Why smart homes need AI-driven energy intelligence

Schneider Electric™



Enabling system-level energy orchestration delivering savings, resilience and simplicity

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Home Energy Intelligence establishes system-level orchestration as a foundational capability for future-ready, adaptive homes.

Executive Summary

Residential energy is entering a new era, defined by electrification. Heat pumps, electric vehicles, electric water heating, rooftop solar, batteries, and connected appliances are moving into homes.

This shift is positive: electricity can be decarbonized, produced locally, and managed digitally, supporting more sustainable, efficient, resilient, and energy-independent households. It also reflects homeowner priorities: 48% rank energy efficiency as their top concern and 38% want to generate their own power.

But electrification makes home energy management more complex, with these factors in play:

- **Flexible loads** — loads whose operation can be shifted in time without affecting user comfort, such as EV charging, domestic hot water, and pool pumps.
- **Distributed generation** — electricity produced on-site by the home itself, most commonly rooftop solar, rather than drawn solely from the grid, turning the household from a pure consumer into a producer.
- **Time-dependent electricity tariffs** — pricing where the cost of a kilowatt-hour changes according to when it is used, whether through fixed time-of-use bands or hourly dynamic rates tied to wholesale markets, so *when* energy is consumed affects the bill as much as *how much*.

Taken together, these factors change what good energy management looks like. It is no longer enough to consider how much electricity a home uses considering what increasingly drives the bill is when it is used, whether it is drawn from the grid or self-generated, and whether surplus is stored or exported.

Each of these decisions carries a cost or a saving, and the way they interact is increasingly complex.

While this creates opportunities to reduce costs, coordinating these decisions (such as weighing tariffs, solar output, and household needs in real time), which has traditionally been done manually, is becoming increasingly difficult, and is more than any homeowner can reasonably do by hand.

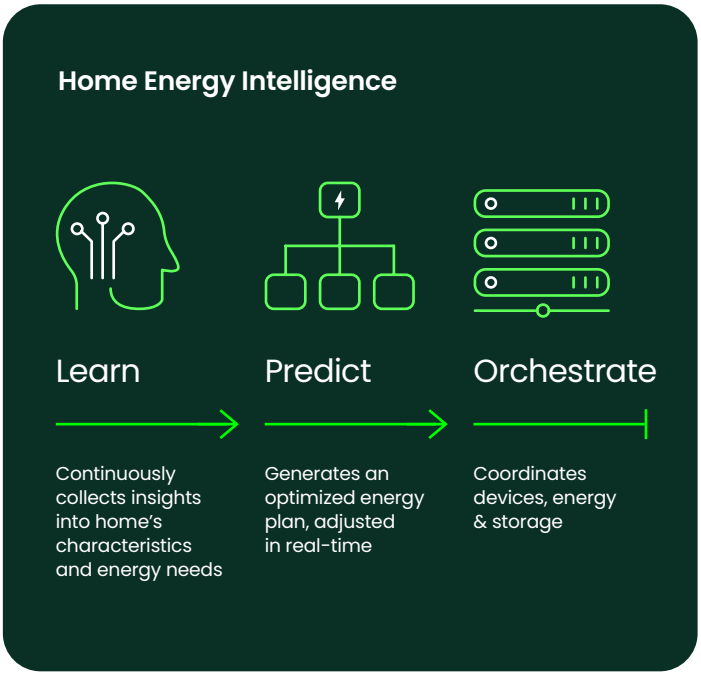


This is where home energy intelligence becomes essential.

We define home energy intelligence as the ability of a home to continuously learn, predict, and autonomously orchestrate energy resources, devices, and storage to balance cost, carbon impact, comfort, resilience, and electrical capacity according to occupant preferences and grid conditions.

So, what does "home energy intelligence" look like? At Schneider Electric, we've created advanced energy technology **that we call the "energy brain."** It balances cost, comfort, and electrical capacity limits. As a result, homeowners, can realize lower bills, less manual effort, better solar self-consumption, fewer capacity risks and enables future participation in flexibility programs – all without compromising comfort or convenience.

Schneider Electric's Wiser Home illustrates how this approach can be applied in practice. Acting as a modular, unified platform that combines smart home automation and energy management, Wiser Home uses AI-driven optimization to continuously orchestrate home energy consumption and production according to tariffs, solar availability, user preferences, and home constraints to generate and adjust an optimized energy plan. The savings quantified in this paper are based on simulations of this optimization logic.



Key Takeaways

1

AI-driven home energy intelligence helps households use electricity **at the right time and in the right way** to cut energy costs by shifting flexible loads to the most cost-effective energy sources, while respecting user preferences and home electrical capacity limits.

2

In Schneider Electric simulations, the Wiser Home AI feature increases cost savings of **up to 27% in homes equipped with solar and dynamic tariffs.**

3

The wider the difference between high and low cost energy periods, including the value of self-consuming solar instead of exporting it, the **more value an energy intelligent home can capture.**

Part 1 — The New Energy Landscape Keeps Reshaping Homes

1. Electrification creates new opportunities and new complexities

For decades, household energy use was relatively simple and predictable. Heating typically relied on gas or oil, while electricity powered lighting, appliances, and consumer electronics. Most households paid a fixed electricity rate, so there was little reason to think about when energy was consumed.

That model is rapidly changing. **Homes are becoming increasingly electric.** Heat pumps, electric vehicles (EVs), electric water heaters, induction cooking, rooftop solar, batteries, and connected devices are moving from early-adopter choices into mainstream conversations.

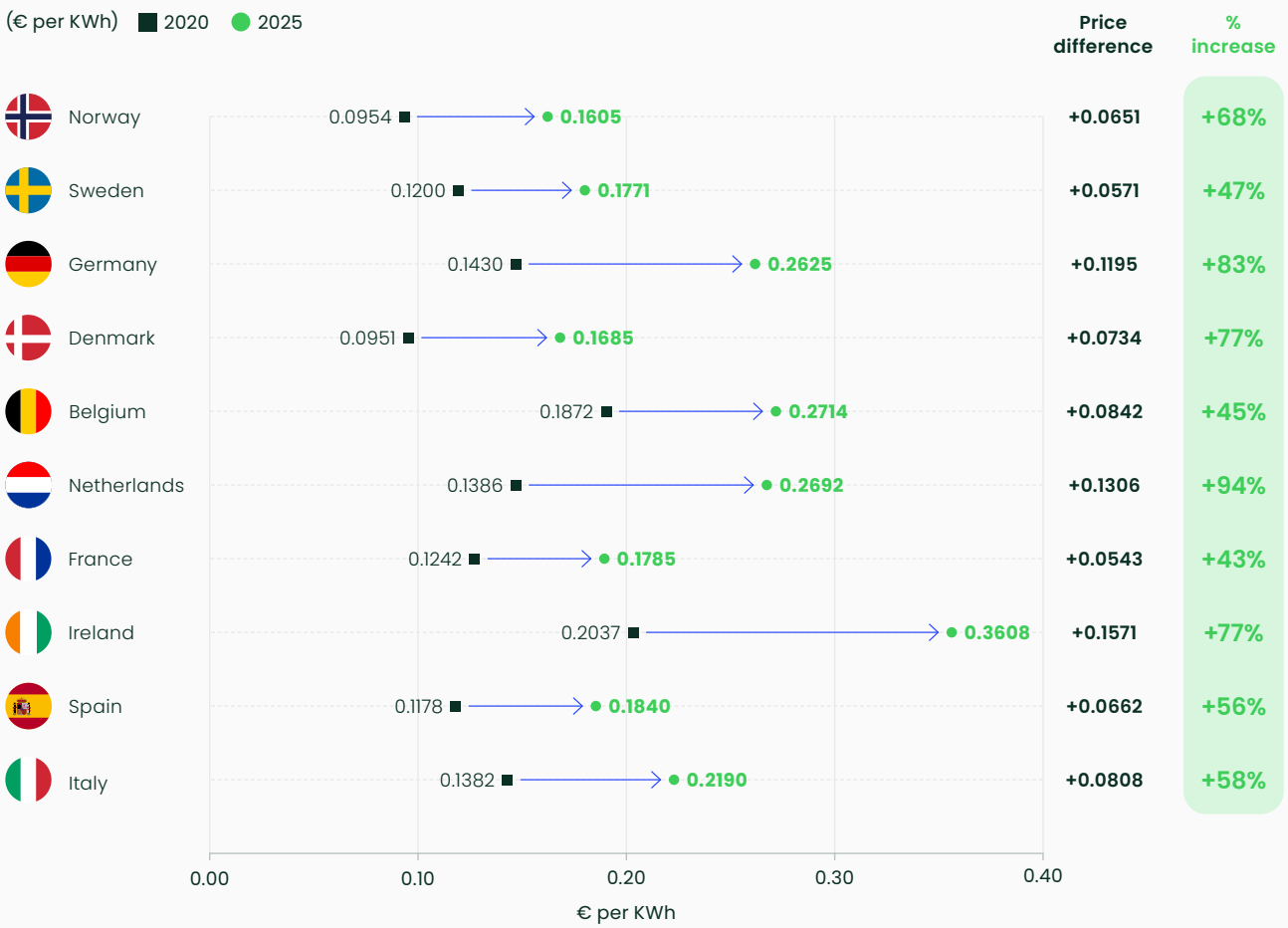
For example:

- The International Energy Agency reports that global electric-car sales passed 20 million in 2025 — about a quarter of all new cars sold worldwide — and those European sales, after stagnating in 2024, rebounded by roughly 30% to more than four million.
- European heat-pump sales returned to growth in 2025, rising about 11% to some 2.6 million residential units and lifting the installed base to around 28 million.
- The average connected home now runs 17 devices underlining how deeply electricity is becoming embedded in everyday life.

This transition creates major opportunities. Electricity can be made from renewable and low-carbon sources. It can be measured in real time. It can be automated. It can be shifted. That makes it fundamentally different from the fuels it replaces. As a result, electrification can improve energy efficiency while **helping decarbonize homes,** which account for approximately 22% of global greenhouse-gas emissions.

Beyond the decarbonization of the energy system, another force accelerating the shift toward an all-electric future is the growing importance of **energy security.** Recent geopolitical tensions and supply disruptions have exposed the vulnerability of fossil fuel-based energy systems, leading to fluctuating electricity prices that directly impact household budgets. As European Commissioner for Energy & Housing Dan Jørgensen stated: *"The conflict in the Middle East—and its impact on energy prices—underscores how volatile global energy markets remain, and how urgently Europe must strengthen its energy resilience."*

Electricity price changes for household consumers in Europe, 2020-2025*



*Schneider Electric's analysis - https://blog.se.com/homes/2026/06/10/energy-in-homes/

Electrification is therefore no longer only about sustainability, it is also about resilience, cost control, and reducing dependence on volatile energy markets.

Electrification is also changing the role of households within the energy system. Increasingly, homes are not only consuming energy but producing it. With more than 11 million European homes equipped with rooftop solar, households are becoming **prosumers,** shifting from passively consuming energy to actively generating, consuming, storing, and in some cases exporting electricity. This trend mirrors the broader expansion of solar energy across Europe, now the fastest-growing source of electricity in the EU.

While these developments create significant benefits, they also introduce a new level of complexity for homeowners.

The practical consequences are significant. As homes electrify, heating, cooling, and domestic hot water are becoming major electrical loads, significantly increasing household electricity demand. EV charging adds another major source of consumption and can increase overall household electricity use by roughly 30–40%.

More importantly, many of these loads do not need to operate immediately to deliver the same level of comfort. These **flexible loads** can be shifted in time without affecting the homeowner's experience. At the same time, electricity prices, solar generation, and grid conditions increasingly vary throughout the day. As a result, the value of electricity has become more time-dependent, making **when electricity is used nearly as important as how much is used.**

This creates a new challenge for homeowners. They must increasingly balance multiple and sometimes competing objectives:

- Minimize energy costs in the face of volatile electricity prices.
- Maximize self-consumption of locally generated solar energy despite weather-dependent production.
- Maintain comfort and convenience.
- Avoid exceeding contractual power limits or creating peak demand.

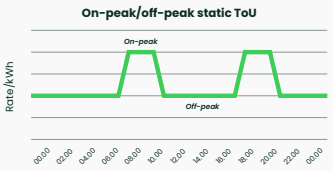
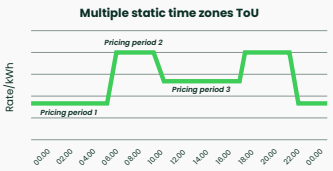
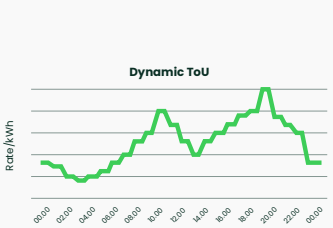
A typical household may face situations such as charging an EV overnight, shifting water heating to low-price periods, or deciding whether to consume or export excess solar production. Individually, these decisions are simple. Collectively, they become difficult to manage manually, particularly as electricity prices become more dynamic and responsive to market and grid conditions.



2. Tariffs are Becoming Part of the Home Energy Management

As more renewable electricity enters the grid, supply becomes more variable and weather dependent. Periods of high generation (e.g. solar production at midday) tend to lower market prices, while low generation or high demand can lead to higher prices. To better align consumption with supply, some tariffs, particularly dynamic tariffs, reflect these fluctuations and encourage consumers to use electricity when it is abundant, so cheaper, and reduce usage when the grid is under pressure.

Tariffs are not all the same. The most common types are summarized below.

Tariff type	How it works	What it means for the home	Illustration
Price evolution of months			
Fixed tariff	The kWh price is fixed for a contract period.	Simple and predictable billing, but offers no incentive to shift electricity use over time.	N/A
Variable tariff	The kWh price can change over time (e.g. monthly or quarterly) based on contract terms or a regulated formula.	The bill reflects market trends over time, but there is no incentive to shift consumption within the day.	N/A
Price variation within the day			
Fixed Time-of-Use (ToU) tariff	The day is divided into predefined price periods (e.g. peak, off-peak, sometimes shoulder periods). These price levels are fixed for the contract duration.	Encourages shifting consumption to cheaper periods (e.g. EV charging, water heating), while remaining predictable and easy to understand.	
Variable Time-of-Use (ToU) tariff	The day is also divided into predefined price periods, but these price levels for each period can be updated periodically (e.g. monthly or quarterly).	Provides an incentive to shift usage within the day, but with less price certainty over time.	
Dynamic tariff	The kWh price follows wholesale market variation, typically varying hourly, and often published day-ahead.	Enables strong savings potential for *"highly sophisticated customers who are ready to be engaged with their consumption, who own large loads, and who can closely monitor and control their consumption, and who are able to shift the demand"* (LCP Delta).	

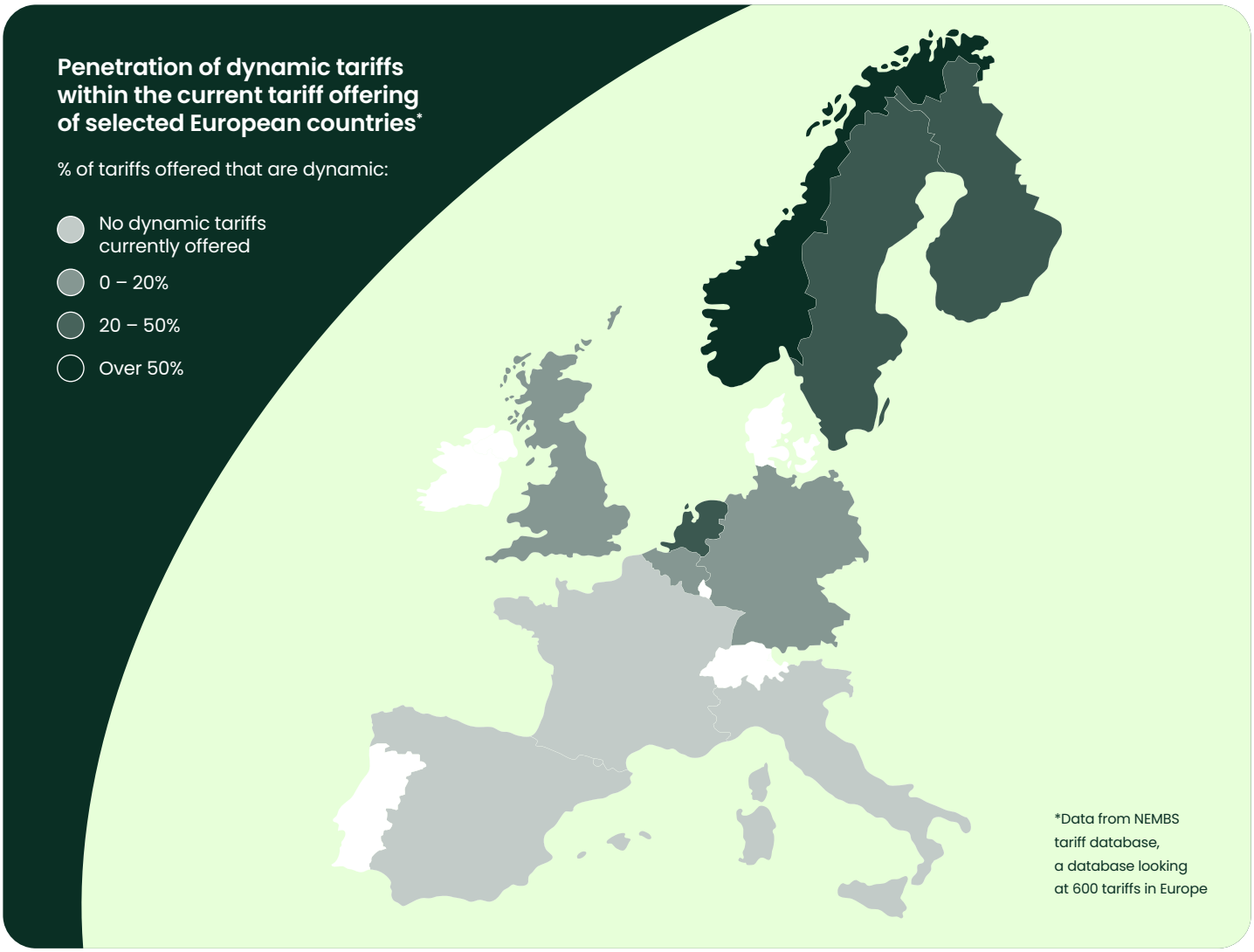
Dynamic tariffs are still unevenly adopted across Europe, but the direction is clear. In the EU, Directive 2019/944 gives final customers with a smart meter the right to request a dynamic electricity price contract and requires at least one supplier to offer it.

In practice, however, adoption varies widely across Member States due to differences in smart meter rollout, levels of flexible asset adoption, and national regulatory frameworks.

ACER (Agency for the Cooperation of Energy Regulators) and CEER (Council of European Energy Regulators) reported in 2024 that 73% of EU households were still on fixed-price contracts. The same report identified slow smart meter rollout as a barrier: only 50% of EU households have smart meters, with ten Member States have a rollout below 30%, of which 6 below 10%. This gap is even more challenging as electricity prices become more volatile.

But in regions where the necessary conditions are in place, namely widespread electrification, smart meter deployment, and flexibility assets such as electric vehicles or heat pumps, adoption of dynamic tariffs is already much higher. It reaches over 50% of households in the Nordics, 80% in Norway. This evolution is also being accelerated by regulation: Germany, for example, has required electricity providers to offer dynamic pricing models since the beginning of 2025.

For homeowners, this creates a new reality. Knowing the tariff is useful, but manually acting on it every day is not realistic. The tariff signal must become part of the home's operating logic, making effective energy management less of a convenience and more of a necessity.



Part 2 — Home Energy Intelligence is Becoming a New Given

1. Why smart devices alone are not enough

In the new energy landscape, the next challenge for smart homes is different. A home with several energy-intensive electric loads cannot be optimized by one device at a time.

If the EV charger, solar inverter, water heater, thermostat, and battery each run in a separate app, the homeowner may have visibility, but not orchestration. Each device may do its job, while the home as a whole is not achieving the highest level of energy optimization possible. For example, that could mean wasting solar production, failing to meet homeowner's needs, or reaching the power contract limit.

This is the gap between smart devices and home energy intelligence. Smart devices can be controlled. An energy-intelligent home can decide how those devices should work together.

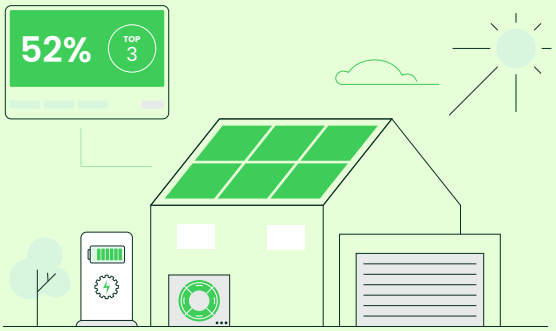
The need becomes clear in practical situations:

- An EV is plugged in at 5pm, but the lowest tariff is expected at 2am. The system should delay charging while still guaranteeing the requested readiness by morning.
- Solar generation is expected at midday. If the user's comfort and readiness requirements allow it, the system should heat water or start EV charging during that window rather than exporting surplus and buying electricity later to perform the same tasks.
- The oven, water heater and EV charger could exceed the utility contract threshold if they run together. The system should lower or pause flexible loads before a problem occurs.
- A homeowner can see energy consumption in the app, but does not want to spend every day comparing tariffs, weather forecasts, solar production, and household routines.

Electrification therefore creates a paradox: it delivers greater efficiency, sustainability, energy independence, and energy security, while simultaneously increasing the complexity of everyday energy decisions. The value of the all-electric home increasingly depends not only on the equipment installed, but also on the ability to coordinate it intelligently.

This is where the story moves from smart home control to **home energy intelligence** orchestration, enabled by Home Energy Management Systems (HEMS), the **"energy brain"** of the home. As homeowners seek greater control over energy costs and consumption, interest in these solutions continues to grow.

How much do homeowners engage with energy management systems?



52% are interested in controlling and regulating their energy equipment to optimise operating times and temperatures

Energy technology equipment (such as home energy systems, wall boxes or solar panels) **is a top 3 home investment**

Online-base market research conducted by Schneider Electric in 2025 on 11,014 homeowners in 10 countries (Germany, Switzerland, Sweden, France, Spain, United States of America, India, Saudi Arabia, United Arab Emirates, Australia)

2. Modern Smart Homes Needs Energy Intelligence Orchestration

Home Energy Intelligence is the ability of a home to automatically optimize energy use overall, to reduce costs without compromising comfort, while managing electrical capacity within the home.

More broadly, it helps make households active participants in the energy system, lowering overall demand, integrating more renewable energy and improving grid efficiency and stability. Home Energy Intelligence means orchestrating when and how much electricity is used by connected devices such as EV chargers, solar inverters, batteries, heating systems, and appliances, based on users' preferences, real-time data, predictive insights, local control, and optimization logic.

In simple terms, it answers four questions continuously:



Question	Examples inside the home
What does the household need?	EV ready by a chosen time, hot water available for daily routines, maintaining a comfortable temperature, etc.
What is the most cost-effective energy available?	Solar production (valued at its export tariff), current and forecast; battery state, current and forecast; grid electricity price, current and forecast
What can be shifted?	Any flexible loads, meaning loads whose operation can be shifted in time without affecting user comfort. Examples include EV charging, domestic hot water, pool pumps, pool or spa heating, battery storage systems, and heating and cooling systems (such as electric heating and heat pumps, when managed intelligently).
What constraints must be respected?	Utility contract limits, main electrical capacity limits, comfort boundaries, and user-defined readiness requirements.

This is different from a fixed schedule. A fixed schedule says: charge at night. Or heat water off-peak. Or use solar when available. Energy intelligence says: given today's tariff, weather, expected solar, home and loads consumption, household habits, readiness requirements, and power contract limit, what is the most cost-effective energy plan for this specific home today?

It also reflects the strategic direction described in Schneider Electric's home energy vision: the home needs an energy intelligence anchor, not another disconnected control layer. That anchor must be able to collect meaningful energy data from key products, use an edge controller and an open platform, and give homeowners clear choices around comfort, convenience, cost and flexibility.

This is what advancing energy tech means. This is why orchestration matters. The value is not created by a single smart device. It is created when the home can coordinate all of the devices that drive the bill.

As Scott Harden, CTO Software Home Solutions at Schneider Electric, notes:



"Most people think they have a smart home. What they actually have is a collection of smart devices, and there is a big difference. The smartest thing your home can do is eliminate the mental overhead of managing energy altogether and meaningfully reduce what you pay for it."

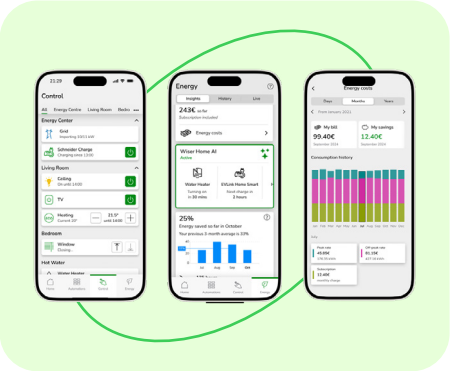
In a nutshell, energy intelligence is transforming homes from simple energy consumers into "consumizers"—a concept we define as homes that actively and continuously optimize energy use across the broader energy system.

Part 3 — Quantifying the Value of Home Energy Intelligence

1. Schneider's Wiser Home, powered by AI: Comfort Meets Energy Intelligence

Wiser Home is Schneider Electric's connected offer for residential buildings. It integrates smart home automation with system level energy management into a unified, modular platform. It gives homeowners one place to monitor, control, and automate loads and sources within the home, including heating, domestic hot water, shutters, lighting, sensors, solar panels, home battery, EV charging and other electrical devices or appliances.

The Wiser Home AI feature is the intelligence layer that continuously optimizes home energy use. It is designed to minimize energy bills while maintaining comfort and operating within the limits of the power contract.



What the Wiser Home AI feature does for the homeowner:

Use case	What the feature does	Why it matters
Smart EV charging	Plans charging at cost-effective periods, such as during solar production or low-tariff periods, while respecting the requested readiness time. Modulates charging power to match available solar surplus generation.	The EV is ready when needed, at the lowest cost.
Smart water heater	Moves water heating cycles to cheaper periods or periods of solar production when readiness requirements allow it.	Hot water remains available when needed, using thermal storage to heat water when it is most cost-effective.
Smart solar self-consumption	Prioritizes the use of solar surplus power to charge flexible loads whenever it is more cost-effective to consume it at home rather than export it to the grid.	The home is powered by solar whenever it delivers the greatest savings.
Power Contract Management	Actively manages total electrical load to avoid exceeding the utility contract limit or main switch rating.	The home can operate more electrical loads while reducing the risk of additional fees or power interruptions, depending on the country.
User control and follow-up	Displays the year-to-date savings and the next 24-hour load activation plan in the app and allows the user to override it at any time.	Automation stays transparent and practical with clear, measurable savings, rather than feeling like a black box.

This following optimization logic* applies consistently across use cases: the system prioritizes the most cost effective energy source – solar is valued at its export (feed-in) tariff – while ensuring that user readiness requirements are met and the electrical contract limit is respected at all times.

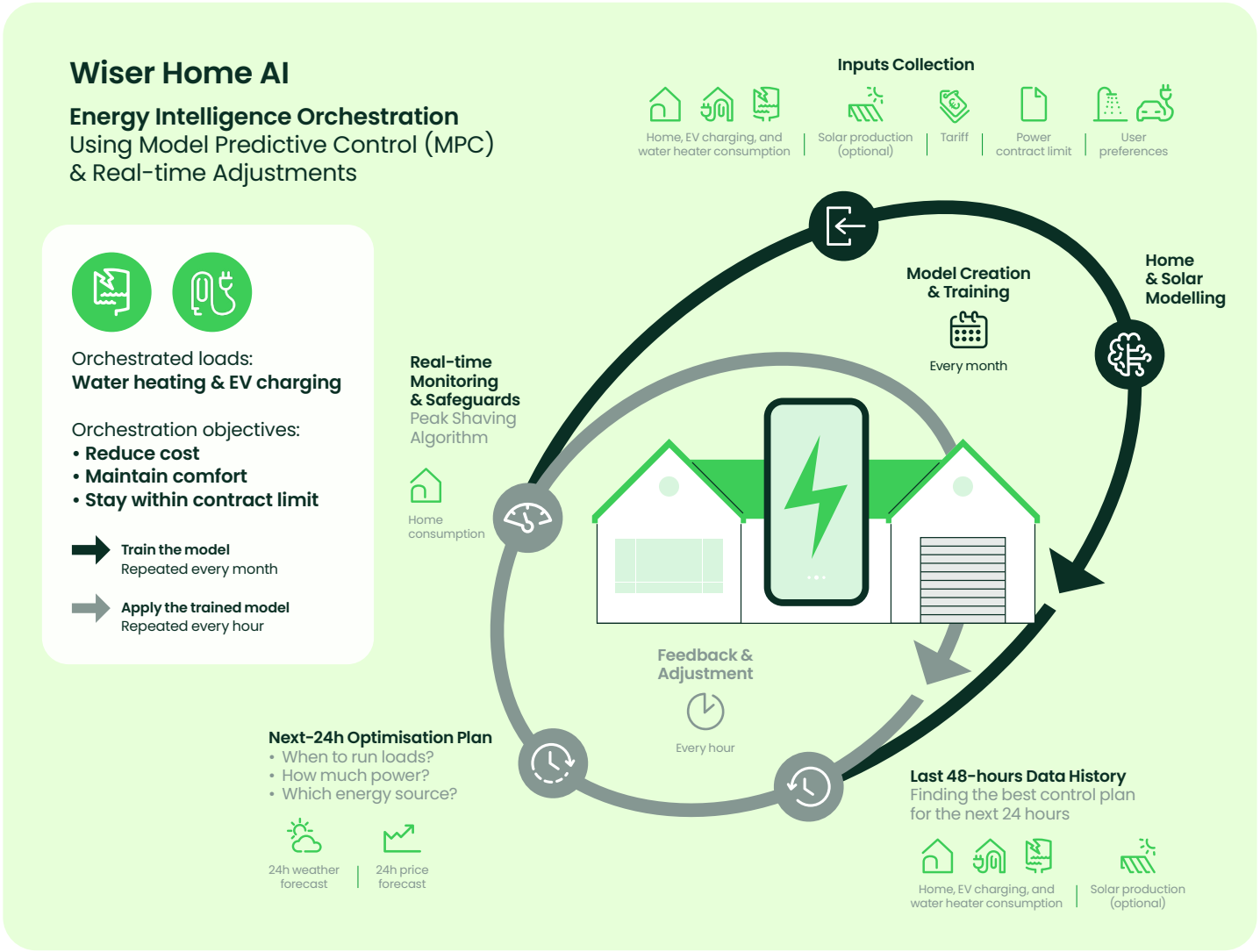
The total savings calculated by the system are the sum over all hours of:

- **Self-consumption savings,** calculated as the difference between the electricity import price and export price for each hour.
- **Solar export earnings,** generated by selling surplus solar energy to the grid.
- **Smart control savings,** achieved by shifting loads to lower-cost hours.

The Wiser Home AI feature acts as the **energy brain of the home.** It was developed in-house by Schneider Electric's Home Solutions division in collaboration with the AI Hub and it uses Model Predictive Control to generate the optimization plan and perform real-time adjustments, ensuring safe and reliable operation.

It uses several types of input: tariff information, weather and solar forecasts, home consumption data, the status of controlled loads, household habits, user preferences, and the electrical contract limit.

The plan is refined every hour, with real-time adjustments as conditions change. All of this happens automatically in the background. Homeowners can view the next 24 hours of planned load activations in the Wiser Home app and override them at any time.



The real value of home energy intelligence orchestration with Wiser Home lies in measurable outcomes above.

*To illustrate the calculation and optimization logic, a few simple EV charging scenarios are provided in the annex.

2. Quantifying the Value of Wiser Home AI feature

To assess how energy intelligent orchestration performs under real world conditions, Schneider Electric conducted simulations using the Wiser Home AI feature.

On top of predicting energy savings, the objective was to evaluate its performance under dynamic pricing, with or without rooftop solar, compared to conventional rule based operation.

The simulations, conducted in May 2025 based on 2024 data, focused on **Germany** and **Denmark,** selected for their complementary energy contexts.

- Germany combines high electricity prices, strong solar adoption, and growing dynamic tariffs;
- Denmark features mature dynamic pricing and a highly renewable power mix.

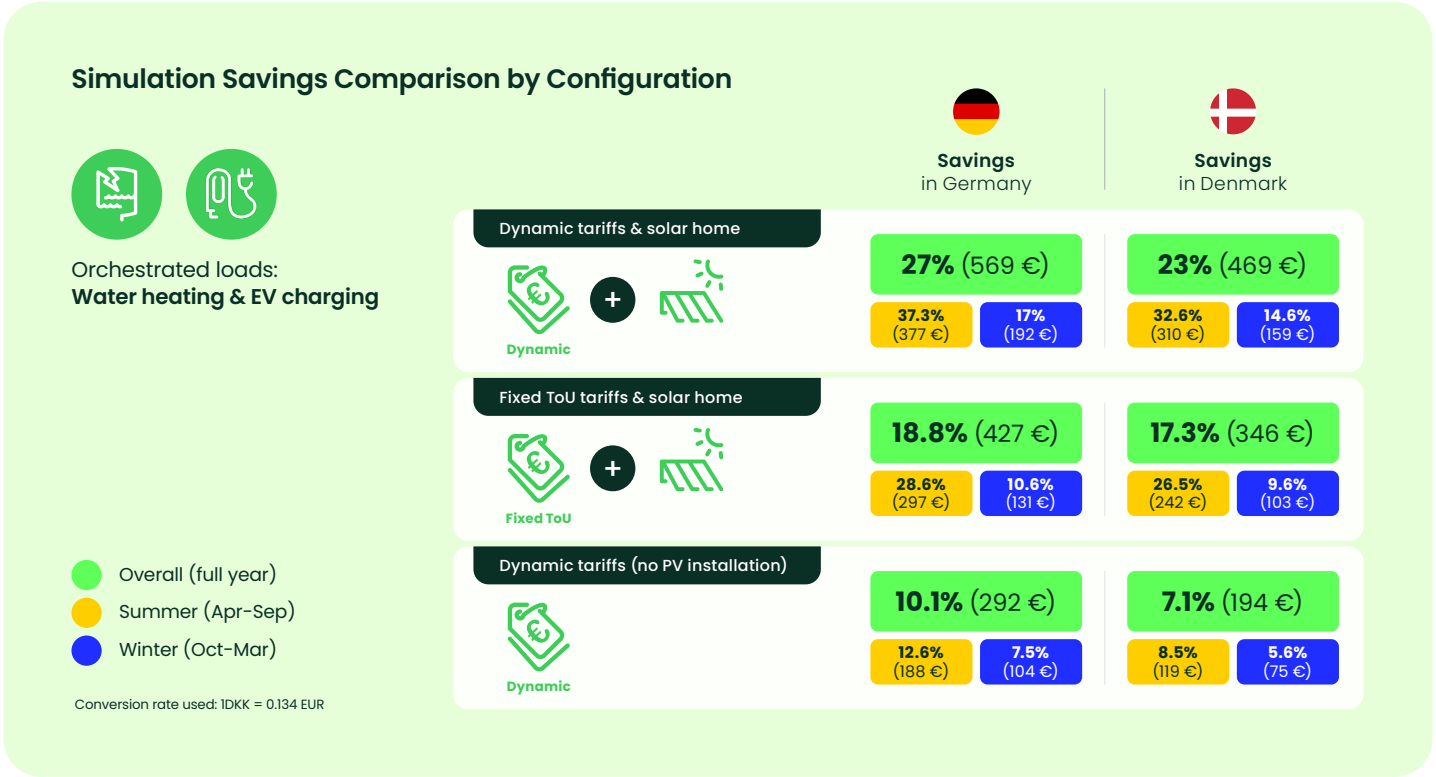
Together, they provide robust and representative insights.

Three configurations are considered:

- Homes with **dynamic tariffs** and **solar PV systems** sized to typical installations in Germany and Denmark.
- Homes with **fixed Time-of-Use tariffs** and **solar PV systems** sized to typical installations in Germany and Denmark.
- Homes with **dynamic tariffs without on-site generation,** fully supplied by the grid.

Each configuration models a typical single-family detached home with two key flexible loads, electric vehicle charging and domestic hot water, alongside standard consumption and a defined power limit. A perfect forecast assumption is used to assess the performance of the optimization logic.

Baseline scenarios represent traditional operation, where loads follow static schedules without optimization: EV charges upon arrival at 5pm, water heater charges overnight night, during off-peak hours.



A detailed overview of assumptions and parameters is provided in Annex B at the end of this paper.

With solar generation, Wiser Home AI delivers the highest savings by combining self-consumption maximization with tariff-based load shifting, while ensuring EV charging and hot water availability according to homeowners' requirements.

In Germany, this increases average savings of **27% (€569/year),** with strong seasonality from **37.3% savings in summer to 17% savings in winter.** Denmark shows a similar trend, with average **23% savings (€469/year),** ranging from **32.6% savings in summer to 14.6% savings in winter.**

Even with a **Time of Use tariff setup,** solar-enabled optimization remains highly effective, with savings of **18.8%** in Germany and **17.3%** in Denmark.

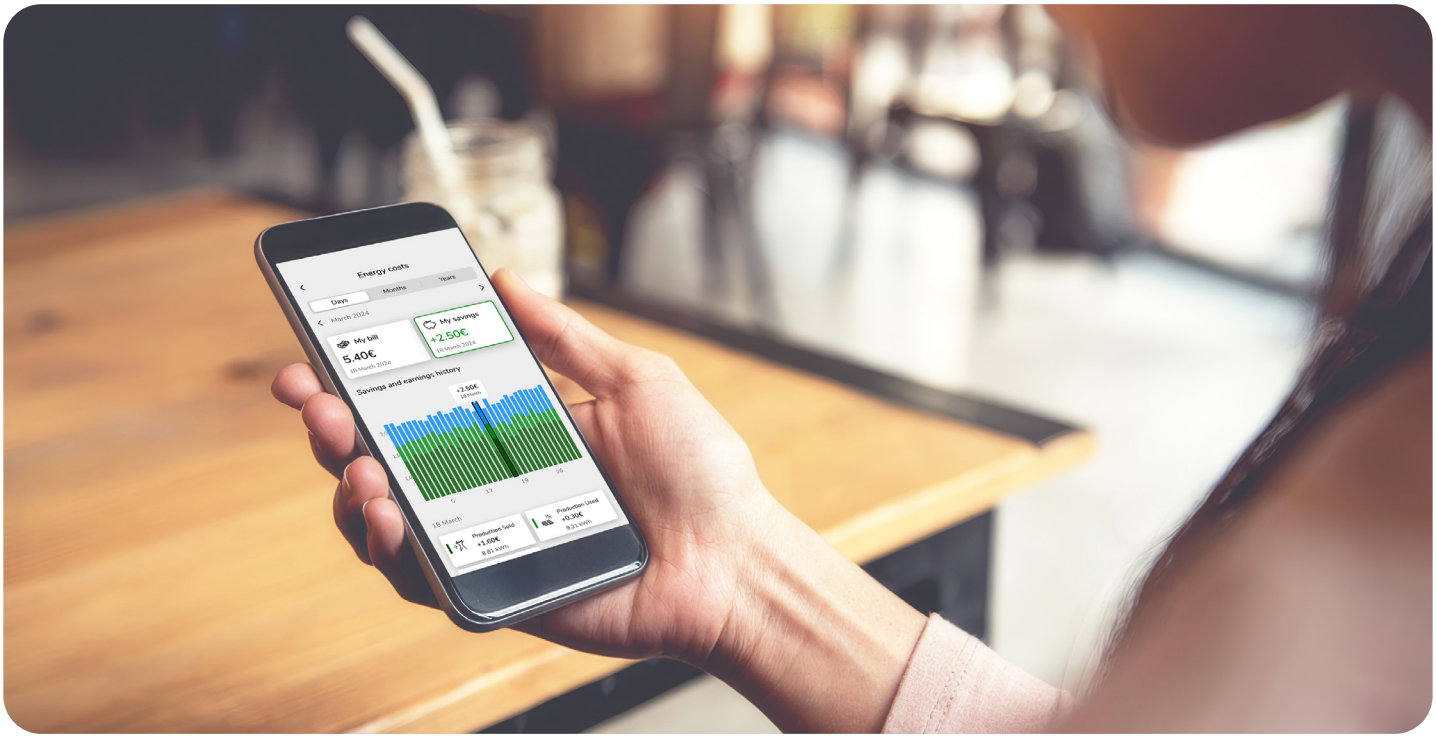
Without solar, savings remain meaningful **in a dynamic tariff context,** driven entirely by intelligent timing and avoiding peak prices. In Germany, savings reach **10.1% (€215/year)**, from **12.6% savings in summer to 7.5% savings in winter.** In Denmark, savings reach **7.1% (€194/year)**, with a similar seasonal pattern **(8.5% to 5.6%).**

Across all configurations, a consistent result emerged: **the bigger the difference between high and low energy prices, the greater the value of energy intelligence.** These differences, known as **price spreads,** may result from market price fluctuations or from solar generation. In many countries, low feed-in tariffs increase the gap between the value of self-consumed solar energy and the cost of grid electricity, creating greater opportunities for energy-intelligent homes to optimize energy use and reduce costs. Differences in results between countries reflect these underlying market structures: Germany exhibits greater price spread, creating more opportunities for optimization, while Denmark's highly renewable and more balanced power system results in more stable prices, i.e. fewer extreme price variations, thereby reducing the potential gains from load shifting.

Across both countries, we found three key insights:

- **Dynamic tariffs amplify** value by providing more frequent and greater price spreads compared to time of use tariffs.
- **Self-consumption maximizes savings** by providing the largest cost advantage over grid electricity, as none of the simulated configurations include negative electricity prices or prices below the feed-in tariff.
- **Seasonality matters,** with higher savings in summer due to increased solar generation and more frequent low-price periods.

These results confirm a central principle: home energy intelligence becomes more valuable as residential energy systems grow in complexity, variability, and volatility.



3. What Energy Intelligence Means for Households and the Market

For households, home energy intelligence changes the experience of electrification.

It allows the home to use electricity more intelligently without asking the homeowner to manage every decision. The value is practical: lower bills, sustained comfort, better use of solar, greater control over high loads, and preventing peak consumption risks such as exceeding the power contract limit, power outage, and degradation of electrical installations.

It also expands the addressable market for home energy management. Solar homes benefit strongly, but they are not the only target. Any electrified home with flexible loads and dynamic tariffs can benefit from orchestration.

For energy systems, the same capabilities support the direction in which regulators are encouraging demand-side flexibility, greater consumer participation, and more efficient grid use. ACER and CEER explicitly call for faster smart meter rollout, more flexible retail contracts, and improved consumer awareness to unlock retail flexibility.

While dynamic tariffs are not yet universal and many households remain on fixed contracts, regulatory momentum is strongly pushing toward more flexible pricing structures.

As electrification, rooftop solar, smart meters, and flexible tariffs continue to expand, the home is evolving toward a more active role in the energy system - and the smart home must evolve with it.



Conclusion — Home Energy Intelligence as the New Standard

Smart homes are entering the next chapter of the electricity era. The future is dependent on not just connecting more devices, and instead will be focused on coordinating the devices that shape the home's energy bill.



Electricity is the right foundation for cleaner, more cost-effective, and resilient homes because it can be decarbonized, self-produced, and digitally controlled. But we need intelligence to coordinate the complexities of the electric-powered home. The homes of today and the future can and should rely on the latest technology to decide when to charge the EV, when to heat water, when to use solar, when to avoid peak prices, and when to shift flexible loads to stay within the power contract limit.

That "technology" is home energy intelligence orchestration: the energy brain of the home. It is aware of sources, loads, tariffs, comfort needs and electrical system constraints; able to plan ahead; able to adapt in real time; and still transparent to the homeowner.

With Wiser Home and its AI feature, Schneider Electric enables the home to automate this complex reality not just for automation's own sake. But to enable the home that can use electricity at the best moment, at the right volume, reduce costs, preserve comfort, and make electrification easier to live with.

AI-driven Home Energy Intelligence is redefining how homes consume and manage energy. By making advanced optimization simple and accessible, it will no longer be a premium feature but a foundational requirement for future-ready homes, empowering homeowners to maximize efficiency, reduce costs, and enhance everyday comfort effortlessly.

About Schneider Electric

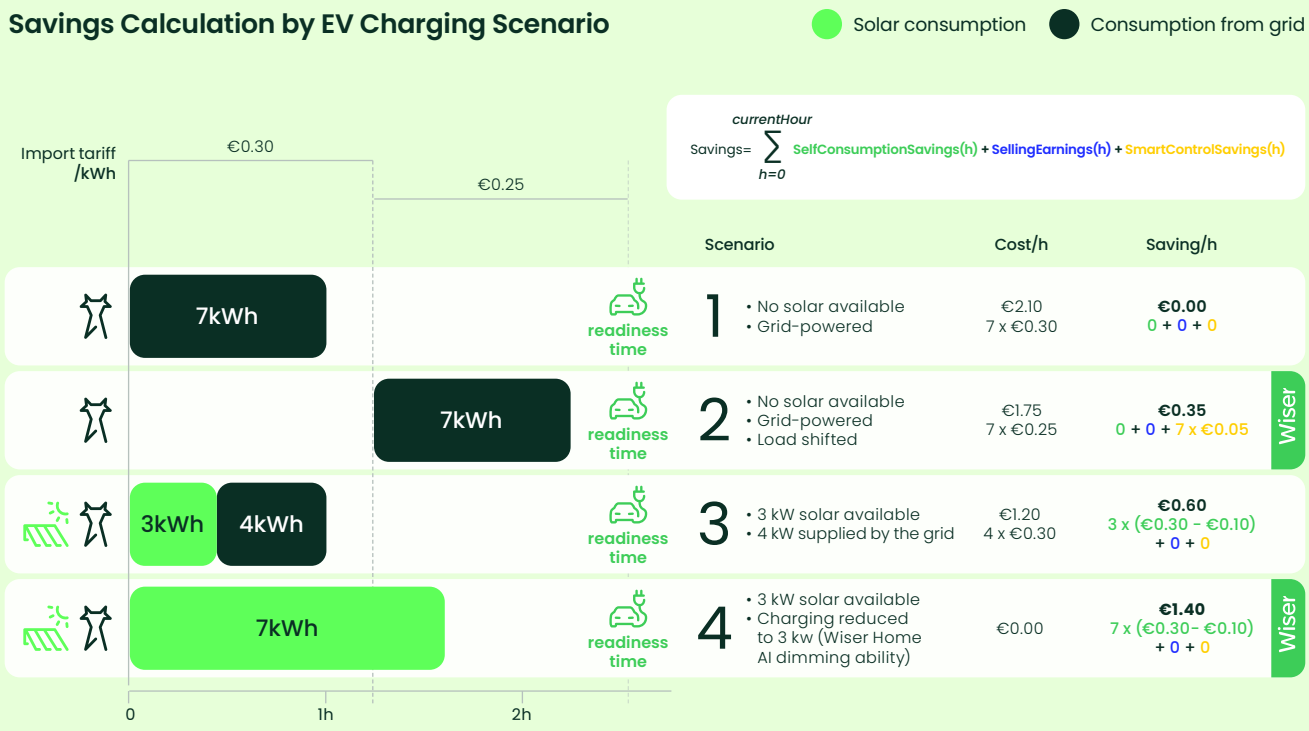


Schneider Electric is a global energy technology leader, driving efficiency and sustainability by electrifying, automating, and digitalizing industries, businesses, and homes. Its technologies enable buildings, data centers, factories, infrastructure, and grids to operate as open, interconnected ecosystems, enhancing performance, resilience, and sustainability. The portfolio includes intelligent devices, software-defined architectures, AI-powered systems, digital services, and expert advisory.

With 160,000 employees and 1 million partners in over 100 countries, Schneider Electric is consistently ranked among the world's most sustainable companies.

Annex A: Wiser Home AI calculation and optimization logic illustrated through EV charging scenarios

Consider a **7 kW EV charger,** electricity import prices of **€0.30/kWh** or **€0.25/kWh** depending on the time of day, and a solar export (feed-in) tariff of **€0.10/kWh.** The solar panels generate a **3kW surplus.**



Let's assume that the **EV readiness requirement is the same across all four scenarios** so that we can compare them within the same available charging window.

- **Without solar** (scenarios 1 & 2): scenario 2 is preferred by the Wiser Home AI feature, which shifts flexible loads to lower-price periods, **selecting the most cost-effective energy based on time.**
- **With solar** (scenario 3 & 4): scenario 4 is preferred by the system. By using charging power optimization (AI-driven dimming), it increases savings from **€0.60 to €1.40 by increasing the amount of solar energy that is self-consumed** rather than exported to the grid or supplemented by grid imports. Charging may take longer. However, because Wiser Home AI ensures that the vehicle will reach the required state of charge by the departure time, it can extend the charging duration and maximize the use of locally produced electricity.

When both **EV charging** and a **water heater** are managed, the system coordinates these loads rather than optimizing them independently. This avoids inefficient overlaps, increases overall savings, ensures user requirements are met, and maintains compliance with the electrical contract limit.

Annex B: Simulation Assumptions and Input Parameters

	Germany	Denmark
Tariffs 2024 + feed in tariffs	Dynamic €/kWh	Dynamic DKK/kWh
Monthly fixed fee	€11.18 (grid + energy provider fee)	DKK 87.03 (shared energy + network)
Average PV installed capacity	7 kW	6 kW
Grid limit	20 kW	
House size	4 occupants	
EV charging	9 kWh daily consumption; vehicle away 7:00 AM – 5:00 PM	
	EV charging starts upon arrival at 5:00 PM	
Water heater	8 kWh daily consumption; typical use at 6:00 AM and 6:00 PM	
	Water heater operates overnight (at off-peak hours)	
Forecast	Based on perfect foresight of electricity prices and solar production	
Optimisation method	Model Predictive Control (MPC)	
Optimisation frequency	1 hour with 15 minutes granularity	
Optimised loads	Both loads – EV charger and water heater - connected and optimised simultaneously	

The results presented in this whitepaper are based on simulations conducted on representative household profiles using forecasted electricity prices and solar production. Actual savings may vary depending on household behavior, equipment configuration, tariff structures, and weather conditions. Results should be interpreted as indicative trends and relative performance comparisons rather than guaranteed outcomes.

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