Solar & Storage for EU Energy Security

How Solar Cuts Gas Costs and Boosts Resilience

SolarPower Europe

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Introduction

Amid the escalating war in the Middle East, it is clear that accelerating domestic power generation that is not reliant on imported fossil fuels is fundamental to ensuring the EU's economic resilience and energy security. Renewable energy, and solar PV with storage in particular, can act as a buffer, cushioning EU citizens and industry from energy price spikes and skyrocketing import costs that might otherwise have been even more severe.

EU gas prices, having crossed the 50 EUR/MWh bar in early March 2026, have increased 50% compared to last year and almost doubled compared to the previous month. Oil prices have also risen by 27%. Translated into euros: 10 days of war have already cost EU taxpayers an additional 3 billion EUR in fossil fuels imports.[1] After 16 days, the additional bill stood at 6 billion EUR, according to President Von Der Leyen's letter to the EU Council on 16 March.[2]

While electricity is cheapest during the day when solar output is the highest, in the early morning and early evening hours – when power demand is high and wind and solar output is low – coal- and gas-fired power plants must fill the gap. This leaves Member States vulnerable to swings in fuel prices, and peak consumption hours have become very expensive due to high gas prices. Earlier this month, wholesale power prices in Germany peaked at around 250 EUR/MWh in the early evenings, more than five times higher than midday levels, according to figures from ENTSO-E.[3]

Against this background, solar and storage can provide strong and quick relief to such emergency conditions. By producing cheap electricity locally and extending its availability beyond sunlight hours, solar and storage reduce the number of hours when gas sets the electricity price under the merit order system, resulting in lower price volatility. Further, the generation of solar electricity in the EU reduces the need to import fossil fuels from third countries, lowering the dependence on supply chains that can be subject to severe disruption, as being experienced in recent times.

The following section outlines how solar and flexibility support the EU to reduce its dependence on fossil fuel imports and shield from volatile energy prices.

[1] *Speech by the President: European Parliament plenary debate.*
[2] *President von der Leyen's letter to EUCO of 16 March 2026.*
[3] *ENTSO-E Transparency Platform.*

How can solar PV and storage shield the EU from fossil fuel price volatility?

1. How much fossil fuel import costs have been saved since the start of the Middle East war thanks to solar electricity generation?

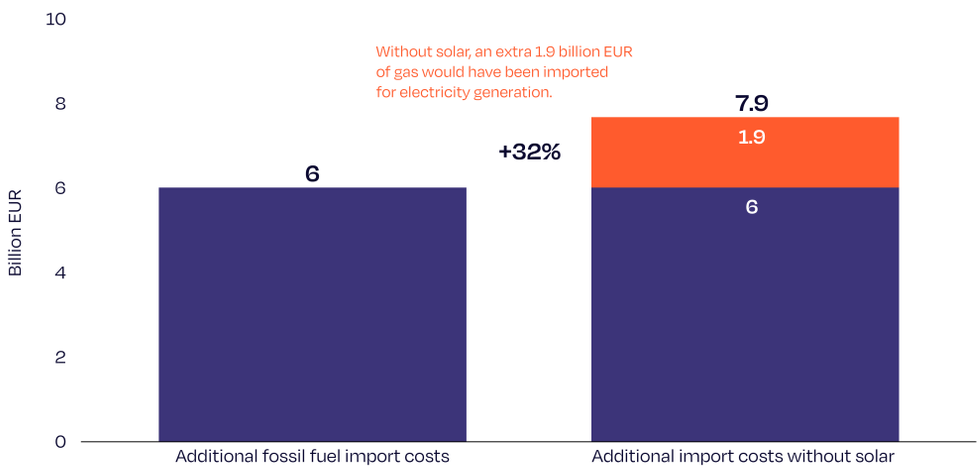
During the first 2.5 weeks of the war in the first half of March, EU installed solar PV generated around 19.9 TWh of electricity. If we had no solar in the EU, this electricity would have to be generated by other incumbent technologies. Assuming this demand would have had to be met by gas-fired power generation, it would have cost 1.9 billion EUR.

On 16 March 2026, European Commission President Ursula von der Leyen stated that since the beginning of the war, the EU had already spent an additional 6 billion EUR on fossil fuel imports. If we didn't have solar electricity generation in the EU, we would have paid 7.9 billion EUR, which is 32% higher.

Find the latest figures on our daily tracker.

Without solar electricity, the EU additional fossil fuel import bill since the war start would have been 32% higher

EU additional fossil fuel import costs and import costs without solar electricity generation, 1-17 March 2026



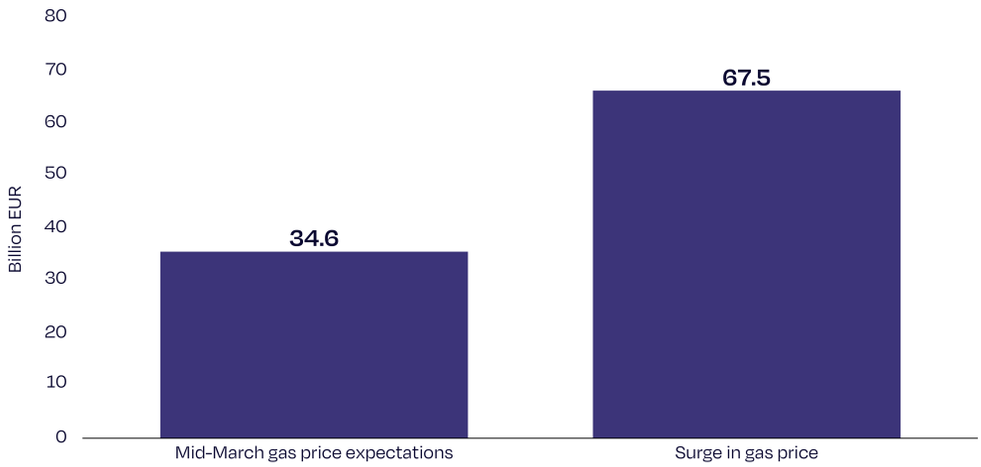
Note: Assuming solar electricity would be replaced by gas generation. Mid-March 2026 gas price of 51.1 EUR/MWh. PV electricity generation assumption based on 2025 generation data, adjusted to 2025 and 2026 YTD additions.

2. How much will be saved in 2026 as a whole thanks to solar generation?

In 2026, the EU solar fleet is expected to generate around 415 TWh of electricity. Assuming that this would have to be produced by gas instead, it would cost 34.6 billion EUR in imports under current gas prices expectation as of mid-March 2026. With a prolongation of the conflict and more severe supply chain disruptions, resulting in a further surge in gas prices, the total import price bill would rise to 67.5 billion EUR.

EU solar electricity generation to save 35-68 billion euros in fossil fuel imports in 2026, depending on future gas price developments

Import cost of replacing EU solar electricity with gas-fired generation in 2026



Note: Assuming all EU solar electricity production is replaced by gas-fired generation. Mid-March gas price expectations for 2026 are based on Rystad Energy data. Surge in gas price scenario assumes Middle East conflict escalation leading to gas prices at 88.9 EUR/MWh for the remainder of the year, based on Rystad Energy assumptions. PV electricity generation assumption based on 2025 generation data, adjusted to 2025 and 2026 expected additions under SolarPower Europe's Medium Scenario.

3. What is the role of storage and flexibility to reduce the impact of gas prices on consumers?

Flexibility plays a crucial role in decreasing the impact of gas price volatility on electricity prices. By maximising the usage of cheap solar electricity, shifting electricity supply to the period when it is most needed and shaving consumption peaks, flexibility solutions reduce the time gas sets the electricity price under the merit order system.

An analysis from Aurora Energy Research specifically highlights that battery storage, pumped storage, and hydroelectric assets provided the necessary flexibility to Spain and United Kingdom's power system to minimise the impact of higher fossil fuel prices[4]. On the contrary, the Netherlands and Germany, more reliant on gas, saw their day-ahead daily market prices increase to a level twice as high as in Spain or the United Kingdom.

[4] *Aurora Energy Research Limited (2026): Value in volatility: The impact of the Iran conflict on European power markets.*

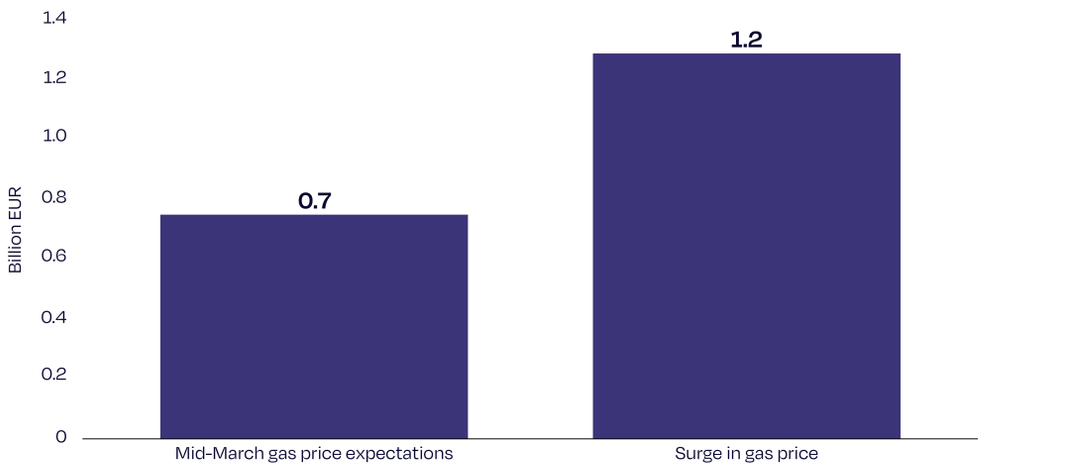
4. How much would be saved in fossil fuel imports in 2026 if this year's PV deployment goes faster than expected?

Under the current expectations for gas price developments for the rest of the year as of mid-March 2026, the EU would save an additional 719 million EUR in fossil fuel imports in 2026 if solar capacity installations follow SolarPower Europe's High Scenario (70 GW) rather than the current trajectory, which assumes a slightly decreasing solar market due to lacking policy support (61 GW). This additional capacity would generate more solar electricity and further reduce imports.

In the event of a conflict escalation and a further surge in gas prices to an average of 89 EUR/MWh for the rest of 2026, the value of avoided fossil fuel imports would increase to as much as 1.2 billion EUR in 2026 thanks to faster solar deployment.

An increase in solar capacity deployment in 2026 would lead to as much as 1.2 billion euros in saved gas imports, compared to the baseline scenario

Extra fossil fuel import cost savings if 2026 EU solar deployment meets the High Scenario rather than the Medium Scenario



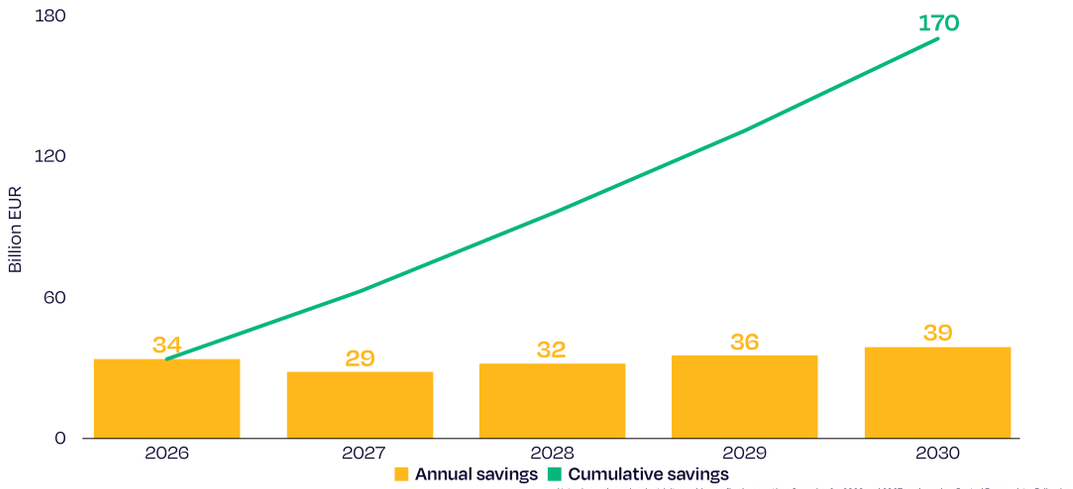
Note: Assuming solar electricity would be replaced by gas generation. Average Jan-Feb 2026 gas prices of 33.9 EUR/MWh. Mid-March gas price expectations for 2026 are based on Rystad Energy data and correspond to an annual average of 41.7 EUR/MWh for the remainder of the year. Surge in gas price scenario assumes Middle East conflict escalation leading to gas prices at 88.9 EUR/MWh for the remainder of the year, based on Rystad Energy assumptions. PV electricity generation assumption based on 2025 generation data, adjusted to 2025 and 2026 expected additions Medium Scenario and High Scenario are based on SolarPower Europe's EU Solar Market Outlook 2026-2030, published in Dec. 2025.

5. How much will be saved in fossil fuel imports until 2030 thanks to solar electricity?

Under mid-March gas price expectations and PV deployment trajectory, solar electricity generation between 2026-2030 would avoid 170 billion EUR of gas import costs, assuming that gas would be used to generate that electricity instead. This represents average annual savings of 34 billion EUR, which is roughly the cost needed to install 34 GW, more than half of annual PV installations for this year.

EU solar electricity generation will avoid 170 billion euros in gas imports between 2026 and 2030

EU additional annual and cumulative gas import savings thanks to solar PV electricity generation, 2026-2030



Note: Assuming solar electricity avoids gas-fired generation. Gas price for 2026 and 2027 are based on Rystad Energy data. Following years are assuming the same gas price as in 2027. Solar PV generation assumptions are based on Medium Scenario.

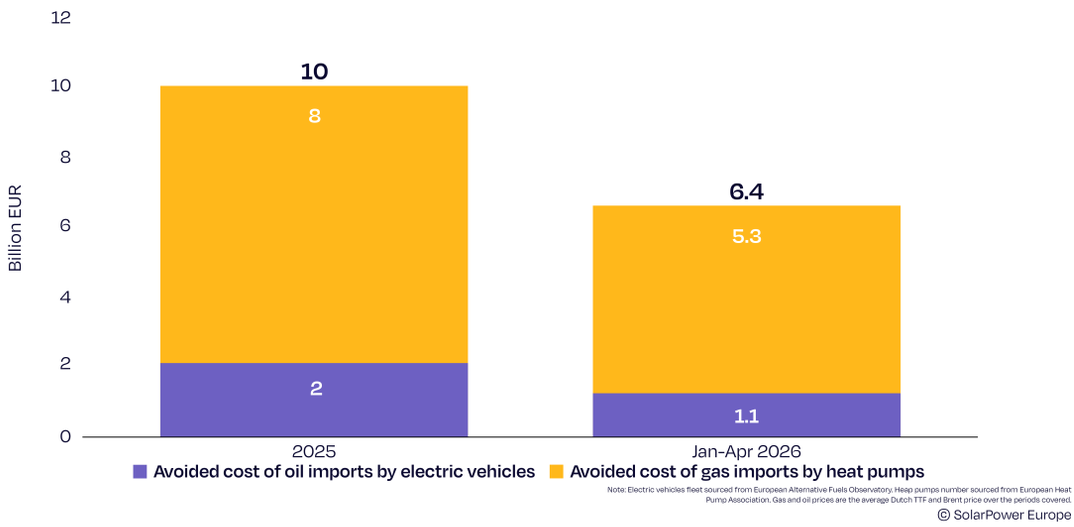
6. How much fossil fuel import costs were saved since the start of the Middle East war thanks to electrification of transport and heat?

With a fleet of almost 8 million battery electric vehicles increasingly powered with RES electricity, the electrification of road transport already saved about 2 billion EUR of avoided oil import costs in 2025 and is expected to save 1.1 billion EUR between January and April 2026 alone. Similarly, the electrification of heating via heat pumps saved about 20 billion EUR in 2025, and is expected to save 5.3 billion EUR between January-April 2026.

Combined, it is already more than 6 billion EUR saved in 2026 alone thanks to electrification of heat and transport.

The electrification of transport and heat in the EU saved 10 billion euros in avoided fossil fuel imports in 2025, and over 6 billion euros in Jan-April 2026 alone

EU fossil fuels imports avoided thanks to electric vehicles and heat pumps



How can solar PV and storage support EU businesses during the energy crisis?

How much a business is directly impacted by wholesale power price volatility depends on its electricity market integration and ability to access hedging instruments on forward markets. Larger electricity consumers can be more directly exposed to the wholesale price, if they buy electricity directly on spot markets and are unable to find suitable hedging products in longer-term market timeframes.

However, most smaller businesses tend to pay the retail electricity price: **retail power prices are contract-based, adjust with a lag and are partially hedged, so the immediate impact of the current conflict in terms of increased electricity bills is still uncertain.** The smaller the size of the business, the smaller the direct impact and the larger the time-delay effect on the energy bill. Moreover, it's hard to say whether retail prices will rise or stagnate at current levels over the next few months, stopping the downward trend since the height of the energy crisis in 2022, or if they will return to 2022 crisis levels. This will largely depend on whether LNG disruption via Hormuz persists into Q2 2026 and further conflict escalation leading to further damages to gas infrastructure occurs.

Taking the example of Germany, in January 2026 the average electricity price for new contracts for small to medium-sized industrial companies was at 16.0 EUR cents/kWh, down 1.6 EUR c/kWh from the previous year (attributed to the subsidy for transmission grid charges and a decrease in procurement costs), and 63% lower than prices at the height of the energy crisis in 2022 (43.3 EUR c/kWh).[5] It remains to be seen how much this will grow in the coming weeks and months in light of the conflict escalation and supply chain disruptions.

Solar and flexibility for EU businesses

There are two main ways in which a business procures electricity from solar PV generation:

1. **Large energy consumers can sign a PPA contract,** procuring a share of their electricity consumption from solar PV in the grid at a fixed price;
2. **Smaller energy consumers** can generate and consume **solar PV electricity from their own solar (and storage) installation.**

In both cases, solar & storage already helps businesses to save on energy costs. Today, solar PV can further protect consumers from the harshest impacts of the sudden increase in gas prices, through increased savings.

Let us consider three scenarios: one base case, with power prices at pre-war levels, taking 2024 as a reference year, and two future pathways: one where gas prices remain at current (already high levels), and one case of conflict escalation in which gas prices increase to levels seen during the 2022 energy crisis. We outline each case below across two case studies from Germany.

Solar PV is Germany's third-largest source of electricity, generating 18% of the total electricity mix in 2025, after wind power (27%), and coal (20%).[6] Germany is the EU's largest (and the world's 5th largest) solar PV market, with more than 118 GW cumulative solar capacity in 2025. Since 2019, 3.4 GW of solar PV capacity have been signed in corporate PPA contracts in Germany[7], allowing large-scale businesses to source solar PV at stable prices, as described in Case Study 1. Additionally, in the last four years, thousands of businesses have made the choice to install solar PV systems, often coupled with battery storage, to decrease reliance on grid-electricity. More than one-third of all solar PV in the country is installed in the commercial segment (systems larger than 250 kW), on large rooftops for businesses like the Schindele dairy farm, outlined in Case study 2. Solar PV in Germany today is powering the equivalent of 200,000 SMEs like this one.

[5] *Electricity price development in Germany for households and industry | BDEW.*
[6] *Ember (2026).*
[7] *RE-Source Platform: PPA deal tracker.*

Case Study 1

Large consumer, Salzgitter & solar PPAs

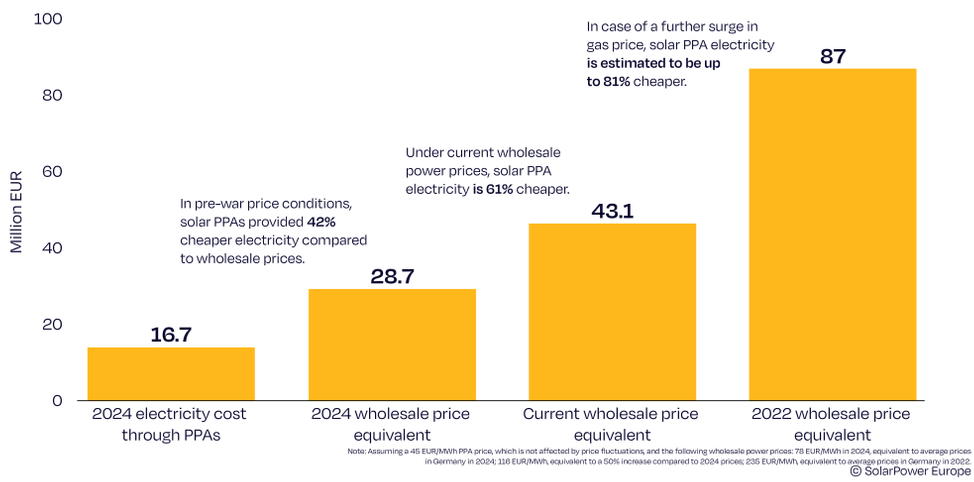
As a reference for large electricity consumers, steel producer Salzgitter signed a total of 370 GWh worth of annual power generation from solar PV under four different PPAs back in 2024. Assuming an average PPA price in Germany of about 45 EUR/MWh[8] , it is estimated that this solar electricity was 42% cheaper than it would have been if bought at the average wholesale power price in 2024[9] , representing 12 million EUR in annual electricity costs savings[10].

With an expected increase in electricity prices, the benefits of procuring electricity through PPAs become more marked. Under the mid-March gas price expectations and assuming that average wholesale electricity prices are 50% higher than in 2024, annual savings amount to 26.5 million EUR or 61% compared to 2024.

Under a more drastic assumption of a surge in gas price similar to the high levels seen in 2022, savings amount to 49 million EUR, or 81% compared to the 2024 base case.

Salzgitter's solar PPAs guarantee a stable electricity price, up to 81% cheaper than wholesale prices depending on price fluctuations

Salzgitter estimated annual electricity costs via PPAs and equivalent under different price conditions in Germany



Note: Assuming a 45 EUR/MWh PPA price, which is not affected by price fluctuations, and the following wholesale power prices: 78 EUR/MWh in 2024, equivalent to average prices in Germany in 2024; 116 EUR/MWh, equivalent to a 50% increase compared to 2024 prices; 235 EUR/MWh, equivalent to average prices in Germany in 2022.

[8] *Assumed PPA price based on 2025 analysis from Pexapark (2026): Pexapark Renewables Market Outlook 2026.*

[9] *At an average 77.7 EUR/MWh in Germany in 2024.*

[10] *This is a conservative estimate, since it is assumed that the consumer pays only the wholesale power price and not additional fees, such as grid fees, balancing costs, etc.*

Case Study 2

Small consumer, Schindele dairy farm

Schindele, a dairy farm in Obergünzburg, consumes approximately 40 MWh of electricity annually for milking machines, automatic feeding systems, and other energy-intensive processes. To reduce reliance on grid electricity and achieve energy independence, the business installed a solar and storage system, including a 100 kW solar PV system, a 67 kWh battery energy storage system, and a hybrid inverter.[11]

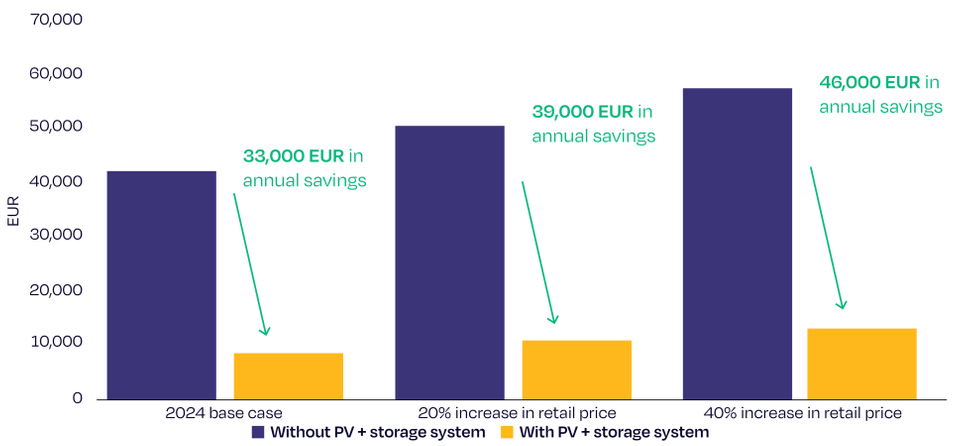
Using smart energy management tools, in tandem with its battery storage system, the user was able to store excess energy for use at night, identify energy-intensive processes, such as feed mixing and equipment cleaning, and re-schedule them to coincide with peak solar generation hours, to avoid load peaks and reduce energy costs. Schindele was able to **autonomously produce 97% of its electricity needs, and reduced its energy costs by 79%, amounting to more than 30,000 EUR in annual energy savings.**

Without a PV installation, small consumers like this business would be vulnerable to rising retail power prices. Assuming their energy contract is renewed the following year, the increase in retail power price will still be felt by the consumer, but with a delay.

Still, assuming that the gas price expectations in mid-March 2026 correspond to an increase in retail electricity prices of 20% throughout 2026, Schindele's solar and storage system will save around 39,000 EUR in electricity costs if self-consumption levels remain the same. In the more extreme case where the surge in gas price corresponds to an increase in retail electricity prices of 40% throughout 2026, [12] the consumer could see up to 46,000 EUR in annual cost savings, compared to a system without a solar + storage system.

Schindele dairy farm can save up to 46,000 euros in annual electricity costs through its solar & storage system, depending on retail price increases

Germany's Schindele dairy farm electricity costs, with and without PV + storage system, under different retail price conditions



Note: Assuming overall annual electricity costs with or without PV + storage are each increased by 20%, if retail power prices increase by 20% similarly if retail power prices increase 40%.

[11] *Source: SMA case study from SolarPower Europe's Flexible Buildings, Resilient Grids (2025).*

[12] *This is comparable to the increase in retail electricity prices experienced between end of 2021 and early 2022 in Germany for this consumer category (20-499 MWh per year).*