW less at the winter evening peak and 23 GWh moved to summer middays.
EFFECT ON THE BILL	Octopus credits €45 a year to customers on a single-rate price and €27 a year to customers already on peak/off-peak hours (guaranteed until the end of 2026), and estimates the average saving at about €33 a year.
WHY IT WORKED, OR DID NOT	The switch is already in the meter and already wired to the water heater for the off-peak hours, so the only costs are software and the customer's consent. It is limited to simple on/off water heaters: newer smart models do not tolerate being cut off abruptly.

LESSON FOR BELGIUM Belgium will not replace its meters now, but the French case shows that the cheapest flexibility uses wiring and connections already in the home. In Belgium these are the exclusive-night circuits of storage heaters and water heaters for as long as they remain, energy managers connected to the meter's data port, and appliances' own internet connections.

Supplier

Independent aggregator

Distribution grid operator

SOURCES [251, 279, 293, 294] · Numbers, source notes and further reading: [p. 166](#)



Finland

Finland requires a load-control switch in new meters for houses; one grid operator now uses it to run storage heating and water heaters in the cheapest hours.

WHO	The government, through a metering decree, requires the switch; a distribution grid operator offers the control service.
WHAT	Finnish rules require new smart meters in detached and semi-detached houses to include a switch that can turn a large load on or off. Grid operators have long used such switches to run electric water heaters and storage heating at night under a day/night network tariff, starting them in stages over at least an hour on the advice of the national transmission system operator, so that the load on the grid does not jump at 10 pm when all these appliances would otherwise switch on at once. Since 2024 one large grid operator offers all households with the new meter a service that switches these loads automatically in the cheapest hours of the exchange price, and it plans to open the switches to independent flexibility providers.
SCALE	A pilot with 76 households (2018–2020), then a service open since 2024 to all of that grid operator's customers with a second-generation meter; participant numbers are not published.
EFFECT ON THE SYSTEM	Not measured. Participant numbers and the load shifted have not been published.
EFFECT ON THE BILL	Not reported.
WHY IT WORKED, OR DID NOT	Once the switch is in the meter it costs little, needs nothing from the household and works with the simplest appliances. But it can only switch on or off, it runs through the grid operator, and thousands of water heaters obeying one signal have to be staggered to avoid creating a new peak.

LESSON FOR BELGIUM Belgium has chosen a different meter, so what could transfer is not the hardware but two practices. One is spreading switch-on times so that a common signal does not create a new peak. Belgian exclusive-night circuits already do this: in Flanders they are switched on within a window from 22:00 to 23:45, in Wallonia at times that vary by substation. The other is opening a grid-operator control channel to market parties.

Distribution grid operator

Regulator

Independent aggregator

SOURCES [45, 246, 295] · Numbers, source notes and further reading: [p. 166](#)

France is moving part of the cheap hours of more than 11 million households from the night to the afternoon by regulatory decision; water heaters wired to the meter's switch follow automatically.

WHO	The national energy regulator, through the network tariff; carried out by the main distribution grid operator.
WHAT	In France the cheap off-peak hours are part of the network tariff set by the regulator; the grid operator fixes them locally, and suppliers, including those selling the state-set regulated tariff that 55% of homes still buy, price their peak/off-peak offers around them. Off-peak hours were traditionally placed at night, when demand was low; with the growth of solar power, the early afternoon is now often cheaper than the night. The regulator therefore decided in 2025 that of the eight off-peak hours at least five must stay at night (11 pm to 7 am) and up to three can move to between 11 am and 5 pm. The grid operator is changing the hours remotely in two waves: 1.7 million customers from November 2025 and 9.3 million between December 2026 and late 2027, the second wave with afternoon hours in summer only. Water heaters wired to the meter's switch follow automatically; appliances on their own timers must be reset by the household.
SCALE	More than 11 million households with peak/off-peak hours, about a third of French homes; changes run from November 2025 to late 2027.
EFFECT ON THE SYSTEM	Not yet measured. The grid operator expects about 5 GW of consumption to move to the afternoon in the sunniest months; no measured result has been published for the first wave.
EFFECT ON THE BILL	On the regulated tariff, off-peak power costs 15.79 euro cents per kWh against 20.65 euro cents at peak (February 2026), a gap of about 4.9 euro cents per kWh. Households whose water heater runs on its own timer rather than the meter's switch risk heating at peak prices until they reset it.
WHY IT WORKED, OR DID NOT	It could be done in one regulatory decision because the hours sit in a single national network tariff, one grid operator runs 95% of the distribution network, and the switch is already in the meter. The other side of that speed is that households are informed rather than asked, and practical problems, such as water heaters left on old timers, surface afterwards.

LESSON FOR BELGIUM When the time signal sits in the network tariff and the switch is already in the house, re-timing millions of appliances becomes a regulatory decision rather than a market campaign. Time blocks are appearing in Belgian network tariffs too: as an option in Wallonia since 2026 and in preparation in Brussels, while Flanders is studying a time-dependent refinement of its capacity tariff. France shows why it helps to plan from the start how appliances will follow a later change of hours: devices wired to the meter follow automatically, devices on their own timers do not.

Regulator

Distribution grid operator

Supplier

SOURCES [166, 240, 250, 252, 262, 278, 296] · Numbers, source notes and further reading: [p. 166](#)

Australia's grid operators can switch millions of water heaters, but households with solar are leaving that control, often on their installer's advice.

WHO	Distribution grid operators, through a separately metered 'controlled load' circuit with a cheaper network rate; installers and households decide whether to stay on it.
WHAT	More than half of Australian homes heat water electrically, and for decades many have done so on a separate circuit that the grid operator switches on only at night, in exchange for a cheaper rate. With rooftop solar now producing a surplus at midday, grid operators are moving these windows into the day: South Australia now runs the circuit with time-of-day prices, and New South Wales and Queensland have stretched the windows into solar hours. At the same time many solar owners rewire their water heater to the normal circuit so it can run on their own panels, because a night-only circuit cannot use them and exporting earns little. A 2023 assessment found 20–25% of the controlled load inactive or disconnected in South Australia, and about one in three solar installers in Queensland advising customers to take the heater off.
SCALE	More than half of Australian homes have electric water heating, about 25 GWh of flexible demand a day (2023); a daytime-shift trial covered 2,850 water heaters.
EFFECT ON THE SYSTEM	In a grid operator's trial with retailers, an average 28% of daily water-heating load moved into solar hours, up to 74% for the best-performing retailer. Researchers modelled that about 940 GWh a year of water heating could run on surplus rooftop solar. The load lost to disconnection has not been measured nationally.
EFFECT ON THE BILL	Not reported in comparable terms. Households join the controlled circuit for a cheaper rate; solar owners leave it to use their own power instead of exporting it at a low feed-in price.
WHY IT WORKED, OR DID NOT	The controlled circuit was designed for a time when electricity was cheapest at night. Now that rooftop solar produces more than enough power at midday, a circuit that switches on only at night stops solar owners from heating water with their own panels, so for them it became a constraint rather than a saving. Installers, who are the ones standing in the house, acted on that. Where windows were moved to the middle of the day, the channel became useful again.

LESSON FOR BELGIUM A central control channel tends to stay in use only if it switches appliances on when power is cheap and plentiful. Where Australian circuits still switched on only at night, solar owners and their installers began to take water heaters off them. Belgium's exclusive-night circuits face this question now that their tariff advantage has ended or is ending in all three regions: their appliances can move to solar hours, stay at night on a clock, or leave central control altogether. Installers wire, size and set up these appliances, so their advice may decide whether flexibility is kept or lost.

Distribution grid operator

Manufacturer & installer

Regulator

SOURCES [244, 254, 255, 297] · Numbers, source notes and further reading: [p. 167](#)

Dutch grid operators turn down public chargers in the evening peak by default, and in Utrecht this halved the charging peak by late winter.

WHO	Two distribution grid operators, working through the companies that operate the public charge points, with local authorities.
WHAT	Since winter 2025/26, two Dutch grid operators have had more than 5,200 public charge points in congested areas turned down on weekdays between 4 pm and 9 pm. The grid operator sends its limits to the companies running the charge points, which lower the charging speed and raise it again after 9 pm; most cars are still full by morning, and many charge points let a driver opt out in an emergency. No payment to drivers or charge point operators has been made public; the charging sector says it would rather deliver full power but accepts the measure while the grid is reinforced. The grid operators' next step is a signal sent a day ahead that asks for slower charging at specific charge points during specific hours.
SCALE	More than 5,200 public charge points (about 2,200 in the south and north-east, over 3,000 in Utrecht province), winter 2025/26.
EFFECT ON THE SYSTEM	Measured in Utrecht province (3,500 charge points, about 600,000 sessions): at 7 pm the charging load was 24% below the expected level in December and 49.5% below it in late February, about 5.8 MW instead of 11.5 MW.
EFFECT ON THE BILL	No price effect for drivers was reported. Evening sessions charge more slowly, and some sessions paused when the limit was set too low.
WHY IT WORKED, OR DID NOT	The grid operator gets a guaranteed reduction at the hour it needs it, without depending on how drivers react to prices, and a few charge point operators with software links reach thousands of sockets. Most cars stay parked for hours, so slower evening charging costs drivers little.

LESSON FOR BELGIUM Where a grid operator needs certainty rather than a likely response, a technical limit agreed with a few charge point operators could be used alongside price signals. Who bears the cost and who gains depends on the contracts under which public charging is run; Belgian authorities and grid operators could settle this in advance.

Distribution grid operator

Government

SOURCES [259–261, 280] · Numbers, source notes and further reading: p. 167

Every new British home charger must avoid peak hours by default and start each charge after a random delay of up to ten minutes.

WHO	The national government, by regulation: a product rule for manufacturers and sellers, enforced by the national product safety regulator.
WHAT	Since 30 June 2022, every home or workplace charger up to 22 kW sold in Great Britain must be smart and connected, and must arrive with default charging hours outside the weekday peaks of 8 to 11 am and 4 to 10 pm. At first use the owner can accept, change or remove those hours, and can override them at any time. Every charge must also start after a random delay of up to 10 minutes, different each time, so that thousands of chargers do not switch on together when a cheap period begins; the owner can cancel it, and the charger must be able to stretch it to 30 minutes if future rules require. The government added these rules after a British trial observed a sudden surge in demand at 10 pm, when many drivers had scheduled charging for the start of a cheaper period.
SCALE	Every new private charger up to 22 kW sold in Great Britain since 30 June 2022.
EFFECT ON THE SYSTEM	Not measured. No public data show how many owners keep the default hours or the random delay. The government's impact assessment expected net benefits, the benefits minus the costs, of about £500 million (€580 million) over 30 years in present value, within a range of £0 to £1.1 billion (€1.3 billion).
EFFECT ON THE BILL	No direct payment. The government estimated that the smart functions add about £40 (€47) per charger in manufacturing cost.
WHY IT WORKED, OR DID NOT	It costs little per device and needs no contract, app or subsidy: flexibility and protection against synchronised switching become factory settings. Because owners can override both, it nudges rather than forces, and its real effect depends on how many keep the settings.

LESSON FOR BELGIUM Belgium's federal tax reduction for home chargers from 2021 to 2024 required a charger that could be steered, but set no default behaviour. A future subsidy or tax incentive could also ask for default off-peak hours and a random start delay; the British government estimated that such settings add about £40 (€47) per charger, and they work whatever tariff the household chooses.

Government

Manufacturer & installer

Regulator

SOURCES [243, 245, 258, 264, 298] · Numbers, source notes and further reading: [p. 167](#)

New rooftop solar can be made controllable without touching existing systems, at little cost to households

Household solar panels produce most around midday, when demand is often low. Where many are installed, sunny middays can bring more power than the electricity system can use: wholesale prices turn negative, meaning that producers pay to sell their power, and local grids reach their limits. Households can respond in two ways: batteries, electric cars and heat pumps can shift their use into those hours, and solar inverters can turn their output down. Germany and the Netherlands had negative wholesale prices in more than 570 hours in 2025, and Belgium in only slightly fewer (Figure 6.1).^[299, 300, 301, pp. 100–101] This chapter draws heavily on Australia, where the surplus is already much larger and states have been setting rules for household solar since 2020.^[302] In the last quarter of 2025, prices in South Australia were negative in 48% of all five-minute intervals, and at one point rooftop panels produced more than the whole state was using: the demand that the state's grid had to supply fell to a record minus 263 MW.^[303]

Countries have found four ways to deal with the midday surplus. Three act directly on the inverter: a fixed cap on how much of its capacity a new system is allowed to export (Germany), a variable export limit that the grid operator lowers only when the local grid is close to its limit (South Australia), and an emergency switch that the system operator can use as a last resort (several Australian states).^[302, 304–307] The fourth works through prices that make midday exports worth less, as in Germany, Australia and the Netherlands.^[304, 308, 309] The limits and switches are built into new installations rather than imposed on existing ones, and when designed well they cost households little. For price signals aimed at households' midday exports, no effect has been measured so far: every measured effect on household exports in this chapter comes from direct control of inverters.^[310, 311]

Existing owners keep what they counted on

Germany's rules cover only new rooftop systems. Since February 2025, a new system is allowed to export at most 60% of its capacity until a smart meter and a control box let the grid operator turn it down.^[304] Once that hardware is in place, the system gets no feed-in payment when the wholesale price is negative, and the lost hours are added to the end of its 20-year support period.^[304] Existing owners can opt in, in return for a slightly higher feed-in tariff.^[304] South Australia's variable limit and emergency switch likewise apply only to new and replaced inverters, so nobody loses what they already had.^[302, 312] In the Netherlands, a change does reach existing owners, but with two years' notice. Under net metering, every kWh a household exports is subtracted from the kWh it buys, so its exports are in effect paid at the full retail price.^[309] Net metering ends on 1 January 2027; until 2030, suppliers must then pay at least half of their own electricity price, before taxes, for exported power.^[309]

Well designed, the limits cost households little

South Australia has used its emergency switch once since 2020, for about an hour, and Western Australia puts the cost of one activation at \$1–2 (about €0.60–1.20) per household.^[302, 306, 313, C30] In the trial of South Australia's variable export limit, the limit stood at its maximum of 10 kW for 99.4% of the time, so exports had to be restricted in only a few hours.^[311] The German rule on negative prices costs more: on 2024 prices, a typical new system with a battery loses about €130 a year, a quarter of its feed-in income.^[314, C31] A battery that starts charging first thing in the morning can be full before midday, when negative prices are most common; a battery that waits and charges at the midday solar peak recovers almost all of that loss, so the cost falls mainly on systems that do not respond to prices.^[314]

One capability, used voluntarily or in an emergency

In South Australia, the variable export limit became the norm once the state required every new inverter to be able to receive it.^[311, 312] During the trial, about a third of new solar customers chose the variable limit; after the requirement, nearly nine in ten did.^[311, 315] The same inverters must also be able to be switched off in an emergency, a requirement since 2020, and the emergency signal can travel through the network operator's flexible-export system, so the same equipment serves both.^[302] Voluntary curtailment and a forced switch-off are technically the same action, an inverter turning down its output on an external signal; what separates them is who decides. The more households curtail voluntarily, the less often an emergency switch would be needed.

No measured effect from price signals

Germany has published no estimate of how much midday feed-in its rule on negative prices removed, and its negative-price hours rose from 457 in 2024 to 573 in 2025.^[299] In Australia, network operators in Sydney and South Australia charge a little for midday exports, and in Sydney the network operator also pays a little for evening ones.^[308, 316] The charge is deliberately small, an estimated €11 a year for an average South Australian household, and it is billed to the supplier, so it reaches households only as far as suppliers pass it on.^[308, 313, 316, C32] Since July 2026, a federal rule has also required suppliers in three Australian states to offer a contract with three free midday hours, and Victoria started a similar scheme of its own on 1 October 2026; no figures have yet been published on how much consumption these hours shift.^[317–319]

What this means for Belgium

- **The federal government and Elia** could look to Australia's design if they pursue an emergency switch for rooftop solar: new and replaced inverters only, so that existing owners keep the terms they invested under; households only after the large wind and solar farms that Elia can already curtail; and one announced test a year.^[302, 320, 321]
- **Governments and grid operators** could require every new inverter to be able to receive an external export limit through an open communication standard, so that the same equipment serves voluntary curtailment, a variable export limit and, if ever needed, an emergency switch.
- **Distribution grid operators in all three regions**, if they extend flexible connections to households, could make a variable export limit the attractive alternative to a low fixed cap. The Flemish framework for flexible connections, adopted in December 2025, is so far only used for larger connections.^[283, 284]
- **Regulators** could ask suppliers to report how much consumption their midday offers shift and how much solar output their curtailment services turn down. If export payments keep falling, as the best offer in Brussels did by almost 30% in 2025, a minimum payment for exported power and export charges limited to real costs, as in the Netherlands, could be options to consider.^[96, p. 23, 309]

HOW WE CALCULATED

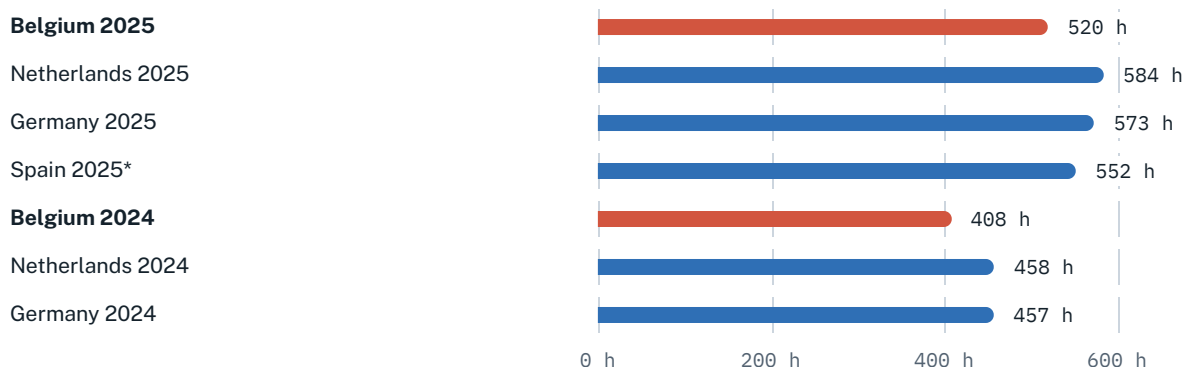
C30 \$1–2 per activation (Australian dollars) ÷ 1.6297 Australian dollars per euro (ECB reference rate, 30/9/2026) ≈ €0.61–1.23 per household.

C31 Feed-in income of a 10 kWp system with a 10 kWh battery on 2024 prices falls from €483 to €351 (pv magazine worked example): €132, about €130 a year lost; €132 ÷ €483 ≈ 27%, roughly a quarter.

C32 \$18 a year (Australian dollars) ÷ 1.6297 Australian dollars per euro (ECB reference rate, 30/9/2026) ≈ €11 a year.

FIGURE 6.1

Negative day-ahead prices now occur a few hundred hours a year in several European markets



Hours with a negative day-ahead price. *Spain from a secondary source. For comparison, South Australia had negative prices in 48% of all five-minute intervals in the last quarter of 2025.

SOURCES [299–301, 303, 322]

WHERE BELGIUM STANDS

Belgium has more than 12 GW of solar panels and adds about 1 GW a year; in Flanders alone, about 1.1 million installations totalled 8 GW at the end of May 2026. Wholesale prices were negative for 520 hours in 2025, up from 221 in 2023, and on 91 days the price was negative between 1 and 2 pm. Flanders ended net metering for new installations from 2021 and paid owners of older systems a one-off compensation when their digital meter arrived; nearly 100,000 households received it in 2025. Exported power is now paid at a price set by the supplier: on a dynamic contract it follows the market and can turn negative, which Elia estimates costs a typical 4 kWp system about €20 a year in 2026. Households pay no network tariff, levies or VAT on the electricity they export: in Flanders and Wallonia these are charged only on the electricity taken from the grid, and Brussels has set its injection tariff at zero for 2025–2029. Several suppliers offer free or very cheap midday hours; apart from one supplier's analysis of its time-of-use customers (see [Chapter 2](#)), none has published how much consumption these offers shift.

In March 2026 Elia asked for a legal basis to steer decentralised generation if the market response falls short; it can already curtail large wind and solar farms, but not rooftop systems. The request proved sensitive. When it came up in the Flemish Parliament, two members called it alarming and problematic, one pointing out that households had been encouraged for years to invest in solar panels. The Flemish energy minister replied that remotely switching off household panels was 'absolutely not on the table' and would in any case not go through the digital meter: switching off was proposed only as a very last step, and there were many other solutions that would not upset or worry people. The Flemish regulator, whose advice the minister had requested, concluded in June 2026 that an emergency switch for rooftop solar is not necessary or desirable for now and is mainly a federal matter. Meanwhile, one supplier offers to switch customers' panels off automatically when prices are negative, in return for a bonus, and Elia considers such curtailment to be in the household's own interest, because it spares the household from paying for the power it exports at those moments.

Brussels ended net metering for small solar systems in 2020–21, and still grants green certificates for ten years to new systems; at the end of 2025 it counted about 17,000 connections that export power to the grid, 3.2% of all supply points, and the best offer for exported power fell by almost 30% over that year. Wallonia ended net metering for systems commissioned from 2024, but keeps it until the end of 2030 for systems of up to 10 kW installed before then.

SOURCES [30, 96, 102, 103, 301, 321, 323–337] · Statement by statement: [p. 168](#)

Examples (5)



Germany

Germany caps feed-in from new rooftop solar at 60% until the grid operator can steer it, and stops paying for exports when wholesale prices are negative.

WHO	The federal government and parliament, which set the rules; grid operators, which can turn systems down once the control box is installed
WHAT	Since February 2025, new rooftop systems above 2 kW in Germany are allowed to feed at most 60% of their capacity into the grid until a smart meter and a control box are installed, through which the grid operator can turn them down. Once that hardware is in place the cap disappears, but the system then gets no feed-in payment in any quarter-hour when the wholesale price is negative; the lost hours are added to the end of its 20-year support period. Existing owners can switch to these rules voluntarily, for a feed-in tariff 0.6 euro cent per kWh higher. In July 2026 the government went further: its bill, now in parliament, would end fixed feed-in payments for new systems below 25 kW from 2027 and cap the feed-in of new rooftop systems below 100 kW at 50%. In September 2026 the federal states asked for that 50% cap to be dropped.
SCALE	Every new rooftop system above 2 kW commissioned since 25 February 2025; Germany added about 8 GW of rooftop solar in 2025.
EFFECT ON THE SYSTEM	Not measured: no estimate has been published of how much midday feed-in the rules have removed. Negative-price hours kept rising, from 457 in 2024 to 573 in 2025.
EFFECT ON THE BILL	For a typical new 10 kW system with a 10 kWh battery, losing the payment at negative prices cuts feed-in income by about €130 a year, roughly a quarter (from about €480 to €350, on 2024 prices). A battery that charges at the midday solar peak instead of first thing in the morning recovers almost all of it. The 60% cap costs a south-facing system without a battery up to about 9% of its output, an east-west system about 1%.
WHY IT WORKED, OR DID NOT	The rules apply only to new systems, and the lost hours are added to the end of the support period, which kept the measure politically workable. The economics are simple: when prices are negative, extra power has a negative value, so producing less is worth something to the system.

LESSON FOR BELGIUM In Belgium, households on a dynamic contract already pay for exporting power when prices are negative, through the market rather than by law, but they are still a small minority. Germany shows how a rule for new installations could give all new systems the same price signal and make them controllable, without changing the terms for existing owners.

Government

Regulator

Distribution grid operator

SOURCES [85, 299, 304, 314, 338–343] · Numbers, source notes and further reading: [p. 169](#)

South Australia's distribution network operator offers solar homes a variable export limit instead of a low fixed one; nearly nine in ten new customers choose it.

WHO	The distribution network operator (SA Power Networks); the state government, which requires every new inverter to be able to receive the limits
WHAT	In South Australia, a new solar household chooses between a low fixed export limit (1.5 kW per phase, or zero in some areas) and a flexible limit of up to 10 kW per phase. With the flexible option, the distribution network operator calculates every 15 minutes how much each part of the network can take and sends the limit over the internet using an open Australian standard, either straight to the inverter, via a small gateway box, or via the manufacturer's cloud; the meter plays no role and no aggregator or supplier sits in between. If the internet connection drops, the inverter falls back to 1.5 kW. Since July 2023 the state has required every new solar system to be able to receive these limits.
SCALE	Standard offer across South Australia since July 2023; over 85% of new customers chose it in the first rollout, over 88% of eligible customers by mid-2025.
EFFECT ON THE SYSTEM	In the field trial, the limit stood at its maximum of 10 kW for 99.4% of the time, so exports had to be restricted in only a small number of hours. More solar can connect and export on the same network; the operator has not published a figure in MW or in avoided network cost.
EFFECT ON THE BILL	Not reported in money. In the trial's summer months, flexible customers exported more than twice as much as the fixed 1.5 kW limit would have allowed, and 97% said they would choose it again or had no preference.
WHY IT WORKED, OR DID NOT	The offer reads as 'export more most of the time' rather than 'being switched off', and the limit only drops when the local network is actually full. Uptake jumped from about a third in the trial to over 85% once the state required all new inverters to be compatible, so the right equipment was already on the roof.

LESSON FOR BELGIUM Flanders adopted a framework for flexible connection agreements in December 2025, so far only used for larger connections. If Belgian distribution grid operators extend flexible connections to households, they could offer a variable export limit, sent straight to the inverter through an open communication standard, as the attractive alternative to a low fixed cap. In South Australia, requiring new inverters to be compatible is what turned a trial into the norm.

Distribution grid operator

Regulator

Manufacturer & installer

SOURCES [283, 284, 305, 311, 312, 315, 344] · Numbers, source notes and further reading: [p. 169](#)

Australian states make every new rooftop inverter remotely switchable for emergencies; South Australia has used it once, for about an hour.

WHO	State governments, which set the rule; the national market and system operator (AEMO), which decides when to use it; distribution network operators and companies registered to send the signal, which carry it out
WHAT	Since September 2020, South Australia has required every new or replaced solar inverter to be remotely switchable off and on. The switch is a last resort for sunny, mild days on which rooftop panels cover so much of the state's consumption that the demand left for the grid could fall too low to keep the power system stable. The system operator can trigger it only after large solar and wind farms and big commercial systems have been turned down; the signal goes over the internet, through registered companies or the network operator's flexible-export system. Western Australia (2022) and Victoria (2024) introduced similar rules, and New South Wales is preparing one. South Australia tests it once a year, announced in advance, for less than an hour.
SCALE	Every new or replaced rooftop system in South Australia since 2020, where about 40% of homes have solar. As a further step, the network operator can raise the voltage at 139 substations, which makes rooftop inverters reduce their output automatically; this reaches about 790,000 of the state's 900,000 customers.
EFFECT ON THE SYSTEM	In the only real activation on record, on 14 March 2021, about 71 MW of distribution-connected solar was curtailed, about 14 MW of it from households, to keep the state's demand above the 400 MW it needed at a time when the state risked being cut off from the rest of the national grid. The broader value is insurance: in late 2025 South Australia's demand on the grid fell to a record minus 263 MW, as rooftop solar covered more than the whole state's use.
EFFECT ON THE BILL	Negligible: the Western Australian government estimates that one activation costs a household \$1–2 (about €0.60–1.20) in lost solar output. No compensation is paid.
WHY IT WORKED, OR DID NOT	It was introduced as a narrow emergency tool with a fixed order of measures, so households are last in line and rarely affected. Because it applies only to new and replaced inverters, the capability grows with the fleet without anyone losing something they already had.

LESSON FOR BELGIUM Elia can already curtail large wind and solar farms, and in 2026 it asked for a legal basis to steer decentralised generation if the market response falls short; for households, the Flemish energy minister said that remotely switching off their panels was 'absolutely not on the table'. If the question returns, Australia shows that a last-resort switch for household solar can be legally narrow, limited to new and replaced inverters, technically simple and almost never used, and that the same compatible inverters can also serve voluntary curtailment and variable export limits.

Government

Elia (transmission)

Distribution grid operator

SOURCES [302, 303, 306, 307, 310, 313, 320, 321, 328, 345, 346] · Numbers, source notes and further reading: p. 170

Australia

Australian distribution network operators now charge a little for midday exports, and in Sydney also pay a little for evening ones; in three states, suppliers must also offer a contract with three free midday hours.

WHO	Distribution network operators (network tariff for exports); the federal government and the Australian Energy Regulator (free-hours offer)
WHAT	Australian distribution network operators have started applying a time-of-use network tariff to exports: exports in the sunniest hours above a free allowance pay a small charge, and in Sydney exports in the late afternoon and evening earn a small reward. In Sydney, for example, midday exports above roughly 6.6 kWh a day cost 1.23 cents per kWh (about 0.75 euro cent) and evening exports earn 3.85 cents (about 2.4 euro cents); the network operator bills this to the supplier, which decides how to pass it on. Separately, since July 2026 every supplier in three states must offer at least one contract with three free hours of electricity around midday (up to 24 kWh a day). Households need a smart meter and choose whether to take it.
SCALE	Export tariffs apply by default to residential customers in the Sydney area and South Australia since July 2025; the free-hours obligation covers New South Wales, south-east Queensland and South Australia since 1 July 2026; Victoria started a similar scheme of its own on 1 October 2026.
EFFECT ON THE SYSTEM	Not measured for either measure. The free-hours offer only started in July 2026, and the export tariff reaches households only as far as suppliers pass it on.
EFFECT ON THE BILL	Small for the export tariff: South Australia's network operator estimated that it costs an average household about \$18 a year (about €11). On the free-hours contracts suppliers recover the cost elsewhere: in Sydney, peak prices are about 64 cents per kWh (about €0.39) against 33 cents on a standard flat contract, and fixed daily charges are 6–34% higher, so a household only gains if it moves enough use into the free window.
WHY IT WORKED, OR DID NOT	The export tariff is a deliberately weak signal that passes through suppliers, so many households may barely notice it; its value is in making explicit that midday exports are not what the network needs. The free hours are more visible, but pay off mainly for households with an electric car, a hot-water tank or a battery.

LESSON FOR BELGIUM Several Belgian suppliers already sell cheap or free midday hours of their own accord; apart from one supplier's analysis of its time-of-use customers, none has published how much consumption these offers shift. A regulator could ask for such reporting before considering an obligation like Australia's. Belgian households pay no network tariff on the electricity they export in any of the three regions, so a small charge on midday exports like Australia's would be a new step for the regional regulators.

Regulator

Distribution grid operator

Supplier

SOURCES [30, 87, 88, 103, 308, 313, 316–319, 347–349] · Numbers, source notes and further reading: [p. 171](#)

The Netherlands ends net metering in one step on 1 January 2027, after suppliers had already begun charging solar homes for their exports.

WHO	The Dutch government and parliament (end of net metering); energy suppliers (export fees); the Authority for Consumers and Markets (ACM), the consumer and competition regulator (oversight)
WHAT	Dutch households have been able to offset every kWh they export against a kWh they buy, taxes included. As midday solar power became worth little, crediting it at the full retail price became a cost for suppliers, and they began charging solar customers an export fee, per kWh or per month, to recover it. From 1 January 2027 offsetting ends altogether: until 2030, suppliers must then pay at least half of their own electricity price, before taxes, for exported power, and are only allowed to charge solar customers the real cost of their exports. The government's stated reasons include ending a cost borne by households without panels and encouraging households to use their own solar power directly, which relieves the grid.
SCALE	All Dutch small consumers with solar panels; end date fixed by parliament in December 2024.
EFFECT ON THE SYSTEM	Not measured for households. Nationally, market-driven curtailment of renewable output at negative prices passed 1 TWh in 2025, up a third on 2024, and negative prices became less extreme; the Netherlands still had 584 negative-price hours in 2025.
EFFECT ON THE BILL	Export fees can take a large part of the payment for exported power: in the ACM's example, a household receives €150 for its exports and pays €70 in export costs. The fees are contested: in September 2026 a Dutch court ruled that a supplier could not add them unilaterally to a running contract.
WHY IT WORKED, OR DID NOT	Under net metering, a kWh exported at midday counted as much as a kWh bought in the evening, so households did not see that midday solar power had become worth little, and the cost of the difference was spread over all customers. Suppliers reacted first with export fees; the legislator then set a minimum for export payments and limited export charges to real costs. A single, firm end date gives households a reason to invest in batteries, smarter contracts and automatic curtailment.

LESSON FOR BELGIUM Belgium's regions have already ended net metering: Brussels in 2020-21, Flanders from 2021 with a one-off compensation for owners of older systems, and Wallonia for systems commissioned from 2024, keeping it until the end of 2030 for older systems of up to 10 kW. The Dutch case adds two rules that Belgian governments and regulators could consider if export payments keep falling: a minimum payment for exported power and a requirement that export charges reflect real costs.

Government

Regulator

Supplier

SOURCES [300, 309, 325, 330, 332, 350, 351] · Numbers, source notes and further reading: [p. 172](#)

Market access alone brings little household volume, and reserve income fades fast once batteries rush in

Home batteries, heat pumps and electric-car chargers can create value in three places. Behind the meter, they lower the household's own bill by shifting its use to cheaper hours or storing its solar power. Locally, they can relieve a congested distribution grid (see [Chapter 4](#)). On national markets, a supplier or an independent aggregator pools many devices and sells their flexibility on the wholesale market or as reserves, capacity that the transmission system operator keeps on standby to balance supply and demand. Many offers for households also steer devices in real time against the imbalance price, the price at which the transmission system operator settles the remaining differences between supply and demand.^[352] What these national markets pay, and how reliably, shapes which offers suppliers and aggregators can build around household devices; this chapter weighs that income against the value behind the meter.

Opening these markets to households has proved easier on paper than in practice. Five years after the United States ordered its wholesale markets to accept pooled home devices, those devices supplied only tens of megawatts.^[353] The American experience suggests that volume follows only once metering, the role of the local grid operator and the settlement with the household's supplier work in practice for small devices.^[353] Where households do get in, the income can shrink quickly. Reserve markets are small by design: the transmission system operator buys only as much reserve as it needs to keep supply and demand in balance, so a few hundred megawatts of batteries can fill one. In Sweden, batteries rushed in when reserve prices were exceptionally high around 2022, and within three years those prices fell by 80 to 90%.^[354, C33] Imbalance prices largely follow what it costs to activate those reserves, so earnings from steering devices against them can shrink in the same way, as a Dutch supplier found.^[352, 355] In Germany and Australia, most home batteries simply store the household's own solar power for the evening. That alone can lower the evening peak on sunny days, and any income from the national markets comes on top of it as a volatile extra. Offers that require fitting equipment in hundreds of thousands of homes are hard to finance on such income; in France, a payment guaranteed for ten years made such an offer possible.^[356]

Permission alone produced little volume

In 2020 the American federal energy regulator ordered the regional wholesale markets to accept pooled home devices such as batteries and car chargers.^[353] By early 2025 only two of the six markets had fully implemented the order, and volumes were small: 20 MW from about 5,000 home solar-and-battery systems in New England.^[353] A study by Lawrence Berkeley National Laboratory, one of the US government's national research laboratories, pointed to practical hurdles: rules meant to stop a device from being paid twice, by a utility programme and by the wholesale market; the local utility's right to review each registration, which in practice works as a veto; and metering that is costly relative to what a small device earns.^[353]

Who pays the supplier decides who keeps the value

A supplier buys electricity in advance for what it expects its customers to use. When an independent aggregator, a company other than the household's supplier, discharges a household's battery to sell that flexibility on the market, the household takes less power from the grid than its supplier bought for it; when the aggregator turns up a heat pump, the household takes more. Someone has to settle that difference with the supplier, and who pays, and at what price, shapes the business case of every independent aggregator.

Since November 2024, Britain has let independent aggregators sell households' flexibility on the wholesale market without the supplier's consent.^[357] The supplier is compensated at a regulated price from a pot shared by all suppliers, and so in the end by all bill payers.^[357] That made entry cheap for aggregators, but large generators, for which the route was never intended, used it too: about £19 million was paid out of the pot in six months, and in August 2026 Ofgem, the British energy regulator, closed the route to generators above 10 MW.^[358–360] Britain is now assessing direct payment by the aggregator, which would protect suppliers but cut into aggregators' margins.^[361]

Reserve markets are small and fill up fast

Reserves come in several products, which differ mainly in how fast they must respond, and for each product the transmission system operator buys only as much as it needs to keep supply and demand in balance, sized for some products on the largest sudden outage: in Sweden, a few hundred megawatts per product.^[354] When reserve prices were exceptionally high around 2022, battery parks and pooled home batteries rushed in.^[354] By late 2025 the capacity approved to provide these reserves was seven to nine times what the Swedish operator buys, and the price of its main reserve against sudden disturbances had fallen from roughly €120 to €20 per MW per hour (see [Figure 7.1](#); for comparison, Belgian prices for frequency containment and automatic reserves fell by 60 to 72% between 2024 and 2025).^[301, 354, C34, C35]

For the companies that pool home batteries, a market that fills up means less income per battery. The home batteries of a Swedish aggregator, some 15,000 of them, earned more than a third less per kilowatt in 2024 than in earlier years.^[362, 363, C36] The aggregator expanded into Finland, where in the first half of 2025 a home battery that combined reserves with charging and discharging on hourly price differences earned about four times as much as one used only to store its owner's solar power.^[364, C37] A Dutch supplier steered its customers' home batteries in real time against the imbalance price, which settles real-time differences between supply and demand; earnings per battery peaked in August 2024 and then fell, as fast-growing flexible capacity competed for a small market.^[355] The supplier then added frequency reserves, day-ahead and intraday trading.^[352] Both companies responded by combining several sources of income for the same batteries.

Batteries that serve their own household can already help the system

Where home batteries are most common, most of them simply serve their own household: they store rooftop solar power during the day and release it in the evening. Germany has about two million, or 48 per 1,000 households (for comparison, Flanders has about 63; see [Figure 7.2](#)), and nearly all are used in this way.^[167, 365–367, C38, C39] Grid electricity is heavily taxed in Germany, so buying less of it is the main way a battery pays for itself. In Australia, only one in ten to one in four battery owners has joined a virtual power plant, yet the market operator measured that battery homes drew on average 0.7 kW less from the grid at the evening peak than comparable solar-only homes, almost three quarters less.^[368, 369, 370, pp. 11–12] The evening, when these batteries release their stored solar power, is also when demand on the system is highest. The effect depends on a sunny day before the peak. On cold winter evenings, when the system is under most pressure and there is little solar power to store, a battery helps only if it charges from the grid in cheaper hours beforehand. A battery that follows a dynamic contract does this on its own, without an aggregator; one that only stores its household's solar power, as most do today, does not.^[365, 370, pp. 11–12]

A long, predictable payment can finance equipment in many homes

A French aggregator fits free control boxes on households' electric radiators and water heaters and switches them off for short periods when the power system is under strain.^[356, 371] In 2022 it won 721 MW in a government tender for demand response, with payments guaranteed for ten years, and committed to equipping 450,000 homes; households keep whatever they save on their own bill.^[356, 372] Because the payment is guaranteed for so long, the company can finance one standard box and its installation in hundreds of thousands of homes; reserve markets that fill up quickly do not offer that kind of certainty.^[356]

Household devices can be steered in two main ways: through an extra control box fitted in the home, or through the manufacturer's own online platform (cloud-to-cloud), which needs no home visit. The French case suggests that the choice between them may depend less on the technology than on how secure the income is.

The first commercial offers for vehicle-to-grid, in which an electric car also feeds power from its battery back to the grid, likewise turn uncertain market income into a predictable reward for the household.^[373–375] They combine a bidirectional charger and an electricity contract for one car maker's models (in Britain together with a leased car), offer free home charging or a fixed payment for each hour the car is plugged in (24 cents in Germany, up to €720 a year), and leave the market risk with the company (see the [box on vehicle-to-grid](#) below).^[373–377]

What this means for Belgium

- **Suppliers and aggregators**, some of which already steer customers' home batteries in Belgium, such as Trevion and Bolt with the aggregator Powernaut, and Frank Energie, could base home-battery offers on several sources of income, with the savings behind the meter as the foundation.^[378–380] They could present reserve and imbalance income as volatile rather than as a promised payback, and show what their steering adds to a battery that already makes the most of the price signals the household is directly exposed to.
- **Governments and regulators** may find that giving households a sensible price signal matters more than requiring household devices to be pooled for national reserve markets. Belgium's power system is under most pressure on cold winter evenings, when there is little solar power to store, and a home battery helps then only if it charges from the grid in cheaper hours beforehand, which a battery that follows a dynamic contract does on its own, without an aggregator. Belgian rules already make the aggregator pay the supplier directly, the approach Britain is now assessing; now that these settlement rules also apply to low-voltage connections for Elia's reserves, workable metering and that settlement may well decide how much household volume follows.^[207, 210, 218, 361, 381] There is no public information that home batteries take part in the capacity remuneration mechanism, which already pays for available capacity; it may be worth understanding why before designing a separate long-term payment for them.^[382]
- **Distribution grid operators** may find household devices available, and possibly cheaper, for local congestion management as national reserve markets fill up; large batteries connected to the transmission grid cannot relieve congestion on the local grid (see [Chapter 4](#)).
- **Governments, regulators and grid operators** that see potential in vehicle-to-grid may want to look at how Belgian tariffs treat electricity that passes through a car battery. Households pay no network tariff, levies or VAT on what they export, but pay them in full on what they draw to charge the car, also on the part they later feed back; since 2026, Germany charges grid fees only once on electricity that is stored and fed back.^[334, 335, 383] Shared and fleet cars, which park at known charging points, may be a practical place to gain first experience, as in Utrecht.^[384, 385]

HOW WE CALCULATED

C33 Swedish reserve capacity prices, 2022 → 2025, read from Svenska kraftnät's charts (approximate): disturbance reserve upward €120 → €20 per MW per hour (–83%), downward €220 → €30 (–86%), fast frequency reserve €200 → €30 (–85%).

C34 Qualified capacity ÷ need in Sweden, Q4 2025: fast frequency reserve 910 ÷ 113 MW ≈ 8; disturbance reserve upward 4,510 ÷ about 550 MW ≈ 8 and downward 3,760 ÷ about 530 MW ≈ 7; normal-operation reserve 1,980 ÷ about 228 MW ≈ 9 (Svenska kraftnät).

C35 Belgian annual average reserve capacity prices, 2024 → 2025 (CREG): frequency containment reserve €44.1 → €17.7 per MW per hour (–60%); automatic reserve upward €61.1 → €17.0 (–72%) and downward €21.0 → €8.4 (–60%).

C36 Earnings per kW of a home battery pooled by the Swedish aggregator: about 1,930 kronor per kW per year in 2024 against about 3,100 in earlier years; 1,930 ÷ 3,100 ≈ 0.62, about 38% less (hemsol.se).

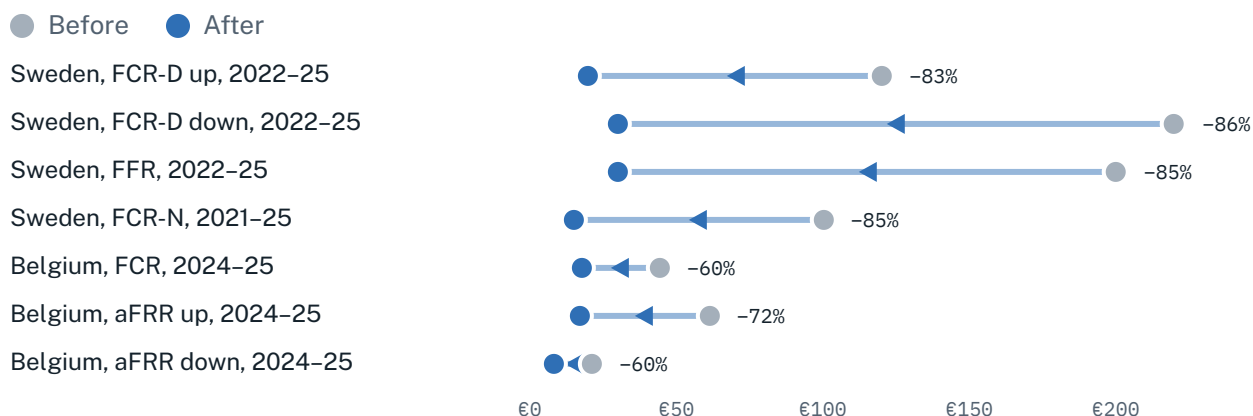
C37 €668 with reserves plus price optimisation ÷ €169 from self-consumption alone (10 kW / 10 kWh battery, Finland, January–June 2025) ≈ 4.

C38 1,968,417 home batteries in operation (October 2025) ÷ 41.1 million households ≈ 48 per 1,000 households.

C39 About 189,100 registered home batteries in Flanders (15 September 2026, provisional) ÷ about 2,992,000 private households in the Flemish Region (1 January 2026) ≈ 63 per 1,000 households.

FIGURE 7.1

Once batteries arrived, reserve prices fell by 60–90%, first in Sweden, then in Belgium

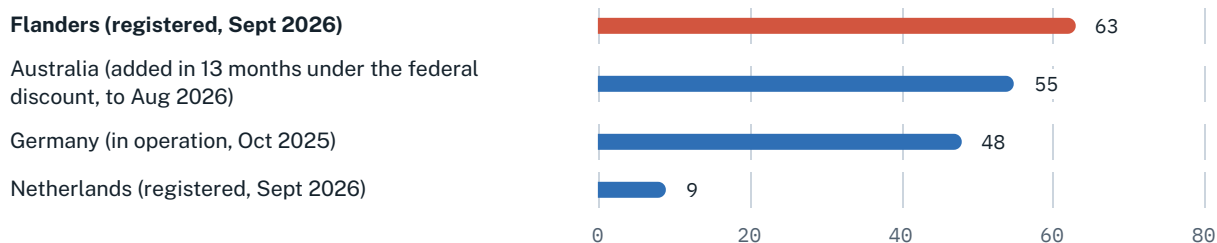


Price per MW per hour of reserve capacity; the arrow runs from the earlier to the later price. FCR: frequency containment reserve (FCR-D for disturbances, FCR-N for normal operation); FFR: fast frequency reserve; aFRR: automatic frequency restoration reserve. Periods differ: Sweden three to four years, Belgium one year; Swedish values are read from a chart and approximate.

SOURCES [301, 354]

FIGURE 7.2

Flanders has at least as many home batteries per household as Germany



Home batteries per 1,000 households. Flanders: batteries registered with the grid operator on 15 September 2026 (provisional), per private household on 1 January 2026. Germany: batteries in operation, October 2025. Netherlands: registered batteries, September 2026; possibly only about half are registered, and the Dutch figure is low mainly because households could offset their solar exports against their consumption (net metering) until the end of 2026, so a battery saved them little (see [Chapter 6](#)). Australia: batteries added under the federal discount in the 13 months to August 2026, per occupied dwelling (2021 census). No comparable public count was found for Wallonia and Brussels.

SOURCES [167, 365–367, 386–389]

WHERE BELGIUM STANDS

Belgian rules already allow an independent aggregator to sell a household's flexibility without its supplier's consent: the Flemish regulator recognises a party independent of the household's supplier as one of five types of flexibility service provider, and 26 providers were registered on the distribution grid in October 2026, including companies that work with households, such as LIFEPOWR, Powernaut and Yuso. Money between aggregator and supplier is settled through 'transfer of energy' rules: the aggregator compensates the supplier directly, at a negotiated price or at a price set by the federal regulator if they cannot agree within four months. For day-ahead and intraday trading these rules already apply to larger connections, but they had not been used by 2025. Homes and other low-voltage connections have been able to offer two of Elia's reserves, frequency containment and automatic frequency restoration, with the data measured by a submeter (for now only a third party's). Since June 2026 the transfer-of-energy rules also apply to low-voltage connections for Elia's reserves, so all of Elia's balancing products are now open to homes, although in Wallonia automatic reserves await a change to the regional decree; only day-ahead and intraday trading by an independent aggregator is not yet covered on low voltage. Some household aggregation already runs through suppliers, which needs no such settlement because the supplier itself steers its customers' devices: Trevion and Bolt work with the aggregator Powernaut to steer customers' batteries, chargers and solar inverters against imbalance prices and pay them a flexibility fee (Trevion: €10 per kW of home battery per year), and Frank Energie steers home batteries for customers on its dynamic contract.

The reserve markets are small and filling up. Belgium needed only about 100 MW of automatic reserve in each direction in 2025, while Elia's connection queue held over 22 GW of battery projects. Capacity prices for frequency containment and automatic reserves fell by 60 to 72% between 2024 and 2025, while the price of upward manual reserve stayed unchanged; the federal regulator attributes the fall to large batteries and a change in market design. The capacity remuneration mechanism is open to batteries and demand response, but its contracted volume comes mainly from power plants, large battery parks and industrial demand response, and there is no public information that home batteries take part.

Home batteries are numerous, but few of them deliver flexibility to the market. Flanders had about 189,000 registered in September 2026, about 63 per 1,000 households and at least as many as Germany, and Elia expects about 740 MW of small-scale batteries across Belgium in 2026; we found no comparable public count of home batteries for Wallonia and Brussels. In 2024, when Belgium had about 140,000 home batteries, Elia counted only about 11,400 that offered flexibility on the electricity markets, roughly one in twelve, and about 1,000 that took part in balancing. Behind the meter, Elia estimates that a home battery on a dynamic energy contract could save a household €230 to €470 a year in 2036, before any reserve income.

Brussels has required a separate licence for flexibility and aggregation services since January 2025; six companies held one in October 2026, and the Brussels regulator describes the regional flexibility market as still emerging. Wallonia has gone the other way: since 9 January 2026 flexibility service providers no longer need a regional licence there.

Bidirectional charging is allowed in Flanders: the charger must be approved by Synergrid, the federation of Belgian grid operators, and a small installation only needs to be notified to Fluvius. We found no comparable public guidance for Brussels and Wallonia. Belgium's first bidirectional charging hub runs as a pilot in Ghent until June 2027, and the car-sharing company Share4Mobility, We Drive Solar and Renault aim to offer vehicle-to-home commercially by early 2027. We found no commercial vehicle-to-grid offer for households in any of the three regions. Households pay network tariffs, levies and VAT on the electricity they draw to charge a car, including any part they later feed back, while the electricity they export is not charged.

SOURCES [96, 102, 165, 167, 173, 175, 207, 210, 218, 301, 323, 367, 378–382, 390–395] · Statement by statement: p. 174

Vehicle-to-grid: first offers, few measured results

An electric car is parked most of the day, and its battery often holds several times as much energy as a home battery. With a bidirectional charger, the car can also send power back, to the home (vehicle-to-home) or to the grid (vehicle-to-grid, V2G). Smart charging can only move the moment a car charges; a car that also discharges could support the grid during the evening peak. That is why vehicle-to-grid is often presented as a large untapped source of household flexibility.

The first commercial offers for private car owners appeared from late 2024, in France, Britain and Germany. Each combines a bidirectional home charger and an electricity contract for one car maker's models; in Britain the leased car itself is part of the package. What the household offers is availability: Octopus Energy in Britain requires the car to be plugged in 12 hours a day on 20 days a month, and E.ON in Germany pays 24 cents for every hour it is plugged in, up to €720 a year. The household gets a predictable reward in return, such as free home charging, and the company carries the market risk. The largest fleet we found is not private: in Utrecht, several hundred shared cars feed power back into the local grid in the evening, under a contract with the grid operator.

Measured results are scarce. In Utrecht, the first 50 shared cars fed more than 65,000 kWh back over five months of 2025 and on several evenings lowered the local grid load by 300 kW. A British trial with 320 home chargers in 2018-2021 found that each could create £230 to £300 (about €270 to €350) of value a year on wholesale markets. We found no published measured results or customer numbers for the commercial offers.

What holds vehicle-to-grid back is less the battery itself than everything around it: few car models and chargers can feed power back, a charger that exports needs the grid operator's approval, and car makers set the battery warranty conditions. Where grid fees or taxes fall on the same electricity when it enters the car and again after it leaves, the business case weakens. Germany removed its double grid fees in 2026; the partners in Utrecht call the Dutch double energy tax a serious obstacle.

SOURCES [373–376, 383–385, 395–397] · Statement by statement: [p. 175](#)

Examples (12)

United Kingdom

Britain lets independent aggregators sell households' flexibility on the wholesale market without the supplier's consent; deciding who compensates the supplier proved the hard part.

WHO	Ofgem, the British energy regulator; Elexon, which administers the electricity settlement rules; independent aggregators and suppliers
WHAT	Since November 2024, an independent aggregator in Great Britain can sell the flexibility of another company's customers (a home battery, heat pump or electric-car charger) directly on the wholesale market, without asking the household's supplier. The supplier has already bought power that the household then does not use (or has to supply extra power when the household uses more), so the rules compensate the supplier at a regulated reference price. Britain chose to fund this compensation from a pot shared by all suppliers rather than charging the aggregator. Large generators soon used the same route: about £19 million flowed out of the shared pot in six months, and in August 2026 the regulator shut the route to generators above 10 MW. A proposal to make aggregators pay suppliers directly is still being assessed.
SCALE	Market-wide in Great Britain since 7 November 2024; £19 million of supplier compensation shared across all suppliers between September 2025 and February 2026. The residential share of the traded volume is not published.
EFFECT ON THE SYSTEM	Not measured. No public figure shows how much household flexibility has been sold through this route; the only published number is the £19 million of compensation, which the regulator linked largely to large generators rather than to households.
EFFECT ON THE BILL	Not reported. The shared pot is paid by all suppliers and so, in the end, by all bill payers; £19 million in six months is small per household, but the regulator judged the trend serious enough for an urgent rule change.
WHY IT WORKED, OR DID NOT	Opening the market was the easy part; settling the money between aggregator and supplier was not. A shared pot made entry cheap for aggregators but attracted parties it was never meant for, while direct payment by the aggregator, now being assessed, would protect suppliers but cut into aggregators' margins. The compensation rule therefore shapes not only whether household flexibility reaches the market, but also who captures its value.

LESSON FOR BELGIUM Belgium already has rules for this 'transfer of energy' and, unlike Britain, makes the aggregator pay the supplier directly at a negotiated price, with a price set by the federal regulator as a fallback. Britain's experience suggests that this settlement design, more than the formal opening of the market, may decide whether independent aggregation of households grows now that Belgium has extended these rules to low-voltage connections, which include homes, for Elia's reserves (since June 2026). So far, several Belgian suppliers steer their own customers' devices, often with an aggregator as partner, which needs no such settlement.

Regulator

Elia (transmission)

Independent aggregator

SOURCES [357–361, 381] · Numbers, source notes and further reading: [p. 176](#)

The US ordered its wholesale markets to accept pooled home devices; five years on, almost no households take part, because the practical conditions have not been worked out.

WHO	The federal energy regulator (FERC), the regional market operators, distribution utilities and state regulators
WHAT	In 2020 the US federal energy regulator required the regional wholesale markets to let aggregators pool small devices behind the meter, such as home batteries, rooftop solar and electric-car chargers, and offer them on the market as if they were a power plant. By early 2025 only two of the six markets under its rules had fully implemented the order. The volumes that did take part are measured in tens of megawatts, for example 20 MW from about 5,000 home solar-and-battery systems in New England.
SCALE	Federal rule since 2020; by January 2025 fully implemented in two of six regional markets. Example: 20 MW from about 5,000 systems in New England's capacity market.
EFFECT ON THE SYSTEM	Measured volumes are small: about 20 MW in New England from 5,000 distributed solar-plus-storage systems, and in Texas (outside the federal rule, with its own pilot) about 15 MW of energy and 9 MW of reserves, as of early 2025. No residential split is published.
EFFECT ON THE BILL	Not reported.
WHY IT WORKED, OR DID NOT	Permission on paper was not enough. Four practical hurdles got in the way: rules to stop a device being paid twice by a utility programme and the wholesale market; the local distribution utility's right to review registrations, which works as a de facto veto; metering and communication requirements that can be costly relative to what a small device earns; and the utility's right to override the aggregator's instructions to the devices, with the aggregator bearing the penalty.

LESSON FOR BELGIUM Belgium already lets independent aggregators sell flexibility from larger connections; homes have been able to offer some of Elia's reserves since 2024, and since June 2026 the rules for settling with the supplier also apply to low-voltage connections for those reserves. The American experience suggests that volume may follow only if metering requirements, the role of the distribution grid operator and the settlement with the supplier are workable for small devices, not merely legally possible.

Regulator

Distribution grid operator

Elia (transmission)

SOURCES [182, 353] · Numbers, source notes and further reading: p. 176

In Sweden, a rush of batteries into small reserve markets cut reserve prices by roughly 80–90% in three years.

WHO	Svenska kraftnät, the Swedish transmission system operator, which buys the reserves; owners of battery parks and home batteries, and the aggregators that pool them
WHAT	Sweden's grid operator buys a fixed and modest amount of fast reserves, a few hundred megawatts per product, to keep supply and demand in balance and the grid frequency stable. Around 2022 these reserves paid exceptionally well, and battery parks, pooled home batteries and other newcomers rushed in. By late 2025 the capacity qualified to provide these reserves was seven to nine times what the grid operator actually buys, and prices fell accordingly: for the main reserve against sudden disturbances from roughly €120 to €20 per MW per hour, and for the fastest reserve from about €200 to €30.
SCALE	Need versus qualified capacity, end of 2025: fastest reserve 113 MW vs 910 MW (830 MW of it batteries); disturbance reserve (upward) about 550 MW vs 4,510 MW; normal-operation reserve about 228 MW vs 1,980 MW.
EFFECT ON THE SYSTEM	Measured as a price effect: capacity prices fell by roughly 80–90% between 2022 and 2025, which the grid operator attributes to new actors such as batteries improving competition. For the system this is good news: reserves became plentiful and cheap.
EFFECT ON THE BILL	Not reported directly. Households whose batteries were pooled into these reserves saw their earnings per kW fall with the prices (the Swedish aggregator example in this chapter gives figures).
WHY IT WORKED, OR DID NOT	Reserve markets are small by design: the grid operator buys only as much as it needs to keep supply and demand in balance, sized for some products on the largest sudden outage, so a few hundred megawatts of new batteries can cover the whole need for one type of reserve. Cross-border platforms, on which grid operators share reserves with neighbouring countries, add further competition.

LESSON FOR BELGIUM Belgian prices for the fast reserves have already followed the Swedish ones down, so home-battery offers built on today's reserve prices may not hold. With an automatic reserve need of about 100 MW in each direction, plans that count on bringing household devices into these national markets in large numbers may overestimate what those markets can absorb. For distribution grid operators, national markets that are already full may leave household devices available, and possibly cheaper, for local congestion management, which large batteries on the transmission grid cannot provide.

Independent aggregator

Government

Distribution grid operator

SOURCES [102, 165, 301, 323, 354] · Numbers, source notes and further reading: p. 177

A Swedish aggregator grew to some 15,000 home batteries, but as reserve markets filled up it earned less per battery and moved into other markets.

WHO	An independent aggregator (CheckWatt), its installer partners and households
WHAT	A Swedish aggregator pools home batteries and solar systems and sells their flexibility to the grid operator's frequency reserves, to local congestion markets run by distribution grid operators and on the power exchanges. Households keep their battery and receive most of the earnings, after a monthly fee of about €5 and a 20% commission. In 2024 its battery fleet tripled, from 90 MW to 270 MW, while its turnover rose two and a half times, to 277 million kronor (about €24 million); in 2025 it was sold to an international battery-system group.
SCALE	About 15,000 battery installations and 290 MW (first quarter of 2025); turnover 277 million kronor in 2024. Around 500 of its customers also served a local congestion market in western Sweden (5.5 MW, winter 2024–25).
EFFECT ON THE SYSTEM	Not measured as a system effect. The aggregator's own growth was part of the surge in supply that pushed reserve prices down (see the Swedish reserve-market example in this chapter).
EFFECT ON THE BILL	Earnings per kW fell: from about 3,100 kronor per kW per year (about €270) in earlier years to about 1,930 kronor (about €170) in 2024. In Finland, a 10 kW / 10 kWh home battery earned €668 in the first half of 2025 by combining reserves with charging and discharging on hourly price differences, against €169 from self-consumption alone.
WHY IT WORKED, OR DID NOT	The model scaled because the Nordic reserve markets admit small pooled units and pay for availability, which suits home batteries. The same small markets then filled up; the company responded by adding more sources of income and expanding into neighbouring countries.

LESSON FOR BELGIUM Pooling home batteries by the tens of thousands is feasible, but in Sweden the income per battery from reserves fell as the fleets grew. Belgian offers could rest on several sources of income, with the savings behind the meter as the base, rather than on a single reserve product.

Independent aggregator

Supplier

SOURCES [165, 362–364, 398–400] · Numbers, source notes and further reading: [p. 177](#)

A Dutch supplier that shared imbalance-trading earnings with home-battery owners saw them peak in summer 2024 and then fall, and responded by trading in more markets.

WHO	An electricity supplier (Frank Energie) and the customers on its dynamic contract whose home batteries it trades
WHAT	From May 2024 a Dutch supplier let customers on its dynamic contract hand over control of their home battery, steered it in real time against the imbalance price (which settles real-time deviations between supply and demand) and passed the earnings on. Over eleven months it paid out about €890,000; a 20 kWh battery earned €292 in its best month, August 2024, after which results fell back. Three causes lay behind the fall: the market for settling imbalances is small, flexible capacity is growing faster than unpredictable generation, and linking the Dutch market to the European platform for balancing energy has damped price swings. Its response was to add frequency reserves, intraday and day-ahead trading from the second quarter of 2025.
SCALE	€892,279 paid out to home-battery customers between May 2024 and March 2025; the number of batteries is not published.
EFFECT ON THE SYSTEM	Not measured. The falling earnings themselves show what is happening in the system: as more flexible capacity competes in the same small market, the price swings it earns from become smaller.
EFFECT ON THE BILL	A 10 kW / 20 kWh battery earned €292 in August 2024, the best month; results in the following winter were much lower. Annual earnings per household are not published.
WHY IT WORKED, OR DID NOT	Imbalance trading pays only when the system has too little or too much power and prices swing; every extra battery responding to the same swings makes them smaller. Practical losses added to this: outages, poor Wi-Fi, manufacturer maintenance and limits set by customers.

LESSON FOR BELGIUM Belgian suppliers and aggregators that trade home batteries could present imbalance earnings as volatile rather than as a payback promise, and plan for several revenue streams from the start. Publishing the amounts actually paid out, as this supplier did, would help customers and policymakers judge such offers.

Supplier

Independent aggregator

SOURCES [352, 355] · Numbers, source notes and further reading: [p. 178](#)



Germany

Germany has two million home batteries, about 48 per 1,000 households, but almost all just store the household's own solar power.

WHO	Households and installers; Enpal, a solar installer that also supplies electricity and pools its customers' devices
WHAT	Germany's official installation register counted about 1.97 million home batteries in operation in October 2025, with 11.8 GW of power. Nearly all were bought to store rooftop solar for the evening, because grid electricity is heavily taxed and buying less of it is the main saving. Germany has never allowed net metering: the electricity a household exports and the electricity it buys are counted separately, also without a smart meter, and a new rooftop system earns less than 8 cents per kWh for exported power, while a household pays about 39 cents per kWh for power from the grid. Using its own solar power in the evening is therefore worth several times more than exporting it. A solar installer that also sells electricity pools its customers' devices: in December 2025 it reported more than 40,000 customers and 100,000 connected devices (solar, batteries and chargers), about 400 MW in total, traded on the power markets.
SCALE	1,968,417 home batteries in operation, 11.81 GW (October 2025); the installer-supplier's pooled fleet about 400 MW (December 2025).
EFFECT ON THE SYSTEM	Not measured. No public estimate shows how much the self-consumption fleet shifts load at system level. New installations are slowing: capacity added in October 2025 was half that of a year earlier.
EFFECT ON THE BILL	Not measured. The pooling company advertises bill savings plus payments of over €1,000 a year 'with effective use'.
WHY IT WORKED, OR DID NOT	Heavy taxes and levies on grid power make self-consumption the obvious way for a battery to pay back. Selling flexibility needs extra steps (a smart meter, a contract that passes on market prices, an aggregator) that most owners have not taken, and Germany's smart-meter rollout has been slow (see Chapter 8).

LESSON FOR BELGIUM Flanders, where net metering has been phased out, already has at least as many home batteries per household as Germany, and Elia expects about 740 MW of small-scale batteries across Belgium in 2026. The open question for Belgium is less whether the batteries exist than whether they respond to a price signal or join an aggregator.

Supplier

Independent aggregator

Government

SOURCES [102, 167, 365–367, 387, 388, 401–408] · Numbers, source notes and further reading: [p. 178](#)

 Australia

Australia added 500,000 batteries in 13 months; only a minority joined a virtual power plant, yet battery homes draw 0.7 kW less at the evening peak.

WHO	The federal government, which funds the purchase discount; the national market operator (AEMO); battery owners and virtual power plant operators
WHAT	Since July 2025 the Australian government has covered roughly 30% of the cost of a home battery, on condition that the battery is able to join a virtual power plant, not that it actually does. In 13 months more than 500,000 batteries were installed, averaging about 28 kWh each, and the budget was raised from \$2.3 billion to \$7.2 billion. Only a minority of battery owners have joined a virtual power plant, between one in ten and one in four; yet the market operator measured that battery homes drew on average 0.7 kW less from the grid at the evening peak than comparable solar-only homes in April–June 2026, and nearly 1 kW in early 2026.
SCALE	507,000 installations and about 14 GWh between July 2025 and mid-August 2026; 389,137 installations and 11.3 GWh in the eastern market by the end of June 2026.
EFFECT ON THE SYSTEM	Measured: evening-peak grid imports of battery homes were 0.7 kW lower per sampled household, 73% lower than solar-only homes (April–June 2026). Across about 600,000 battery homes, the market operator estimated the total effect at nearly 600 MW in the first quarter of 2026.
EFFECT ON THE BILL	Not reported as a measured bill effect. The discount covers about 30% of the purchase; savings depend on each household's own retail tariff.
WHY IT WORKED, OR DID NOT	A battery that simply maximises the household's own solar use charges at midday and discharges after sunset to cover evening consumption, which happens to coincide with the system's evening peak. No aggregator is needed for that; joining a virtual power plant is optional and only a minority has done so.

LESSON FOR BELGIUM In Belgium, too, most home batteries mainly serve self-consumption, so they may already lower evening demand on sunny days. Belgium's power system, however, is under most pressure on cold winter evenings, when there is little solar power to store; a battery may help then only if it charges from the grid in cheaper hours beforehand, which a battery that follows a dynamic contract does on its own, without an aggregator. Making sure households face a sensible price signal may therefore matter more than requiring batteries to be pooled.

Government Supplier Independent aggregator

SOURCES [102, 167, 368–370, 386, 402, 409, 410] · Numbers, source notes and further reading: [p. 179](#)

A French aggregator fits free control boxes on electric heaters, financed by a ten-year state-backed contract for 721 MW from homes and small buildings.

WHO	An independent aggregator (Voltalis); the French energy ministry and the transmission system operator RTE, which organise the demand-response tender; households
WHAT	A French company fits a small control box on households' electric radiators and water heaters, free of charge, and switches them off for short periods when the power system is under strain. It earns its money from the power system rather than from the household: from the national capacity market and balancing markets, and above all from a government tender for demand response. In 2022 it won 721 MW in that tender, 94% of the volume awarded in the lot for homes and small buildings, with payments guaranteed for ten years until 2032, and committed to equipping 450,000 homes. The household signs up for at least three years and keeps whatever it saves on its own bill.
SCALE	721 MW awarded in October 2022, to be in place by 2025 and available until 2032; 1.5 million connected devices (2026). The number of equipped homes is not published.
EFFECT ON THE SYSTEM	No figure has been published for the peak reduction actually delivered. The contracted capacity is 721 MW; in July 2026 the company was also certified for the secondary (automatic) reserve.
EFFECT ON THE BILL	The box and its installation are free, and the household keeps whatever it saves on its own bill; the company advertises savings of up to 15%.
WHY IT WORKED, OR DID NOT	The model works financially because a public tender guarantees a payment per megawatt for ten years, on top of the capacity market, and that payment finances the up-front hardware. It also relies on a single standard box, fitted to simple electric radiators and water heaters and installed at very large scale.

LESSON FOR BELGIUM The French model rests on a long-term, predictable payment for available capacity rather than on the box itself. Belgium's capacity remuneration mechanism also pays for available capacity and is open to batteries and demand response, but its contracted volume comes mainly from power plants, large battery parks and industrial demand response, and there is no public information that home batteries take part. In Belgium's debate between installing an extra control box and steering devices through the manufacturer's own online platform (cloud-to-cloud), the French case suggests that home visits can pay off at scale, but only with revenue secure enough to finance them.

Government

Independent aggregator

Elia (transmission)

SOURCES [165, 356, 371, 372, 411, 412] · Numbers, source notes and further reading: [p. 179](#)

In Utrecht, shared electric cars that feed power back into the local grid in the evening grew from 50 to about 300 in a year, and a contract with the grid operator now lays down when they are allowed to do so.

WHO	MyWheels, a car-sharing company; We Drive Solar, which supplies the bidirectional charging points; Renault, which supplies the cars; Stedin, the local distribution grid operator; LomboXnet, which operates the charging points; ElaadNL, a knowledge centre for charging set up by the Dutch grid operators
WHAT	In 2025, MyWheels began offering Renault 5 E-Tech cars that can both charge and discharge as shared cars in Utrecht, parked at bidirectional charging points from We Drive Solar. The cars charge when wind and solar power are plentiful and feed power back in the evening, when demand is highest and the local grid is close to its limit. The first 50 cars and 50 charging points ran for five months before 120 more cars were added in November 2025; by June 2026 the fleet counted about 300 cars in Utrecht and 50 in Eindhoven. In June 2026, Stedin signed a capacity-steering contract with LomboXnet, the operator of the charging points. The contract sets when and under what conditions the cars are allowed to feed power back, and lays down requirements for performance, communication protocols, certification and cybersecurity. The partners aim for 500 cars by the end of 2026 and 1,000 in 2027, with Amsterdam and Rotterdam next.
SCALE	50 cars and 50 bidirectional charging points in the first phase of 2025; more than 350 cars by June 2026 (about 300 in Utrecht and 50 in Eindhoven), together able to discharge 2 MW and holding 25 MWh of battery storage. Target: 500 cars by the end of 2026 and 1,000 in 2027.
EFFECT ON THE SYSTEM	Measured on a small scale. Over five months in 2025, the first 50 cars fed more than 65,000 kWh back into the grid, about 1,300 kWh per car, and on several evenings lowered the load on the local grid by 300 kW. The partners aimed for 1 MW in winter 2025-26 with the larger fleet; we found no published result for that winter.
EFFECT ON THE BILL	No published figure on earnings. The cars belong to the car-sharing company, not to households, so the gain goes to the operator. In a user survey, 94% said the cars had enough charge when they picked them up, and 83% valued the vehicle-to-grid function.
WHY IT WORKED, OR DID NOT	A shared car spends much of its time parked at a fixed charging point, so its battery is predictably available, and one company controls both the cars and the charging. That avoids the hardest steps of vehicle-to-grid with private cars: matching each car to a compatible charger, persuading each owner to plug in, and agreeing terms with each household. The contract sets clear rules on when the fleet is allowed to feed power back, which a grid operator needs before it can count on it. The partners call the Dutch energy tax a serious obstacle to making the model pay at scale, because the same electricity is taxed when the car charges and again after it has been fed back.

LESSON FOR BELGIUM Shared and fleet cars, which park at known charging points and are run by one company, may be an easier first step for vehicle-to-grid in Belgium than private cars. A contract like Stedin's, setting when such cars are allowed to feed power back and what equipment and cybersecurity they need, could serve as a template for Belgian grid operators, building on the test market for local flexibility that Fluvius already runs.

Distribution grid operator

Independent aggregator

Government

SOURCES [384, 385, 396] · Numbers, source notes and further reading: [p. 180](#)

In Britain, a supplier sells vehicle-to-grid as one package of leased car, bidirectional charger and free home charging, on condition that the car stays plugged in for long hours and the supplier can discharge it.

WHO	Octopus Energy, an electricity supplier, with its car-leasing business Octopus Electric Vehicles; BYD, the car maker; Zaptec, which makes the charger
WHAT	In June 2025, Octopus and BYD announced a package called Power Pack: a leased BYD Dolphin, a bidirectional Zaptec Pro home charger and a tariff under which home charging is free, at a launch price of under £300 (about €350) a month. In return, Octopus decides when the car charges and when it sends power back to the grid: it charges when electricity is cheap and exports at peak times, when electricity is expensive. The tariff, Octopus Power Pack, spells out what the household commits to. The car must be plugged in for 12 hours a day on 20 days a month; it can take up to 210 kWh a month from the grid, enough for about 625 miles (about 1,000 km) of driving; and the minimum charge level the driver sets must be below 30%, so that the car can still be discharged. The home needs a smart meter that Octopus can read and the local grid operator's approval to export power. In October 2026 the tariff worked with only one combination of car and charger. Octopus had tested the idea earlier in Powerloop, one of the trials in a government-funded vehicle-to-grid programme, in which 135 drivers leased a Nissan Leaf together with a bidirectional charger, a tariff and an app.
SCALE	Open to households in Great Britain with the one compatible car and charger; we found no published customer numbers. The earlier Powerloop trial involved 135 drivers.
EFFECT ON THE SYSTEM	Not measured. We found no published figures on how much power Power Pack cars have fed back, or when. Powerloop's published outcomes are practical rather than measured volumes: the minimum size for taking part in the Balancing Mechanism, the market Britain's system operator uses to balance supply and demand in real time, was lowered, and the procedure for connecting a bidirectional charger at home was simplified.
EFFECT ON THE BILL	Not measured. The household's gain is built into the price: home charging up to 210 kWh a month is free in exchange for availability. We found no published data on how often customers meet the plug-in conditions, or on what the package saves them in practice.
WHY IT WORKED, OR DID NOT	Selling the car, the charger and the tariff together puts every link that usually breaks under one supplier's control: whether car and charger work together, whether the car is plugged in, and whether the supplier is allowed to discharge it. The conditions show what a supplier needs from a household to make vehicle-to-grid pay: long and predictable plug-in hours and the right to use part of the battery. The household is rewarded with free charging rather than a payment that varies with market prices, so the supplier carries the market risk.

LESSON FOR BELGIUM Belgian suppliers that consider vehicle-to-grid could start, as Octopus did, with a bundle in which car, charger and contract come from partners that have tested them together, and state plainly how long the car must be plugged in. Such a bundle may reach only a small group at first, but it can show how much availability a supplier needs before offers for any car and any charger exist.

Supplier

Manufacturer & installer

Independent aggregator

SOURCES [373, 376, 413] · Numbers, source notes and further reading: [p. 180](#)

In France, Renault offers vehicle-to-grid to private car owners as a package of home charger and electricity contract for its own models, with the battery warranty kept by the car maker.

WHO	Mobilize, Renault Group's brand for energy and mobility services, which supplies the electricity contract; The Mobility House, a company that pools the cars and trades their flexibility; Renault, the car maker
WHAT	Since October 2024, owners of a Renault 5 E-Tech or an Alpine A290 in France can sign up for Mobilize V2G. They install a bidirectional home charger, the Mobilize PowerBox Verso, and take an electricity contract from Mobilize. The Mobility House pools the cars and trades their flexibility on the electricity market, charging when power is cheap and feeding it back when it is expensive; the partners present the earnings as a way for owners to charge, and so drive, for free. Owners set the minimum and maximum charge level of the car in an app. Renault keeps the battery warranty and states that it expects no visible extra wear. The partners planned to follow with Britain in 2025 and with Germany once the rules there allowed it; we found no report of either launch by October 2026.
SCALE	Available across France since October 2024 for two car models with one charger; we found no published customer numbers.
EFFECT ON THE SYSTEM	Not measured. We found no published figures on the number of cars enrolled, the energy fed back or the markets the cars serve.
EFFECT ON THE BILL	Not measured. No published figure shows what households have saved; the offer is presented as free charging rather than as a stated amount.
WHY IT WORKED, OR DID NOT	The car maker designs the car, the charger and the warranty together, so a household does not have to check compatibility or worry that discharging voids the battery warranty. The partners also pointed to favourable conditions in France: rules they called supportive, and a nationwide smart-meter rollout. In Germany, by contrast, they named more than 900 grid operators, grid fees charged twice on electricity that passes through the car battery and a slow smart-meter rollout as obstacles in 2024.

LESSON FOR BELGIUM Car makers that sell in Belgium and already offer vehicle-to-grid elsewhere could bring such packages here; Flanders has already set out how a bidirectional charger is approved and notified. Belgian governments and regulators may want to map, region by region, the steps such a package would face: approval of the charger, notification to the grid operator, and how grid tariffs and levies apply to electricity that goes into and out of a car battery.

Manufacturer & installer

Supplier

Independent aggregator

Regulator

SOURCES [375] · Numbers, source notes and further reading: [p. 180](#)



Germany

Germany stopped charging grid fees twice on electricity that passes through a car battery from 2026; a car maker and a supplier then launched an offer that pays households 24 cents for every hour the car is plugged in, up to €720 a year.

WHO	The German parliament (Bundestag), which amended the Energy Industry Act; BMW, the car maker; E.ON, an electricity supplier
WHAT	Until the end of 2025, electricity that a car took from the grid and later fed back paid grid fees twice in Germany: once when the car charged and again when someone else used the fed-back power. In November 2025 the Bundestag amended the Energy Industry Act so that, from 1 January 2026, electric cars are treated like other forms of storage and this electricity pays grid fees only once. New process rules meant to make this easier in practice followed from April 2026. In February 2026, BMW and E.ON launched one of the first vehicle-to-grid offers for private customers in Germany. It combines BMW's new iX3 and other models of its 'Neue Klasse' range with a BMW Wallbox Professional and an E.ON electricity contract. The household receives 24 cents for every hour the car is plugged in with vehicle-to-grid switched on, up to €60 a month or €720 a year, however much power actually flows, plus 40 cents for every kWh actually fed back; E.ON's software decides when the car charges and discharges. A smart meter is required.
SCALE	Nationwide in Germany since February 2026, for one car range and one wallbox; a discount on the wallbox was reserved for the first 100 customers. We found no published customer numbers.
EFFECT ON THE SYSTEM	Not measured. We found no published figures on how many cars have enrolled or how much power they have fed back.
EFFECT ON THE BILL	Not measured. The hourly bonus depends on plug-in time rather than on power delivered: a car plugged in for about 250 hours a month, roughly eight hours a day, reaches the monthly maximum; energy actually fed back is paid on top. BMW calculates that the maximum of €720 a year pays for about 2,200 kWh of charging at an assumed 33 cents per kWh, enough for 12,000 to 14,000 km a year in its new iX3.
WHY IT WORKED, OR DID NOT	Car makers and aggregators had named the double grid fees as an obstacle to vehicle-to-grid in Germany, and the first offer for private customers followed shortly after they were removed. Paying per hour plugged in gives the household a reward that is simple to understand and to check, and gives the supplier what it needs most: cars that are reliably available. Like the first offers in Britain and France, it works with only one car maker's cars and charger.

LESSON FOR BELGIUM Germany shows that removing a charge on stored electricity can be the step that lets commercial offers start. In Belgium, households pay no network tariff, levies or VAT on the electricity they export, but they do pay them in full on the electricity they draw to charge a car or a home battery, also on the part they later feed back. Belgian governments and regulators may want to look at how this affects vehicle-to-grid and home batteries, and whether an approach like Germany's could apply.

Government

Regulator

Supplier

Manufacturer & installer

SOURCES [374, 377, 383] · Numbers, source notes and further reading: [p. 181](#)

The meters are mostly there; what matters now is whether data, prices and control signals flow by default

A supplier can reward a household for using electricity at cheaper hours only if a meter records when it was used and those values reach the supplier. A heat pump or car charger can follow a price only if it can read that price. Likewise, a home energy manager, the box or app that coordinates a household's devices, can steer devices of different brands only if they share a common communication protocol. This chapter is about that groundwork: meter data, machine-readable prices and common protocols for devices.

In most countries in this report the meter itself is no longer the bottleneck: smart meters are close to universal in the Nordic countries and Austria, and 96% of French homes have one (see [Figure 8.1](#)).^[45, 47, 294, 414] What differs is whether data, prices and control signals flow by default. Britain is changing how suppliers are charged for their customers' electricity: every meter is moving to settlement on measured half-hourly use, so that a supplier gains when its customers shift their use to cheaper hours, whatever contract it sells them.^[415, 416] California publishes every time-varying rate in one public database that devices can read, and the Dutch grid operators have proposed a short list of five protocols that a home energy manager should speak.^[417–420] Germany shows what can happen when the meter itself is made very demanding: ten years after it chose a heavily certified design, only about 6% of metering points have one.^[421, 422] None of these reforms has a measured effect on flexibility of its own; they are preconditions for the measures in the other chapters.

Data makes a difference where its use is the default

For a household's bill to reward it for shifting its use, four links must be in place: the smart meter itself; measurement of use per quarter-hour or half-hour; the use of those measured values in the settlement between suppliers; and their delivery to the supplier for billing. A link that works only on request tends to reach few households. Austria shows this for the second link: at the end of 2024, 97% of its metering points had a smart meter, but only 13% recorded quarter-hourly values.^[47] Austria is now making quarter-hourly recording the default.^[47]

Behind every household's bill sits a second calculation, the wholesale settlement, in which each supplier is charged for what its customers used. Until the current reform, British homes were settled on an assumed daily pattern of use rather than on what their meters measured.^[423] A supplier whose customers moved their use to cheap hours was therefore still charged as if they had not, and had little reason to offer them a time-of-use tariff^[415] or to help them shift in any other way. In 2021 Britain's energy regulator, Ofgem, decided that every meter would be settled on its measured half-hourly use.^[415] Moving the meters to the new arrangement began in October 2025, the date by which the original plan expected it to be finished, and is due to be complete by May 2027; about 20 million of some 34 million metering points had moved by September 2026.^[415, 416, 424, 425, C40]

Settlement on measured values gives the supplier a reason to help its customers shift, whatever contract it sells them: even with a fixed price per kWh, every kWh a customer moves to a cheaper hour lowers the supplier's costs, so steering services, cheap or free hours and smart tariffs start to pay for the supplier itself (see the [box on settlement](#) below).^[415, 416] Billing on measured values is a separate step, needed only for contracts that price by time, and it is what passes the gain on to the household directly. Norway, Denmark and Finland already do this: every household's hourly values reach its supplier through a central datahub, a national database for meter data, and households on contracts that follow the hourly spot price have been billed on them for years.^[45, 120, 414, 426–428]

Devices need machine-readable prices and a short list of protocols

A heat pump or charger cannot read a tariff sheet or a bill: to follow a price automatically, it needs that price as data. Since 2023 California's state energy agency has required the large utilities, and the largest local public bodies that buy energy on residents' behalf, to publish every time-varying rate in one free public database.^[417, 418] Each rate, usually covering both energy and network costs, has a standard number, so a heat pump or charger that knows this number can fetch the exact hourly price and follow it automatically.^[5, 62, 418] Britain will require the same of its suppliers from February 2027.^[429, 430]

To steer a heat pump, a charger, a battery and a solar inverter, a home energy manager today has to speak at least ten different protocols.^[419] ElaadNL, the joint innovation centre of the Dutch distribution grid operators, has proposed a short list of five: one standard for signals coming into the home from outside, and four for communicating with the devices inside it, one of which is only for car chargers.^[420, 431] The grid operators cannot impose this list, so they are trying to steer the market towards it. A device maker needs to support just one of the four in-home standards, while any compatible energy manager speaks all five, so a household can combine devices of different brands.^[420] Test events, where manufacturers check that their products work together, and free open-source software support the choice; certification is planned for the end of 2026.^[420, 432, 433]

A heavily certified meter held back the rules built on it

In 2016 Germany chose not a simple smart meter but a separate, highly secured communication unit next to the meter, certified by the federal cyber-security agency; mass rollout could only start once devices from three independent manufacturers had been certified.^[421] Germany then built new rules on that unit: every supplier must offer a dynamic contract, network tariffs can vary by time of day, and grid operators can dim new heat pumps and chargers during moments of grid stress.^[241, 263, 434, pp. 4, 25] In mid-2026 only 5.9% of metering points had the unit, so most households cannot use the dynamic contract their supplier must offer.^[422] In 2023 parliament restarted the rollout on new terms: units can now be installed first and have functions added later by software, and a household pays at most €20 a year.^[421]

Each new generation of meters, and any rule that devices must be controllable (see [Chapter 5](#)), faces the same choice: a separate certified box that first has to reach every home, or standard communication built into the device itself.

Preconditions for the mass market, set by public bodies

These reforms matter less for the first customers than for the mass market. Britain's large time-of-use tariffs (see [Chapter 2](#)) existed before its settlement reform: the suppliers that pioneered them chose to have those customers settled half-hourly, one customer at a time.^[59] The reform makes such tariffs worth offering to every household. In 2021 Ofgem estimated that the reform would bring consumers net benefits, after its cost, of £1.6–4.5 billion (about €1.9–5.2 billion) over 2021–2045, roughly £2–5 a year per metering point.^[164, 415, 425, C41, C42] In each example in this chapter, a regulator, a government or the grid operators laid this groundwork, not the market; suppliers and device makers build on it.

What this means for Belgium

- **Regulators** at federal and regional level could jointly require one machine-readable format for contract prices and network tariffs, as California does and Britain will from 2027.^[417, 430] Their own price comparison tools, such as the Flemish regulator's V-test, could be a starting point: to compare contracts, the regulators already collect the details of the offers they list, so publishing them in a machine-readable form would be a modest further step.^[435]
- **Governments, regulators and grid operators** could endorse the Dutch short list of protocols, since Belgium buys its devices on the same market. They could also take part in its test events and link

subsidies or tariff benefits to devices that speak one of the four in-home standards.

- **Governments and grid operators** preparing the next generation of meters, which Fluvius plans from 2033, or any rule that devices must be controllable, could keep certification proportionate, let functions be added by software after installation, and prefer standards built into the devices. ^[436, pp. 8, 39]

HOW WE CALCULATED

C40 5.8 million metering points under the new arrangement + 28.1 million still on legacy settlement (March 2026) $\approx$ 34 million (Elexon).

C41 £1.6–4.5 billion $\div$ 0.86 $\approx$ €1.9–5.2 billion (€1 = £0.86).

C42 £1.6–4.5 billion $\div$ 25 years (2021–2045) $\div$ about 34 million metering points (Elexon, March 2026: 5.8 + 28.1 million) $\approx$ £1.9–5.3 per metering point per year, rounded to £2–5. This is our own division; Ofgem does not publish a per-meter figure.

FIGURE 8.1
Most countries now have the meters; far fewer use their data by default

WHERE	WHAT IS COUNTED	VALUE	UNIT
Flanders	digital meters (electricity and gas), Oct 2025	80.45	% of meters
Flanders	homes whose quarter-hourly values go to the supplier (metering regime 3), Jun 2026	5.9	% of digital meters in homes
Flanders	settlement between suppliers on measured quarter-hourly values	since 2026	every digital meter that communicates
Wallonia	communicating meters at the largest grid operator, end of 2025	28	% of low-voltage meters
Brussels	smart meters, all customer types, end of 2025	$\leq$ 30	% of homes (161,055 smart meters vs 538,401 residential delivery points; upper bound)
Germany	smart metering systems, Jun 2026	5.9	% of metering points
Great Britain	meters settled on actual half-hourly use, Sep 2026	60	% of metering points in scope (target 100% by May 2027)
Austria	smart meters / quarter-hourly measurement switched on, end of 2024	96.9 / 12.6	% of metering points
Norway	smart meters; hourly values used for billing	100	% ($\approx$); billing on hourly values: yes
Denmark	smart meters; hourly values used for billing	100	%; billing on hourly values: yes
Finland	smart meters; hourly values used for billing of exchange-price contracts	100	% ($\approx$)
Sweden	smart meters with 15-minute data / contracts with an hourly or quarter-hourly price	100 / 13.6	%
France	homes with a smart meter	96	% of homes (38.4 million meters)

Smart meter rollout and default use of interval data for settlement or billing.

SOURCES [45, 47, 96, 101, 231, 294, 414, 422, 424, 436–440]

WHERE BELGIUM STANDS

Flanders has most of the hardware in place. About 80% of its electricity and gas meters were digital by October 2025, the rollout is due to be complete by mid-2029, and Fluvius plans a new generation of digital meters from 2033. Since 2026 Fluvius has read the quarter-hourly values of every digital electricity meter by default, and since the same year the settlement between suppliers has been based

on those measured values, rather than on an assumed daily pattern, for every digital meter that communicates. This is the Flemish counterpart of Britain's reform, and it applies to every household with such a meter, whatever its contract.

Whether those values also reach the household's supplier for billing is a separate step. That happens only once the meter is in the quarter-hourly metering regime, which dynamic and time-of-use contracts, energy sharing and flexibility services require; the supplier arranges the switch, for instance when a household chooses a dynamic contract. In June 2026, 148,125 Flemish homes, 5.9% of homes with a digital meter, were in this regime; other households are billed on their total use between two meter readings, whatever time of day the electricity was used. The Flemish government's flexibility plan announced that the quarter-hourly regime would, in a later phase, become the default.

Brussels and Wallonia are further behind on the meter itself. At ORES, Wallonia's largest grid operator, 28% of low-voltage meters were communicating at the end of 2025; Walloon grid operators must reach 80% by the end of 2029. Brussels had about 161,000 smart meters across all customer types at the end of 2025, enough for at most three homes in ten. There the smart meter's remote reading is off by default and is switched on only with the household's consent. For meters that are read remotely, the data have been passed to suppliers and other market parties since June 2025, as monthly readings or, if the household chooses, as quarter-hourly values; at the end of 2025 only 3% of smart meters, fewer than 5,000 households, used the quarter-hourly option. The Brussels grid operator, Sibelga, tested a near-real-time data platform for energy service providers in 2024-25; at this stage it does not plan an active role in building one, but remains open to it if a harmonised framework across the regions emerges.

We found no Belgian contract prices or network tariffs published in a machine-readable format, and no Belgian selection of communication standards for home devices.

SOURCES [96, 101, 211, 231, 436–439, 441–445] · Statement by statement: [p. 182](#)

BOX

Why settlement on measured values gives suppliers a reason to sell flexibility

Every supplier buys electricity in advance for its customers and is then charged, period by period, for what they actually used. This wholesale settlement sits behind every household bill, and most households never hear of it. Where a household's measured values are not used for it, the settlement assumes that the household followed a standard daily pattern. A supplier whose customers move their washing, car charging or heat pump to cheaper hours is then charged as if nothing had moved, so it gains nothing from helping them do it.

Once settlement uses each household's measured values, every kWh that a customer moves to a cheaper period lowers the supplier's costs. That holds whatever contract the household has: the supplier can keep selling a fixed or variable price per kWh and still gain from offering steering of the car or heat pump, cheap or free hours, or a smart tariff. Billing the household on its measured values is a separate step, needed only for contracts that price by time.

This is the reasoning behind Britain's move of every meter to half-hourly settlement; in Norway, Denmark and Finland, the datahubs already settle households on measured hourly values. It is easy to overlook, because the choice of contract is what households see, while the settlement, which shapes what suppliers want to offer, stays out of sight.

SOURCES [415] · Statement by statement: [p. 182](#)

Examples (4)

Netherlands

Dutch grid operators propose a short list of five protocols for home energy managers, down from at least ten, and plan to certify devices by the end of 2026.

WHO	ElaadNL, the joint innovation centre of the six Dutch distribution grid operators, with the Dutch climate ministry and the national standards body (NEN)
WHAT	A home energy manager (the box or app that coordinates a household's devices) that wants to steer a heat pump, a car charger, a battery and a solar inverter today has to speak at least ten different communication protocols. The Dutch distribution grid operators, through their joint innovation centre, have proposed a short list of five: one open standard for signals coming into the home from outside, and four for talking to devices inside the home, one of them specifically for car chargers. A compatible energy manager speaks all five; a device maker only needs one of the four in-home standards to work with any compatible energy manager. The grid operators cannot impose the list on manufacturers, so they try to steer the market towards it: the centre pays for free open-source software building blocks and runs test events where manufacturers check that their products work together, with a certification scheme planned by the end of 2026.
SCALE	16 manufacturers and developers at the first test event (February 2026), 28 at the second (June 2026), about 50 expected at the third (November 2026); framework published 1 June 2026.
EFFECT ON THE SYSTEM	Not measured. The aim is to remove the integration cost that keeps many devices from being steered at all; there are no figures yet on cost savings or extra flexible capacity.
EFFECT ON THE BILL	Not reported. The intended benefit is that any compatible heat pump, charger or battery works with any compatible energy manager, so buying a device no longer locks a household into one brand's app or one service provider.
WHY IT WORKED, OR DID NOT	It is too early to judge the results, but the approach is credible: the choice was made by grid operators that need controllable devices to manage congestion, it uses existing international standards instead of inventing a new one, and it comes with test events, free software and a certification date. Its limit is that the grid operators cannot impose the list: the organisations behind the five standards only sent letters of support, and policymakers are asked to reward compatible devices through subsidies and procurement.

LESSON FOR BELGIUM Belgium buys its heat pumps, chargers and inverters on the same north-west European market as the Netherlands, so it could adopt the same short list rather than start a separate discussion. Belgian governments, regulators and grid operators could endorse the Dutch selection, take part in the test events, and link subsidies or tariff benefits to devices that speak one of the four in-home standards.

Government

Regulator

Distribution grid operator

SOURCES [419, 420, 431–433, 446, 447] · Numbers, source notes and further reading: [p. 183](#)

California requires its main electricity providers to publish every time-varying rate in one public database, so devices can fetch their home's exact price.

WHO	The California Energy Commission, the state energy agency; the large utilities and the largest local public bodies that buy energy on residents' behalf, which must publish their rates
WHAT	In most of California a household cannot choose its supplier: the local utility delivers the power and sets the rates, although in many areas a local public body buys the energy on residents' behalf. Since 2023 the state energy agency has required the large utilities and the largest of those local bodies to publish all their time-varying rates in one free public database, give each rate a standard identification number and keep it up to date; the database also carries a carbon signal and grid emergency alerts. A heat pump, charger or energy app that knows a home's rate number, which the household can share through a lookup tool the utilities must provide, can fetch the exact price for every hour instead of relying on a PDF or a bill. The agency also sets appliance rules: since September 2025, new pool pump controls must by default run when prices and emissions are low.
SCALE	The three largest investor-owned utilities, the two largest municipal utilities and the 14 largest local energy buyers; database online since August 2021, rules in force since April 2023, new version since June 2026.
EFFECT ON THE SYSTEM	Not measured. No figures are published on how many devices or services use the database. For pool controls, the agency expects a permanent shift of nearly 400 MW of demand by 2030 and 560 MW by 2033, an estimate made when the rule was adopted.
EFFECT ON THE BILL	Not reported for the database itself. For pool controls the agency estimates a saving of about \$1,131 over the life of the control for a household on a time-of-use rate (about €980).
WHY IT WORKED, OR DID NOT	It is cheap and institutionally simple: the agency hosts the database, utilities upload their rates, and anyone can read them without registering. Whether it changes behaviour at scale is still open: there are no usage figures, and the appliance rules so far cover a single product.

LESSON FOR BELGIUM We found no Belgian contract prices or network tariffs published in a standard format that a device can read; they appear as documents and on bills. Belgium's federal and regional regulators could jointly require suppliers and grid operators to publish them in one machine-readable format, as California does and as Britain will require of its suppliers from February 2027. The regulators' own price comparison tools could be a starting point: to compare contracts they already collect the details of the offers they list, and the Flemish V-test can already calculate what a contract would cost on a household's own quarter-hourly values, so publishing those details in a machine-readable form would be a modest further step.

Regulator

Supplier

Distribution grid operator

SOURCES [417, 418, 429, 430, 435, 448–451] · Numbers, source notes and further reading: [p. 183](#)

Britain is moving every electricity meter, homes included, to settlement on actual half-hourly use, so that suppliers gain when their customers shift their use to cheaper hours.

WHO	Ofgem, the national energy regulator; Elexon, which runs the wholesale settlement system and manages the switch; suppliers, which move their own customers
WHAT	Behind every electricity bill sits a wholesale settlement in which each supplier is charged for what its customers used, half-hour by half-hour. British households were settled on a standard profile, an assumed daily pattern based on about 2,000 sample meters, so a supplier whose customers moved their use to cheap hours was still charged as if they had not and had little reason to offer smart tariffs. In 2021 the regulator decided that every meter would be settled on its measured half-hourly use; suppliers began moving customers in October 2025 and must finish by May 2027. Before the reform, suppliers could only choose to do this customer by customer, as the pioneers of smart tariffs did; now it becomes the default for everyone.
SCALE	About 34 million metering points; 20.2 million (about 60%) moved by early September 2026; migration complete on 7 May 2027, new settlement timetable from July 2027.
EFFECT ON THE SYSTEM	Not yet measured; the switch is still under way. In 2021 the regulator estimated the net benefits for consumers, after the cost of the reform, at £1.6–4.5 billion (about €1.9–5.2 billion) over 2021–2045, mainly from flexible demand lowering generation and network costs. Final settlement will also take four months instead of fourteen, which lowers suppliers' financial risk.
EFFECT ON THE BILL	No direct effect on the bill: a household still pays according to the tariff it chooses. What changes is that a supplier now earns the value of its customers' shifting, so offering and pricing time-of-use and dynamic tariffs becomes worthwhile for all suppliers, not only the pioneers.
WHY IT WORKED, OR DID NOT	The switch is progressing because the regulator fixed national milestones and one body coordinates every supplier and data service, but it took longer than planned: the 2021 plan aimed to finish by October 2025, the year migration actually started. Britain's large time-of-use tariffs came before this reform, through voluntary half-hourly settlement, so the reform spreads an incentive that leading suppliers already had.

LESSON FOR BELGIUM Flanders already reads quarter-hourly values from every digital electricity meter, and since 2026 the settlement between suppliers has been based on those measured values for every meter that communicates: the step Britain is now completing. That step, rather than billing households on quarter-hourly values, is what gives every supplier a reason to help its customers shift, whatever contract it sells them; billing on quarter-hourly values is needed only for contracts that price by time, and the supplier arranges it when a household chooses one. Brussels and Wallonia could face the same choice once most homes have a communicating meter.

Regulator

Distribution grid operator

Supplier

SOURCES [415, 416, 423–425, 452] · Numbers, source notes and further reading: [p. 184](#)



Germany

Germany's heavily certified smart meter reached only 6% of metering points in ten years, leaving its new flexibility rules largely without the hardware they depend on.

WHO	The federal government and parliament, which set the design in law; the federal cyber-security agency (BSI), which certifies the equipment; the federal grid regulator (Bundesnetzagentur), which monitors the rollout; and the local metering operators, which install the systems
WHAT	In 2016 Germany chose not a simple smart meter but a separate, highly secured communication unit next to the meter, which had to be certified by the federal cyber-security agency; mass rollout could only start once devices from three independent manufacturers had been certified, which took until 2020. Meanwhile Germany built new rules on top of that unit: grid operators can dim new heat pumps and chargers during moments of grid stress, every supplier must offer a dynamic tariff, and grid charges can vary by time of day. In 2023 parliament restarted the rollout: the three-manufacturer rule was dropped, units can now be installed first and have their control functions switched on later by software update, and a household's cost was capped at €20 a year.
SCALE	3.17 million smart metering systems on 54.1 million metering points (5.9%) at 30 June 2026; 26% of the cases where installation is mandatory.
EFFECT ON THE SYSTEM	Not measured as such. The visible effect is the delay: in mid-2026 about 94% of German metering points still lacked the smart metering system on which the new rules for dynamic tariffs, time-varying grid charges and grid-operator control are built. In March 2026 the regulator opened 77 enforcement procedures against metering operators that had not yet started.
EFFECT ON THE BILL	Since 2023 a household pays at most €20 a year for the smart metering system, with grid operators carrying most of the rest. The full cost is about €60–130 a year per meter, against about €22 in France and €77 in Britain, plus about €100 a year for a control box. Most households cannot use the dynamic contracts that every supplier has had to offer since 2025, because those require the new meter.
WHY IT WORKED, OR DID NOT	Security and certification requirements, fixed before a single unit was installed, set both the cost and the pace: functions were specified in detail but there was no hardware to run them on. The 2023 restart is the government's own correction: install first with a basic set of functions, add the rest later by software, and cap what households pay.

LESSON FOR BELGIUM Flanders already has its digital meters, so there the lesson concerns what comes next: the next generation of meters, which Fluvius plans from 2033, and any future rule that heat pumps, chargers or batteries must be controllable. Certification could be kept proportionate, functions added by software after installation, and standard communication built into the devices preferred over a separate certified box that first has to reach every home. In Brussels and Wallonia, where most homes do not yet have a communicating meter, the German experience applies today: rules and offers that rely on the meter reach only a minority of households until the rollout is well advanced.

Government

Regulator

Distribution grid operator

SOURCES [289, 421, 422, 436, 453, 454] · Numbers, source notes and further reading: [p. 184](#)

Synthesis and recommendations for Belgium

Five patterns across the chapters

Britain leads in practice, but the Nordic countries came first on data. British suppliers sell tariffs built around a device: in July 2025, 835,000 households were on a smart time-of-use tariff, 653,000 of them on a car tariff (see [Chapter 2](#)). British grid operators buy flexibility routinely, with 9 GW under contract in 2024 and one shared method to weigh its cost against that of reinforcement (see [Chapter 4](#)). On data, Norway, Denmark and Finland came first: they have billed households on measured hourly values for years. British suppliers launched their car and smart tariffs before the regulator's settlement reform, by having those customers settled on measured half-hourly use one at a time. The reform, which does this for every meter, gives every supplier a reason to help its customers shift, whatever contract it sells them (see [Chapter 8](#)). Britain's lead also rests on a rule Belgium does not have: a British supplier pays the network charges itself and is free to fold them into one all-in price per kWh, so it can make all of it cheaper at night, whereas a Belgian supplier passes the regulated network charges on unchanged (see [Chapter 2](#)).

Imposing control or leaving it to the market: a spectrum. On one path, the law or the regulator requires devices to be steerable and decides who steers them. On the other, flexibility is left to contracts with suppliers and aggregators, which is broadly where Belgium stands. The choice reflects different views of how far public rules should reach into a household's appliances, and most countries combine the two (see [Chapter 5](#)). Germany allows grid operators to dim new heat pumps and chargers during moments of grid stress, but guarantees 4.2 kW and gives a network-charge discount; Britain makes new home chargers default to off-peak hours, which the owner can override. Such rules reach scale where the wiring already exists, as for French water heaters on the meter switch, and stall where it does not, as German dimming still waits for smart meters (see [Chapters 5 and 8](#)). On the market side, opening wholesale and reserve markets to aggregators produced little household volume by itself (see [Chapter 7](#)).

Automation delivers; simple prices help the people who respond themselves. Automatic control makes the largest difference. In Québec, where one utility runs both kinds of scheme in the same winters, homes that had to act themselves cut about 0.8 kW per peak event and homes with a steered thermostat about 2.9 kW (see [Chapter 3](#)). Where flexibility reached scale, a device acted on its own, set by a rule or sold in a contract (see [Chapters 2, 3 and 5](#)). Contracts with simple, easy-to-understand price differences can also change behaviour: the first 8,000 customers of a Belgian time-of-use contract used 45% of their electricity in the cheapest blocks, more than before they switched (see [Chapter 2](#)). That simplicity matters mainly where people respond to the price themselves, because steering software can follow an hourly price just as well as prices that change in fixed time blocks.

Politics steps in when bills rise sharply. Slovenia's parliament passed an emergency law within weeks after households with solar panels faced network-bill rises of more than 200%, and Sweden's government stopped its peak-charge obligation less than ten months before the date by which all grid companies would have had to introduce the charge (see [Chapter 1](#)). In Norway, where almost every household paid the hourly price, the government offered an optional flat state price from October 2025, after years of crisis support, and by April 2026 about two-thirds of households in the south had switched to it. Softer interventions keep the incentive in place: Ireland caps only the wholesale-linked part of mandatory dynamic offers, at a level exceeded in 0.6% of trading periods from 2021 to 2023 (see [Chapter 2](#)), and Germany and South Australia apply new solar rules only to new installations (see [Chapter 6](#)). A network tariff reform leaves a grid operator's capped revenue unchanged, yet public debate in parliament and the media often treated such reforms as a price rise, and analyses of who would pay more and who less were often missing (see [Chapter 1](#)).

Measured effects are scarce and smaller than forecasts. Where peak-based network tariffs were evaluated, peaks fell by only a few per cent, about 3% in Flanders; advance estimates for planned time-of-use network tariffs are higher, as is the 11% that the Dutch national grid-congestion programme expects (see [Chapter 1](#)). No measured result has been published for Germany's dimming, France's re-timed water heaters or Britain's charger defaults (see [Chapter 5](#)), for price signals on solar exports (see [Chapter 6](#)) or for the data reforms (see [Chapter 8](#)). The most reliable figures come from comparisons with a control group or from metering the device itself (see [Chapter 3](#)).

Recommendations

- 1. Regional regulators (Flemish, Walloon and Brussels) and the grid operators:** before a new network tariff starts, publish who will pay more and who less, phase in the change, and evaluate it a few years later with meter data and a household survey, as Norway did (see [Chapter 1](#)).
- 2. Regional regulators (Flemish, Walloon and Brussels):** when designing fixed time blocks, check whether new peaks appear at the start of cheap windows, consider combining the blocks with a peak charge, as Austria plans, and build in a staggered start, as Britain and Finland do (see [Chapters 1](#) and [5](#)).
- 3. Federal and regional governments and their regulators:** before the Flemish duty to offer a dynamic contract reaches all suppliers in 2029, design crisis protection that still gives households a reason to avoid expensive hours, such as support based on the monthly average price or a cap like Ireland's (see [Chapter 2](#)).
- 4. Suppliers and aggregators:** sell control as the product, such as a low fixed price or a cheap window in return for steering the car, battery or heat pump, on by default in a contract the customer chooses, with clear terms and an easy override. Under the Flemish capacity tariff, steering may also need to limit the charging power of electric cars (see [Chapters 2](#) and [3](#)).
- 5. Suppliers and aggregators:** build home-battery offers on several sources of income, with the savings on the household's own bill as the foundation, present reserve and imbalance income as volatile, and show what steering adds to a battery that already makes the most of the price signals the household is directly exposed to (see [Chapter 7](#)).
- 6. Federal and regional governments:** in any future product rule or subsidy for home chargers, require off-peak default hours and a random start delay as well as steerability; Britain's rule was estimated to add about £40 (€47) per device to manufacturing costs. For heat pumps, regional premiums could require the installer to schedule the heating of domestic hot water in the middle of the day, when solar power is plentiful, rather than in the morning or evening peak, when heating it brings the household no benefit (see [Chapters 4](#) and [5](#)).
- 7. Federal and regional governments:** if a safety net under market-based flexibility is wanted, apply it to new and replaced equipment only, with a guaranteed minimum, a payment and published interventions, as in Germany, and households last in the order of measures, as in Australia (see [Chapters 5](#) and [6](#)).
- 8. Manufacturers and installers:** make every new heat pump, charger and inverter able to receive an external signal over an open standard, such as those on the Dutch short list, and commission it with price-following control switched on and, for heat pumps, with domestic hot water heated in the middle of the day. Size heat pumps and set backup heaters with the cold-spell peak in mind (see [Chapters 2](#), [4](#), [5](#), [6](#) and [8](#)).
- 9. Regulators at federal and regional level:** jointly require one machine-readable format for contract prices and network tariffs, so that a device can fetch the household's exact price, as California does and Britain will from 2027. The regulators already collect the details of the offers in their price comparison tools, so this would be a modest further step (see [Chapter 8](#)).
- 10. Fluvius and the other grid operators:** publish per congestion point, with one shared method, the price up to which flexibility is cheaper than reinforcement: the yearly value of postponing it. For households,

consider a published availability price per kW per year, sold through suppliers and aggregators with a recruitment plan, and, together with Elia, complete the planned extension of FlexHub, the platform that the grid operators and Elia already share to register which flexibility provider serves which connection, to all flexibility products, including the grid operators' own congestion services, so that a household signs up its devices once and can change provider as easily as it changes supplier (see [Chapter 4](#)).

11. **The federal regulator and Elia:** publish each year, in aggregate and within the confidentiality rules of the capacity mechanism, how much of the contracted capacity comes from household devices and how that changes, so that all Belgian stakeholders can follow the trend. For any household product at times of scarcity, Elia could pay per kW measured on the device, use competitive bids from the start and require a control group where a household baseline is unavoidable (see [Chapters 3](#) and [7](#)).
12. **Regulators at federal and regional level:** measure what moves. Track not only how many households have a fixed, variable or dynamic contract, but also how many have a time-of-use contract, a contract built around a device or another new type of offer. Include time-of-use contracts in the regulators' price comparison tools as well, such as the Flemish V-test, which in October 2026 compared only fixed, variable and dynamic contracts. Ask suppliers to report how much consumption their products actually shift, including time-of-use contracts and offers of free electricity in certain hours: shifting consumption is a policy goal with benefits for society as a whole, so progress deserves to be tracked publicly. Report grid operators' flexibility purchases as contracted capacity, energy used and euros per kW, with the household share (see [Chapters 2](#), [4](#) and [6](#)).

Open questions

Finally, five questions remain open. They matter a great deal for residential flexibility in Belgium, yet even after looking this widely beyond Belgium's borders, we found no country that has produced the evidence to answer them. They are where new measurements, in Belgium or abroad, would add most to what this report can offer.

- **How do heat pumps behave in a multi-day freeze?** A British trial measured short evening turn-downs, also below 3°C, but never observed a severe winter. That flexibility would barely reduce the network peak in a once-in-twenty-years freeze is a modelled result, not a measurement. Fluvius is now collecting quarter-hourly data from a growing number of digital meters, and these data can help identify which homes have a heat pump. That growing body of data offers an ideal opportunity to measure what heat pumps actually do to electricity use in the coldest hours (see [Chapter 4](#)).
- **How much consumption do households actually shift?** Regulators mainly count how many households are on each type of contract. Public figures on how much consumption moves under time-of-use, dynamic or steering contracts are rare, and the few that exist come from suppliers' own analyses (see [Chapters 2](#) and [6](#)).
- **Do rules that require devices to be steerable deliver once they are in place?** Germany's dimming, France's re-timed water heaters and Britain's charger defaults have no published measured effect, nor is it known how many British owners keep the defaults (see [Chapter 5](#)).
- **What can an aggregator add to a battery that already makes the most of the price signals its household faces?** Australian battery homes, mostly outside any aggregator's pool, drew 0.7 kW less at the evening peak than solar-only homes; in California, an independent analysis found most emergency battery output additional (see [Chapters 3](#) and [7](#)). Households would benefit from clarity on two numbers: what a home battery saves on their annual bill when it makes the most of the prices and tariffs they already face, and how much more it could earn by also serving markets they cannot access themselves. The same question applies to smart charging of an electric car at home.
- **Who gains?** In Britain, the quarter of households with the largest potential to shift could each move about 243 kWh a year, and half of all households less than a tenth of that. The households with the least room were more often renters and on lower incomes. We found no Belgian data on who takes part in flexibility offers or gains from them; under the Flemish capacity tariff, peaks fell most in

homes with an electric car and not significantly in homes without an electric car, home battery or heat pump (see Chapters [1](#) and [2](#)).

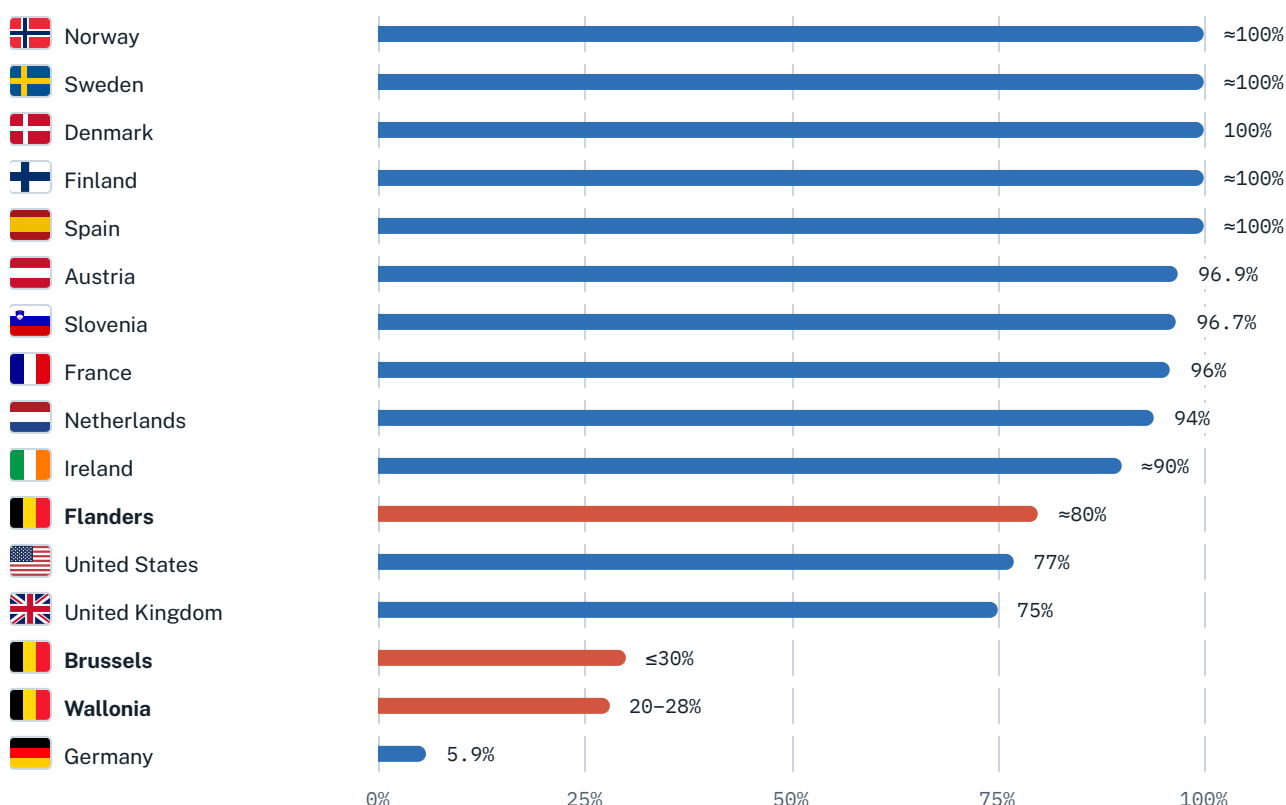
Country profiles

Key facts for each country in this report, with Belgium as the reference. The figures below compare six indicators that matter for residential flexibility. The profiles then give the full picture for each country, with their sources. The table at the end compares the main indicators side by side.

Key indicators compared

FIGURE A.1

Smart meters are in nearly every home in most countries; Germany, Wallonia and Brussels lag far behind

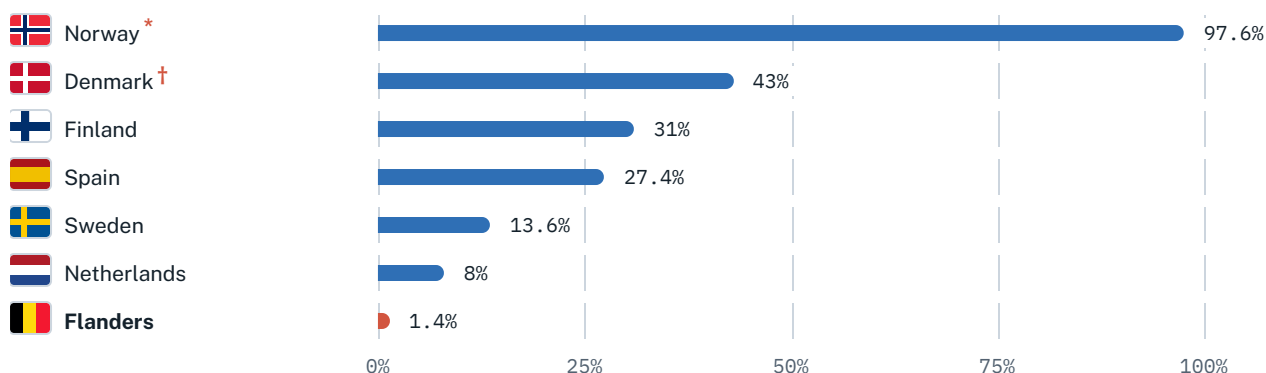


Share of homes or metering points with a smart meter, latest year available (2023-2026). Definitions differ: Germany counts only certified smart metering systems with a communication gateway; Austria's meters mostly did not yet record quarter-hourly values (12.6% in 2024); in Great Britain 71% of homes have a meter working in smart mode; Wallonia ranges from 20% to 28% depending on the grid operator; the Brussels figure is an upper bound. Not shown: Switzerland (legal target of 80% by the end of 2027), Canada and Australia (figures by province or state only).

SOURCES [44, 45, 47, 68, 96, 182, 282, 294, 414, 422, 455–459]

FIGURE A.2

Hourly and quarter-hourly prices are common in the Nordic countries and Spain; in Flanders fewer than 2 in 100 households have one

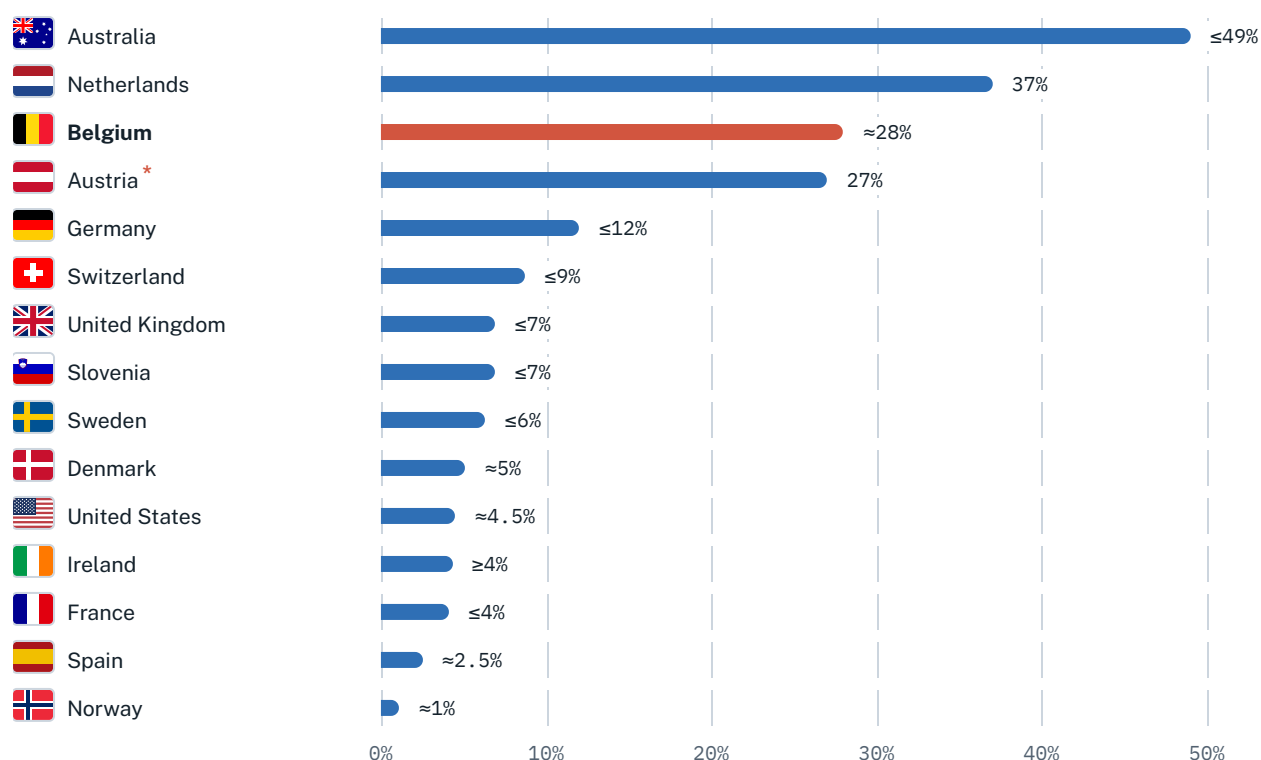


Households on a price that follows the wholesale market hour by hour or quarter by quarter. * Norway: share of household consumption by contract type (Q2 2026); since late 2025, however, about two-thirds of households in southern Norway have opted for a fixed state price on top of their spot contract (see [Chapter 2](#)), so far fewer households actually face the hourly price. † Denmark: from a household survey of 2023 (986 respondents), in which 15% did not know their contract type. The other definitions differ as well: Finland, share of retail contracts (end of 2023); Spain, the regulated default tariff, which is priced hourly (end of 2025); Sweden, share of contracts (July 2026); Netherlands and Flanders, share of households (2026). We found no comparable figure for the other countries, nor for Wallonia or Brussels.

SOURCES [45, 60, 61, 83, 85, 96, 106, 120, 426–428, 440]

FIGURE A.3

About one in four Belgian households has solar panels, one of the highest shares in this report

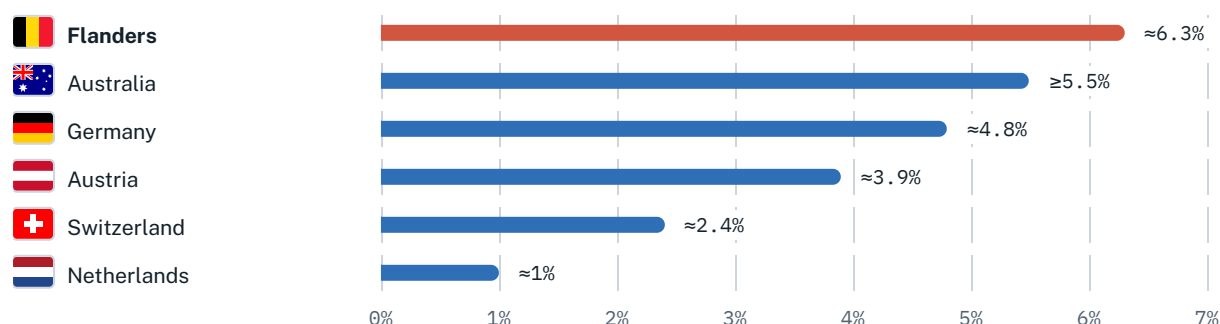


Share of households with solar panels, latest year available (2024-2026). How we calculated: where only the number of installations is published, it is divided by the number of households in the country profile; "≤" marks an upper bound because the count includes non-residential systems or, for Australia, systems installed since 2001 that may since have been replaced; "≥" marks a lower bound (Ireland: grant-supported homes only). * Austria: households that said in a survey (about 1,000 respondents, September 2025) that they have solar panels; the same survey found far more home batteries than the official count, so the real share may be lower. Belgium: installations in Flanders (end of May 2026) and Wallonia (end of 2025, largest grid operators only) divided by all Belgian households; no count was found for Brussels, and the Flemish count includes some non-residential systems. Flanders alone is about 37%. Not shown: Finland and Canada (no figure found).

SOURCES [44, 324, 387, 389, 458, 460-480]

FIGURE A.4

Where home batteries are counted, Flanders is near the top, at about 6 in 100 households; for most countries we found no count

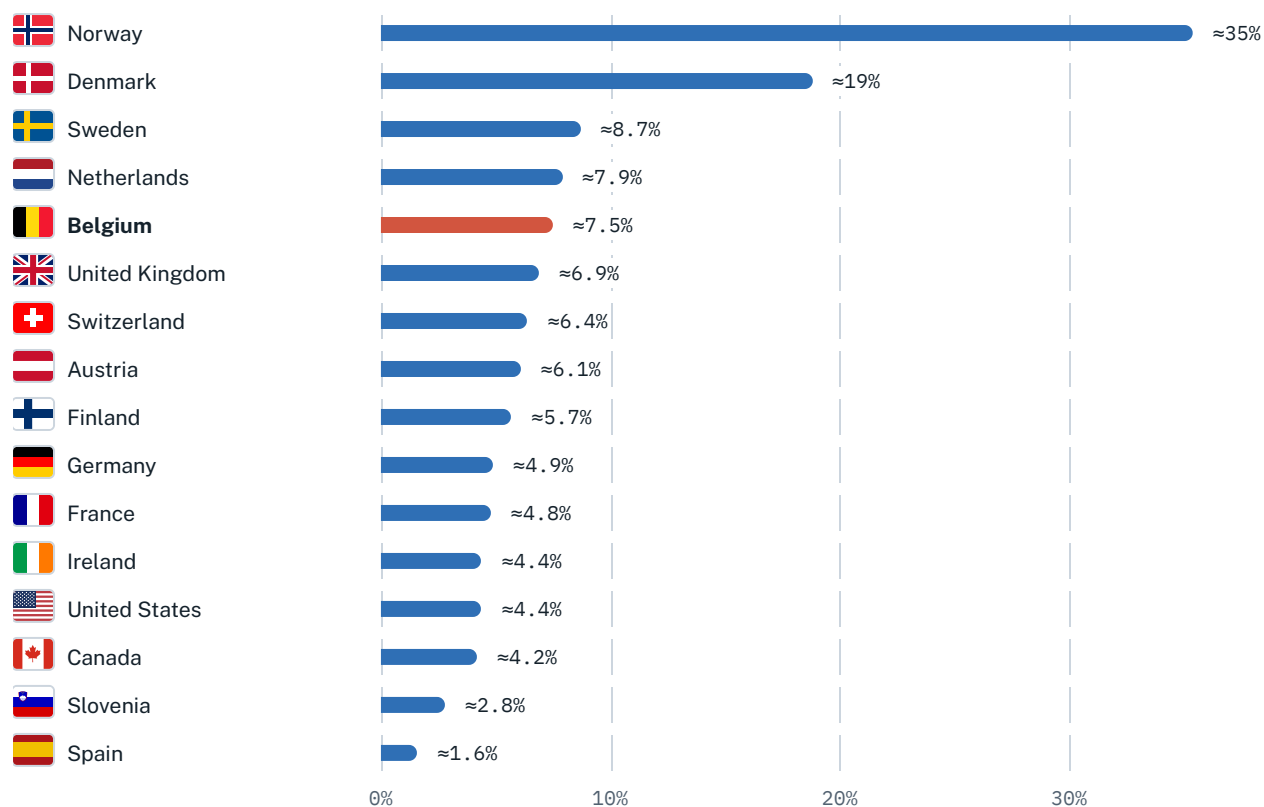


Share of households with a home battery, latest count (2024-2026). How we calculated: the number of home batteries divided by the number of households, assuming one battery per household. Flanders: registered batteries, September 2026 (provisional); Australia: only the batteries added since July 2025 under the federal discount, so the true share is higher; Germany: in operation, October 2025; Austria: end of 2024; Switzerland: all battery storage systems, end of 2025; Netherlands: registered batteries, September 2026, possibly about half of the real number (see Figure 7.2). We found no count of the installed stock for Wallonia and Brussels, nor for the United Kingdom, Ireland, the Nordic countries, Slovenia, France, Spain, the United States or Canada.

SOURCES [167, 323, 365, 367, 369, 388, 403, 460, 466, 481, 482]

FIGURE A.5

Norway has nearly five times as many electric cars per household as Belgium, where roughly 7 in 100 households have one

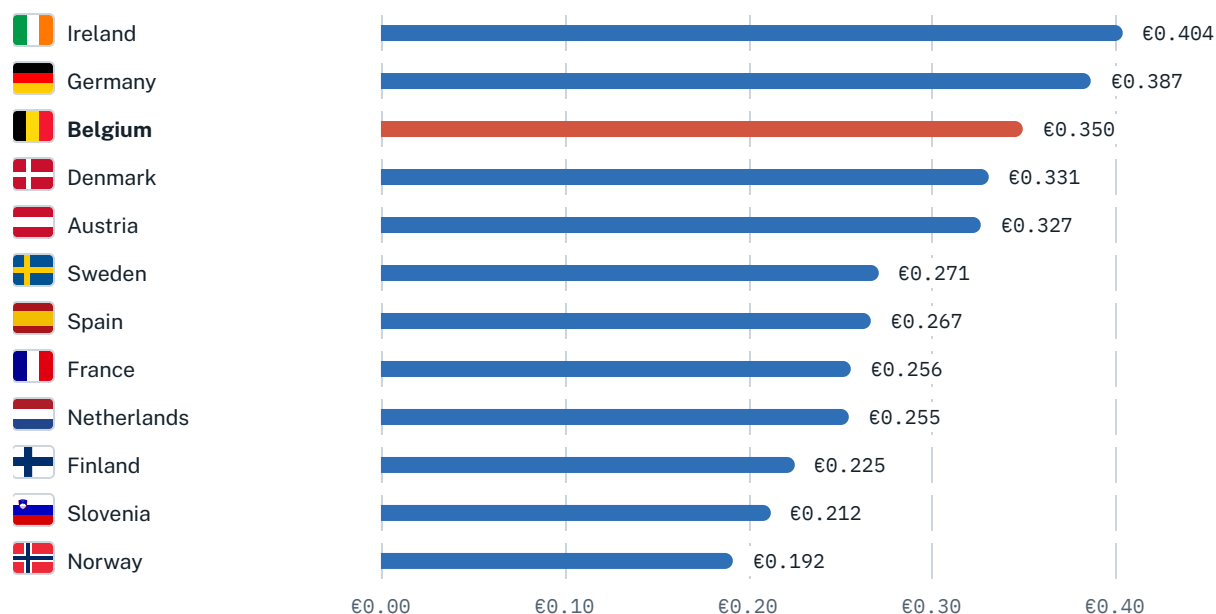


Approximate share of households with a battery-electric car, end of 2025 (United Kingdom: mid-2026). How we calculated: the stock of battery-electric cars divided by the number of households in the country profile, so the figure is the number of such cars per 100 households; because some households have two and some cars are company cars, the true share of households is somewhat lower, most of all in Norway. Plug-in hybrids are not included; for the United States and Canada, battery-electric light-duty vehicles. Not shown: Australia, which publishes the fleet of battery-electric and plug-in hybrid cars together.

SOURCES [366, 389, 477–480, 483–498]

FIGURE A.6

Belgian households pay one of the highest electricity prices among the European countries in this report



Average household price per kWh including all taxes and levies, second half of 2025, for a yearly consumption of 2,500 to 5,000 kWh (Austria estimated; Slovenia capped by the government). The same Eurostat dataset and method apply to every country shown. Not shown: the United Kingdom, Switzerland, the United States, Canada and Australia, whose prices are measured differently (see their profiles below). [Figure 1.2](#) shows the share of network costs in these prices.

SOURCES [407]

Country by country

Belgium



Three regions with three meter rollouts and three network tariffs: Flanders has digital meters in most homes and a capacity charge, while Wallonia and Brussels are only a quarter to a third of the way through their meter rollout; most homes heat with gas.



POPULATION	11.96 million (1 January 2026) ^[499]
HOUSEHOLDS	5.24 million private households (2025) ^[389]
SMART METERS	In Flanders about 80% of homes and small businesses have a digital meter (about 2.95 million, end of 2025); in Wallonia 20–28% depending on the grid operator, and in Brussels about 161,000 smart meters, at most 30% of homes (both also end of 2025) ^[96, 282, 458]
CONTRACTS	In Flanders 1.36% of households had a dynamic contract in April 2026 (0.89% in December 2025), 73% a variable and 26% a fixed price (end of 2025); in Brussels just over 1% of the fewer than 5,000 households with a quarter-hourly smart meter had one, and in Wallonia dynamic offers have been on the regulator's price comparison tool since June 2025. Day/night meter rates are common but not counted separately; there is no regulated default price, only a capped social tariff for eligible households (14% of households in Brussels). ^[85, 96, 106]
HOUSEHOLD NETWORK TARIFF	Each region sets its own: since January 2023 Flanders charges per kW of the household's highest quarter-hour each month (at least 2.5 kW), plus a per-kWh and a fixed yearly charge, without time blocks. Wallonia charges mainly per kWh and has offered an optional time-block tariff for homes with a working smart meter since January 2026; Brussels plans time blocks from 2030 and is preparing a tariff in which households with a smart meter choose a capacity. ^[29, 31, 500, 501]
DISTRIBUTION GRID OPERATORS	Seven: Fluvius in Flanders (with eight tariff areas), five in Wallonia (ORES, RESA and three smaller ones) and Sibelga in Brussels; Elia runs the transmission grid (2026) ^[502–504]
RETAIL MARKET	Free choice of supplier in all three regions and no regulated default price. In Flanders the largest supplier serves 39% of households and the three largest 74%; Brussels has five active household suppliers, the largest serving 73%, and Wallonia about twice as many suppliers as Brussels (end of 2025). ^[85, p. 24, 96, p. 4]
ROOFTOP SOLAR	About 1.5 million solar installations, about 28% of households: 1.10 million in Flanders (8.0 GW, end of May 2026) and at least 0.39 million in Wallonia (end of 2025); we found no comparable count for Brussels ^[324, 458]
HOME BATTERIES	In Flanders about 189,100 registered home batteries with 1,867 MWh (15 September 2026, provisional), about 63 per 1,000 households; we found no comparable count for Wallonia or Brussels, but Elia puts small-scale battery capacity across Belgium at about 740 MW (2026) ^[167, 323, 367]
ELECTRIC CARS	395,188 battery-electric cars (end of 2025); 34.7% of new cars sold in 2025 were battery-electric ^[485, 490]
HEAT PUMPS	About 210,000 water-based heat pumps (air-to-water and ground source) that heat the whole home, plus about 1.03 million air-to-air units, of which about 825,000 serve mainly as air conditioning or secondary heating (2024) ^[505]
HOUSEHOLD PRICE	€0.350 per kWh including all taxes for a household using 2,500–5,000 kWh a year (second half of 2025); network costs make up about 34% of the price ^[1, 407]

SOURCES [1, 29, 31, 85, 96, 106, 167, 282, 323, 324, 367, 389, 407, 458, 485, 490, 499–505]

United Kingdom



Three homes in four have a smart meter and two in three pay a regulator-capped default price; the few who leave the flat rate mostly pick a cheap overnight tariff for their electric car.



POPULATION	67.56 million in Great Britain and 69.5 million in the United Kingdom (mid-2025) ^[506]
HOUSEHOLDS	29.0 million households in the United Kingdom (2025), about 28.2 million of them in Great Britain ^[478]
SMART METERS	75% of homes in Great Britain have a smart electricity meter, and 71% have one working in smart mode (June 2026) ^[459]
CONTRACTS	About two thirds of households are on their supplier's default tariff, whose price the regulator caps, and about one third on a fixed-term contract (July 2025). 2.8% of households (835,000) were on a smart time-of-use tariff, 653,000 of them on an electric-car tariff; dynamic tariffs are included in that figure and not counted separately. ^[59]
HOUSEHOLD NETWORK TARIFF	Network charges are billed to the supplier, which passes them on through the household's daily standing charge and unit rate. For every meter settled half-hourly, which will be all meters by May 2027, the distribution charge has three time bands (red, amber and green), but whether these reach the household's bill is up to the supplier. ^[416, 507]
DISTRIBUTION GRID OPERATORS	14 regional distribution licence areas owned by six groups, plus independent operators of newer local networks (2026) ^[508, 509]
RETAIL MARKET	Free choice among 22 active household suppliers; the six largest serve 92% and the largest electricity supplier 25% (second quarter of 2025), and the regulator caps the price of every supplier's default tariff each quarter ^[59]
ROOFTOP SOLAR	About 2.0 million solar installations in the United Kingdom (22.1 GW, March 2026), 99% of them small-scale; homes are not counted separately, so at most about 7% of households have solar panels ^[467]
HOME BATTERIES	No count of the installed stock; more than 40,000 certified home battery installations were added in 2025 ^[404]
ELECTRIC CARS	About 2.0 million licensed zero-emission (battery-electric) cars (June 2026); 23.4% of new cars sold in 2025 were battery-electric ^[485, 491]
HEAT PUMPS	No count of the installed stock; more than 60,000 certified heat pumps for central heating, mostly air-to-water, were installed in 2025, while air-to-air units are not counted ^[404]
HOUSEHOLD PRICE	Under the price cap for October–December 2026: 26.32p per kWh (about €0.31) plus a standing charge of 54.83p a day (about €0.64), or about €0.39 per kWh in all at a typical 2,700 kWh a year, including 5% VAT. Network costs make up about 23% of a typical combined gas and electricity bill (early 2026) ^[59, 89]

SOURCES ^[59, 89, 404, 416, 459, 467, 478, 485, 491, 506–509]

Ireland



Households pay about €0.40 a kWh, more than in Belgium; almost every home now has a smart meter, and since June 2026 the five largest suppliers must offer a half-hourly price with a cap.



POPULATION	5.51 million (1 January 2026) ^[499]
HOUSEHOLDS	2.33 million private households (2025) ^[389]
SMART METERS	About 2.1 million homes have a smart meter, roughly 90% of households (2026) ^[68, 457]
CONTRACTS	Since June 2026 the five largest suppliers must offer a dynamic contract, with the dynamic part of the price capped at €0.50 per kWh; uptake has not yet been published. A wide range of time-of-use tariffs is on offer, but shares by contract type are not published, and there is no regulated default price. ^[67, 123, 457, 510]
HOUSEHOLD NETWORK TARIFF	Mainly a fixed standing charge plus a per-kWh charge, with no capacity charge (2026) ^[457]
DISTRIBUTION GRID OPERATORS	One, ESB Networks; EirGrid runs the transmission grid
RETAIL MARKET	Free choice of supplier and no regulated price; in 2022 nine suppliers served households and the largest supplied 48.7% of household consumption, and five suppliers now have more than 200,000 customers each (2026) ^[511, pp. 48, 53]
ROOFTOP SOLAR	More than 100,000 homes, at least 4% of households, have rooftop solar installed with a state grant, and small-scale solar totals 727 MW (end of 2025) ^[471]
ELECTRIC CARS	103,299 battery-electric cars (end of 2025); 18.9% of new cars sold in 2025 were battery-electric ^[485, 490]
HEAT PUMPS	About 153,000 homes have a heat pump, about 7% of households (end of 2024); the split by type is not published ^[512, p. 35]
HOUSEHOLD PRICE	€0.404 per kWh including all taxes for a household using 2,500–5,000 kWh a year (second half of 2025); network costs make up about 37% of the price ^[1, 407]

SOURCES [1, 67, 68, 123, 389, 407, 457, 471, 485, 490, 499, 510–512]

Netherlands



A market much like Belgium's, but with smart meters almost everywhere, solar on more than a third of homes and 8% of households on an hourly price; the grid operators want every home on a network charge that is more expensive in the evening from 2029.



POPULATION	18.13 million (1 January 2026) ^[499]
HOUSEHOLDS	8.66 million private households (2025) ^[389]
SMART METERS	94% of the electricity and gas meters of households and small businesses are smart (2026) ^[456]
CONTRACTS	About 8% of households have a dynamic contract, 55% a fixed and 37% a variable price (July 2026); day/night meter rates are common but not counted separately, and there is no regulated price ^[83]
HOUSEHOLD NETWORK TARIFF	Today a fixed yearly charge set by the size of the connection, with no per-kWh or time element. The grid operators have proposed that from January 2029 two thirds of the charge depend on how much and when a household uses electricity (most expensive 4–11 pm in winter); the regulator is due to decide by the end of 2026. ^[513]
DISTRIBUTION GRID OPERATORS	Six regional distribution grid operators (Enexis, Liander, Stedin, Coteq, Rendo and Westland Infra); TenneT runs the transmission grid ^[514, 515]
RETAIL MARKET	Free choice of supplier and no regulated price; dynamic contracts are sold mostly by newer suppliers, the three largest of which hold about 55–70% of that segment (June 2026) ^[95]
ROOFTOP SOLAR	More than 3 million homes have solar panels, 37% of the housing stock (end of 2025; a year earlier just under 3 million homes, over 35%) ^[461, 462]
HOME BATTERIES	79,231 registered home batteries with 1,006 MW (30 September 2026); possibly only about half of all home batteries are registered ^[388, 403, 482]
ELECTRIC CARS	680,605 battery-electric cars (end of 2025); 40.2% of new cars sold in 2025 were battery-electric ^[485, 490]
HEAT PUMPS	2.6 million heat pumps in all buildings (end of 2024): 72% air-to-air units used mostly for cooling, 22% air-to-water (many of them hybrid, next to a gas boiler) and 6% ground source ^[516]
HOUSEHOLD PRICE	€0.255 per kWh including all taxes for a household using 2,500–5,000 kWh a year (second half of 2025); network costs make up about 46% of the price ^[1, 407]

SOURCES [1, 83, 95, 388, 389, 403, 407, 456, 461, 462, 482, 485, 490, 499, 513–516]

Germany



More than 800 grid operators, a home battery in almost one home in twenty and detailed rules for steering heat pumps and chargers, but only about one meter in seventeen is smart enough to make those rules work.



POPULATION	83.47 million (1 January 2026) ^[499]
HOUSEHOLDS	41.1 million households (2025) ^[366]
SMART METERS	5.9% of metering points have a smart metering system, a meter with a certified communication gateway (3.17 million of 54.1 million, June 2026) ^[422]
CONTRACTS	The number of households with a dynamic contract is not published; every supplier has had to offer one since 2025. 22% of households stay on the local default supplier's basic tariff, priced by that supplier, and about 78% are on other contracts (2024). ^[434, pp. 4, 25]
HOUSEHOLD NETWORK TARIFF	A per-kWh charge plus a fixed yearly charge, with no capacity element. Households with a controllable heat pump, charger or battery get a discount for letting the grid operator dim it (since January 2024) and can opt for a time-of-use network charge (since April 2025). ^[241, 263]
DISTRIBUTION GRID OPERATORS	More than 800 distribution grid operators; 819 reported data for 2024 ^[434, p. 17]
RETAIL MARKET	Free choice among on average 139 suppliers per household and no regulated price (2024); 22% of households stay on the local default supplier's basic tariff, and the four largest default suppliers deliver about 44% of all basic-supply volume ^[434, pp. 17, 25]
ROOFTOP SOLAR	About 4.8 million grid-connected solar systems of all sizes (106 GW, early 2026), so at most about 12% of households have a rooftop system, plus more than 1.3 million plug-in balcony panels (August 2026) ^[464, 465]
HOME BATTERIES	1,968,417 home batteries in operation with 11.81 GW, about 48 per 1,000 households (October 2025) ^[365]
ELECTRIC CARS	2,034,260 battery-electric cars (end of 2025); 19.1% of new cars sold in 2025 were battery-electric ^[485, 490]
HEAT PUMPS	About 1.6 million heat pumps used for heating at the end of 2024 (1.3 million air-to-water, 310,000 ground source), and 299,000 more sold in 2025; air-to-air units are not counted ^[517, pp. 8–9, 12, 518]
HOUSEHOLD PRICE	€0.387 per kWh including all taxes for a household using 2,500–5,000 kWh a year (second half of 2025); network costs make up about 29% of the price ^[1, 407]

SOURCES [1, 241, 263, 365, 366, 407, 422, 434, 464, 465, 485, 490, 499, 517, 518]

Austria



Nearly every home has a smart meter, and the regulator now puts it to use: since 2026 the network charge is cheaper at midday in summer, and a monthly peak charge is planned from 2027.



POPULATION	9.22 million (1 January 2026) ^[499]
HOUSEHOLDS	4.21 million private households (2025) ^[389]
SMART METERS	96.9% of metering points have a smart meter, but only 12.6% recorded quarter-hourly values in 2024; quarter-hourly recording becomes the default, with the right to opt out, in 2026–27 ^[47]
CONTRACTS	Shares by contract type are not published; fixed-price, monthly-indexed and spot-price products are all on offer, and there is no regulated price (2025) ^[519, p. 10]
HOUSEHOLD NETWORK TARIFF	A per-kWh charge plus monthly fixed fees; since April 2026 the per-kWh charge is 20% lower from 10 am to 4 pm between April and September for every home whose meter records quarter-hours, applied automatically. From January 2027 a charge on each household's highest quarter-hour of the month is planned for all households. ^[27, 46]
DISTRIBUTION GRID OPERATORS	More than 110 electricity grid companies, about two thirds of them publicly owned (September 2025) ^[520]
RETAIL MARKET	Free choice of supplier and no regulated price, but the regional incumbent still serves 68% to over 98% of households in its home grid area (2024); 37 suppliers were active nationwide in early 2025 and only 4.5% of customers switched in 2024 ^[519, pp. 9–10, 22–23]
ROOFTOP SOLAR	9.4 GW of solar across all segments at the end of 2024, 2.5 GW of it added that year; in a survey of September 2025, 27% of households said they have solar panels ^[463]
HOME BATTERIES	165,045 home solar batteries with 2,202 MWh of usable storage, about 39 per 1,000 households (end of 2024) ^[481]
ELECTRIC CARS	257,717 battery-electric cars (end of 2025), 59% of them registered to companies; 21.3% of new cars sold in 2025 were battery-electric ^[485, 490]
HEAT PUMPS	The installed stock is not published; 13% of households heat mainly with a heat pump (2025 survey), and 45,872 heat pumps for space heating were sold in 2024, over 80% of them air-to-water ^[463, 521]
HOUSEHOLD PRICE	€0.327 per kWh including all taxes for a household using 2,500–5,000 kWh a year (second half of 2025, estimated); network costs make up about 31% of the price ^[1, 407]

SOURCES [1, 27, 46, 47, 389, 407, 463, 481, 485, 490, 499, 519–521]

Switzerland



Households cannot choose their supplier: some 580 local utilities sell at a regulated price, and a new law says the flexibility of a home's boiler or heat pump belongs to the household, not the grid operator.



POPULATION	9.12 million (1 January 2026) ^[499]
HOUSEHOLDS	About 3.9 million private households (end of 2020) ^[477]
SMART METERS	Grid operators must fit smart meters at 80% of metering points by the end of 2027; we found no figure for the current share ^[522]
CONTRACTS	Households cannot choose their supplier: all buy at the regulated basic-supply tariff of their local grid operator, which often has day and night rates (2026) ^[523]
HOUSEHOLD NETWORK TARIFF	Set by each of about 580 local grid operators: mostly a per-kWh charge plus metering and fixed fees, often with higher day and lower night rates. Many have switched boilers and heat pumps by ripple control for decades, which since the 2024 law requires the customer's consent and a published payment. ^[248, 253, 524–526]
DISTRIBUTION GRID OPERATORS	About 580 grid operators, most of which also supply households (tariffs for 2027) ^[523]
RETAIL MARKET	No free choice for households: each is supplied by its local grid operator at a regulated tariff, so there are about 580 local monopolies rather than a retail market (2026) ^[523]
ROOFTOP SOLAR	About 338,000 solar installations of all sizes with almost 9.5 GW (end of 2025); in 2025, 25,562 of the 37,257 new installations were on single-family homes ^[466]
HOME BATTERIES	Almost 93,500 battery storage systems with 1.38 GWh at the end of 2025, 27,775 of them added that year ^[466]
ELECTRIC CARS	249,966 battery-electric cars (end of 2025), 71% of them registered to private owners; 22.8% of new cars sold in 2025 were battery-electric ^[485, 490]
HEAT PUMPS	18.5% of residential buildings have a heat pump (2022); heating oil is still the most common source, in 39% of them ^[527]
HOUSEHOLD PRICE	27.7 Swiss cents per kWh (about €0.30) for a typical household using 4,500 kWh a year in 2026, falling to 26.5 cents (about €0.29) in 2027; grid use and metering make up about 45% of the 2026 price (calculated from the components ElCom publishes) ^[524, 525]

SOURCES [248, 253, 466, 477, 485, 490, 499, 522–527]

Norway



Homes heat and drive on electricity, almost every household has an hourly spot contract, and since late 2025 most southern homes have swapped that price exposure for a state-set fixed price.



POPULATION	5.63 million (1 January 2026) ^[528]
HOUSEHOLDS	2.67 million private households (1 January 2026) ^[496]
SMART METERS	Practically every home has had a smart meter with hourly readings since 2019 ^[45, 414]
CONTRACTS	97.6% of household electricity is bought on hourly spot-price contracts, 1.0% at a fixed and 1.4% at a variable price (second quarter of 2026). Since October 2025 households can opt into a fixed price set by the state and paid through their grid company, and about 60% of household meters in southern Norway have done so (January 2026). ^[120, 426]
HOUSEHOLD NETWORK TARIFF	Mandatory for all households since July 2022: a monthly capacity charge in kW steps based on the household's highest hourly peaks, plus a per-kWh charge that most grid companies make cheaper at night ^[2]
DISTRIBUTION GRID OPERATORS	77 grid companies with household customers (2025) ^[2]
RETAIL MARKET	Free choice among about 120 suppliers and no regulated price; the largest holds about 19% and the five largest just over half (2023). Since October 2025 households can also opt into a state-set fixed price paid through their grid company. ^[121]
ROOFTOP SOLAR	30,360 households are registered as solar prosumers, about 1.1% of households (end of 2025) ^[476]
ELECTRIC CARS	945,185 battery-electric cars, 32.1% of all cars (end of 2025); 95.9% of new cars sold in 2025 were battery-electric ^[483–485]
HEAT PUMPS	41% of households have a heat pump, 35% an air-to-air unit and 7% an air-to-water or ground-source system; heat pumps are the main heating for 36% of households (2022) ^[529, 530]
ELECTRIC HEATING	Electricity, directly or through a heat pump, is the main heating source for about four in five households; district heating and gas play almost no role (late 2023) ^[121]
HOUSEHOLD PRICE	€0.192 per kWh including all taxes for a household using 2,500–5,000 kWh a year (second half of 2025); network costs make up about 50% of the price ^[1, 407]

SOURCES [1, 2, 45, 120, 121, 407, 414, 426, 476, 483–485, 496, 528–530]

Sweden



Electric and heat-pump heating are common, most households pay a monthly-average price rather than an hourly one, and a planned peak-based network charge was halted in 2026.



POPULATION	10.61 million (1 January 2026) ^[479, 499]
HOUSEHOLDS	5.00 million households (2025) ^[479]
SMART METERS	Practically every home has a smart meter, and the second generation, which records 15-minute values, was in place by 1 January 2025 ^[45]
CONTRACTS	13.6% of contracts have a quarter-hourly or hourly price, 61.1% a variable price based on the monthly average spot price and 7.5% a fixed price (July 2026); 8.3% sit on a default contract priced by the supplier that the grid company assigns ^[440]
HOUSEHOLD NETWORK TARIFF	Mostly a fixed annual fee set by the main fuse size plus a per-kWh charge. A charge based on peak use is up to each grid company since the government halted the planned obligation in March 2026, and some companies that had introduced one have dropped it. ^[9, 45]
DISTRIBUTION GRID OPERATORS	About 170 distribution grid companies (2025) ^[45]
RETAIL MARKET	Free choice among about 150 suppliers and no regulated price; the three largest hold 36% (2023), and customers who never choose sit on a default contract priced by the supplier their grid company assigns ^[531]
ROOFTOP SOLAR	About 314,600 grid-connected solar installations with 5,541 MW at the end of 2025, at most about 6% of households; 21,600 were added in 2025 ^[468]
ELECTRIC CARS	432,709 battery-electric cars, about 8.6% of all cars (end of 2025); 36.5% of new cars sold in 2025 were battery-electric ^[488, 489]
ELECTRIC HEATING	Electricity is the main heating source for 23% of households (late 2023) ^[531]
HOUSEHOLD PRICE	€0.271 per kWh including all taxes for a household using 2,500–5,000 kWh a year (second half of 2025); network costs make up about 40% of the price ^[1, 407]

SOURCES [1, 9, 45, 407, 440, 468, 479, 488, 489, 499, 531]

Denmark



Most homes are on district heating, and the main lever is a time-of-use network charge that makes the 5–9 pm winter peak several times more expensive than the night.



POPULATION	6.03 million (1 July 2026) ^[532]
HOUSEHOLDS	2.88 million households (1 January 2026) ^[480]
SMART METERS	Every home has had a smart meter with hourly readings since 2020 ^[45]
CONTRACTS	In a 2023 survey, 43% of households had a spot-price contract, about 27% a fixed price (for at most three months) and 15% a variable price, while 15% did not know their contract type ^[427]
HOUSEHOLD NETWORK TARIFF	A time-of-use network charge plus a fixed subscription, used by 27 of the 36 grid companies in January 2024: a nationwide 5–9 pm peak that in winter costs three times the normal rate, with the night at a third of it, about 9 to 1 within a winter day ^[12]
DISTRIBUTION GRID OPERATORS	36 distribution grid companies (January 2024) ^[12]
RETAIL MARKET	Free choice among about 40 suppliers and no regulated price; the largest holds about 25% and the three largest more than half, and the supplier sends a single bill that includes the network charge (2023) ^[427]
ROOFTOP SOLAR	About 147,000 solar installations under 15 kW, the size typical of homes, which is about 5% of households (March 2025) ^[469]
ELECTRIC CARS	540,980 battery-electric cars, 18.6% of all cars (1 January 2026); 68.2% of new cars sold in 2025 were battery-electric ^[486, 487]
HEAT PUMPS	We found no official count of the installed stock; heat pump sales rose by 36% in 2025, and most homes are heated by district heating ^[533]
ELECTRIC HEATING	District heating is the main heating source for 63% of households and electricity for only 6% (late 2023) ^[427]
HOUSEHOLD PRICE	€0.331 per kWh including all taxes for a household using 2,500–5,000 kWh a year (second half of 2025); network costs make up about 23% of the price ^[1, 407]

SOURCES [1, 12, 45, 407, 427, 469, 480, 486, 487, 532, 533]

Finland



Electric heating is common outside the cities, about a third of households are on exchange-price contracts, and the newest smart meters carry a relay the grid operator can switch.



POPULATION	5.65 million (1 January 2026) ^[499]
HOUSEHOLDS	2.98 million private households (2025) ^[389]
SMART METERS	Practically every home has a smart meter with hourly readings; new meters must record 15-minute values by the end of 2028 and carry a relay the grid operator can switch ^[45]
CONTRACTS	31% of all supply contracts were exchange-price (dynamic) contracts at the end of 2023; in a household survey that year, 49% had a fixed and 14% a variable price ^[45, 428]
HOUSEHOLD NETWORK TARIFF	A fixed monthly charge set by fuse size plus a per-kWh charge; some grid companies add a kW-based power charge, and dynamic network tariffs are not allowed (2025) ^[45]
DISTRIBUTION GRID OPERATORS	77 distribution grid operators, the 15 largest covering about 70% of customers (2022) ^[428]
RETAIL MARKET	Free choice among about 50 suppliers and no regulated price; the three largest held 48% of metering points (2022), and the largest supplier in each grid area must supply anyone who has not chosen ^[428]
ELECTRIC CARS	169,458 battery-electric cars (2025); 37.2% of new cars sold in 2025 were battery-electric ^[485, 490]
HEAT PUMPS	More than 1.8 million heat pumps have been sold to date; of the 112,000 sold in 2025, 96,000 (86%) were air-to-air and about 14,000 air-to-water or ground source ^[534]
ELECTRIC HEATING	District heating is the main heating source for about 45% of households and electricity for about 25% (late 2023) ^[428]
HOUSEHOLD PRICE	€0.225 per kWh including all taxes for a household using 2,500–5,000 kWh a year (second half of 2025); network costs make up about 37% of the price ^[1, 407]

SOURCES [1, 45, 389, 407, 428, 485, 490, 499, 534]

Slovenia



A small market with capped household prices, where a sharp five-block peak network charge introduced in 2024 drew a political backlash within one winter.



POPULATION	2.14 million (1 January 2026) ^[499]
HOUSEHOLDS	0.87 million private households (2025) ^[389]
SMART METERS	96.7% of all metering points have an advanced meter (end of 2024) ^[44, pp. 6–7]
CONTRACTS	The government capped household electricity prices in 2024, so suppliers priced their offers at the cap; shares by contract type are not published ^[44, pp. 6–7]
HOUSEHOLD NETWORK TARIFF	Since October 2024 every user pays, in each of five time blocks, a charge on an agreed quarter-hourly power, set from the previous year's measured peaks, plus a per-kWh charge; the most expensive block applies only on winter working days at peak hours ^[7, 18]
DISTRIBUTION GRID OPERATORS	One: ELES runs both the transmission and the distribution grid, working through five regional distribution companies (2024) ^[44, p. 49]
RETAIL MARKET	Households can choose any supplier, but the government caps household prices, so suppliers price at the cap and switching is at a record low (2024) ^[44, p. 7]
ROOFTOP SOLAR	60,245 self-supply solar installations with 779 MW; 6.2% of all electricity consumers also produce (end of 2024) ^[44, p. 8]
ELECTRIC CARS	24,548 battery-electric cars (2025); 11.2% of new cars sold in 2025 were battery-electric ^[485, 490]
HOUSEHOLD PRICE	€0.212 per kWh, a capped price, including all taxes for a household using 2,500–5,000 kWh a year (second half of 2025); network costs make up about 21% of the price ^[1, 407]

SOURCES [1, 7, 18, 44, 389, 407, 485, 490, 499]

France



More than half of homes still buy at the state-set regulated tariff, over 11 million have off-peak hours set by the grid operator, and the meter itself can switch water heaters.



POPULATION	69.11 million (1 January 2026) ^[499]
HOUSEHOLDS	32.38 million private households (2025) ^[389]
SMART METERS	96% of homes have the national smart meter, Linky (38.4 million meters, 2026) ^[294]
CONTRACTS	54.8% of homes buy at the regulated tariff (June 2026). More than 11 million households, about a third, have peak and off-peak hours, including an estimated 0.9 million on a critical-peak option; the number of dynamic contracts is not published. ^[166, 296]
HOUSEHOLD NETWORK TARIFF	A national network tariff set by the regulator: a fixed part that rises with the subscribed power plus a per-kWh part, which households can take with peak and off-peak hours through their supplier's offer. The grid operator sets the off-peak hours locally and is moving part of them to the middle of the day between November 2025 and October 2027. ^[166]
DISTRIBUTION GRID OPERATORS	About 160 distribution grid operators; Enedis alone covers 95% of mainland France ^[535]
RETAIL MARKET	Households can choose any supplier, but 54.8% of homes still buy at the regulated tariff, which only EDF and local incumbent suppliers are allowed to sell and whose level the regulator proposes and the government sets twice a year (June 2026) ^[278, 296]
ROOFTOP SOLAR	About 1.33 million solar installations are connected to the Enedis grid (30.8 GW, June 2026), so at most about 4% of households have solar panels; homes are not counted separately, and France's total solar capacity is 34.0 GW ^[472, 473]
ELECTRIC CARS	1,543,440 battery-electric cars (2025); 20.0% of new cars sold in 2025 were battery-electric ^[485, 490]
HEAT PUMPS	About 7 million heat pumps of all types, air-to-air units included, with 528,000 sold in 2025 ^[533]
HOUSEHOLD PRICE	€0.256 per kWh including all taxes for a household using 2,500–5,000 kWh a year (second half of 2025); network costs make up about 29% of the price ^[1, 407]

SOURCES [1, 166, 278, 294, 296, 389, 407, 472, 473, 485, 490, 499, 533, 535]

Spain



Every household pays a three-period time-of-use network charge and a contracted power limit, and about a quarter sit by default on an hourly-priced regulated tariff.



POPULATION	49.59 million (1 January 2026) ^[499]
HOUSEHOLDS	19.74 million private households (2025) ^[389]
SMART METERS	Practically every home has a smart meter; at the end of 2018, more than 99% of meters on connections up to 15 kW were smart meters ^[455]
CONTRACTS	27.4% of household consumers (8.2 million) are on the regulated default tariff, priced hour by hour from the wholesale market (since 2024 partly from forward prices), and 21.7 million are on free-market offers (end of 2025); every household also pays a three-period time-of-use network charge ^[60, 61]
HOUSEHOLD NETWORK TARIFF	Mandatory for every household since June 2021: a per-kWh network charge in three time periods (peak, mid and off-peak, with weekends off-peak) plus a charge on the contracted kW in two periods, with the meter enforcing the contracted power ^[16]
RETAIL MARKET	Households can pick any supplier, but those with up to 10 kW who never choose are placed on a government-set regulated tariff that follows hourly wholesale prices and is sold only by designated reference suppliers; about 27% of household consumers are on it (end of 2025) ^[60, 61]
ROOFTOP SOLAR	483,930 residential self-consumption solar installations with 2,281 MW at the end of 2024, about 2.5% of households; another 368 MW of residential systems were added in 2025 ^[474, 475]
HOME BATTERIES	We found no count of home batteries; 339 MWh of batteries were installed alongside self-consumption solar in 2025, more than twice as much as in 2024 ^[475]
ELECTRIC CARS	312,914 battery-electric cars (2025); 8.8% of new cars sold in 2025 were battery-electric ^[485, 490]
HOUSEHOLD PRICE	€0.267 per kWh including all taxes for a household using 2,500–5,000 kWh a year (second half of 2025); network costs make up about 27% of the price ^[1, 407]

SOURCES [1, 16, 60, 61, 389, 407, 455, 474, 475, 485, 490, 499]

United States



Most households buy from one regulated utility that also runs the grid; California put most of them on time-of-use rates by default, while smart meters are still scarce in New England.



POPULATION	341.8 million (1 July 2025), of which 39.4 million in California and 7.2 million in Massachusetts ^[497]
HOUSEHOLDS	129.2 million households (2020–24 average), of which 13.5 million in California and 2.8 million in Massachusetts ^[497]
SMART METERS	77% of residential meters nationally are smart; about 83% in the Pacific region that includes California, but only 25% in New England, which includes Massachusetts (end of 2023) ^[182]
CONTRACTS	In most states households buy at their utility's regulated rate, usually a flat or tiered price per kWh; time-based rates had 18.2 million enrolments across all customer classes in 2023, and California's three large utilities put households on time-of-use by default. In Massachusetts 74% of households are on the utility's basic service, 12% with a competitive supplier and 14% in a municipal aggregation (2023–24). ^[182, 536]
HOUSEHOLD NETWORK TARIFF	Most utilities run both the grid and the supply, so households pay one regulated rate covering both, usually a fixed monthly charge plus a per-kWh charge. Time-of-use is opt-in at most utilities but the default at California's three large utilities since 2019–2022; in Massachusetts the bill shows a separate distribution charge without time variation. ^[5, 62]
DISTRIBUTION GRID OPERATORS	About 3,000–3,500 electric utilities: 59% community-owned, 26% cooperatives and 5% investor-owned, though the investor-owned ones serve 66% of customers. California has three large investor-owned utilities with 12.5 million accounts, plus municipal utilities. ^[537]
RETAIL MARKET	It depends on the state: in most, one regulated utility both delivers and sells power and households cannot choose. Massachusetts lets households pick a competitive supplier, with the utility as the default, while California lets towns and counties buy power collectively for their residents (38% of demand in 2025) but households cannot switch supplier individually. ^[62, 536, 538]
ROOFTOP SOLAR	About 5.8 million homes have rooftop solar, about 4.5% of households, with 47 GW of capacity (early 2026) ^[470]
HOME BATTERIES	No official count; 45% of new home solar systems came with a battery in early 2026, and more than 100,000 Californian households with a battery took part in a state grid-support test in 2025 ^[470]
ELECTRIC CARS	5.69 million battery-electric cars (2025), 1.84 million of them in California and 0.11 million in Massachusetts; about 7.5% of new light vehicles sold in 2025 were battery-electric ^[492, 493]
HEAT PUMPS	A ducted central heat pump, an air-to-air system that heats and cools the whole home, is the main heating in 13% of homes nationally but in only 3% in California and 2% in Massachusetts (2020) ^[539]
HOUSEHOLD PRICE	17.3 cents per kWh on average (about €0.15, 2025); 32.0 cents in California and 29.4 cents in Massachusetts (about €0.28 and €0.26, 2024), including fixed charges but excluding most taxes ^[62, 540]

SOURCES [5, 62, 182, 470, 492, 493, 497, 536–540]

Canada



Electricity is run province by province: hydro-rich Québec heats with electric baseboards at some of North America's lowest prices and peaks in winter, while Ontario puts households on a regulated time-of-use price by default.



POPULATION	41.42 million (1 April 2026), of which 16.10 million in Ontario and 9.02 million in Québec ^[541]
HOUSEHOLDS	Just under 15 million households (2021 census) ^[498]
SMART METERS	In Ontario practically every home has had a smart meter since 2014 (4.8 million installed from 2006); we found no figure for Québec or for Canada as a whole ^[131]
CONTRACTS	In Ontario most households buy at a regulated price that is time-of-use by default, with a tiered price and an ultra-low overnight option as alternatives; shares are not published (2025). In Québec almost all households pay one regulated two-block rate, and 305,000 had chosen a winter peak-event option (winter 2023–24). ^[146, 542]
HOUSEHOLD NETWORK TARIFF	Ontario's bill separates a regulated delivery charge, mostly a fixed monthly distribution charge plus per-kWh transmission and loss charges, from the regulated energy price, which carries the time-of-use signal. Québec has one bundled rate from Hydro-Québec, with a daily fixed charge, a cheaper first 40 kWh a day and a more expensive remainder, and no time variation outside the opt-in winter options. ^[542, 543]
DISTRIBUTION GRID OPERATORS	Ontario has several dozen local distribution companies, the largest being Hydro One; in Québec, Hydro-Québec serves almost all customers
RETAIL MARKET	Each province runs its own system: in Québec the state-owned Hydro-Québec supplies households at regulated rates with no supplier choice; in Ontario households can sign with a licensed retailer, but most buy at the regulated price plan that the regulator sets each November ^[127, 543]
ELECTRIC CARS	623,481 battery-electric vehicles (end of 2025), 268,369 of them in Québec and 158,942 in Ontario; battery-electric and plug-in hybrid cars together were about 8.7% of new sales in 2025 ^[494, 495]
HEAT PUMPS	9% of households heat mainly with a heat pump, 1% of them with a ductless mini-split (2023); in Québec electric baseboard heaters are the main heating for 58% of households, in Ontario gas furnaces for 75% (2021) ^[544]
HOUSEHOLD PRICE	For a home using 1,000 kWh a month, including taxes: 9.5 cents per kWh in Montréal (about €0.06), 17.9 cents in Toronto (about €0.11) and 16.5 cents in Ottawa (about €0.10) (April 2025) ^[545]

SOURCES [127, 131, 146, 494, 495, 498, 541–545]

Australia



Rooftop solar is so widespread that South Australia's grid demand has dipped below zero at midday, and network charges and regulated offers now make the middle of the day the cheapest time to use power.



POPULATION	27.92 million (31 March 2026), of which 8.67 million in New South Wales, 7.15 million in Victoria and 1.92 million in South Australia ^[546]
HOUSEHOLDS	9.28 million households (2021 census), of which 2.90 million in New South Wales, 2.39 million in Victoria and 0.69 million in South Australia ^[387]
SMART METERS	Practically all homes in Victoria (99.6%), about 42% in New South Wales and 35–40% in South Australia and the other states (June 2023); the AEMC's count of remotely read meters in November 2024 gave Victoria 99%, Tasmania 78%, South Australia 46%, Queensland 43%, the ACT 40% and New South Wales 39%; every home must have one by 2030 ^[547–549]
CONTRACTS	69.4% of residential customers were on a flat rate, 26.5% on time-of-use and 4.1% on a demand-based plan (August 2025). Those who never switch sit on a standing offer with a regulator-capped price: 6.4% in New South Wales, 6.8% in South Australia and 16.8% in Victoria (2025). ^[550]
HOUSEHOLD NETWORK TARIFF	Set by the distribution business and approved by the federal regulator, then passed on by retailers as they choose: a fixed daily charge plus per-kWh charges that are time-of-use for most smart-meter homes, with a cheap midday window in South Australia. Since July 2025 New South Wales and South Australia also have a two-way export price (a small charge for midday exports above a free allowance, a reward in the evening), while Victoria keeps both flat and time-of-use options. ^[308, 369, 551, 552]
DISTRIBUTION GRID OPERATORS	Three in New South Wales, five in Victoria and one in South Australia (2026) ^[552, 553]
RETAIL MARKET	Free choice of retailer in all three states: about nine in ten households in New South Wales and South Australia and over eight in ten in Victoria are on a competitive offer. Those who never switch sit on their retailer's standard contract, whose price the regulator caps; the three largest retailers serve 56.6% of Victorian households (2025). ^[369, 550, 552, 553]
ROOFTOP SOLAR	4.53 million small-scale solar systems installed since 2001 (30.6 GW), including 1.19 million in New South Wales, 0.91 million in Victoria and 0.47 million in South Australia (August 2026) ^[460]
HOME BATTERIES	510,949 home batteries installed under the national subsidy between July 2025 and August 2026, on top of an older fleet not in this count; about a quarter of battery owners take part in a virtual power plant (January 2026) ^[369, 460]
ELECTRIC CARS	103,269 battery-electric cars sold in 2025, 8.3% of all new vehicles; more than 454,000 electric vehicles, battery-electric and plug-in hybrid, were on the road at the end of 2025 ^[554, 555]
HEAT PUMPS	No recent official count: the usual electric heater is a reverse-cycle air conditioner, an air-to-air unit used for both cooling and heating; in 2014, 49% of households cooled mainly with one and 38% used electricity as their main heating energy ^[556]
HOUSEHOLD PRICE	The regulated cap on standard contracts for 2026–27, flat rate including fixed charges and tax: about 48.7 cents per kWh in the Sydney area (about €0.30), 58.4 cents in South Australia (about €0.36) and 39.8 cents in Victoria (about €0.24); network costs are 33–46% of the bill ^[552, 553]

SOURCES [308, 369, 387, 460, 546–556]

Side by side

COUNTRY	SMART METERS	CONTRACTS	NETWORK TARIFF	ELECTRIC CARS	HEAT PUMPS	HOME BATTERIES	PRICE
 Belgium	≈80% Flanders; 20–28% Wallonia; ≤30% Brussels (2025–26) ^[96, 282, 458]	Dynamic 1.36% Flanders (Apr 2026); fixed 26%, variable 73% ^[85, 96, 106]	Flanders: kW monthly peak; Wallonia: optional time blocks; Brussels: planned ^[29, 31, 500, 501]	395,000; 34.7% of new cars (2025) ^[485, 490]	≈210,000 water-based; 1.03 million air-to-air (2024) ^[505]	Flanders ≈189,100 (Sept 2026); Belgium ≈740 MW ^[167, 323, 367]	€0.350/kWh; network ≈34% (2025) ^[1, 407]
 United Kingdom	75% of homes; 71% in smart mode (2026) ^[459]	Price-capped default ≈½; smart time-of-use 2.8% (2025) ^[59]	Via supplier; time bands reach supplier, not always the bill ^[416, 507]	≈2.0 million (2026); 23.4% of new cars (2025) ^[485, 491]	No stock count; >60,000 installed in 2025 ^[404]	No stock count; >40,000 added in 2025 ^[404]	≈€0.39/kWh all-in under the price cap (Q4 2026) ^[59, 89]
 Ireland	≈90% (2.1 million homes, 2026) ^[68, 457]	—	Standing charge + per kWh; no capacity charge ^[457]	103,000; 18.9% of new cars (2025) ^[485, 490]	≈153,000 homes, ≈7% (2024) ^[512, p. 35]	—	€0.404/kWh; network ≈37% (2025) ^[1, 407]
 Netherlands	94% of meters (2026) ^[456]	Dynamic 8%, fixed 55% (2026) ^[83]	Fixed by connection size; time-of-use proposed from 2029 ^[513]	681,000; 40.2% of new cars (2025) ^[485, 490]	2.6 million, 72% of them air-to-air (2024) ^[516]	79,231 registered (Sept 2026) ^[388, 403, 482]	€0.255/kWh; network ≈46% (2025) ^[1, 407]
 Germany	5.9% smart metering systems (June 2026) ^[422]	Dynamic not published; 22% on basic default tariff (2024) ^[434, pp. 4, 25]	Per kWh + fixed; time-of-use optional for steerable devices ^[241, 263]	2.03 million; 19.1% of new cars (2025) ^[485, 490]	≈1.6 million for heating (2024); 299,000 sold (2025) ^[517, pp. 8–9, 12, 518]	≈1.97 million; 48 per 1,000 households (2025) ^[365]	€0.387/kWh; network ≈29% (2025) ^[1, 407]
 Austria	96.9%; 12.6% quarter-hourly (2024) ^[47]	—	Per kWh, 20% cheaper summer midday; monthly peak from 2027 ^[27, 46]	258,000; 21.3% of new cars (2025) ^[485, 490]	Main heating for 13% of households (2025) ^[463, 521]	165,045; 39 per 1,000 households (2024) ^[481]	€0.327/kWh; network ≈31% (2025) ^[1, 407]
 Switzerland	Target 80% by the end of 2027 ^[522]	100% regulated basic supply (no supplier choice) ^[523]	Per kWh, often day/night; set by each local operator ^[248, 253, 524–526]	250,000; 22.8% of new cars (2025) ^[485, 490]	18.5% of residential buildings (2022) ^[527]	≈93,500 storage systems (end of 2025) ^[466]	≈€0.30/kWh; network ≈45% (2026) ^[524, 525]
 Norway	≈100% (since 2019) ^[45, 414]	Spot 97.6% of use; state fixed price ≈60% in south ^[120, 426]	Monthly kW steps + per kWh, often cheaper at night ^[2]	945,000 (32% of all cars); 95.9% of new (2025) ^[483–485]	41% of households, mostly air-to-air (2022) ^[529, 530]	—	€0.192/kWh; network ≈50% (2025) ^[1, 407]
 Sweden	≈100%; 15-minute data since 2025 ^[45]	Hourly or quarter-hourly 13.6%; monthly-average 61.1% (2026) ^[440]	Fuse-size fee + per kWh; peak charge optional since 2026 ^[9, 45]	433,000; 36.5% of new cars (2025) ^[488, 489]	—	—	€0.271/kWh; network ≈40% (2025) ^[1, 407]
 Denmark	100% (since 2020) ^[45]	Spot 43%; fixed ≈27% (2023 survey) ^[427]	Time-of-use; winter 5–9 pm peak ≈9× the night ^[12]	541,000 (18.6% of all cars); 68.2% of new (2025) ^[486, 487]	No stock count; sales +36% (2025) ^[533]	—	€0.331/kWh; network ≈23% (2025) ^[1, 407]
 Finland	≈100% hourly; 15-minute by the end of 2028 ^[45]	Exchange-price 31%; fixed ≈49% (2023) ^[45, 428]	Fuse-size fee + per kWh; some add a kW charge ^[45]	169,000; 37.2% of new cars (2025) ^[485, 490]	1.8 million sold to date, mostly air-to-air ^[534]	—	€0.225/kWh; network ≈37% (2025) ^[1, 407]
 Slovenia	96.7% (2024) ^[44, pp. 6–7]	Prices capped by the government (2024) ^[44, pp. 6–7]	Five time blocks, kW + kWh; priciest on winter workdays ^[7, 18]	24,500; 11.2% of new cars (2025) ^[485, 490]	—	—	€0.212/kWh (capped); network ≈21% (2025) ^[1, 407]

COUNTRY	SMART METERS	CONTRACTS	NETWORK TARIFF	ELECTRIC CARS	HEAT PUMPS	HOME BATTERIES	PRICE
 France	96% of homes (2026) ^[294]	Regulated tariff 54.8%; peak/off-peak >11 million (2026) ^[166, 296]	Fixed by subscribed kVA + per kWh; optional off-peak hours ^[166]	1.54 million; 20.0% of new cars (2025) ^[485, 490]	≈7 million incl. air-to-air (2025) ^[533]	—	€0.256/kWh; network ≈29% (2025) ^[1, 407]
 Spain	≈100% (since 2018) ^[455]	Hourly-priced regulated default 27.4% (2025) ^[60, 61]	Three time periods per kWh + contracted kW ^[16]	313,000; 8.8% of new cars (2025) ^[485, 490]	—	No stock count; 339 MWh added (2025) ^[475]	€0.267/kWh; network ≈27% (2025) ^[1, 407]
 United States	77% nationally; ≈83% Pacific, 25% New England (2023) ^[182]	Mostly regulated flat rates; California time-of- use by default ^[182, 536]	Bundled utility rate; time-of-use default in California ^[5, 62]	5.69 million; ≈7.5% of new (2025) ^[492, 493]	Main heating in 13% of homes (2020) ^[539]	No count; 45% of new solar homes add one (2026) ^[470]	≈€0.15/kWh; California ≈€0.28 (2024–25) ^[62, 540]
 Canada	Ontario ≈100% (since 2014) ^[131]	Ontario time-of-use default; Québec 305,000 on peak options ^[146, 542]	Ontario: delivery mostly fixed; Québec: bundled two-block rate ^[542, 543]	623,000; plug-ins ≈8.7% of new (2025) ^[494, 495]	Main heating for 9% of households (2023) ^[544]	—	Montréal ≈€0.06, Toronto ≈€0.11/kWh (2025) ^[545]
 Australia	Victoria ≈100%; New South Wales ≈42%; others 35–40% (2023) ^[547–549]	Flat 69.4%; time-of-use 26.5%; demand 4.1% (2025) ^[550]	Time-of-use with cheap midday; export price since 2025 ^[308, 369, 551, 552]	8.3% of new (2025); 454,000 incl. hybrids on the road ^[554, 555]	49% cool mainly with reverse-cycle units (2014) ^[556]	510,949 added since July 2025 (Aug 2026) ^[369, 460]	Cap ≈€0.24– 0.36/kWh; network 33–46% (2026–27) ^[552, 553]

SOURCES [1, 2, 5, 7, 9, 12, 16, 18, 27, 29, 31, 44–47, 59–62, 68, 83, 85, 89, 96, 106, 120, 131, 146, 166, 167, 182, 241, 248, 253, 263, 282, 294, 296, 308, 323, 365, 367, 369, 388, 403, 404, 407, 414, 416, 422, 426–428, 434, 440, 455–460, 463, 466, 470, 475, 481–495, 500, 501, 505, 507, 512, 513, 516–518, 521–527, 529, 530, 533, 534, 536, 539, 540, 542–545, 547–556]

Dictionary

The technical terms and abbreviations that are explained with a ⓘ symbol in the report, in alphabetical order.

ACM	The Netherlands Authority for Consumers and Markets, which also regulates the Dutch energy market.
AEMO	The Australian Energy Market Operator, which runs the electricity market and power system in eastern and southern Australia.
Aggregator	A company that bundles the flexibility of many devices or households and sells it in electricity markets or to grid operators. An independent aggregator is a party other than the household's supplier.
Atrias	The joint company of Belgium's distribution grid operators that runs the central market system for exchanging meter data and switching suppliers.
Balancing and reserves	The transmission system operator (Elia in Belgium) keeps supply and demand in balance at every moment. It buys reserves from flexible units: FCR reacts within seconds, aFRR automatically within minutes, and mFRR is activated manually within about a quarter of an hour.
Baseline	An estimate of what a household or device would have used without the request to change, needed to measure and pay for the flexibility it delivers.
Bidirectional charger	A charger that can both charge an electric car and draw power from its battery, for the home or the grid. Only some car models support it.
Bundesnetzagentur	Germany's federal network agency, which regulates electricity, gas, telecoms and rail networks.
Capacity mechanism	A scheme that pays power plants, batteries and flexible consumers to be available when supply is tight. Belgium's capacity remuneration mechanism (CRM) is run by Elia through auctions; selected capacity must pay back revenue when market prices exceed a strike price.
Capacity tariff	The Flemish network tariff for households since 2023: part of the grid charge depends on the household's monthly peak, its highest quarter-hourly average power in the month, with a minimum of 2.5 kW.
Car tariff	A supplier tariff for households with an electric car, typically with a cheap rate during a few night hours that applies to all the household's consumption in those hours. In many car tariffs the supplier also decides when the car charges.
Congestion	A part of the grid where cables or transformers cannot carry all the power that users want to take or feed in at certain moments.
Critical-peak price	A time-of-use price with a much higher rate in a limited number of announced peak periods, such as France's 'red days'.
CRU	The Commission for Regulation of Utilities, Ireland's energy regulator.

Curtailment	Reducing the output of solar panels or other generators below what they could produce, for example when prices are negative or the grid is full.
Demand response	Consumers changing when or how much electricity they use in response to a price or a request.
Dynamic contract	A supplier contract whose energy price follows the wholesale market for each hour or quarter-hour, usually the day-ahead price plus a fee or margin. Under EU law, larger suppliers must offer one to households with a smart meter.
E-Control	Austria's energy regulator.
Elxon	The body that runs the settlement of Britain's electricity market, matching what each supplier's customers used with what it bought.
Elhub	Norway's central data hub, which collects meter readings from all grid operators and shares them with suppliers.
ENA	The Energy Networks Association, the trade body of Britain's electricity and gas network companies.
Enedis	The grid operator that runs about 95% of France's electricity distribution network.
Energy sharing	Households and firms assigning their exported solar power to another consumer, such as a neighbour or the members of an energy community. The sharing happens in the billing, not through a separate cable.
Exclusive-night circuit	A separately metered circuit for storage heaters and electric water heaters that is powered mainly at night at a lower network tariff. It exists in all three Belgian regions; its tariff advantage is being phased out, and in Flanders the tariff ends on 1 January 2028.
Feed-in	Electricity a household exports to the grid, usually from solar panels; in Belgium it is called injection. The feed-in tariff or compensation is what the household is paid for it.
FERC	The Federal Energy Regulatory Commission, which regulates wholesale electricity markets and transmission in the United States.
Flexibility market	A market in which a grid operator buys reductions or increases in use at a given place and time, as an alternative or a bridge to reinforcing the grid.
Flexibility service provider	A company registered to offer flexibility from customers' installations to the system operator or the grid operators.
Flexible connection	A grid connection on which the grid operator can limit the power at certain times, often in exchange for a faster connection or a lower charge.
Hedge	A contract that protects a supplier or customer against high prices, for example by fixing a price in advance.
Home energy management system	Software, often in a box at home, that steers devices such as a heat pump, charger, battery and solar inverter, for example to follow prices or to limit the household's peak.

Imbalance	The difference between what a supplier or other market party planned to take from or feed into the grid and what it actually did. The system operator settles it at the imbalance price.
Interoperability	The ability of devices and software from different makers to work together through common standards or protocols.
Intraday market	The market in which electricity is traded on the day itself, up to shortly before delivery, after the day-ahead market has closed.
Inverter	The device that converts the direct current from solar panels or a battery into alternating current for the home and the grid. It can also limit how much power is exported.
Kraken	Octopus Energy's software platform for billing, customer service and steering devices, also licensed to other suppliers.
Negative price	A wholesale price below zero: producers pay to sell their power, usually because more is produced than the system can use at that moment, for example on sunny middays.
NESO	The National Energy System Operator, which balances Great Britain's power system.
Net metering	Netting a household's solar exports against its consumption, as if the meter ran backwards. In Belgium, Brussels ended it in 2020-21, Flanders for new installations from 2021 and Wallonia for systems commissioned from 2024; the Netherlands ends it on 1 January 2027.
NGED	National Grid Electricity Distribution, the distribution grid operator for the Midlands, South West England and South Wales.
NVE-RME	The Norwegian Energy Regulatory Authority, part of the Norwegian Water Resources and Energy Directorate.
Ofgem	Great Britain's energy regulator, which sets the rules for suppliers and grid operators and runs the default price cap.
Peak event	A short period, announced in advance, when electricity is scarce or the grid is close to its limit, in which households are paid, or face a higher price, to use less.
Price cap	A maximum price. In Britain, the regulator's price cap limits the unit rate and standing charge of default tariffs, which most households pay.
Ripple control	Signals sent over the power lines themselves to switch devices such as water heaters on or off.
RTE	France's transmission system operator.
RVO	The Netherlands Enterprise Agency, the government agency that runs subsidy and innovation programmes.
Self-consumption	Using the electricity from one's own solar panels at home instead of exporting it to the grid.

Settlement	After the fact, the grid operators or a central settlement body determine how much electricity each supplier's customers used in each period, so that each supplier pays the wholesale and balancing costs of that period. If settlement uses standard profiles instead of measured values, a supplier gains nothing when its customers shift their use.
Smart charging	Charging an electric car at moments chosen by software, for example when prices are low, instead of as soon as it is plugged in.
Smart meter	A meter that records consumption in short intervals, a quarter-hour or half an hour, and can send the readings remotely. In Flanders the smart meter is called the digital meter.
Smart time-of-use tariff	The British regulator's term for tariffs that need a smart meter and whose price depends on when electricity is used: fixed time-of-use tariffs, car and heat-pump tariffs, and dynamic tariffs.
SMR3	The Flemish metering regime in which the grid operator passes a household's quarter-hourly readings to its supplier. It is needed for a dynamic contract; the supplier requests it when the household signs one.
Standing charge	A fixed daily or monthly charge on an electricity bill, paid regardless of consumption, as in Britain and Ireland.
Synergrid	The federation of Belgium's electricity and gas grid operators, which publishes the common technical and market rules.
Tariff	Strictly speaking, a tariff is a regulated price, such as the network tariff that pays for the grid. In line with common usage, this report also calls some supplier contracts tariffs (a dynamic tariff, a time-of-use tariff, a car tariff); those are commercial prices set by the supplier.
Time-of-use	A price that differs by time of day according to a schedule fixed in advance, for example cheaper at night or around midday. Unlike a dynamic price, the hours and prices do not change with the market from day to day.
Transfer of energy	The Belgian rules that let an independent aggregator sell a customer's flexibility without the supplier's consent, with a correction so that the supplier is paid for the energy it bought but the customer did not use.
Type of use	A contract aimed at one type of device, or at households that own it, such as a car or heat-pump tariff. It can price only that device's consumption or the household's whole consumption, and it can be combined with time-of-use prices. The term is not yet widely used; this report mostly speaks of car or heat-pump tariffs.
UKPN	UK Power Networks, the distribution grid operator for London, the South East and the East of England.
Vehicle-to-grid (V2G)	An electric car that can also send power from its battery back to the grid, through a bidirectional charger. When the power only goes to the car owner's own home, it is called vehicle-to-home.
Virtual power plant	Many small devices, such as home batteries, steered together so that they act like one power plant in electricity markets.

Wholesale price

The electricity price on the power exchange. The day-ahead market sets a price for each hour or quarter-hour of the next day; 'spot price' usually means this day-ahead price. Dynamic contracts follow it.

Numbers, sources and further reading by example

This appendix collects, for every example in Chapters 1 to 8, how its figures were obtained or calculated (Numbers), the sources used and a few suggestions for further reading. Numbers in square brackets refer to the references in Appendix D. Every example ends with a line that points to its entry here, and every entry links back to the example. The appendix also lists, for the “Where Belgium stands” blocks and the boxes, which source supports which statement.

Chapter 1 · Network tariffs

Measured effects of new network tariffs are small, and politics steps in when bills jump

Where Belgium stands Statements and sources

Flanders has charged households with a digital meter for their monthly peak quarter-hour since 1 January 2023, minimum 2.5 kW, with no time-of-day element. [11]

The capacity charge ranges from €49.05 to €57.10 per kW per year excluding VAT across the eight Fluvius tariff areas (2026). [33]

After one year, Fluvius said the grid was used 8.3% more efficiently than in 2022; estimated savings €20-40 a year for heat-pump homes, €60 for electric-car owners, €5-10 for other homes. [28]

Ghent University study (meter data, 2022-2024): average monthly peak about 3% lower; about 5% (320 W) for households with an electric car; not significant for homes without technology. [4]

The Flemish regulator's evaluation, based on the Ghent University study, found that users with high peaks cut them by about 5% on average, most visibly owners of electric cars. [34]

Fluvius modelled a time-dependent per-kWh network charge for low-voltage users, estimating a 10-20% reduction of the expected system peak (scenario analysis). [20]

The Flemish regulator declined time-of-use network tariffs in October 2025: 'the uncertain benefits ... do not outweigh the possible risks, added complexity for network users and implementation costs'; it asked Fluvius to study a time-dependent refinement of the capacity tariff. [35]

Since 1 January 2026 Walloon households with an active communicating meter can ask their supplier for an optional network tariff with five time blocks. [29]

In July 2022 the Flemish energy minister took the regulator to the Brussels Court of Appeal over the capacity tariff and asked for a two-year delay; the regulator kept the 1 January 2023 start. [36] [37]

In August 2026 the Flemish energy minister said the government is not competent for network tariffs, which are the regulator's responsibility. [38]

About 40% of Flemish households know the capacity tariff (2024). [39]

The capacity tariff was postponed twice by six months because market IT systems were not ready [40]

The then Flemish energy minister went to court against the regulator's decision [36]

The Flemish government lost the case; the capacity tariff remained in force [41]

Ghent University study of 42,077 households: about 3% lower peaks on average, about 5% (320 W) with an electric car; smaller effect in households without low-carbon technologies [4]

Fluvius modelled time-of-use network blocks (10-20% lower system peak) but left time signals on energy to suppliers for now [20]

The Flemish regulator decided not to introduce time-of-use network charges [35]

Brussels network tariff structure 2025-2029 and the planned advanced tariff [30] [31]

In the Flemish regulator's price report, network-use charges (including the capacity charge) came to €223.73 of a typical household electricity bill of €1,248.17 for a new contract in December 2025, about 18%, assuming an average monthly peak of 4.26 kW. [42]

Ghent University policy brief (more than 50,000 Flemish households, meter data 2022-2024): the capacity tariff lowered average monthly peaks by 51 to 122 watts (1 to 3%) and by 319 watts for households with an electric car; the effect is not statistically significant for homes without technology. [43]



Norway

N01

[↑ The example, p. 12](#)

Norway charges every household for its monthly peak; an official evaluation found that peaks barely moved.

NUMBERS

Per household per year	Peak-based part about €130-205 per year in the 2-5 kW step (NOK 1,530-2,400 at NOK 11.7 = €1)
Share of the bill	Network costs about 50% of the average household price in 2025 (Eurostat; the energy part was unusually low that year)
Price difference	Night discount on the per-kWh part about 20% at a typical grid company (example: 37 vs 29 Norwegian øre per kWh, ≈ €0.007 per kWh)

Period covered: 2022-2025

SOURCES

[\[2\]](#) Norwegian energy regulator, external evaluation of capacity-based grid tariffs (Oslo Economics et al.), report 8/2025: conclusion p. 6; method (survey 1,058, six grid companies) p. 10; steps p. 16-17; NOK 1,530-2,400 p. 17; recommendations p. 7; day/night p. 15

[\[10\]](#) Norwegian government: adjusted introduction of the new grid tariff model (start 1 July 2022 after December 2021 postponement; two-year transition for the energy share)

[\[22\]](#) Norwegian EV Association: parliament postpones new grid tariff (17 Dec 2021)

[\[1\]](#) Eurostat, household electricity price components 2025 (network share Norway 49.7%)

FURTHER READING

Evaluation of capacity-based grid tariffs (Norwegian) [\[2\]](#)



Slovenia

SI1

[↑ The example, p. 13](#)

Slovenia put every household on a five-block peak network tariff at once; after one winter of bill shocks, parliament overrode the regulator.

NUMBERS

Share of the bill	Network costs about 21% of the average household price in 2025 (Eurostat; prices capped by the government; the yearly average hides the winter concentration)
Price difference	Price per kW in the most expensive block 3.75 times that of the next block (first winter, 2024-25)

Period covered: 2024-2027

SOURCES

[\[7\]](#) RTV SLO: emergency law lowering the most expensive block for January-February 2025; €19.45 million borne by ELES; regulator and legal-service warnings on unconstitutionality; ministry: increases above 200% for solar and heat-pump households

[\[8\]](#) Slovenia Times: parliament intervenes in network charges (regulator: law encroaches on its independence and runs against EU law; legal service: may run afoul of the Constitution; >200% for solar-only and solar-plus-heat-pump households) (Feb 2025)

[\[18\]](#) Grid operators' information site on the new network charge and time blocks

[\[44\]](#) Regulator AGEN-RS, Report on the energy situation in Slovenia 2024 (smart meters 96.7%; 877,806 household customers) (Jul 2026)

[\[21\]](#) Sredenšek et al., 'Transformation of the Network Tariff Model in Slovenia: Impact on Prosumers and Other Network Users', Energies 19(2) (mechanism: shift from kWh to kW, end of annual netting) (Jan 2026)

[\[1\]](#) Eurostat, household price components 2025 (network share Slovenia 21.3%)

FURTHER READING

Slovenia Times: parliament intervenes in electricity network charges [\[8\]](#)



Sweden

SE3

[↑ The example, p. 14](#)

Sweden ordered all grid companies to charge households for their peaks, then scrapped the order; Ellevio, one of Sweden's three largest grid companies and the first of them to introduce the charge, had measured 2-3% lower peaks.

NUMBERS

Share of the bill Peak-based part up to 40% of Ellevio's grid fee; network costs about 40% of the average Swedish household price in 2025 (Eurostat)

Period covered: 2022-2026

SOURCES

[\[9\]](#) Government Offices of Sweden: requirement to introduce capacity charges stopped; reasons; regulator to repeal by 30 June 2026 and propose a new model by 12 April 2027; voluntary use allowed meanwhile

[\[3\]](#) Ellevio: almost one year of capacity tariffs (2-3% lower peaks; ~10,000 extra houses; >10% changed habits; 14% lower fees; up to 40% of the grid fee) (11 Nov 2025)

[\[24\]](#) Ellevio: return to fuse-based grid fee from 1 June 2026, 'no increased revenues for Ellevio'

[\[23\]](#) Ellevio: how the price model relates to the revenue cap set by the regulator (2024-2027) (11 May 2026)

[\[45\]](#) Nordic Energy Research (2025): about 170 Swedish grid companies

FURTHER READING

Government press release (Swedish) [\[9\]](#)



Denmark

DK1

[↑ The example, p. 15](#)

Most Danish grid companies charge nine times as much per kWh in the 5-9 pm winter peak as at night, for every customer; the effect has not been measured.

NUMBERS

Per household per year Not given per year. Regulator's example: up to about €104 per month in winter and €38 in summer for an EV owner shifting 400 kWh a month, at the most expensive grid company (DKK 775 and 280 incl. VAT; DKK 7.46 = €1)

Share of the bill Network tariff about 23% of the average household price in 2025; taxes about 49% (Eurostat)

Price difference Winter: peak 9 x night; regulator's example implies up to about DKK 1.94 (≈ €0.26) per kWh shifted, incl. VAT, at the most expensive grid company. Summer peak levels ranged DKK 0.18-0.76/kWh between grid companies (April 2024).

Period covered: 2023-2026

SOURCES

[\[12\]](#) Danish Utility Regulator, network tariffs for households (25 + 2 of 36 grid companies time-varying on 1/1/2024; periods; ratios; DKK 0.18-0.76 peak summer 2024; savings up to DKK 280/775 per month for 400 kWh shifted; no behavioural evaluation)

[\[1\]](#) Eurostat, household price components 2025 (network share Denmark 23.1%)

[\[26\]](#) Brylle, Andersen & Madsen, 'Scaling Demand-Side Flexibility Through Dynamic Tariffs' (case study: 76% of transformer exceedances in the 0-6 h low-load period) (11 Jun 2026)

FURTHER READING

Danish Utility Regulator: household network tariffs (Danish) [\[12\]](#)



Austria cut the per-kWh network charge by 20% around midday in summer, automatically for homes with quarter-hourly data, and plans a monthly peak charge from 2027.

NUMBERS

Share of the bill	Network costs about 31% of the average Austrian household price in 2025 (Eurostat)
Price difference	20% off the per-kWh network charge, 10:00-16:00, April-September
Per kW per year	Draft 2027: charge per kW of the monthly highest quarter-hour, minimum 2 kW, higher price above 10 kW; target 50% of network costs via kW within three years (amounts not yet set)

Period covered: 2026-2027

SOURCES

[\[15\]](#) City of Vienna press service: Wiener Netze summer network charge, 20% between 10:00 and 16:00, 1 April-30 September, automatic for customers with quarter-hourly metering (opt-in via portal); 1.6 million smart meters

[\[14\]](#) E-Control press information: network charges 2026, 20% lower per-kWh price 10:00-16:00 in summer for low-voltage customers; new structure expected with the 2027 amendment under the new electricity law (18 Dec 2025)

[\[27\]](#) E-Control, draft network tariff principles regulation (SNE-G-V) with explanations: monthly peak charge from 1/1/2027, summer and winter discount windows

[\[46\]](#) WKO Lower Austria: new tariff elements 2026 (summer low per-kWh price applies automatically where quarter-hourly data are read)

[\[47\]](#) E-Control smart meter monitoring report 2025 (96.9% smart meters, 12.6% with quarter-hourly measurement, end of 2024)

[\[1\]](#) Eurostat, household price components 2025, Austria: energy 0.1600, network 0.0959, taxes 0.0530 €/kWh

FURTHER READING

Vienna press release on the summer network charge (German) [\[15\]](#)



The Netherlands plans to put every household on a time-of-use network tariff from 2029; the expected 11% lower peak is a forecast, not a measurement.

NUMBERS

Share of the bill	Network costs about 46% of the average Dutch household price in 2025 (Eurostat; inflated because a large energy-tax credit makes net taxes slightly negative)
Price difference	Up to four price levels per day

Period covered: 2025-2029

SOURCES

[\[32\]](#) ACM: publication of Netbeheer Nederland's code change proposal for volume- and time-dependent transport tariffs for small consumers (two-thirds usage- and time-dependent; draft decision expected summer 2026; implementation expected 2029)

[\[13\]](#) Netbeheer Nederland, code change proposal (PDF): 67/33 split, five blocks, max. four price levels, mandatory for $\leq 3 \times 80$ A, start 1/1/2029 or 1/1/2030, billing via suppliers, no quantified effect

[\[19\]](#) Gaslicht.com: 11% less pressure on the grid at peak moments; 700,000 extra homes and 500,000 charge points by 2030; based on the national grid-congestion programme (18 Nov 2025)

[\[48\]](#) Eerlijkverbruik.nl: summary of the proposal (time blocks; Berenschot warning on rebound peaks) (May 2026)

[\[25\]](#) Bailey, Brown, Myers, Shaffer & Wolak, AER: Insights 7(4) 2025: time-of-use pricing 'unintentionally induces new and larger shadow peaks of simultaneous charging'

[\[1\]](#) Eurostat, household price components 2025, Netherlands: energy 0.1468, network 0.1135, taxes -0.0136 €/kWh

FURTHER READING

The proposal at the Dutch regulator (Dutch) [\[32\]](#)

Every Spanish household chooses how many kW to reserve in its network tariff; most reserve too much, and almost nobody uses the separate, almost free level for nights.

NUMBERS

Per household per year	About €31 per year for 1.11 kW over-reserved in the daytime period (2026 network and regulated charges, before taxes)
Share of the bill	Network costs about 27% of the average Spanish household price in 2025 (Eurostat)
Price difference	Network and regulated charges per kWh (2026): 9.76 c€ weekday peak vs 2.93 c€ shoulder vs 0.33 c€ night/weekend
Per kW per year	Reserved power (2026): €27.70 per kW per year weekday daytime vs €0.73 per kW per year nights and weekends
Belgian equivalent	For comparison: the Flemish capacity charge is about €49-57 per kW per year before VAT depending on the tariff area (2026), on the measured average monthly peak, minimum 2.5 kW.

Period covered: 2021-2026

SOURCES

[\[16\]](#) CNMC household panel blog: contracted power (63%/1.11 kW over in peak, 67%/1.6 kW off-peak, 2.5% different powers, 44% ignore hourly differences; power periods) (28 Jun 2024)

[\[49\]](#) CNMC consumer guide: how to change contract conditions (once every 12 months via the supplier; fees for lowering and raising power)

[\[17\]](#) Eleia Energía: 2026 network and regulated charges (energy periods 9.7553/2.9267/0.3292 c€/kWh; power €27.70 and €0.73 per kW per year; meter cuts supply when exceeded)

[\[1\]](#) Eurostat, household price components 2025 (network share Spain 27.0%)

[\[33\]](#) Flemish Utility Regulator, distribution network tariffs for electricity 2026 (capacity charge €49.05-57.10 per kW per year excl. VAT across the eight tariff areas)

FURTHER READING

Spanish regulator's household panel on contracted power (Spanish) [\[16\]](#)



Austria built thousands of energy communities on network discounts; the regulator's cost-benefit review found no grid relief, little lost network revenue and clear extra costs.

NUMBERS

Per household per year	About €57 for a Vienna household sharing 1,200 kWh (illustrative calculation, 2026)
Share of the bill	Lost network revenue about €110,000 a year, about 0.004% of total network revenue of about €2.5 billion (2023)
Price difference	Discount on the per-kWh network charge for shared kWh: 57% local, 28% regional

Period covered: 2021-2026

SOURCES

[\[50\]](#) E-Control, cost-benefit analysis of energy communities under the renewables law (€110,000 lost network revenue; about €2.5 bn total; grid operators' €200 claim judged too high; no grid relief; 396 communities / 3,760 metering points at 30/6/2023)

[\[51\]](#) Energiemagazin.at: over 3,800 renewable energy communities plus over 3,500 joint generation installations (mid-2025); up to 57% network discount; levy exemptions

[\[52\]](#) Stromliste.at: rules from 1 October 2026; 57% local / 28% regional discount on the per-kWh network charge for shared kWh only; ~EUR 57/year example for 1,200 kWh in Vienna

[\[53\]](#) VITO/EnergyVille for the Flemish regulator, cost-benefit analysis of the contribution of energy communities and active customers in a building to relieving the Flemish distribution grid (18 September 2023; RAPP-2023-19): generally no change in investment needs; network-tariff adjustment not advisable

[\[54\]](#) Flemish regulator, RAPP-2025-21, Energy communities, energy sharing and energy selling (23 October 2025): 10,324 of 3.6 million connection points (0.28%) in December 2024; Annex 2: two households lose €154 a year by sharing 20%; only contracts without a sharing fee break even below the average 24% shareable

[\[55\]](#) Flemish regulator: energy sharing and selling (forms; Fluvius calculates shared volumes per quarter-hour; only the energy component is affected, network charges and levies remain; most suppliers charge an administrative fee) (29 Jun 2026)

[\[56\]](#) Test-Aankoop: suppliers charge administrative fees for energy sharing (16 Sep 2024)

FURTHER READING

E-Control cost-benefit analysis of energy communities (German) [\[50\]](#)

Chapter 2 · Supplier contracts

What scales is a simple offer built around a device, not exposure to hourly prices

Where Belgium stands · prices and contracts Statements and sources

Share of Flemish households on a dynamic contract: 0.09% (start 2024), 0.29% (start 2025), 0.89% (December 2025), 1.36% (April 2026). [85, pp. 10–12]

End of 2025: variable 73.24%, fixed 25.87%, dynamic 0.89% of household electricity customers in Flanders. [85, p. 12]

At the end of 2025, 18 suppliers offered 34 dynamic contracts in Flanders. [85, p. 10]

148,125 homes (5.90% of digital meters in homes) had quarter-hourly readings switched on for their supplier in June 2026. [101]

The regulator publishes a monthly dashboard of fixed, variable and dynamic contracts (last updated 24 September 2026). [84]

About 11,000 dynamic contracts in Belgium at the end of 2024. [102, p. 91]

ENGIE's time-of-use contract has grown to nearly 25,000 customers in less than a year; its cheapest blocks are up to 45% cheaper than peak hours. [87]

Among the first 8,000 customers, 45% of consumption falls in the cheapest blocks; customers shifted about 15% of their consumption there after switching; about 8.5 GWh a year in total. [103]

A dynamic contract brought, on average, neither a clear gain nor a clear loss for 1,014 Flemish households (Aug 2024-Aug 2025). [86]

Trevion's flexibility reward (monthly, based on imbalance prices, requires an energy management box) is tied to a market-indexed contract of indefinite duration; its fixed-price contract carries no flexibility reward. [104]

Eneco pays 1.5 cents per smart-charged kWh on any contract, and up to €250 a year for letting it steer a home battery without a dynamic contract. [90][105]

Flemish decree adopted 1 July 2026: duty to offer a dynamic contract extended to suppliers with more than 50,000 delivery points from 1 January 2027 and to all suppliers from 1 January 2029 (it already applied above 200,000 since 2021); new duty to offer a fixed-price contract for suppliers above 200,000. [100]

The first dynamic offers appeared in the Brussels-Capital Region in March 2025; at the end of 2025, three suppliers offered five dynamic offers on the residential market. [96, p. 18]

At the end of 2025, 161,055 smart meters were installed in Brussels, 3% of them in the quarter-hourly regime that passes data to the market: fewer than 5,000 households, of whom just over 1% had signed a dynamic contract. [96, p. 18]

In October 2025 Engie launched a time-of-use offer in Brussels for holders of a smart meter in the quarter-hourly regime, with 'super off-peak' hours. [96, p. 18]

Residential electricity market shares in Brussels, December 2025: Electrabel (Engie) 73%, TotalEnergies 13%, Luminus 6%, Mega 4%, Bolt 2%, the grid operator as supplier of last resort 2%; five active suppliers on the residential market, against about twice as many in Wallonia and four times as many in Flanders. [96, pp. 4, 20]

Since June 2025 the Walloon regulator's price comparison tool includes dynamic-price offers; choosing one requires a communicating meter with its communication function switched on, and the regulator warns that such a contract exposes the consumer to more risk than a monthly-indexed one. [106]

The V-test lets users filter contracts by tariff type: fixed, variable or dynamic (no time-of-use category, October 2026); with a year of uploaded quarter-hourly values it can also calculate prices for dynamic products and for products with a different price per time block. [99]

Where Belgium stands · device-based offers Statements and sources

ENGIE's contract with fixed cheap hours (super off-peak 1-7 am every day, plus 11 am-5 pm at weekends) grew to almost 25,000 customers in less than a year and promises up to 45% savings in the cheapest hours compared with its peak price (energy component only). [87]

An analysis by ENGIE's research centre of the first 8,000 customers on that contract found 45% of their electricity use in the super off-peak hours, about 15% more than before they switched, or 8.5 GWh a year for the customer group. [103]

By device, ENGIE reports the share of use in super off-peak hours as 42% for customers with an electric car, 45% with solar panels and a battery, and 32% with a heat pump. [107]

Luminus's contract with fixed cheap hours has off-peak hours from 10 pm to 7 am and 11 am to 5 pm, with super off-peak prices up to 50% cheaper on summer weekdays and free energy on Sunday afternoons in the first contract year; network costs and taxes still apply. [88]

Dynamic contracts covered 0.89% of Flemish household electricity customers in December 2025. [85, p. 12]

Eneco pays €0.015 per kWh charged in smart mode, 'up to one euro' per full battery, to customers with an Eneco fixed or variable contract who let its app schedule charging through the car maker's connection (14 brands). [90]

ENGIE pays 1.5 euro cents per kWh charged while its app steers the car, for customers on its Empower, Flow or Easy contracts. [91] [92]

In Eneco's fixed contract for October 2026, the energy price is 22.10 euro cents per kWh including VAT; with the Flemish green-power and combined-heat-and-power cost (1.51), excise (4.876) and a Fluvius distribution charge (5.64, Halle-Vilvoorde example) the price per kWh is about 34.1 cents, before the capacity charge and fixed fees. The energy part is about 65% of that. [93]

ENGIE's free-energy hours, announced a day ahead when sun and wind are plentiful, covered 163 hours over 45 days in 2025; a consumer organisation valued them at €6.50-8 a year for a household that changes nothing, and €123-142 more for one that charges a car five hours a week in those hours. [108]

A small supplier offers a monthly reward to customers who install a €500 steering box (VAT and installation included) so its technology partner can use their battery or charger; no customer numbers are published. [109]

Luminus's smart-charging app schedules charging automatically and works with all Luminus tariffs, including its fixed-hours and dynamic contracts. [110]

ENGIE markets its Empower contracts (fixed, variable, and variable with fixed cheap hours) to owners of an electric car, a smart home battery or a smart heat pump, with automatic shifting through its app. [111]

In 2025 the average Belgian household price per kWh (Eurostat's medium consumption band) was made up of energy and supply €0.1541, network €0.1196 and taxes and levies €0.0799, so energy about 44% and network charges 33.8% of the price. [1]

Luminus's Smart Charging app schedules charging at the moments when the energy cost is lowest and works with all Luminus electricity contracts; its SmartFlex time-of-use contract is up to 50% cheaper in super off-peak hours. The app does not optimise for the capacity tariff. [98]

Who benefits from flexibility? Statements and sources

Households that switched to a heat-pump tariff with fixed cheap and expensive hours saved £318 a year on average (18% of energy costs), £240 of it from shifting; 6,631 households, December 2021 – June 2024. [82]

A heat-pump household persona could save £504 a year on its best smart tariff in March 2025, but £180 after dedicated heat-pump tariffs were withdrawn. [112, p. 21]

In an Ofgem survey of 4,385 people, 1,085 with linked half-hourly meter data, the quarter of households with most flexibility potential could shift about 243 kWh a year, the second quarter about 67 kWh; the group with least potential was more likely to rent and have lower incomes. [113, pp. 9–10]

Half of UK households have less than a tenth of the flexibility potential of the most flexible quarter; shifting a quarter of laundry use to off-peak times would save an average household about £10.40 a year. [114]

In a British trial with 37,000 participants, households with vulnerabilities took part in flexibility events at similar rates to others, while electric-car owners shifted more than three times as much energy as the average participant. [112, p. 32]

Some participants reported cutting electricity use below what they felt was necessary, switching off essential appliances or changing care routines to take part; the number was relatively small and concentrated among households already rationing energy. [112, p. 33]

In areas where a British network operator sought local flexibility, successful procurement was associated with a higher share of higher-income households. [112, p. 33]

A home with solar panels and an electric car had access to 25 types of smart offer and could save up to £523 a year; a renter with a gas boiler and a prepayment meter had one offer, worth as little as £38 — both modelled on the best available tariffs in March 2025. [115, p. 21]

Octopus: what one supplier does at scale Statements and sources

Octopus served over 7.7 million UK households and almost 10 million worldwide in September 2025; its boilerplate of August 2026 gives 11 million households in 27 countries. [\[72\]](#) [\[116\]](#)

Over 500,000 drivers are on its smart car-charging tariff (August 2026); it holds 59% of British households on car tariffs, which number nearly one million. [\[69\]](#)

The car tariff's night and smart-charging rate is 7.6p per kWh in October 2026, against a capped standard unit rate of 26.32p. [\[71\]](#) [\[89\]](#)

Kraken was 'managing over 2GW of power from EVs, home batteries and heat pumps' and had over 70 million contracted household and business accounts worldwide, with licensees including EDF, E.ON Next, Origin Energy, Plenitude and Tokyo Gas. [\[72\]](#)

In December 2025 Octopus sold a minority stake in Kraken at a valuation of \$8.65 billion, described as a first step towards a full spin-off. [\[117\]](#)

Octopus's own heat pump is 'designed and manufactured in the UK'. [\[78\]](#)

Octopus's research arm measured its heat-pump tariff among 6,631 customers: average evening use halved and daily use was unchanged. [\[82\]](#)



Netherlands

NL7

[↑ The example, p. 25](#)

One in twelve Dutch households now has a dynamic electricity contract, against about one in seventy-five in Flanders, and Dutch growth is still accelerating.

NUMBERS

Belgian equivalent At the Dutch share (8%), Flanders would have roughly 240,000 households on a dynamic contract instead of about 40,000 (1.36% in April 2026, on about 2.99 million private households, Statistics Flanders 1 January 2026).

Period covered: 2022-2026

SOURCES

[\[83\]](#) ACM, Energiemonitor: toename aantal dynamische contracten zet door (8% of households, July 2026)

[\[94\]](#) Solar & Storage Magazine, reporting the ACM Energiemonitor (573,000 consumers with a dynamic contract on 1/1/2026)

[\[118\]](#) ANWB Energie news release citing ACM (133,000 at the end of 2022) (8 Apr 2026)

[\[75\]](#) Essent, Slim Sturen (home battery steering with a fixed or variable Essent contract; monthly fees)

[\[97\]](#) Essent, Slim Sturen vanaf 2027 (end of net metering 1/1/2027; reward profiles)

[\[85\]](#) Flemish regulator (VNR), Marktrapport 2025 (RAPP-2026-12): dynamic 0.89% Dec 2025, 1.36% April 2026; 18 suppliers, 34 dynamic products

[\[86\]](#) EnergieID for VEKA, Profielanalyse dynamisch prijscontract (1,014 Flemish households) (16 Oct 2025)

[\[64\]](#) Installatiemonitor survey 3 report (19% of dynamic-contract heat pump owners use smart control) (19 Jan 2026)

[\[70\]](#) energienet.nl, market commentary on growth drivers (citing ACM) (8 Apr 2026)

[\[95\]](#) Solar & Storage Magazine, reporting the ACM Energiemonitor (651,000 consumers with a dynamic electricity contract on 1/6/2026; market shares)

FURTHER READING

ACM Energiemonitor (Dutch) [\[83\]](#)

VNR dashboard: share of customers on fixed, variable and dynamic contracts (Dutch) [\[84\]](#)

Spain put a quarter of its households on an hourly price by default; they barely respond, and the government has since smoothed the price.

NUMBERS

Belgian equivalent At Spain's default share (27.4%), Flanders would have about 820,000 households on an hourly price, against about 40,000 today (1.36%, April 2026, on about 2.99 million private households).

Period covered: 2015-2026

SOURCES

[\[60\]](#) MITECO, regulated default tariff (eligibility ≤ 10 kW, reference suppliers, price formula incl. long-term price signals since 1/1/2024)

[\[61\]](#) Merca2, CNMC household panel end of 2025 (8.2 million, 27.4%; free market 37.4% fixed, 17.3% time bands, 21.4% unaware; 2025 bill +13% vs +3%) (15 Aug 2026)

[\[119\]](#) Energías Renovables, CNMC household panel Q2 2025 (52.2% do not know the difference; 48.6% ignore hourly differences)

[\[58\]](#) Fabra et al., AEA Papers and Proceedings (no difference in response between hourly-priced and other households) (May 2021)

FURTHER READING

Spanish ministry: the regulated default tariff explained (Spanish/English) [\[60\]](#)

Almost every Norwegian household pays the hourly spot price, yet since late 2025 most southern homes have chosen a flat state price on top of it.

NUMBERS

Price difference Flat state price 0.40 NOK/kWh excl. VAT ($\approx$ €0.034 at 11.7 NOK per euro)

Belgian equivalent Norway: 97.6% of household consumption on spot contracts; Flanders: 1.36% of households on a dynamic contract (April 2026).

Period covered: 2021-2026

SOURCES

[\[65\]](#) Hofmann (Statnett), Energy Regulation Quarterly: ~97% on real-time pricing (SSB, Feb 2026); support scheme design; state price uptake two-thirds of southern households (April 2026); unpublished consumption effect

[\[120\]](#) Statistics Norway (SSB), electricity prices: 97.6% of household consumption on spot (Q2 2026)

[\[66\]](#) Elhub, how much consumption is on the state fixed price (~1.4 million meters; 60% of southern household meters) (20 Jan 2026)

[\[121\]](#) Nordic Energy Research, Evaluation of Nordic retail markets, ch. 8 Norway (about 120 suppliers, no regulated tariff) (2024)

[\[2\]](#) Norwegian Energy Regulatory Authority, evaluation of the household grid tariff (capacity steps; most grid companies cheaper at night) (2025)

[\[122\]](#) Clean Energy Wire on a study by Norwegian School of Economics researchers in Energy Policy: NordLink raised average prices and increased price volatility in southern Norway (15 May 2026)

FURTHER READING

Recent developments on real-time pricing in Norway (Energy Regulation Quarterly) [\[65\]](#)



Ireland IE1

[↑ The example, p. 28](#)

Ireland's regulator made the five biggest suppliers offer a dynamic contract whose wholesale-linked part can never exceed 50 cents per kWh.

NUMBERS

Price difference Cap of €0.50/kWh on the wholesale-linked rate; base rates of Irish suppliers roughly €0.17-0.25/kWh on top (September 2026)

Period covered: 2024-2026

SOURCES

[\[67\]](#) CRU, Dynamic Electricity Price Tariffs — Decision Paper (structure, €500/MWh cap, rationale, 2021-2023 exceedance analysis, supplier concerns) (26 Sep 2024)

[\[123\]](#) CRU, notification to suppliers extending the deadline to 1 June 2026

[\[68\]](#) CRU, Introducing the new Dynamic Price Tariff for electricity (five suppliers; cap; 2.1 million smart meters)

[\[124\]](#) Directive (EU) 2024/1711 amending Article 11 of Directive 2019/944

[\[125\]](#) solarinfo.ie, Irish dynamic tariffs compared (base rates; no uptake figures) (12 Sep 2026)

FURTHER READING

CRU consumer page on dynamic price tariffs [\[510\]](#)



United States US1

[↑ The example, p. 29](#)

California moved millions of households onto time-of-use prices by default; almost nobody left, a quarter did not notice, and peak use barely fell.

NUMBERS

Price difference Sacramento: 28 vs 12 cents/kWh (peak vs overnight; $\approx$ €0.24 vs €0.10 at €1 = \$1.15), ratio about 2.3

Belgian equivalent Per 1,000 households: about 7-14 kW less at peak at the first large utility, against about 230 kW in Sacramento (134 MW / 575,000 households).

Period covered: 2018-2022

SOURCES

[\[63\]](#) SDG&E update to the CPUC on the default TOU transition (74% aware; ~99% remained; 602,000 customers) (25 Sep 2019)

[\[126\]](#) CPUC Resolution E-4910 (baseline: 46% did not know their rate plan)

[\[6\]](#) Energy Institute at Haas: SMUD time-of-use results (prices, 134 MW, thermostat) (4 Nov 2024)

[\[5\]](#) SDG&E Default TOU Evaluation PY2019 (load impacts) (4 May 2020)

FURTHER READING

Do time-of-use prices deliver energy savings at the right time? (Energy Institute at Haas) [\[6\]](#)



Canada CA1

[↑ The example, p. 30](#)

Ontario added an optional overnight price ten times cheaper than its weekday evening peak, aimed at households that charge an electric car.

NUMBERS

Price difference Overnight option: 3.9 vs 39.1 cents/kWh ($\times 10$); standard time-of-use 9.8 vs 20.3 cents ($\times 2.1$); from 1 Nov 2025

Belgian equivalent For comparison: one Belgian time-of-use supply contract has its cheapest block up to 45% below its peak price (ratio about 1.8).

Period covered: 2023-2026 (background 2006-2014)

SOURCES

[\[127\]](#) OEB, electricity prices from 1 November 2025 (TOU, ULO, tiered)

[\[128\]](#) Ontario Environmental Registry, proposal and decision on the Ultra-Low Overnight price plan (voluntary; from May 2023)

[\[129\]](#) OEB, RPP Price Report Nov 2025-Oct 2026 (ULO consumption profile)

[\[130\]](#) OEB, RPP Price Report Nov 2024-Oct 2025 ('increased uptake'; earlier profile)

[\[131\]](#) Auditor General of Ontario, Annual Report 2014, section 3.11 (background)

FURTHER READING

Ontario Energy Board: current electricity prices [\[127\]](#)



Netherlands

NL3

[↑ The example, p. 31](#)

Only one in five Dutch heat pump owners with a dynamic contract lets the heat pump follow prices automatically.

SOURCES

[\[64\]](#) Installatiemonitor survey 3 report (definition of smart control; 19% vs 6%) (19 Jan 2026)

[\[132\]](#) Installatiemonitor home page (organisations; >6,000 participants)

[\[133\]](#) Installatie Totaal, survey summary (26.1%, 13.9%, 18% vs 6%) (21 Jan 2026)

[\[134\]](#) Duurzaam Ondernemen, survey summary (19% vs 6%) (2026)

FURTHER READING

Installatiemonitor (Dutch) [\[132\]](#)



United Kingdom

EU4

[↑ The example, p. 32](#)

British households that leave a flat price mostly choose cheap device tariffs with supplier steering, not hourly prices: electric-car tariffs grew 84% in a year, other smart tariffs 27%.

NUMBERS

Price difference Leading car tariff 7.6p vs capped standard rate 26.32p per kWh (–71%; ≈ 8.8 vs 30.6 c€ at €1 = £0.86), October 2026; market range for night car charging 6.5-8.49p (Dec. 2025)

Belgian equivalent 2.8% of households ≈ 145,000 Belgian households (2.8% × 5.16 million private households, Statbel 1/1/2024)

Period covered: 2024-2026

SOURCES

[\[59\]](#) Ofgem, State of the Market – Energy Retail Highlights, January 2026 (p. 3 and p. 21)

[\[57\]](#) LCP Delta, Beyond Tariffs: GB household flexibility market monitor, December 2025 (pp. 5-14)

[\[69\]](#) Octopus Energy, press release 'Half a million Brits ditch pump pain...' (500,000+ drivers; 59% of EV-tariff customers per Cornwall Insight; nearly 1 million households on EV tariffs, almost +60% in a year; 8p/kWh, 8.4p until 1 Oct; boilerplate 11 million households in 27 countries) (5 Aug 2026)

[\[71\]](#) Octopus Energy, Intelligent Octopus Go product page (7.6p/kWh, 23:30-05:30 plus up to 6 hours of smart charging a day; '70% compared to the average price cap unit rate')

[\[89\]](#) Ofgem, Energy price cap unit rates and standing charges (GB average, direct debit: 26.32p/kWh and 54.83p/day for 1 Oct – 31 Dec 2026; 26.11p/kWh for 1 Jul – 30 Sep 2026)

[\[135\]](#) European Central Bank, euro reference rates; this report converts at one rounded 2025-26 rate throughout (€1 = £0.86)

[\[72\]](#) Octopus Energy, press release on Kraken (over 70 million contracted accounts; 'managing over 2GW of power from EVs, home batteries and heat pumps'; over 7.7 million UK households; almost 10 million worldwide) (18 Sep 2025)

[\[136\]](#) Statbel, households: 5,163,139 private households on 1 January 2024

FURTHER READING

Ofgem, State of the Market – Energy Retail Highlights (January 2026) [\[59\]](#)

LCP Delta, Beyond Tariffs: GB household flexibility market monitor (December 2025) [\[57\]](#)



Over half a million British drivers let their supplier decide when the car charges, for a night rate about 70% below the standard price.

NUMBERS

Per household per year	About £850 ≈ €990 per year compared with a petrol car at 7,600 miles a year (supplier's estimate; not compared with a standard electricity tariff)
Price difference	7.6p vs 26.32p per kWh (–71%); ≈ 8.8 vs 30.6 c€ at €1 = £0.86 (October 2026)
Belgian equivalent	500,000 of ≈ 29.8 million British domestic customers ≈ 1.7% → ≈ 87,000 Belgian households (denominator derived from Ofgem: 835,000 = 2.8%)

Period covered: 2024-2026

SOURCES

- [69] Octopus Energy, press release 'Half a million Brits ditch pump pain...' (500,000+ drivers; 59% of EV-tariff customers per Cornwall Insight; nearly 1 million households on EV tariffs, almost +60% in a year; 8p/kWh, 8.4p until 1 Oct; boilerplate 11 million households in 27 countries) (5 Aug 2026)
- [71] Octopus Energy, Intelligent Octopus Go product page (7.6p/kWh, 23:30-05:30 plus up to 6 hours of smart charging a day; '70% compared to the average price cap unit rate')
- [89] Ofgem, Energy price cap unit rates and standing charges (GB average, direct debit: 26.32p/kWh and 54.83p/day for 1 Oct – 31 Dec 2026; 26.11p/kWh for 1 Jul – 30 Sep 2026)
- [135] European Central Bank, euro reference rates; this report converts at one rounded 2025-26 rate throughout (€1 = £0.86)
- [72] Octopus Energy, press release on Kraken (over 70 million contracted accounts; 'managing over 2GW of power from EVs, home batteries and heat pumps'; over 7.7 million UK households; almost 10 million worldwide) (18 Sep 2025)
- [59] Ofgem, State of the Market – Energy Retail Highlights, January 2026 (p. 3 and p. 21)
- [90] Eneco Belgium, SlimLaden page (€0.015 per smart-charged kWh, 'up to one euro' per full battery; Eneco contract, fixed or variable; car API of 14 brands)
- [91] ENGIE Belgium, blog on Smart Charge ('1,5 eurocent per kWh' for Empower, Flow or Easy contracts; car brands via the app)
- [137] ENGIE Belgium, Empower page (Smart Charge works with Empower Flextime 'just like with the other Empower, Easy and Flow contracts'; reward per smart-charged kWh)
- [110] Luminus (Lumiworld), 'Charge your electric car cheaply with the Luminus Smart Charging app' (works with all Luminus rates: SmartFlex, dynamic, classic two-rate)
- [136] Statbel, households: 5,163,139 private households on 1 January 2024
- [98] Luminus, Smart Charging app (schedules charging at the lowest energy cost; works with all Luminus contracts; SmartFlex up to 50% cheaper in super off-peak hours)

FURTHER READING

Octopus Energy, Intelligent Octopus Go product page [71]



United Kingdom

UK17

[↑ The example, p. 34](#)

A heat-pump tariff with fixed cheap and expensive hours halved average evening use in 6,600 British homes, without raising daily consumption.

NUMBERS

Per household per year	£318 ≈ €370 (at €1 = £0.86), of which £240 from shifting
Share of the bill	18% of household energy costs
Price difference	Cheap windows –51%, evening window +50% vs the tariff's day rate (October 2026); during the study about –40% / +60%
Belgian equivalent	Per 1,000 homes on such a tariff: about 0.45 MW less average demand between 4 and 7 pm (0.22 kWh per half-hour = 0.45 kW per home; year-round average)

Period covered: 2021-2024

SOURCES

[\[82\]](#) Bernard, Hackett, Metcalfe & Schein, 'Decarbonizing Heat: The Impact of Heat Pumps and a Time-of-Use Heat Pump Tariff on Energy Demand', NBER Working Paper 33036 (Table 2, p. 31; sections 2.2, 3.2.2; abstract) (Oct 2024)

[\[138\]](#) Centre for Net Zero, paper page 'Decarbonising heat...' ('halving consumption during the evening peak', '18%', 'load-shifting away from peak periods is possible even on the coldest days') (2 Oct 2024)

[\[139\]](#) NBER Digest, 'Household Heat Pump Adoption and Energy Use' (tariff during the study: about 40% cheaper in green windows, 60% more expensive at peak; £318 saved, £240 from shifting) (Feb 2025)

[\[79\]](#) Octopus Energy, Cosy Octopus product page (cheap windows 04-07, 13-16, 22-24 '51% cheaper than the Day rate'; 16-19 '50% above the Day rate'; eligibility)

[\[57\]](#) LCP Delta, Beyond Tariffs: GB household flexibility market monitor, December 2025 (pp. 5-14)

[\[135\]](#) European Central Bank, euro reference rates; this report converts at one rounded 2025-26 rate throughout (€1 = £0.86)

FURTHER READING

Centre for Net Zero, Decarbonising heat (paper page with summary) [\[138\]](#)



Finland

FI3

[↑ The example, p. 35](#)

A Finnish supplier gives heat-pump owners cheaper fixed hours, but only as long as it is allowed to steer the heat pump through the manufacturer's online service.

NUMBERS

Per household per year	Supplier's estimate: €135-157 per year
Price difference	1.5 c€/kWh: 6.78 vs 8.28 c€/kWh energy price (–18%), plus €4.76/month, November 2025

Period covered: 2025-2026

SOURCES

[\[73\]](#) Väre, press release launching the heat-pump smart-savings contract (nearly 800 customers in development; steering via Kapacity.io cloud) (3 Sep 2025)

[\[74\]](#) Väre/Helen, product page (now 'smart fixed-term savings electricity' under Helen; cheap 13-16 and 23-07; 12 or 24 months; ground, air-water, air-air and exhaust-air heat pumps; Elenia meter load-control option; savings estimates €135/yr and €157/yr)

[\[76\]](#) lampopumput.info forum thread quoting Väre's terms: 6.78 c/kWh (13-16, 23-07), 8.28 c/kWh (07-13, 16-23), €4.76/month; later post 5.3/6.8 c/kWh (13 Nov 2025)

[\[140\]](#) Väre, article on smart heating results (64 customers, 57 heat-pump control; 92% improved their 'consumption impact' on the spot-price contract; average 0.7 c/kWh) (3 Oct 2025)

[\[141\]](#) Kapacity.io, case 'Väre and Finland's first heat pump tariff' (Väre part of Helen since June 2026)

[\[142\]](#) NIBE Belgium, Smart Price Adaption (standard in F- and S-series heat pumps; plans operation over 24 hours on EPEX prices; requires a dynamic contract and the myUplink connection)

[\[143\]](#) Startup.eu, NOX Energy (Antwerp; connects heat pumps, solar panels, home batteries and electric cars to the energy market through existing apps of suppliers or manufacturers; €3 million seed round, September 2026)

FURTHER READING

Väre/Helen, product page (in Finnish) [\[74\]](#)



In Britain, the households that can shift the most electricity use are car owners on higher incomes; half of homes can shift less than a tenth as much.

NUMBERS

Per household per year Modelled best case: £38 ≈ €44 (renter, gas boiler, prepayment) to £523 ≈ €610 (solar + EV), March 2025 tariffs

Period covered: 2019-2026

SOURCES

[\[113\]](#) Ofgem / Ipsos, Flexibility and Net Zero (FANZ) Survey Findings Report 2025 (4,385 respondents, 1,085 with linked smart-meter data, fieldwork June 2025; p. 9-10) (May 2026)

[\[114\]](#) Which?, 'Household Energy Flexibility: Who Really Benefits?' (analysis of the Ofgem FANZ survey; laundry-shifting estimate £10.40/yr) (30 Sep 2026)

[\[112\]](#) Centre for Sustainable Energy, Smart and Fair 2024-2026 Full Report (p. 21 persona savings; pp. 28-34 CrowdFlex, DFS, DSO procurement; p. 22 participation)

[\[115\]](#) Centre for Sustainable Energy, news item 'Smart & Fair 2024-26 report' (23 Jul 2026)

FURTHER READING

Centre for Sustainable Energy, Smart and Fair 2024-2026 (full report) [\[112\]](#)

Ofgem, Flexibility and Net Zero Survey Findings Report 2025 [\[113\]](#)

Chapter 3 · Peak events

When devices respond on their own, a peak event delivers ten to a hundred times more per household

Where Belgium stands Statements and sources

A 2024 overview of 150 empirical estimates of demand flexibility found that critical-peak prices and critical-peak rebates did not yet exist in Flanders. [\[172, pp. 12–13\]](#)

Since 1 January 2026 Walloon low-voltage customers with an active communicating meter (up to 56 kVA) can opt in, through their supplier, to a network tariff with five time blocks; it is entirely optional and they can switch back at any time. [\[29\]](#)

26 flexibility service providers are registered for the Flemish distribution grid, including Powernaut, Yuso and LIFEPOWR. [\[173\]](#)

In Fluvius' market-based flexibility tests of winter 2024-25, 89 activations delivered 1,304 kWh in total; the regulator called this a first proof that the market model works, at limited scale. [\[174\]](#)

Belgium had about 140,000 home batteries (614 MW, about 1.2 GWh) at the end of 2024; about 11,400 delivered market flexibility, against 24,300 expected two years earlier. [\[175\]](#)

The October 2025 capacity auctions contracted, for 2029-30, 239 MW of demand response and 179 MW of new batteries (525 MW nominal, derated), at a weighted average price of €27.3k per MW per year; the one-year-ahead auction for 2026-27 cleared at €14.1k per MW per year. [\[165\]](#)

Belgium's capacity mechanism lets non-standard assets self-declare their derating, which lowers the barrier to entry. [\[176\]](#)

Under the Brussels regulator's tariff methodology for 2025-2029, the household network tariff keeps its existing structure (including the day/night split) during a transition period (2025-2027); by 1 January 2028 at the latest, households with a smart meter who give explicit consent to the collection of their data move to a tariff with three bands every day: peak 17:00-22:00, day 07:00-17:00, night 22:00-07:00, with the peak price above the day price and the day price at least equal to the night price. [\[30, pp. 25–28\]](#)

The Brussels grid operator refers in its 2026-2030 development plans to an 'advanced' incentive tariff from 2028 aimed at optimising use of the grid and encouraging flexible customers to shift large loads. [\[177, p. 6\]](#)

Fluvius's second test winter ran from 1 December 2025 to 30 April 2026 and tested demand reduction and higher feed-in from local generation; a third series of winter tests, for 2026-27, has published zones and product sheets. [\[178\]](#)[\[179\]](#)

Flanders had about 189,100 registered home batteries with 1,866.7 MWh on 15 September 2026 (provisional). [\[167\]](#)

Brussels network tariff structure 2025-2029 and the planned advanced tariff [\[30\]](#)[\[31\]](#)



United Kingdom

UK12

[↑ The example, p. 42](#)

Britain pays households, through their suppliers, to cut their use at peak moments; replacing a high fixed price with competitive bids cut the cost per kWh by more than 90%.

NUMBERS

Price difference	Paid to households (one supplier, 2023-24): £1.75-4 per kWh saved (about €2.0-4.7). System operator's average accepted price: £3.10/kWh (2023-24) -> £0.21/kWh (2024-25).
Per kW per year	About €33 per kW of average event reduction per winter (£28/kW, research estimate on 12 events in 2023-24)
Belgian equivalent	Per 1,000 households that opt in to an event: about 0.2 MW; per 1,000 households merely signed up: about 0.01 MW (2023-24, one supplier's customers). Pounds converted at €1 = £0.86.

Period covered: 2022-2026

SOURCES

[\[144\]](#) NESO, 'Nearly 2 million households and businesses registered for Demand Flexibility Service (DFS) last winter' (4 Jul 2025)

[\[163\]](#) NESO, DFS Winter 2024/25 Overview Report (28 providers, 1.98m MPANs, top events 327,505-443,224 MPANs, >99% manual, average accepted bid £210/MWh, domestic share 47-77%) (Jul 2025)

[\[150\]](#) Bernard, Metcalfe & Schein, Critical Peak Rewards, NBER WP 35485 (2.7 million participants, 23.1% complier reduction, 0.01 kW ITT, 0.2146 kW per opted-in household, 37.4% opt-in per event, £1.75-4/kWh, average accepted bid £3,100/MWh, MVPF 0.63 and 3.08, £28/kW-yr) (Jul 2026)

[\[155\]](#) NESO, Demand Flexibility Service page (2026 design changes; constraint management from 7/10/2026)

FURTHER READING

NESO: Demand Flexibility Service [\[155\]](#)

Critical Peak Rewards (NBER working paper) [\[168\]](#)



United States

US7

[↑ The example, p. 43](#)

California signed up four million households automatically for a \$2-per-kWh peak reward: they barely responded, while households that signed up themselves cut about eight times more.

NUMBERS

Price difference \$2 per kWh reduced (about €1.75), later \$1

Belgian equivalent Per 1,000 auto-enrolled households: about 0.03 MW; per 1,000 self-enrolled households: about 0.23 MW (California summer peak, 2022). US dollars converted at €1 = \$1.15.

Period covered: 2022-2025

SOURCES

[\[151\]](#) Demand Side Analytics for PG&E, 2022 ELRP Load Impact Report (CALMAC) (2023)

[\[145\]](#) CPUC, Emergency Load Reduction Program page (nearly four million auto-enrolled; residential \$1/kWh; residential part sunsets after programme year 2025, D.23-12-005)

[\[161\]](#) NBC Bay Area (2023) on PG&E payouts of more than \$55 million

FURTHER READING

PG&E 2022 load impact evaluation (CALMAC) [\[151\]](#)



Canada

CA2

[↑ The example, p. 44](#)

In electrically heated Québec, automatic thermostats cut about 3 kW per home at winter peaks, but the utility's own thermostat brand was its most expensive programme per kW.

NUMBERS

Per household per year About €16-39 (bill credit, manual) and about €84 (thermostat rewards), winter 2023-24

Price difference Thermostat rewards about \$7 (€4.5) per event

Per kW per year Thermostat brand about €85 per kW per winter (\$136, 2022-23) vs €37 or less (\$60) for other programmes

Belgian equivalent Per 1,000 homes: about 2.9 MW with automatic thermostats vs about 0.8 MW on the manual peak-event rate (Québec homes, mostly electric heating; not directly transferable). Canadian dollars converted at €1 = \$1.60.

Period covered: 2022-2025

SOURCES

[\[146\]](#) Hydro-Québec, 'Hilo and dynamic pricing: significant savings in spite of a mild winter' (16 Apr 2024)

[\[180\]](#) Hydro-Québec, 'Power demand and the grid's capacity' (2,330 MW in winter 2024-25)

[\[169\]](#) Le Devoir, 'Hilo coûte cher et ne répond pas aux attentes d'Hydro-Québec' (internal documents) (2023)

FURTHER READING

Hydro-Québec results, winter 2023-24 [\[146\]](#)



United States

US4

[↑ The example, p. 45](#)

American utilities turn down hundreds of thousands of smart thermostats on the hottest afternoons for about \$25 a year; what limits them is sign-up, not technology.

NUMBERS

Per household per year About €22 a year per thermostat (\$25) plus €43 one-off (\$50)

Per kW per year About €17 per kW per year (\$25 / 1.25 kW, on the utility's 'up to' figure)

Belgian equivalent Per 1,000 thermostats: up to about 1.25 MW (Arizona, central air conditioning). US dollars converted at €1 = \$1.15.

Period covered: 2021-2026

SOURCES

[\[147\]](#) Arizona Public Media, 'Arizona utilities offering payments for thermostat control when power grid strained' (May 2025)

[\[181\]](#) SRP newsroom, Bring Your Own Thermostat (incentives, opt-out, max 15 events) (8 Jun 2021)

[\[182\]](#) FERC, 2025 Assessment of Demand Response and Advanced Metering

[\[159\]](#) Canary Media, 'Google Nest spinout picks Texas for 1GW virtual power plant' (19 Nov 2024)

[\[160\]](#) Volts podcast, 'The promise of residential VPPs' (Renew Home CEO on enrolment rates) (20 Dec 2024)

FURTHER READING

FERC annual demand response assessment [\[182\]](#)



Germany

DE5

[↑ The example, p. 46](#)

A German grid operator's app asking people to shift use delivered about 1 kWh per person per call; home chargers steered automatically shifted most of their charging sessions.

NUMBERS

Price difference Pilot: grid price signal averaging 2 cents/kWh lower, peaks of 9-10 cents; manual response only at 20 cents/kWh discount

Belgian equivalent Per 1,000 app responders: about 1 MWh per call

Period covered: 2022-2025

SOURCES

[\[183\]](#) TransnetBW, 'Dezentrale Flexibilität: Der schlafende Riese der Energiewende' (11 Feb 2025)

[\[183\]](#) Grids & Benefits results via TenneT and electrive (30 Jan 2026)

FURTHER READING

TransnetBW, 'Dezentrale Flexibilität: Der schlafende Riese der Energiewende' [\[183\]](#)

**United States**

US2

[↑ The example, p. 47](#)

California pays aggregators to discharge home batteries in grid emergencies: in a 2025 test, over 100,000 batteries delivered 535 MW for two hours.

NUMBERS

Per household per year About €270-350 per 5 kW battery (\$62.10-80.73/kW-yr x 5 kW), shared with the aggregator

Per kW per year About €54-70 per kW per year (\$62.10, or 80.73 with bonus)

Belgian equivalent Flanders: about 189,100 registered home batteries (15 September 2026, provisional) vs about 129,000 batteries enrolled in the Californian programme (2025), of which more than 100,000 discharged together in the July 2025 test. US dollars converted at €1 = \$1.15.

Period covered: 2022-2026

SOURCES

[\[152\]](#) Brattle, Assessing VPP Performance: Impacts of a Test Event in California (1 Aug 2025)

[\[148\]](#) Brattle, The Demand Side Grid Support Program: An Assessment of Scale and Value, December 2025 Update

[\[154\]](#) The 2035 Initiative, The DSGS Program: Participation Rates Across California (Apr 2026)

[\[175\]](#) Elia, Adequacy and flexibility study 2026-2036 (home batteries: 614 MW end of 2024; 11,400 of 140,000 delivering market flexibility) (Jun 2025)

[\[165\]](#) Elia press release on the October 2025 CRM auctions, as republished by MarketScreener

[\[167\]](#) Solar & Storage Magazine, 'De harde cijfers: Vlamingen installeerden dit jaar al ruim 10.000 thuisbatterijen, daadwerkelijke groei nog fors hoger' (Fluvius data: about 189,100 registered home batteries in Flanders on 15 September 2026; provisional)

FURTHER READING

Brattle: DSGS assessment of scale and value [\[148\]](#)

**United States**

US6

[↑ The example, p. 48](#)

New England utilities pay home-battery owners a published \$225-400 per kW each summer, based on what the battery itself discharged, with no estimate of the household's normal use.

NUMBERS

Per household per year About €900 per battery home (\$1,030, Massachusetts, summer 2025)

Per kW per year About €195-350 per kW per summer (\$225-400), up to 60 events of 2-3 hours

Belgian equivalent Per 1,000 battery homes: about 5.5 MW (US battery sizes). US dollars converted at €1 = \$1.15.

Period covered: 2017-2026

SOURCES

[\[162\]](#) Rhode Island Energy, ConnectedSolutions Program Guide 2024-2026 (batteries)

[\[153\]](#) ESS News, 'Massachusetts expands \$5.4 million residential battery VPP program to EVs' (28 Jul 2026)

[\[184\]](#) Clean Energy Group, ConnectedSolutions: An Assessment for Massachusetts (Sep 2021)

FURTHER READING

Rhode Island Energy battery programme guide [\[162\]](#)

Nearly a million French households chose a variant of the regulated tariff that costs over four times as much on 22 'red' winter days set by the grid operator.

NUMBERS

Per household per year	About €110 saving vs the standard regulated price for 6,000 kWh/year (August 2026 prices)
Share of the bill	About 8%
Price difference	€0.56/kWh: red-day peak €0.73 vs blue-day peak €0.17 (incl. taxes, August 2026), on 22 days x 16 peak hours

Period covered: 2022-2026

SOURCES

- [185] RTE, Bilan électrique 2023 — Flexibilités
- [158] CRE, press release on regulated tariffs from 1 August 2026 (19.37 million residential customers on the regulated tariff)
- [186] CRE, public consultation on the construction of the regulated tariffs (red days drawn at the end of winter) (Jun 2026)
- [157] Hellowatt, Tempo reform and winter 2025-26 red days (18 Jun 2026)
- [149] Kelwatt, Tempo prices from August 2026 and comparison with the base option

FURTHER READING

RTE electricity review 2023: flexibility [185]

Chapter 4 • Grid operators buying flexibility

Buying household flexibility is routine for British grid operators, to postpone reinforcement rather than replace it

Where Belgium stands Statements and sources

Fluvius and the market operator NODES announced a local flexibility market in Flanders on 27 June 2024; the market has operated in test mode since the start of 2025. [213]

56 test zones for winter 2025-26 (1 December 2025 – 30 April 2026). [214]

Bids contain a reservation price (€/MW/h) and an activation price (€/MWh); contracted bids are paid as bid; customers on 230 V or 400 V networks can take part in aggregated form via an aggregator. [212]

Winter 2024-25: 52 parties approached, 4 obtained provider status, 1.3 MWh over 89 deliveries, more than 240 assets registered, about 0.105% of the volume sought. [215]

The Flemish regulator's report: 1,304 kWh of flexibility over 89 interventions; the market model 'works, though on a limited scale'; non-market flexibility in 2024: 129 interventions on the distribution grid, 509.2 MWh. [206]

1,242 files for flexible connection contracts ('Fall-Back Flex') for businesses on 18 August 2026; the article mentions no household version. [216]

ORES was preparing a local flexibility market (Pic@U, end of 2025) and a peer-to-peer project; Brussels does not prioritise market solutions because congestion there is largely caused by electric-car charging. [200, pp. 10, 164–168]

The shared flexibility platform, whose register and calculation engine is called FlexHub, was built by the distribution grid operators and Elia and is maintained jointly; it records which provider serves which access point for which product. Elia is currently the party requesting flexibility for FCR, aFRR, mFRR and the capacity mechanism and facilitates transfer of energy; low-voltage access points can take part in FCR and aFRR, for which the guide specifies measurement by submeter, for now only third-party submeters. A provider can include an access point only after signing a flexibility agreement with the grid user; on a change of provider the grid operator ends the service for the previous provider and informs it. [207]

26 flexibility service providers registered on the Flemish electricity distribution grid. [173]

The Brussels electricity ordinance requires that the grid operator acquire services, including flexibility services, through transparent, non-discriminatory and market-based procedures. [217, p. 6]

The Brussels low-voltage grid has a large capacity reserve: average load is 33% on transformers and 20% on low-voltage cables; the Brussels regulator will consider regulatory instruments such as flexible connections. [217, pp. 4, 11]

Fluvius's second test winter ran from 1 December 2025 to 30 April 2026 in zones across Flanders and tested demand reduction and higher feed-in from local generation; companies, aggregators and other market parties could take part after registering as flexibility service providers; further tests on demand increase were announced for summer 2026. [178]

Fluvius has published the zones and product sheets for a third series of winter tests of market flexibility, for winter 2026-27, presented in a webinar on 15 September 2026. [179]

Fluvius acts as data manager for FlexHub, the onboarding and access register for flexibility service providers, for distribution grid users in Flanders, Brussels and Wallonia; a provider registers in four steps. [208]

On 14 May 2024 the Brussels regulator approved the Synergrid documents for flexibility services: the model contract between flexibility service provider and distribution grid operator (which requires the provider to request access to FlexHub), the network flexibility study C8/01, the measurement specification C8/06 and the Market Guide Flexibility 2.0; low-voltage access points can take part in FCR and aFRR from May 2024. [218]

The grid operators' next step is a FlexHub for several flexibility requesting parties, suitable for all flexibility products, in a document release targeted for the first quarter of 2027. [210]

The grid operators present FlexHub as Belgium's embryo of a flexibility information system, already used for adequacy and balancing products (FCR, aFRR, mFRR, the capacity remuneration mechanism and transfer of energy for day-ahead and intraday), built on one set of shared capabilities: a flex register, asset register, mandate register and metering register (time series of 15 minutes, 4 seconds and 2 seconds), onboarding and prequalification, a catalogue of baseline methods, volume calculation and an activation register. [209]

A provider onboards once, across requesting parties and products; FlexHub calculates the delivered volumes used for financial settlement (the requesting party pays the provider) and, for transfer of energy, for the corrections of the supplier's and balance responsible party's perimeters, and sends them to the provider, Elia, the requesting party and the parties concerned. [209]

The grid operators say FlexHub will soon be used for congestion and incompressibility products as well (flexible connection, local flexibility market, technical measures) and name scattered implementation depending on product and region as the main risk; a draft European network code on demand response (March 2025) foresees a single entry-point portal and API and a single flexibility information system per country. [209]

Heat pumps in a long cold spell Statements and sources

In winter, French national electricity demand rises by about 2.4 GW for every degree Celsius drop in temperature, because so many homes heat with electricity. [219][220]

France's record national demand, 102.1 GW, came on 8 February 2012 during a long cold wave with temperatures about 8°C below normal; the 2025 peak was 88 GW (14 January, 9 a.m.). [221, p. 18][219][222]

Québec, where most homes heat with electricity, uses nearly twice as much electricity in winter as in summer; on cold days heating can be up to 80% of an average household's daily use. [180][223]

In winter 2024-25, Québec households on a peak-event rate or a smart-thermostat programme, together with businesses, lowered peak demand by 2,330 MW; peak events run between 6 and 10 a.m. and 4 and 8 p.m., up to 30 times a winter. Québec's record peak, 43,124 MW, was set on 3 February 2023. [223][180]

In British monitoring of several hundred air-source heat pumps (2020-2023), the median whole-system efficiency fell from 3.37 units of heat per unit of electricity at 10°C outdoors to 2.37 at -3°C and 2.30 at -5°C. [224]

On the coldest day in the earlier data (mean -0.4°C), the median efficiency of 484 British heat pumps was 2.44. [225]

In Bavaria, during the coldest three-to-four-day spells of recent years (11-15 February 2021, average night -12°C; 7-10 February 2023, average night -9°C), the fleet peak of the heat pumps alone averaged 2.02 kW (2021, 283 systems) and 1.91 kW (2023, 761 systems) per heat pump; including electric backup heaters it rose to 2.79 kW and 2.17 kW. [226]

The same study reports that backup heaters accounted for 29% of the electrical peak in 2021 and 15% in 2023, often switched on by morning hot-water programmes or below a set outdoor temperature; about 80% of systems used a night setback between 21:00 and 04:00. [226]

Even on the coldest days analysed, the Bavarian heat pumps' compressors ran at a median of about 30% of full speed and the systems were active about 65% of the time, so they did not run continuously at their technical limit. [227][228]

German grid planning approaches often assume that more than 90% of heat pumps run at the same time on cold winter days. [226]

In a British distribution network trial with over 1,000 heat pump homes (winter 2023-24), two-hour evening turn-downs reduced demand by 0.6 kW per participating home on average (48% of that home's peak load): 1.1 kW below 3°C, 0.7 kW at 3-7°C and 0.4 kW above 7°C; slightly fewer households opted in on the coldest days. The coldest event averaged -1.4°C. [191]

The trial's final report finds about 0.07 kW more demand response per heat pump for every degree colder, but states that gaps remain 'particularly around extreme winter scenarios not experienced during the project's lifecycle'. [192]

A British network desk study estimated that in a once-in-twenty-years winter, peak heat demand is about twice that of an average winter, and that flexibility measures would have a negligible or very low impact on peak demand at network level. [205]

A British study using winter 2022-23 smart meter data from about 50 heat pump homes, scaled to a once-in-twenty-years winter, found that on very cold days heat pumps run for long periods with little diversity between homes; backup heaters were not included. [229]

In a German monitoring of 77 heat pumps in existing homes (December 2019 – December 2024), electric backup heaters used about 1.3% of the electricity; high outliers were due to faults or wrong settings, most heat pumps were generously sized, and temperatures below -5°C were rare. [230]

Elia assumes that, in all its scenarios, the majority of Belgian heat pumps will not be flexible, and finds that their contribution to closing the 2036 capacity need is limited (around 200 MW in its high-flexibility case, against about 800 MW for electric vehicles). Its model lets heat pumps shift up to 10% of daily energy within the day and does not model the building's thermal behaviour. [175]

Belgium had about 210,000 hydronic heat pumps (air-to-water and ground-source) at the end of 2024, out of about 1.3 million heat pumps of all types. [175]

From 2026, Fluvius reads quarter-hourly electricity values from digital meters as standard. [211]

Wallonia's largest distribution grid operator had 429,272 communicating meters at the end of 2025, 28% of its low-voltage meters. [231]

Brussels had 161,055 smart meters (all customer types) at the end of 2025; against 538,401 residential delivery points that is at most about 30% of homes. [96, p. 18]



Three Dutch grid operators publish a fixed price for household flexibility, €60 to €120 per kW per year, and buy it through suppliers.

NUMBERS

Per kW per year 60 (2 h) / 90 (4 h) / 120 (6 h), availability only, paid to the supplier or aggregator

Belgian equivalent Flanders publishes no such price: providers in Fluvius's congestion test market are paid what they bid.

Period covered: 2025-2026

SOURCES

[\[196\]](#) Solar & Storage Magazine, 'Consumenten krijgen geld voor slim aansturen thuisbatterij en laadpaal' (255 MW, 50,000–70,000 households, regions, devices, market call 1 July, operational by November 2026)

[\[171\]](#) NextEnergy, 'Netcongestie uitgelegd: oorzaken, cijfers & vergoeding 2026' (price list €60/2 h, €90/4 h, €120/6 h; availability-based; inverters excluded; household waiting list from 1/7/2026)

[\[195\]](#) NextEnergy, 'Huishoudens krijgen vergoeding voor slim aansturen van laadpaal, thuisbatterij en warmtepomp' (market call published 3/7/2026; Enexis, Liander, Stedin)

[\[198\]](#) Solar & Storage Magazine, 'Proef ontlasten stroomnet met thuisbatterijen en laadpalen uitgebreid naar hybride warmtepomp' (first phase: 2,200 chargers, ~85 batteries, ~500 hybrid heat pumps; 60% less charging 17:00–21:00 at one supplier, Nov 2025) (13 Jan 2026)

[\[197\]](#) Vattenfall press release 'Samenwerking energieleveranciers en netbeheerders fors opgeschaald' (first phase: 35,000 households in 21 areas a year earlier; 255 MW, with a financial reward for households) (26 Jun 2026)

[\[232\]](#) KHN, 'Netcongestie: vanaf 1 juli 2026 ook kleinverbruikers op de wachtlijst' (ACM prioritisation framework; connections up to 3×80 A)

FURTHER READING

Solar & Storage Magazine on the scale-up (Dutch) [\[196\]](#)

British grid operators buy flexibility routinely and households supply a growing share, but most contracted capacity is rarely called upon.

NUMBERS

Per kW per year ≈ 38 (£33 at €1 = £0.86; estimate, average of all products and operators, 2023-24)

Belgian equivalent Flemish congestion-market test, winter 2024-25: 1.3 MWh used in 89 activations, against 13 GWh at one British operator in 2024/25.

Period covered: 2023-2026

SOURCES

[\[188\]](#) Energy Networks Association, 'GB cements status as world leader in energy flexibility with estimated £300m savings for bill payers' (31 GW tendered, 9 GW contracted, 22 GWh, 2024; 'Contracted is the flexibility that has been secured via tenders to be delivered') (26 Jun 2025)

[\[189\]](#) UK Power Networks, DSO Performance Panel Report 2024/25 (450 MW operational, 13 GWh dispatched, 176,894 assets, 23% of capacity from households, demand turn-up £54 = 44% of average yearly network bill, £114m benefits) (Apr 2025)

[\[194\]](#) UK Power Networks DSO, 'Flexibility' web page (availability payment for standby and utilisation payment for activation; up to £600/MWh in the past; 10 kW per location, domestic customers via a third party)

[\[233\]](#) UK Power Networks, 'DSO hits flexibility milestone' (over 100,000 assets, 2 GW on the platform; 7.8 GWh dispatched in 2023/24) (6 Jan 2025)

[\[193\]](#) National Grid Electricity Distribution, Flexibility Market Insights Report (99% of new registrations in summer 2025 were domestic technologies; 197,000 assets; example prices) (Jan 2026)

[\[202\]](#) National Grid Electricity Distribution, Distribution Flexibility Services Procurement Report 2025/26 (100.52 MW contracted, 5,589 MWh delivered, 43 providers, >309,000 assets) (May 2026)

[\[170\]](#) Axle Energy, 'Local Network (DNO) Flexibility: Everything You Need to Know' (~£33 per kW per year average for 2023-24; ~20% of GB households in a constraint zone; min. bid 10-50 kW; availability and/or utilisation payments)

[\[187\]](#) Energy Networks Association, 'Britain breaks flexibility records for four years running' (2021/22 tendered by product: Dynamic 1,584 MW and Restore 1,149 MW of 3,635 MW) (14 Jul 2022)

[\[215\]](#) Solar & Storage Magazine, 'Fluvius start nieuwe testen voor flexibiliteitsmarkt' (winter 2024-25: 4 providers, 1.3 MWh over 89 deliveries, >240 assets, 0.105% of sought volume) (27 May 2025)

FURTHER READING

UK Power Networks: how to take part in local flexibility [\[194\]](#)

UK Power Networks open data: every flexibility dispatch ukpowernetworks.opendatasoft.com/explore/dataset/ukpn-flexibility-dispatches

Britain lets grid operators spend the same budget on grid reinforcement or on flexibility, and makes them check with one common method which is cheaper.

SOURCES

[\[201\]](#) Ofgem, ED3 Sector Specific Methodology Decision – core document (par. 2.38-2.39, 2.51-2.52, 2.62-2.69; Totex Incentive Mechanism retained; ED3 starts 1 April 2028)

[\[190\]](#) ENA Open Networks / Baringa, Common Evaluation Methodology and Tool v3.0 ('The value of the flexibility products is primarily derived from the time value of money from deferring large capex expenditure'; ceiling price at which flexibility 'becomes more expensive (has a worse NPV) than reinforcing')

[\[234\]](#) ENA Open Networks, Common Evaluation Methodology (first published version) (23 Dec 2020)

[\[200\]](#) Kessels et al. (VITO) for the European Commission, Specification and design criteria for Local Flexibility Markets (regulatory frameworks 'often still CAPEX-biased, favouring grid expansion over flexibility', p. 146) (Nov 2025)

[\[188\]](#) Energy Networks Association, 2024 flexibility figures (9 GW contracted; £300m savings estimate) (26 Jun 2025)

[\[199\]](#) Vlaamse Nutsregulator, Tariefmethodologie distributie 2025-2028 (capital costs remunerated with a normative return; flexibility services listed among network-management costs) (21 Jun 2024)

FURTHER READING

ENA Common Evaluation Methodology v3.0 (how the ceiling price is calculated) [\[190\]](#)

Britain has made one body responsible for aligning its flexibility markets, starting with a shared register, due in 2027, that will let an aggregator sign a device up once for both local and national markets.

SOURCES

- [203] Ofgem, 'Ofgem fast-tracks new energy flexibility tool for early launch' (register once to participate in both local and national flexibility markets; launch 2027; delivered by Elexon)
- [235] Solar Power Portal, 'Ofgem appoints Elexon as market facilitator for local energy' (decision July 2024; fully operational by early 2026)
- [236] Ofgem, Decision: market facilitator policy framework (Jul 2024)
- [204] Elexon, Market Facilitator Delivery Plan at a glance (FMAR phase 1 by September 2027; common dispatch API; market data portal; standard definitions)
- [207] Synergrid, Market Guide Flexibility 3.0 (final version of 8 June 2026, French), sections 2.2, 2.3.2.2, 4.1 and 4.3.2 and Table 4
- [208] Fluvius, 'Fluvius als databeheerder' (FlexHub as onboarding and access register; four registration steps for an FSP; distribution customers in Flanders, Brussels and Wallonia)
- [237] Fluvius, 'Ontsluiten meetgegevens aan energiedienstverleners via Mijn Fluvius' (customer grants data access via the portal; mandate valid three years; no reference to flexibility services)
- [238] GOPACS, home page ('a partnership of the Dutch grid operators to engage in joint congestion management'; flexibility needed inside and outside the congestion area)
- [239] Enlit World, 'GOPACS and Nord Pool enhance access to electricity flexibility' (Nord Pool, EPEX SPOT and ETPA connected; first activations via Nord Pool expected in 2026) (30 Sep 2025)
- [210] Synergrid, PDG meeting Explicit Flex (transfer of energy and mFRR live on low voltage from 9 June 2026; next step: a FlexHub for several flexibility requesting parties, suitable for all flexibility products, targeted for the first quarter of 2027)
- [209] FlexCon 2026, presentation 'How Belgium turned four system challenges into one shared flexibility platform' by Christof Denolf and Philippe Dewever, Synergrid track (23 September 2026)

FURTHER READING

Elexon delivery plan for the flexibility market facilitator [204]

A British grid operator's trial in over 1,000 heat pump homes: short turn-downs kept homes comfortable and delivered more on colder days.

NUMBERS

Belgian equivalent Per 1,000 heat pump homes that join a peak event: about 0.6 MW on an average evening, 1.1 MW below 3°C (two-hour turn-downs).

Period covered: 2022-2025

SOURCES

- [191] National Grid Electricity Distribution, EQUINOX Trial Two outcomes webinar (over 1,000 households; 0-3 two-hour events a week; 0.4/0.7/1.1 kW by temperature; 85% no or slight comfort change in the coldest events, 92% across all; 47% opted in and turned down on an average event; three payment models) (29 Oct 2024)
- [205] National Grid Electricity Distribution / Guidehouse, 'Heat pump flexibility: EQUINOX and beyond' (three winters; 85% comfort; 78% satisfied with stacking; manual and aggregator control both work; the 1-in-20-winter statement attributed to the Peak Heat desk study) (3 Nov 2025)
- [192] National Grid Electricity Distribution, EQUINOX – Transition of learning to Business as Usual (about 0.07 kW more response per degree colder; gaps remain 'around extreme winter scenarios not experienced during the project's lifecycle') (19 Dec 2025)

FURTHER READING

EQUINOX and beyond: summary of the trial and related studies [205]

Chapter 5 • Mandatory controllability

Some countries simply require devices to be steerable, and it works where the infrastructure is already there

Where Belgium stands Statements and sources

The exclusive-night tariff is a specific network tariff for storage heating and storage water heaters on a separate meter; its advantage has been phased out since 2021 and it ends on 1 January 2028. [266] [267] [268]

The exclusive-night circuit is switched on between 22:00 and 23:45 and off between 06:00 and 08:00 (8–9 hours of charging), with optional afternoon charging between 12:00 and 16:00 in some local configurations; the circuit must not contain sockets. [276]

Fluvius has been sending letters since 28 September 2026 to customers who still have an exclusive-night meter, mentioning renovation, smart control or a free emergency solution with a clock. [273]

The Flemish digital meter has a customer port (P1, closed by default, opened by the household via Fluvius) and a second port (S1) reserved for the grid operator. [281]

maakjemeterslim.be is the public catalogue of energy management systems run by the Flemish energy and climate agency with Flux50, Fluvius, VOLTA and ODE; 33 of its 42 products must be installed by a professional and 35 of 42 are sold through installers. [277]

About 2.95 million digital electricity meters were installed in Flanders by the end of 2025, about 80% of homes and small businesses; full rollout is due by mid-2029. [282]

A federal tax reduction for private home chargers (1 September 2021 to 31 August 2024, falling from 45% to 15%) required a 'smart' charger whose charging time and power are steered by a freely chosen energy management system, and the use of green electricity. [264] [265]

The Flemish Parliament adopted a framework for flexible connection agreements in congested areas (December 2025); in practice it targets larger connections. [283] [284]

About 4,000 exclusive-night meters remain in Brussels; they are switched on by a signal at off-peak times. For some years the night-only rate has been no cheaper than the off-peak rate of a day/night meter, and these meters will stop working once smart meters arrive. The Brussels grid operator removes them and installs a smart meter free of charge; a grant of up to €475 per meter covers electrician and inspection costs. [269] [271] [270]

In Brussels a smart meter is installed automatically for new connections, solar panels, charging stations, home batteries and energy sharing; the large-scale rollout began in October 2023 and almost all residents should have one by the end of 2030. [285]

A technical prescription approved by the Brussels regulator in May 2024 requires load limiting ('bridage') on collective charging points when their total power exceeds the contractual power calculated by the grid operator, and allows 7.4 kW or 22 kW chargers on 400 V networks only with a charging-management system that keeps phase imbalance acceptable; the standard power available to every user is 3.7 kW. [286, pp. 6–8]

In the area of Wallonia's largest grid operator the exclusive-night circuit is most often powered from 22:00 to 07:00 or 21:00 to 06:00, with times varying by substation and a daytime top-up in winter in some cases; since 1 January 2026 its distribution tariff equals that of the off-peak hours of a day/night meter. [272]

From the end of September 2026 Fluvius has been writing in phases to customers who still have an exclusive-night meter, mentioning renovation, smart control or a free emergency solution with a clock; customers with solar panels or higher use follow after New Year. [274] [275]

About 2.95 million digital electricity meters were installed in Flanders by early 2026, about 80% of homes and small businesses; full rollout is required by 1 July 2029. [287]

Germany lets grid operators dim new heat pumps, home chargers and home batteries during moments of grid stress, and in return guarantees their connection and lowers their network charge.

NUMBERS

Per household per year 110–190 (fixed network-charge discount per controllable device, including VAT)

Period covered: 2024–2026

SOURCES

[\[241\]](#) Bundesnetzagentur, press release 27/11/2023: rules for integrating heat pumps and charging devices (no refusal or delay; 4.2 kW; €110–190; 60%)

[\[288\]](#) Bundesnetzagentur, press release 16/6/2023: second consultation, floor raised to 4.2 kW (heat pumps keep running, ~50 km in two hours)

[\[263\]](#) Bundesnetzagentur, consumer portal on controllable devices (Module 3 time windows; publication of interventions from 1/3/2025)

[\[242\]](#) Bundesnetzagentur, smart meter rollout statistics, first half of 2026 (5.9% of all metering points; 26.1% of mandatory cases)

[\[289\]](#) Bundesnetzagentur, press release 27/3/2026: 77 proceedings over missed smart meter rollout

[\[290\]](#) 50komma2, 'Neue Vorschläge der Bundesnetzagentur' (3.7 kW to 4.2 kW) (Jun 2023)

[\[291\]](#) bne, 'Endlich 14a: guter Auftakt der Bundesnetzagentur' (balanced compromise; risk of becoming standard practice) (28 Nov 2023)

FURTHER READING

Bundesnetzagentur: consumer information on controllable devices (German) [\[263\]](#)

A Swiss law gives households control over the flexibility of their own appliances, and one city utility is switching off its decades-old remote control of water heaters.

SOURCES

[\[253\]](#) Bulletin.ch (VSE), 'Mehr Flexibilität beim Netzbetrieb' (BKW: 140,000+ receivers plus ~30,000 at partners) (19 Sep 2022)

[\[257\]](#) Stadtwerk Winterthur, 'Rundsteuerung' (switch-off 1/1/2028; customers hold switching authority; no longer economic)

[\[292\]](#) Stadtwerk Winterthur, Q&A for electrical installers, status 12/2025 (no compensation; EMS recommended; rewiring by installers)

[\[256\]](#) Stadtwerk Winterthur, fact sheet on switching off ripple control (signal off 31/12/2027)

[\[249\]](#) Repower, information on the use of customers' flexibility (existing control continues unless the customer objects; discount; grid-emergency exception)

[\[248\]](#) Energonia, 'Flexibilität, Lastmanagement und Abregelung im Mantelerlass' (consent, published compensation, guaranteed uses) (2025)

[\[247\]](#) Swiss Federal Office of Energy, 'Federal Act on a Secure Electricity Supply from Renewable Energy Sources' (approved by 68.7% in the popular vote of 9 June 2024; in force in stages from 1 January 2025)

FURTHER READING

Repower: what the new Swiss rules mean for a household (German) [\[249\]](#)

In France the meter itself can switch the water heater, so a supplier can steer millions of them without a home visit.

NUMBERS

Per household per year 27–45 (supplier credit); about 33 estimated average saving

Belgian equivalent Pilot result of 0.3 kW per home at 7 pm $\approx$ 0.3 MW less per 1,000 participating homes (simple multiplication; no Belgian estimate).

Period covered: 2025-2026

SOURCES

[\[251\]](#) pv magazine France, 'Le pilotage intelligent des ballons d'eau chaude, un levier massif pour le réseau français' (237 homes, 20%, 0.3 kW; 7.8 million compatible; 780 MW and 23 GWh as Octopus estimates) (24 Feb 2026)

[\[293\]](#) L'EnerGeek, 'Ce minuscule réglage Linky qu'Octopus Energy exploite' (dry contact; schedules up to 24 h ahead; on/off water heaters only) (24 Feb 2026)

[\[279\]](#) Octopus Energy France, specific terms of the water-heater programme (eligibility, consent, override, €45/€27 a year)

[\[294\]](#) Enedis, 'Le compteur Linky' (96% of homes)

FURTHER READING

pv magazine France on smart water-heater control (French) [\[251\]](#)

Finland requires a load-control switch in new meters for houses; one grid operator now uses it to run storage heating and water heaters in the cheapest hours.

SOURCES

[\[45\]](#) Nordic Energy Research, 'Demand side flexibility in the Nordics' (2025), Finland section (relay in AMR 2.0; Elenia pilot 76 households; 2024 spot-price service; plan to open to FSPs)

[\[246\]](#) Finnish Energy, 'Principles of electricity metering 2023' (decree 767/2021 relay requirement; staggering over at least one hour) (Sep 2024)

[\[295\]](#) Nurmijärven Sähkö, 'Service relay and HAN port' (load control switched on in stages 22:00–24:00, off at 06:00)

FURTHER READING

Nordic Energy Research: flexibility in the Nordics, Finland [\[45\]](#)

France is moving part of the cheap hours of more than 11 million households from the night to the afternoon by regulatory decision; water heaters wired to the meter's switch follow automatically.

NUMBERS

Price difference $\approx$ 4.9 euro cents per kWh (regulated tariff, 6 kVA: 20.65 peak vs 15.79 off-peak, from 1/2/2026)

Period covered: 2025-2027

SOURCES

[\[166\]](#) Enedis, 'Modification des heures creuses : comprendre ce qui change à partir du 1er novembre 2025' (CRE decision in the network tariff; rules; waves; meter switch)

[\[262\]](#) euro-énergie, 'Enedis met en œuvre la réforme des heures creuses' (about 5 GW expected to move to afternoons in the sunniest months) (2025)

[\[240\]](#) Selectra, 'Pourquoi Enedis va modifier vos heures creuses à distance dès la fin 2026' (second wave, summer/winter split; no measured results)

[\[296\]](#) CRE, retail market observatory Q2 2026 (54.8% of residential sites on the regulated tariff)

[\[278\]](#) CRE, regulated tariff from 1/2/2026: peak 20.65 vs off-peak 15.79 c€/kWh at 6 kVA

[\[252\]](#) Kohen Avocats, 'Nouvelles heures creuses : chauffe-eau déréglé, facture alourdie' (practical problems with timers)

[\[250\]](#) Enercoop, 'Enedis : définition' (Enedis operates 95% of the French electricity distribution network; local distribution companies run the rest)

FURTHER READING

Enedis: what changes in the off-peak hours (French) [\[166\]](#)



Australia AU4

[↑ The example, p. 69](#)

Australia's grid operators can switch millions of water heaters, but households with solar are leaving that control, often on their installer's advice.

SOURCES

[244] RenewEconomy, 'Electric hot water is a hero of flexible demand. Where does it stand in the age of rooftop solar?' (B. Yildiz, UNSW) (31 Oct 2023)

[297] RACE for 2030, SolarShift project page (940 GWh; 2,850 heaters; completed February 2025)

[255] UNSW, SolarShift Customer Hot Water Roadmap report (controlled-load windows; 28% average and up to 74% shifted in the trial) (2025)

[254] SolarQuotes, 'Midday is the new off-peak' (time clock or ripple control; why solar owners divert) (18 Oct 2024)

FURTHER READING

RACE for 2030: SolarShift, turning electric water heaters into megawatt batteries [297]



Netherlands NL5

[↑ The example, p. 70](#)

Dutch grid operators turn down public chargers in the evening peak by default, and in Utrecht this halved the charging peak by late winter.

NUMBERS

Belgian equivalent ≈ 1.6 kW less per public charge point at 7 pm (5.67 MW / 3,500 points), i.e. ≈ 1.6 MW per 1,000 public charge points.

Period covered: 2025-2026

SOURCES

[260] Stedin via ANP press portal, 'Netbewust laden vermindert piekdruk op stroomnet tot 49,5 procent'

[261] Solar & Storage Magazine, 'Netbewust laden elektrische auto halveert avondpiek op stroomnet' (December 24%; late February 11.46 to 5.79 MW; opt-out; paused sessions) (Jul 2026)

[259] Solar & Storage Magazine, 'Netbeheerders starten met netbewust laden bij ruim 5.200 publieke laadpalen' (18 Nov 2025)

[280] Stedin, 'Netbewust laden van elektrische voertuigen' (daily capacity limits sent to charge point operators via an API)

FURTHER READING

Stedin: grid-aware charging of electric vehicles (Dutch) [280]



United Kingdom UK13

[↑ The example, p. 71](#)

Every new British home charger must avoid peak hours by default and start each charge after a random delay of up to ten minutes.

SOURCES

[243] legislation.gov.uk, The Electric Vehicles (Smart Charge Points) Regulations 2021 (peak hours, default charging hours, randomised delay, scope)

[245] UK government, 'Complying with the Electric Vehicles (Smart Charge Points) Regulations 2021', guide v2.1 (0–600 s at each charge; extendable to 1,800 s; enforcement) (May 2022)

[258] UK government, impact assessment for the regulations (£500m NPV; £40 per charger; 10 pm surge in a trial; review by 2025) (Sep 2021)

[298] Svea Solar, 'Fiscaal voordeel voor laadpaal' (Belgian tax reduction 2021–2024: smart charger, green electricity)

[264] SBB, 'Groen licht voor fiscaal voordelige laadpalen' (definition: charging time and power steered by a freely chosen energy management system, independent of the supplier) (Dec 2021)

FURTHER READING

UK government guide to the smart charge point regulations [245]

Chapter 6 · The solar peak

New rooftop solar can be made controllable without touching existing systems, at little cost to households

Where Belgium stands Statements and sources

Belgium has more than 12 GW of solar panels and adds about 1 GW a year. [323]

Flanders: 1,101,349 solar installations, 8,010.8 MW (inverter capacity), end of May 2026 (provisional). [324]

520 hours of negative day-ahead prices in 2025 (408 in 2024, 221 in 2023); on 91 of 365 days the price was negative between 13:00 and 14:00. [301, pp. 100–101]

Nearly 100,000 Flemish households with solar panels received compensation in 2025 for the end of net metering. [325] [326]

Under a dynamic contract, the injection cost at negative prices for a 4 kWp system is about €20 in 2026 (rising to €40 in 2036 in the central scenario). [102, p. 277]

Elia asked for decentralised generation to be made steerable, with a legal basis, 'if the market response is not sufficient'; large wind and solar parks can already be curtailed, rooftop systems cannot. [321]

The Flemish regulator advised that an emergency switch is 'for now not necessary or desirable' in Flemish rules and is primarily a federal matter. [327]

When Elia's call for an emergency switch came up in the Flemish Parliament, two members called it alarming and problematic, one noting that people had been encouraged for years to invest in solar panels, electric cars and heat pumps. The Flemish energy minister replied that remotely switching off household panels 'is absolutely not on the table' and that any measure would not go through the digital meter; switching off is proposed as a very last step, but there are many other solutions that do not upset or worry people. She had asked the Flemish regulator for its advice. [328]

Frank Energie offers Belgian customers automatic switch-off of their panels at negative prices and on the imbalance market, with a bonus of about 10% of the market price, for nine inverter brands. [329]

Elia says that modulating solar panels at negative prices is in the end user's interest, as it spares them from paying for the energy they produce. [321]

At 31 December 2025 Brussels counted 16,981 injection points, 3.2% of supply points and 11% more than in 2024; over 2025 the best offer for injected power lost 1.55 euro cents per kWh, almost 30%. [96, p. 23]

Brussels ended net metering for solar installations of 5 kW or less in two steps: the network-cost part from early 2020, the energy part with the launch of the new market system (MIG6), planned for November 2021; injected power is now sold to a supplier at the energy price only. [330]

Brussels still supports solar panels with green certificates for 10 years; for installations commissioned from 1 April 2026 new rates apply, e.g. 1.739 certificates per MWh for a 6 kWp system; the certificate price is set by supply and demand. [331]

For 2025-2029 a zero injection tariff applies on the Brussels distribution grid. [30, p. 35]

Walloon decree of 1 October 2020: net metering ends on 31 December 2023, but is maintained until 31 December 2030 for renewable installations of up to 10 kW commissioned before 1 January 2024. [332]

Walloon installations certified before 1 January 2024 keep net metering until 31 December 2030, also with a communicating meter; the communicating meter allows network costs to be billed on actual gross consumption instead of the flat prosumer tariff. [333]

An analysis by ENGIE's research centre of the first 8,000 customers on its time-of-use contract found 45% of their electricity use in the super off-peak hours, about 15% more than before they switched. [103]

For Flemish households, distribution network tariffs, levies and excise are charged per kWh taken from the grid; the payment for exported power is exempt from VAT for private customers, and injection charges apply only to producers above 10 kVA. [334]

In Flanders and Wallonia, no network tariffs or levies are deducted from the payment for exported power, and that payment is exempt from VAT. [335]

The Walloon regulator states that the prosumer tariff is neither an injection tariff nor a tax, and that there is no injection tariff for small prosumers. [336]

The Flemish regulator advised that, for now, it finds an emergency switch for decentralised generation neither necessary nor desirable in Flemish rules; the matter is mainly a federal one. [327] [337]

Germany caps feed-in from new rooftop solar at 60% until the grid operator can steer it, and stops paying for exports when wholesale prices are negative.

NUMBERS

Per household per year -130

Belgian equivalent Elia estimates that a 4 kWp system with 30% self-consumption on a Belgian dynamic contract pays about €20 a year for exports at negative prices in 2026 (adequacy and flexibility study, June 2025, p. 277). In Belgium the market price does this for households on a dynamic contract (1.36% of Flemish households in April 2026); Germany does it by law for all new systems.

Period covered: 2025-2027

SOURCES

[\[304\]](#) Clearingstelle EEG|KWKG, 'Das Solarspitzengesetz: Ein Überblick' (A. Seidl-Schulz) (Jul 2025)

[\[314\]](#) pv magazine Deutschland, 'Keine Angst vor dem Solarspitzengesetz' (worked example 10 kWp + 10 kWh battery, 2024 prices) (22 Dec 2025)

[\[299\]](#) Bundesnetzagentur, press release on electricity market data 2025 (573 of 8,760 hours negative; 457 in 2024) (5 Jan 2026)

[\[338\]](#) Bundesnetzagentur, renewables expansion 2025 (16.4 GW PV, roughly half on buildings) (8 Jan 2026)

[\[339\]](#) Bundesregierung, 'Kabinett beschließt EEG-Novelle und Netzpaket' (50% feed-in cap for small and medium rooftop PV; end of feed-in payments for new systems <25 kW) (29 Jul 2026)

[\[340\]](#) pv magazine Deutschland, EEG amendment and grid package on the Bundestag agenda for a first reading on 24/9/2026; EU state-aid approval still needed

[\[341\]](#) Verbraucherzentrale Hamburg, 'Solarspitzen und Fördergelder' (HTW Berlin: 60% cap costs 1.1% (east-west) to 9.0% (south, no battery) of output) (9 Sep 2025)

[\[342\]](#) HTW Berlin, 'Nullvergütung bei negativen Börsenstrompreisen und weitere Konstruktionsfehler des Solarspitzen-Gesetzes' (Apr 2025)

[\[343\]](#) pv magazine Deutschland, 'EEG-Novelle: Bundesrat fordert umfangreiche Änderungen' (the federal states ask to drop the permanent 50% feed-in cap for rooftop systems below 100 kW) (25 Sep 2026)

[\[85\]](#) Vlaamse Nutsregulator, Marktrapport 2025 (RAPP-2026-12): dynamic contracts 0.89% of Flemish households in December 2025, 1.36% in April 2026

FURTHER READING

Clearingstelle EEG|KWKG overview of the Solar Peak Act (German) [\[304\]](#)

Federal government: cabinet adopts EEG amendment and grid package (German) [\[339\]](#)

South Australia's distribution network operator offers solar homes a variable export limit instead of a low fixed one; nearly nine in ten new customers choose it.

SOURCES

[\[311\]](#) ARENA / SA Power Networks, Flexible Exports for Solar PV – Final Trial Report (19 Oct 2023)

[\[305\]](#) SA Power Networks, Flexible Exports (consumer page)

[\[344\]](#) SA Power Networks, Flexible Exports (industry page)

[\[312\]](#) Government of South Australia, Dynamic Exports questions and answers

[\[315\]](#) SolarQuotes, 'SAPN: Electricity Peak Period Tweaks, Flexible Exports Update' (>88% of eligible customers choose flexible exports) (18 Jun 2025)

[\[283\]](#) Flemish Parliament, document 559 (2025-2026), framework for flexible connection agreements in congested areas (adopted 10 December 2025)

[\[284\]](#) Fluviu, annual report 2025 (2026)

FURTHER READING

ARENA final trial report (English) [\[311\]](#)



Australian states make every new rooftop inverter remotely switchable for emergencies; South Australia has used it once, for about an hour.

SOURCES

[\[302\]](#) Government of South Australia, Regulatory changes for smarter homes (remote disconnection/reconnection since 28/9/2020)

[\[320\]](#) SA Power Networks, Solar curtailment for minimum system demand events (order of measures; 139 substations, ~790,000 of 900,000 customers)

[\[310\]](#) AEMO, Quarterly Energy Dynamics Q1 2021 (14/3/2021: ~71 MW distributed PV curtailed incl. ~14 MW residential)

[\[303\]](#) AEMO, Quarterly Energy Dynamics Q4 2025 (negative prices in 48.4% of SA intervals; SA operational demand record ~263 MW; 25 GW rooftop PV) (Jan 2026)

[\[306\]](#) Government of Western Australia, Emergency Solar Management (since 14/2/2022; SA used once for about an hour; \$1–2 per household per activation)

[\[307\]](#) Victorian Government, Victoria's emergency backstop mechanism for solar (small systems from 1/10/2024)

[\[345\]](#) NSW Government, Emergency backstop ('New solar protections are coming')

[\[346\]](#) WattClarity, 'Solar stop test completed in South Australia' (25 Aug 2026)

[\[313\]](#) ECB euro reference rate EUR/AUD 1.6297 (30/9/2026)

[\[321\]](#) Solar & Storage Magazine, 'Elia wil meer instrumenten om in te grijpen bij stroomoverschotten' (Elia's Summer Outlook 2026: legal basis to steer decentralised generation if the market response falls short; large wind and solar farms can already be curtailed)

[\[328\]](#) Solar & Storage Magazine, 'Minister Depraetere sluit uitschakelen zonnepanelen via noodknop uit' (questions in the Flemish Parliament; the minister rules out remotely switching off household panels) (3 Jul 2026)

FURTHER READING

SA Power Networks: solar curtailment for minimum system demand events [\[320\]](#)

Western Australia: Emergency Solar Management [\[306\]](#)



Australian distribution network operators now charge a little for midday exports, and in Sydney also pay a little for evening ones; in three states, suppliers must also offer a contract with three free midday hours.

NUMBERS

Per household per year	11
Price difference	Network tariff for injection (Sydney): -1.23 vs +3.85 Australian cents/kWh ($\approx$ -0.75 vs +2.4 euro cents). Free-hours contracts (Sydney): 0 in the window vs $\approx$ 64 c/kWh peak ($\approx$ €0.39), against $\approx$ 33 c/kWh ($\approx$ €0.20) on a standard flat contract.
Belgian equivalent	Belgian supplier offers with cheap or free midday hours: ENGIE time-of-use (weekend 11:00–17:00 super off-peak, up to 45% cheaper than peak; $\sim$ 25,000 customers), Luminus time-of-use (Mon–Sat 11:00–17:00 super off-peak in spring/summer, up to 50% saving; free energy on Sundays 11:00–17:00 in the first contract year), Energie.be (free energy component on Sundays 11:00–16:00, April–September; 27,400 households). Exchange rate EUR/AUD 1.6297 (ECB, 30/9/2026).

Period covered: 2024-2026

SOURCES

- [\[308\]](#) Ausgrid, Two-way solar pricing (1.23 c/kWh 10:00–15:00 above 200 kWh/month; 3.85 c/kWh reward 16:00–21:00; mandatory from July 2025; retailers decide pass-through)
- [\[316\]](#) SolarQuotes, 'Solar Export Tariff For South Australia Soon' (SAPN: 1 c/kWh 10:00–16:00 above 9 kWh/day; about \$18 a year for an average household) (13 Jun 2025)
- [\[317\]](#) ABC News, Solar Sharer free-electricity offer from 1 July 2026
- [\[347\]](#) SolarQuotes, 'Free Electricity For All? Not Quite: Solar Sharer Explained' (federal minister; via AER Default Market Offer) (5 Nov 2025)
- [\[318\]](#) SolarQuotes, 'Solar Sharer: 3 Hours Of Free Power Explained' (at least one plan; 24 kWh/day cap; smart meter; cost recovered elsewhere) (9 Jun 2026)
- [\[348\]](#) SolarQuotes, 'Solar Sharer Plans Compared: Three Free Hours, At A Cost' (Sydney: peak 63.7 c vs 33.1 c flat; supply charge +6% to +34%; Victoria from October) (24 Jul 2026)
- [\[313\]](#) ECB euro reference rate EUR/AUD 1.6297 (30/9/2026)
- [\[87\]](#) ENGIE Belgium, Empower Flextime (super off-peak 01:00–07:00 daily and 11:00–17:00 at weekends; up to 45% cheaper than peak; $\sim$ 25,000 customers)
- [\[88\]](#) Luminus, SmartFlex (super off-peak Mon–Sat 11:00–17:00, 21/3–20/9, up to 50% saving; Happy Sunday free energy 11:00–17:00, first contract year)
- [\[349\]](#) Energie.be, Energieke zondag (free energy component Sundays 11:00–16:00, April–September; 27,400 households)
- [\[103\]](#) Solar & Storage Magazine, ENGIE analysis of the first 8,000 customers on its time-of-use contract (45% of use in the super off-peak hours) (24 Feb 2026)
- [\[30\]](#) Brugel, Decision 264, tariff methodology 2025-2029 part 2 (19 March 2024), p. 35 (zero injection tariff on the Brussels distribution grid)
- [\[319\]](#) SolarQuotes, 'No Solar Sharer where you live? Every alternative, by state' (Victoria's own 'Midday Power Saver' scheme started on 1 October 2026)

FURTHER READING

Ausgrid: two-way solar pricing [\[308\]](#)

SolarQuotes: Solar Sharer plans compared [\[348\]](#)



The Netherlands ends net metering in one step on 1 January 2027, after suppliers had already begun charging solar homes for their exports.

SOURCES

[\[309\]](#) Rijksoverheid, Salderingsregeling (ends 1/1/2027; minimum 50% of bare supply price until 2030)

[\[350\]](#) ACM ConsuWijzer, 'Salderen en terugleveren' (export costs; example €150 compensation vs €70 costs)

[\[300\]](#) TenneT, news on 2025 market data (584 negative hours vs 458 in 2024; market-based curtailment >1 TWh, +33.5%) (30 Apr 2026)

[\[351\]](#) Rechtbank Amsterdam, 'Eenzijdig terugleverkosten opnemen in overeenkomst mag niet' (ruling 25/9/2026, Vattenfall)

[\[330\]](#) Brugel, 'Fin du principe de la compensation' (end of net metering for Brussels systems of 5 kW or less, 2020-2021)

[\[332\]](#) Walloon Parliament, decree of 1 October 2020 on the end of compensation, art. 2 (net metering kept until 31 December 2030 for systems up to 10 kW commissioned before 2024)

[\[325\]](#) Belga via MSN, 'Bijna 100.000 Vlaamse gezinnen met zonnepanelen kregen dit jaar compensatie voor afschaffing terugdraaiende teller' (29 Dec 2025)

FURTHER READING

ACM ConsuWijzer: net metering and exports (Dutch) [\[350\]](#)

Where Belgium stands Statements and sources

The Flemish regulator lists five types of flexibility service provider, including 'a party that is not dependent on the supplier or the balance responsible party of the grid user at its access point'. [\[173\]](#)

26 flexibility service providers were registered on the Flemish electricity distribution grid in October 2026 (12 on the local transport grid), including Powernaut, Yuso and LIFEPOWER. [\[173\]](#)

If an aggregator and a supplier do not agree on the transfer-of-energy price within the negotiation period (currently four months), a regulated price is imposed by CREG; settlement runs through a central settlement model. [\[381\]](#)

'The ToE DA/ID solution is already implemented on the Transmission, local transport and HV-MV distribution grid connected points but has never been used so far.' [\[381\]](#)

The grid operators' plan: manual frequency restoration reserve (mFRR) on low voltage (head meter) from the beginning of 2026, a proof of concept for automatic frequency restoration reserve (aFRR) in the first quarter of 2026 and market-wide in the third quarter of 2026, mFRR with submeter from the first quarter of 2027. [\[381\]](#)

In 2022, 91% of delivery points offering mFRR did so under the bilateral 'opt-out' arrangement between aggregator and supplier; use of the correction model declined from 2021 to 2022. [\[390\]](#)

Average Belgian reserve capacity prices 2024 → 2025: frequency containment reserve (FCR) €44.1 → €17.7/MW/h; aFRR up €61.1 → €17.0; aFRR down €21.0 → €8.4; mFRR up unchanged at €7.8. CREG cites large-scale batteries (and, for aFRR, a switch to four-hour blocks). [\[301\]](#)

Average Belgian aFRR need in 2025: 103 MW up and 107 MW down; mFRR 926 MW up and 836 MW down. [\[301\]](#)

In October 2025 CREG approved revised rules to facilitate the participation of distribution-grid-connected assets in the aFRR and mFRR markets. [\[301\]](#)

More than 22 GW of battery projects in Elia's connection pipeline (June 2025); Elia considers 2–3 GW (2030) and 4–6 GW (2035) system-relevant. [\[102, pp. 348, 350\]](#)

Belgium had about 140,000 home batteries (614 MW) at the end of 2024; about 11,400 delivered market flexibility and about 1,000 were unlocked for balancing (2024). [\[102, pp. 94–95, 302\]](#)

Elia's Summer Outlook 2026 puts small-scale battery capacity in Belgium at about 740 MW, against 640 MW for large-scale batteries. [\[323\]](#)

The capacity remuneration mechanism is open to production, demand-side management and storage units, subject to conditions such as a minimum derated capacity of 1 MW; there is no public information that home batteries take part, and the contracted volume consists mainly of power plants, large battery parks and industrial demand response. [\[382\]](#)

Since 1 January 2025, flexibility and aggregation activities in Brussels require a licence separate from the supply licence; the Brussels regulator describes the flexibility market in the region as still at an emerging stage and names Flexcity, Centrica Business Solutions Belgium, Lifepowr, Montea and Powernaut as active or positioning themselves. [\[96, pp. 31–32\]](#)

The Brussels regulator's list of licence holders for flexibility and/or aggregation services shows six companies: Centrica Business Solutions Belgium, Companion.energy, Eneco Energy Trade, Flexcity Belgium, Lifepowr and Montea. [\[391\]](#)

The licence rests on article 26ter of the Brussels electricity ordinance of 19 July 2001 and a Brussels government decree of 30 May 2024. [\[392, p. 2\]](#)

Since 9 January 2026, the date the Walloon decree of 19 December 2025 on miscellaneous energy provisions entered into force, flexibility service providers no longer have to hold a regional licence for the supply of flexibility services. [\[393\]](#)

Flanders had about 189,100 registered home batteries with 1,866.7 MWh on 15 September 2026 (provisional; registrations can lag installations by up to six months). [\[167\]](#)

The October 2025 capacity auctions contracted, for 2029–30, 239 MW of demand response and 179 MW of new batteries (derated), at a weighted average price of €27.3k per MW per year; the one-year-ahead auction for 2026–27 cleared at €14.1k per MW per year. [\[165\]](#)

The Flemish Region had about 2,992,000 private households on 1 January 2026; with about 189,100 registered home batteries this gives about 63 per 1,000 households (Germany, October 2025: about 48). [\[367\]](#)

Elia estimates that a home battery on a dynamic energy contract could save a Belgian household €230 to €470 a year in 2036, depending on the battery. [\[175\]](#)

In Flanders, a bidirectional charger must be approved by Synergrid; for small installations a notification to Fluvius is enough, while other installations need a prior grid study. [\[394\]](#)

Belgium's first bidirectional charging hub, in Ghent, runs as a pilot until June 2027 under the European COPPER project. [\[395\]](#)

The car-sharing company Share4Mobility, We Drive Solar and Renault aim to launch a commercial vehicle-to-home offer in Belgium by the end of 2026 or early 2027. [\[395\]](#)

We found no commercial vehicle-to-grid offer for households in Belgium. [\[395\]](#)

In the Synergrid documents approved by the Brussels regulator on 14 May 2024 for a limited period (until 31 December 2025), low-voltage access points can take part in FCR and aFRR; for the capacity remuneration mechanism they can be added to a provider's pool from May 2024, measured on the main meter. [\[218\]](#)

Trevion and Bolt, with Powernaut as the virtual power plant operator, steer customers' home batteries, chargers and solar inverters through an energy management system and pay them a fee for taking part. [378]

Trevion's flexibility programme enrolls customers' devices in the imbalance market through a virtual power plant and pays €10 per kW of home battery per year. [379]

Frank Energie steers heat pumps, chargers and solar panels in Belgium; its home-battery steering remains linked to its dynamic contracts. [380]

Since 9 June 2026 the transfer-of-energy rules and the manual frequency restoration reserve are live on low voltage; all balancing products are open at all voltage levels, except transfer of energy for day-ahead and intraday trading on low voltage; in Wallonia a decree amendment for aFRR is expected in the third quarter of 2026. [210]

Low-voltage access points can take part in frequency containment reserve (FCR) and automatic frequency restoration reserve (aFRR); the guide's metering table names a submeter as the source of the measurement data for both, for now only third-party submeters. The opening of aFRR to low voltage is recorded in its version history from April 2023. [207]

Vehicle-to-grid: first offers, few measured results Statements and sources

Since October 2024, owners of a Renault 5 E-Tech or Alpine A290 in France can join Mobilize V2G with a bidirectional PowerBox Verso charger and a Mobilize electricity contract; The Mobility House trades the cars' flexibility. [375]

Octopus Power Pack works only with a BYD Dolphin and a Zaptec Pro charger; the car must be plugged in 12 hours a day on 20 days a month, take less than 210 kWh a month, and have a minimum charge level below 30%. [376]

The Power Pack bundle combines a leased BYD Dolphin, a bidirectional Zaptec Pro charger and free home charging, at a launch price of under £300 a month. [373]

BMW and E.ON's offer pays 24 cents per hour plugged in with vehicle-to-grid switched on, up to €60 a month (€720 a year), for BMW's Neue Klasse cars with a BMW Wallbox Professional. [374]

By June 2026 MyWheels had more than 350 shared cars that can feed power back, about 300 in Utrecht and 50 in Eindhoven. [384]

Stedin and the charging-point operator Lomboxnet signed a contract in June 2026 that sets when and under what conditions the cars may feed power back. [385]

Over five months in 2025, 50 shared Renault 5s in Utrecht fed more than 65,000 kWh back into the grid and lowered the evening load on the local grid by 300 kW several times. [396]

In Project Sciurus (April 2018 – March 2021), 320 bidirectional chargers were installed in homes; each could create £230 to £300 of value a year on wholesale electricity markets. [397]

From 1 January 2026, electricity that an electric car stores and feeds back pays German grid fees only once, after an amendment of the Energy Industry Act passed by the Bundestag in November 2025. [383]

The Utrecht partners call the Dutch double energy tax on electricity that is stored and fed back a serious obstacle to scaling vehicle-to-grid. [385]

Car makers restrict battery warranty coverage when batteries are cycled far more often than about once a day. [395]

In 2024, Renault and The Mobility House named double grid fees, more than 900 grid operators and a slow smart-meter rollout as obstacles to vehicle-to-grid in Germany. [375]



Britain lets independent aggregators sell households' flexibility on the wholesale market without the supplier's consent; deciding who compensates the supplier proved the hard part.

NUMBERS

Belgian equivalent

There is no Belgian volume to compare with: the Belgian route for selling flexibility on the day-ahead and intraday markets through an independent aggregator, open to larger connections, had not been used by 2025. For scale: £19 million spread over about 28 million British households is about £0.70 per household per half year.

Period covered: 2023-2027

SOURCES

[\[357\]](#) Ofgem, Decision on BSC modification P415 (approval; supplier compensation mutualised; compensation price based on the price cap methodology) (6 Oct 2023)

[\[358\]](#) Ofgem, P511 urgency decision letter (≈£19 million mutualised 1/9/2025–28/2/2026; large generators using the route)

[\[359\]](#) Ofgem, P511 Balancing and Settlement Code (BSC) changes — decision page (approved 10/8/2026, implemented 24/8/2026)

[\[360\]](#) Elexon, 'New rule approved to support flexibility' (P511 thresholds <2 MW / 2–10 MW / >10 MW; £19 million) (12 Aug 2026)

[\[361\]](#) Elexon, P510 modification page (direct compensation; status: assessment, report expected 11/2/2027)

[\[381\]](#) Synergrid, Design note Transfer of Energy — consultation report ('ToE DA/ID ... has never been used so far'; regulated CREG price after 4 months without agreement) (2025)

FURTHER READING

VITO-EnergyVille for Synergrid (2024), 'Study on the need for correction mechanisms for independent aggregation of DSO end points' — compares settlement models in France, Finland, Estonia, Hungary, Denmark, Great Britain and an EU-wide scan including Belgium [\[390\]](#)

Elexon, P510 'Introducing direct, bidirectional compensation' — the live British debate, with workgroup papers [\[361\]](#)

Synergrid, Design note Transfer of Energy (consultation report) — the Belgian roadmap for low-voltage connections [\[381\]](#)

Nordic Energy Research (2022), 'The regulation of independent aggregators' — accessible comparison of compensation models pub.norden.org/nordicenergyresearch2022-04



The US ordered its wholesale markets to accept pooled home devices; five years on, almost no households take part, because the practical conditions have not been worked out.

SOURCES

[\[353\]](#) Lawrence Berkeley National Laboratory, 'State regulatory opportunities to advance distributed energy resource aggregations in wholesale markets' (Jan 2025)

[\[182\]](#) FERC, 2025 Assessment of Demand Response and Advanced Metering (no update on aggregation volumes)

FURTHER READING

Lawrence Berkeley National Laboratory (2025) — the four barriers explained, with options for state regulators [\[353\]](#)

In Sweden, a rush of batteries into small reserve markets cut reserve prices by roughly 80–90% in three years.

NUMBERS

Per kW per year	Disturbance reserve (upward): about €1,050 per kW per year in 2022 and about €175 in 2025, if sold in every hour of the year. For comparison, Belgium's capacity auctions of October 2025 paid about €14 to €27 per derated kW per year.
Belgian equivalent	Belgium shows the same pattern a step later: the federal regulator recorded average capacity prices falling from €44.1 to €17.7 per MW per hour for the frequency containment reserve and from €61.1 to €17.0 for upward automatic reserve between 2024 and 2025, citing large batteries and a change in market design. Belgium needs only about 100 MW of automatic reserve in each direction, against about 740 MW of small-scale batteries that Elia expects for 2026 and over 22 GW of large battery projects in its connection queue (2025).

Period covered: 2022–2025

SOURCES

- [354] Svenska kraftnät, Balancing Market Outlook 2030–2026 update (need vs prequalified capacity Q4 2025; price charts 2021–2025)
- [301] CREG, Monitoring Report 2025, study F(3197), Tables 7-1 and 7-2 and §224–225 (25 Jun 2026)
- [102] Elia, Adequacy and flexibility study 2026–2036 (AdeqFlex'25), BOX 10-3 p. 348 (>22 GW battery projects) (Jun 2025)
- [165] Elia press release on the October 2025 capacity remuneration mechanism auctions (for 2029–30: 239 MW of demand response and 179 MW of new batteries, derated, at a weighted average of €27.3k per MW per year; €14.1k per MW per year for 2026–27), as republished by MarketScreener
- [323] Elia, Summer Outlook 2026 (≈740 MW small-scale batteries)

FURTHER READING

Svenska kraftnät, Balancing Market Outlook 2030 (2026 update) — need, supply and prices per reserve product [354]
 Clean Horizon Storage Index — monthly revenue index for batteries in 15 European markets, including Belgium and Sweden cleanhorizon.com/battery-index

A Swedish aggregator grew to some 15,000 home batteries, but as reserve markets filled up it earned less per battery and moved into other markets.

NUMBERS

Per household per year	≈€2,700 (earlier years, 10 kW battery) → ≈€1,680 (2024, 10 kW / 10 kWh), gross before fees
Per kW per year	≈€270 per kW per year (earlier years) → ≈€170 (2024), gross before fees; for comparison, Belgium's capacity auctions of October 2025 paid about €14 to €27 per derated kW per year.
Belgian equivalent	For comparison, Elia estimates that a home battery on a dynamic contract could save a Belgian household about €230–470 a year in 2036, depending on the battery, behind the meter and before any reserve income.

Period covered: 2023–2025

SOURCES

- [362] CheckWatt press release, 'CheckWatt's revenue increased by 150 percent' (turnover, MW, number of installations) (27 Mar 2025)
- [398] CheckWatt, 'CheckWatt signs agreement to be acquired by Emaldo Group' (2 Apr 2025)
- [364] CheckWatt, 'Comparing profitability for residential batteries with different operating modes in Finland during January–June 2025'
- [399] CheckWatt, FAQ (fees: €5/month + 20% of compensation; markets served)
- [400] CheckWatt press release, local flexibility market western Sweden (500 installations, 5.5 MW) (9 Dec 2024)
- [363] Hemsol.se, 'CheckWatt: omdöme, funktion, pris och ersättning' (historical ≈3,100 SEK/kW/yr; 2024 ≈19,284 SEK for 10 kW/10 kWh) (independent comparison site) (2026)
- [165] Elia press release on the October 2025 capacity remuneration mechanism auctions (for 2029–30: 239 MW of demand response and 179 MW of new batteries, derated, at a weighted average of €27.3k per MW per year; €14.1k per MW per year for 2026–27), as republished by MarketScreener

FURTHER READING

CheckWatt's own Finnish comparison of operating modes (reserves vs self-consumption), H1 2025 [364]



Netherlands

NL4

[↑ The example, p. 90](#)

A Dutch supplier that shared imbalance-trading earnings with home-battery owners saw them peak in summer 2024 and then fall, and responded by trading in more markets.

SOURCES

[352] Frank Energie, 'Ontwikkeling handelsresultaten thuisbatterijen' (Q1 2025 results; causes; new markets from Q2 2025)

[355] Solar & Storage Magazine NL, 'Opbrengst thuisbatterij neemt af na recordjaar 2024, nieuwe handelsmarkten op komst' (€892,278.53; €291.79 in August 2024) (16 Apr 2025)

FURTHER READING

Clean Horizon Storage Index — monthly battery revenue index across 15 European markets (not specific to home batteries) cleanhorizon.com/battery-index

Mijnbatterij.nl — independent Dutch platform tracking real home-battery results mijnbatterij.nl



Germany

DE3

[↑ The example, p. 91](#)

Germany has two million home batteries, about 48 per 1,000 households, but almost all just store the household's own solar power.

NUMBERS

Belgian equivalent Home batteries per 1,000 households: Flanders ≈63 (about 189,100 registered on 15 September 2026 / 2.99 million private households on 1 January 2026); Germany ≈48 (1.97 million in operation / 41.1 million households, October 2025); Netherlands ≈9 (79,231 registered / 8.66 million private households, September 2026); Australia ≈55 added in 13 months under the federal discount (507,000 / 9.28 million occupied dwellings, 2021 census). United Kingdom: stock not published; more than 40,000 certified installations in 2025 alone. Belgium as a whole: about 140,000 home batteries (614 MW) at the end of 2024; Elia expects about 740 MW of small-scale batteries in 2026.

Period covered: 2023-2025

SOURCES

[365] Speicheratlas, 'Heimspeicher in Deutschland' (Marktstammdatenregister data, October 2025)

[401] Enpal press release, 'Über 40.000 Enpal-Kunden in Deutschlands größtem Virtuellen Kraftwerk' (company figures) (17 Dec 2025)

[366] Destatis, Haushalte und Familien (41.1 million main-residence households)

[102] Elia, AdeqFlex'25, BOX 3-2 p. 94 and p. 144–145 (140,000 home batteries, 614 MW, Belgium, end of 2024) (Jun 2025)

[402] Fluvius data via VEKA / Solar & Storage Magazine (174,812 registered home batteries in Flanders, 1/4/2026, provisional)

[388] GadgetGear.nl citing energieleveren.nl via Solar Magazine (79,231 registered home batteries in NL, 1,005.9 MW, 30/9/2026)

[403] Zonneplan, 'Aantal thuisbatterijen in Nederland' (EDSN: possibly only half registered; net metering ends 2027) (Jul 2026)

[404] MCS, 'UK homes installing a small-scale renewable every 90 seconds' (40,000+ certified battery installations in 2025) (10 Feb 2026)

[387] ABS, 2021 Census QuickStats Australia (9,275,217 occupied private dwellings)

[167] Solar & Storage Magazine, 'De harde cijfers: Vlamingen installeerden dit jaar al ruim 10.000 thuisbatterijen, daadwerkelijke groei nog fors hoger' (Fluvius data: about 189,100 registered home batteries in Flanders with 1,866.7 MWh on 15 September 2026; provisional)

[367] Statistics Flanders (Statistiek Vlaanderen), 'Huishoudtypes' (about 2,992,000 private households in the Flemish Region on 1 January 2026)

[405] Stromvermittlung, Stromlexikon 'Saldierung' (no net metering over the year in Germany; meters running backwards are not allowed; import and export are metered separately)

[406] 1KOMMA5°, 'Zweirichtungszähler' (feed-in payment below 8 cents per kWh for new systems; separate metering of feed-in and consumption)

[407] Eurostat, household electricity prices (nrg_pc_204), Germany, second half of 2025: €0.387 per kWh including taxes, consumption band 2,500-5,000 kWh

[408] Flemish minister in parliament (130,000 home batteries detected, ±June 2026)

FURTHER READING

Speicheratlas — monthly German home-storage statistics from the official register [365]



Australia added 500,000 batteries in 13 months; only a minority joined a virtual power plant, yet battery homes draw 0.7 kW less at the evening peak.

NUMBERS

Belgian equivalent If Flanders' roughly 189,000 registered home batteries (September 2026) each shaved 0.7 kW off the evening peak, that would be about 130 MW. Flemish batteries are smaller (11.5 kWh on average for those installed in 2025, against about 28 kWh) and few Flemish households have a dynamic contract, so the real effect may differ, especially on winter evenings.

Period covered: 2025-2026

SOURCES

[370] AEMO, Quarterly Energy Dynamics Q2 2026, p. 11–12

[368] RenewEconomy, 'Passive home batteries deliver enormous benefit to the grid, says AEMO, even if not orchestrated in VPPs' (10 Jun 2026)

[409] Prime Minister of Australia, 'Half a million cheaper home batteries bringing down bills' (14 Aug 2026)

[410] Minister for Climate Change and Energy, 'More Australians to benefit from Cheaper Home Batteries' (\$2.3 bn → \$7.2 bn; tiered support from 1 May 2026)

[386] Energy-Storage.news, 'Australia's Cheaper Home Batteries Program officially passes 500,000 installations' (507,000; average 28 kWh) (17 Aug 2026)

[102] Elia, AdeqFlex'25 p. 144–145 (Flemish home-battery subsidy 2019 – March 2023) (Jun 2025)

[369] ACCC (Australian Competition and Consumer Commission), June 2026: 'only around 24% of customers with installed batteries participate in a virtual power plant' (share as of January 2026)

[167] Solar & Storage Magazine, 'De harde cijfers: Vlamingen installeerden dit jaar al ruim 10.000 thuisbatterijen, daadwerkelijke groei nog fors hoger' (Fluvius data: about 189,100 registered home batteries in Flanders with 1,866.7 MWh on 15 September 2026; provisional)

[402] Fluvius data via the Flemish Energy and Climate Agency, reported by Solar & Storage Magazine (average 11.5 kWh for home batteries registered in Flanders for 2025, provisional) (2026)

FURTHER READING

AEMO Quarterly Energy Dynamics — quarterly measured effect of home batteries on demand aemo.com.au/energy-systems/major-publications/quarterly-energy-dynamics-qed



A French aggregator fits free control boxes on electric heaters, financed by a ten-year state-backed contract for 721 MW from homes and small buildings.

SOURCES

[356] Voltalis press release, 'Voltalis lauréat de l'appel d'offres effacement avec 721 MW retenus' (3 Oct 2022)

[372] RTE, 'L'appel d'offres effacement' (organisation, lots, complementary remuneration to the capacity mechanism)

[411] Voltalis group homepage (1.5 million connected devices)

[371] Kelwatt, 'Voltalis: avis, fonctionnement du thermostat' (three-year commitment; free box) (20 Aug 2026)

[165] Elia press release on the October 2025 capacity remuneration mechanism auctions (for 2029-30: 239 MW of demand response and 179 MW of new batteries, derated, at a weighted average of €27.3k per MW per year; €14.1k per MW per year for 2026-27), as republished by MarketScreener

[412] Voltalis press release on its secondary-reserve certification (2/7/2026)

FURTHER READING

RTE — how the French demand-response tender works [372]



Netherlands

NL9

[↑ The example, p. 94](#)

In Utrecht, shared electric cars that feed power back into the local grid in the evening grew from 50 to about 300 in a year, and a contract with the grid operator now lays down when they are allowed to do so.

SOURCES

[396] Solar Magazine, 'Utrechtse deelauto's verminderen congestie op stroomnet met 300 kilowatt' (50 Renault 5s and 50 bidirectional charging points; more than 65,000 kWh fed back in five months; 300 kW reductions in the evening; 120 more cars from November 2025; aim of 1 MW in winter 2025-26)

[384] Solar Magazine, 'Deelauto's MyWheels leveren 2 megawatt ontladvermogen en 25 megawattuur opslagcapaciteit' (more than 350 cars: 300 in Utrecht, 50 in Eindhoven; user survey; 500 cars by end of 2026, 1,000 in 2027)

[385] Solar Magazine, 'Capaciteitssturingscontract voor elektrische auto's in Utrecht die stroom terugleveren' (contract between Stedin and LomboXnet; double energy tax called a serious obstacle) (19 Jun 2026)

FURTHER READING

European Commission, Urban Mobility Observatory, 'Two European cities advance vehicle-to-grid solutions' (2025) urban-mobility-observatory.transport.ec.europa.eu/news-events/news/two-european-cities-advance-vehicle-grid-v2g-solutions-2025-07-04_en

Last Mile Solutions, 'Europe's first V2G ecosystem in Utrecht' (case study on the charging infrastructure) lastmilesolutions.com/insights/cases/v2g-utrecht-last-mile-solutions-we-drive-solar



United Kingdom

UK18

[↑ The example, p. 95](#)

In Britain, a supplier sells vehicle-to-grid as one package of leased car, bidirectional charger and free home charging, on condition that the car stays plugged in for long hours and the supplier can discharge it.

SOURCES

[373] Octopus Energy, 'Octopus & BYD turbocharge EV revolution with all-inclusive car and charging bundle' (Power Pack bundle: BYD Dolphin, Zaptec Pro bidirectional charger, free home charging; launch price under £300 a month) (23 Jun 2025)

[376] Octopus Energy, 'Octopus Power Pack: the UK's first Vehicle-to-Grid tariff' (eligibility and conditions: 12 hours a day on 20 days a month, under 210 kWh a month, minimum charge level below 30%, smart meter, G99)

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France

FR6

[↑ The example, p. 96](#)

In France, Renault offers vehicle-to-grid to private car owners as a package of home charger and electricity contract for its own models, with the battery warranty kept by the car maker.

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Chapter 8 · Data, meters and standards

The meters are mostly there; what matters now is whether data, prices and control signals flow by default

Where Belgium stands Statements and sources

80.45% of Flemish meters (79.26% electricity, 82.35% gas) were digital in October 2025; full rollout target 30 June 2029. [\[437, p. 19\]](#)

From 2026 quarter-hourly values are read by default for electricity; they are not shared with the supplier or an energy service provider without the customer's consent; standard billing uses the difference between meter readings. [\[211\]](#)

The quarter-hourly metering regime is requested by the customer from its supplier and is needed for energy sharing, dynamic or time-of-use contracts and flexibility services. [\[101\]](#)

148,125 homes (5.90% of digital meters in homes) were in the quarter-hourly metering regime in June 2026. [\[101\]](#)

The flexibility plan's action 14 stated that quarter-hourly values would 'in a next phase also be used by default in market processes (metering regime 3), where this is currently only possible on request'. [\[441\]](#)

The grid operators' settlement redesign (Settle 2.0) takes the quarter-hourly values of each customer with a communicating digital meter in Flanders into account in allocation from 2026; individual quarter-hourly values are sent to suppliers only for meters in the quarter-hourly regime. [\[438\]](#)

Fluvius: the measured quarter-hourly values of all grid users' digital electricity meters will be brought into market processes by default (new settlement engine, 2026); a new generation of digital meters is planned from 2033. [\[436, pp. 8, 39\]](#)

The Flemish regulator VREG has been called the Vlaamse Nutsregulator (VNR) since 1 January 2025. [\[442\]](#)

Wallonia's largest grid operator had 429,272 communicating meters at the end of 2025, 28% of its low-voltage meters (115,926 installed in 2025). [\[231\]](#)

Walloon grid operators must reach 80% digital electricity meters by 31 December 2029; in Brussels large-scale rollout started in October 2023 with most homes to be equipped by the end of 2030. [\[443\]](#)

Brussels had 161,055 smart meters (all customer types) at the end of 2025, 3% of them in the quarter-hourly regime; against 538,401 residential delivery points that is at most about 30% of homes (simple ratio; an upper bound, as the meter count includes non-residential customers). [\[96, p. 18\]](#)

Under the Brussels electricity ordinance, the remote-reading function of a smart meter is off by default; households give or manage consent through the grid operator's My Sibelga app. [\[444\]](#)

Since 1 June 2025 the communication of smart-meter data to the market is active in Brussels; customers can choose regime R1 (monthly indices) or R3 (monthly validated curves plus daily curves the next day). At the end of 2025, 3% of the 161,055 smart meters were in the quarter-hourly regime, fewer than 5,000 households. [\[96, p. 18\]](#)

The Brussels grid operator tested a near-real-time data platform (data below 15-minute resolution from the meter's customer port, shared with energy service providers with explicit consent) in a proof of concept from October 2024 to June 2025 with six energy-sharing operations; it concluded that, 'at this stage', it does not plan an active role in building such a platform, but remains open if a harmonised interregional framework emerges, citing insufficient demonstrated market interest and the lack of critical mass in Brussels alone. [\[445, pp. 3, 14, 24\]](#)

The Flemish regulator's decision on the grid operators' proposal for the allocation and reconciliation methodology for electricity, under which measured quarter-hourly values replace profiled volumes in allocation from 2026, also for customers in the standard metering regime. [\[439\]](#)

Fluvius: it is a regulatory choice to include the real quarter-hourly values in allocation from 2026, instead of a statistical spread of real monthly volumes; a new settlement engine is being built for this. [\[436, p. 3\]](#)

Why settlement on measured values gives suppliers a reason to sell flexibility Statements and sources

British households were settled on a standard profile, so a supplier whose customers moved their use to cheap hours was still charged as if they had not; in 2021 the regulator decided that every meter would be settled on measured half-hourly use. [\[415\]](#)



Netherlands

EU1

[↑ The example, p. 102](#)

Dutch grid operators propose a short list of five protocols for home energy managers, down from at least ten, and plan to certify devices by the end of 2026.

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Project page with test events and open-source software [447]



United States

US3

[↑ The example, p. 103](#)

California requires its main electricity providers to publish every time-varying rate in one public database, so devices can fetch their home's exact price.

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Britain's plan for machine-readable supplier tariffs (from 2027) [430]



United Kingdom

UK14

[↑ The example, p. 104](#)

Britain is moving every electricity meter, homes included, to settlement on actual half-hourly use, so that suppliers gain when their customers shift their use to cheaper hours.

NUMBERS

Belgian equivalent Spread evenly over about 34 million metering points and 25 years, Ofgem's net benefits of £1.6–4.5 billion come to roughly £2–5 (about €2.3–5.8) per metering point per year.

Period covered: 2021–2027

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Germany

DE1

[↑ The example, p. 105](#)

Germany's heavily certified smart meter reached only 6% of metering points in ten years, leaving its new flexibility rules largely without the hardware they depend on.

NUMBERS

Belgian equivalent Coverage comparison: Germany 5.9% of metering points with a smart metering system (June 2026) against about 80% digital meters in Flanders (October 2025), 28% of low-voltage meters at Wallonia's largest grid operator (end of 2025) and about 161,000 smart meters in Brussels, at most about 30% of homes (end of 2025).

Period covered: 2016–2026

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