

FEMS App Time-of-Use Tariff

Version:2026.9.1

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1. Introduction

Dear customer,

Thank you for choosing the "FEMS App Time-of-Use Tariff". You are welcome to send us your suggestions so that we can further improve the quality of our products.

2. Installing the app

When you ordered the "FEMS App Time-of-Use Tariff", you received a 16-digit license key. You can use this license key to redeem the app independently in the EMS App Center.

You can find instructions on how to proceed at this link: here.

After installing the "FEMS App Time-of-Use Tariff", you still need to install the corresponding app for your electricity provider. You can find this in the EMS App Center:

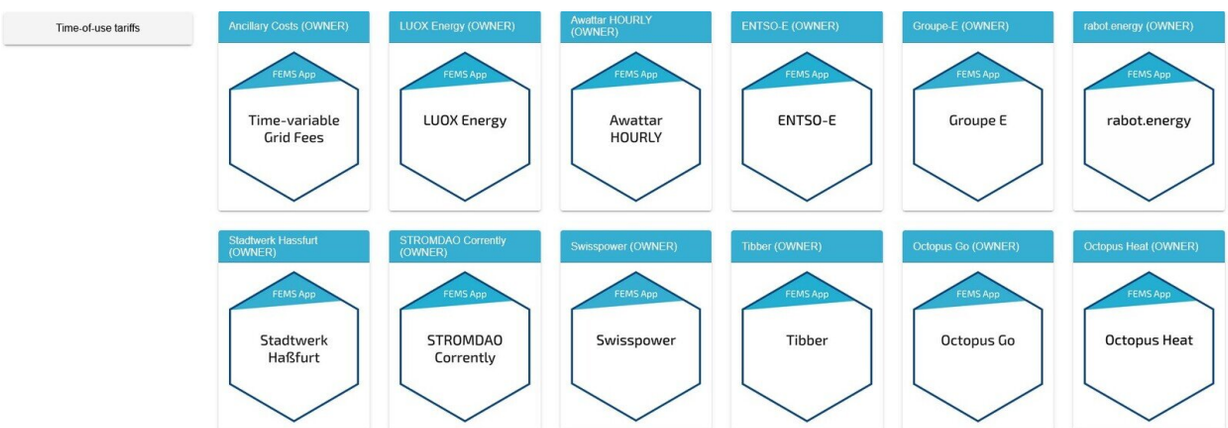


Image 1. Selection of the appropriate tariff app

2.1. Time-variable grid charges and FEMS App Time-of-Use Tariff — ENTSO-E

When using time-variable grid charges in conjunction with Time-of-Use tariffs, the checkbox **Use Time-of-use tariffs according to § 14a EnWG (Module 3)?** must be checked when installing the ENTSO-E app: ☑



Image 2. Checking the § 14a box

In the next step, select the **Grid operator**. If this is not listed, please select **Other**.

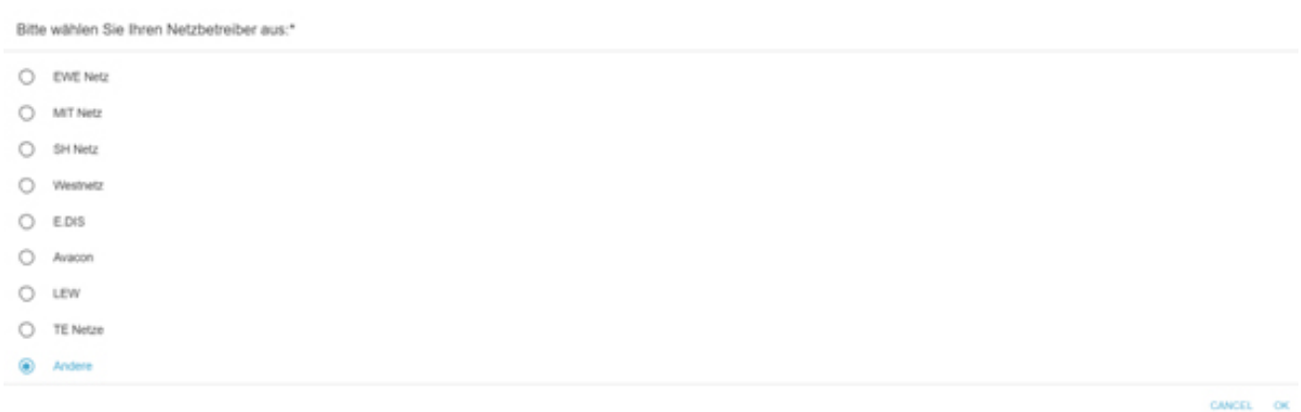


Image 3. Selecting the grid operator

The grid operator’s prices can now be entered on a quarterly basis:

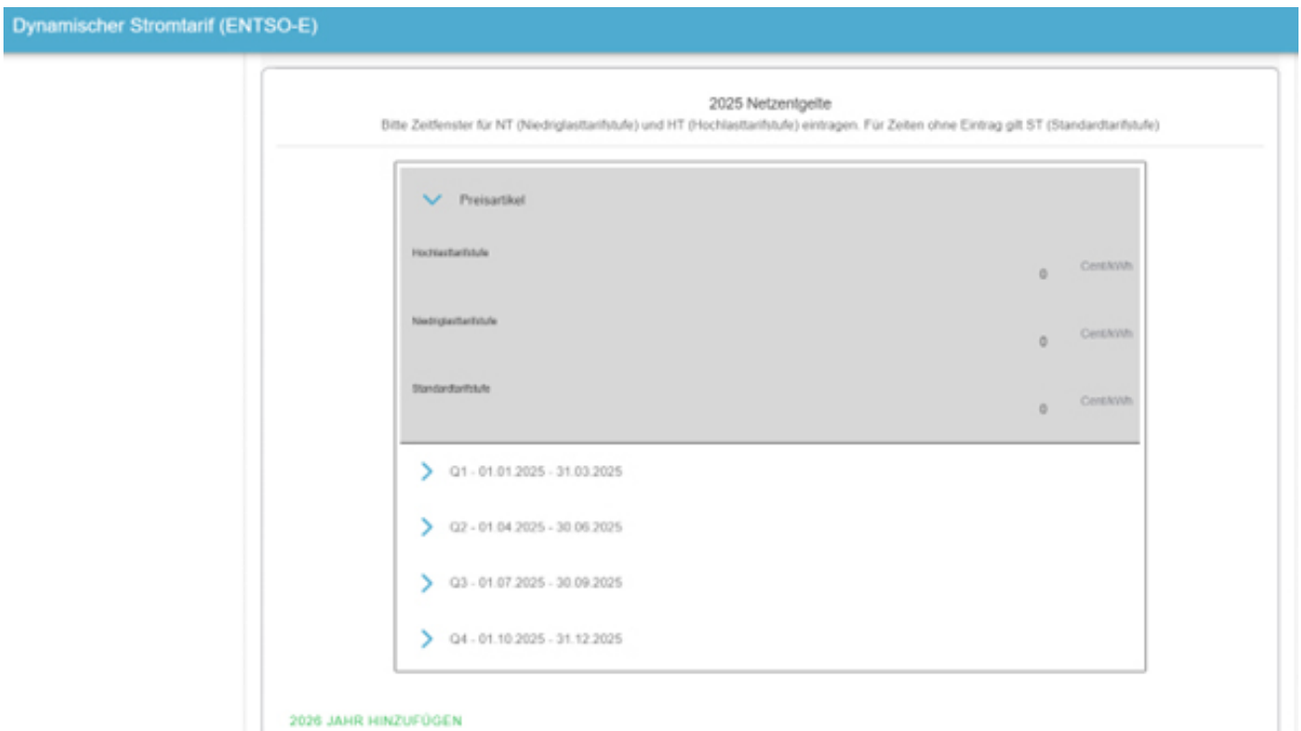


Image 4. Input — Prices of the grid operator

When using the ENTSO-E app, the spot market electricity prices are always used.

To retrieve real-time electricity prices, communication with the Entso-E servers (`web-api.tp.entsoe.eu`) is required.

3. FEMS App Time-of-Use Tariff

3.1. Why a dynamic electricity tariff?

Previously, the rule was that the electricity price per kilowatt hour (kWh) was fixed statically for at least a whole year. However, electricity is actually traded on the exchange e. g. in 15-minute units for the next day ("day-ahead"). These 15-minute electricity exchange prices reflect the variability of an energy system based on renewable, volatile wind and solar energy. Electricity is always particularly cheap on the exchange when the sun is shining, the wind is blowing or consumption is low. The dynamic electricity tariff is therefore always closer to reality than a tariff set statically by the energy supplier[1]. For us as a society, this ideally results in a win-win situation: end customers can benefit from favorable prices if they can flexibly shift their grid consumption over time. Grid operators can distribute the load on the grids more evenly by using variable prices. This is another reason why the legislator is obliging all energy suppliers in Germany to offer dynamic electricity tariffs from January 2025.

*[1] A favorable exchange price is not always beneficial to the grid; on the contrary, it can even lead to expensive redispatch costs. The regulatory authorities are actively working on these issues. For example, there are discussions about making grid fees variable in order to reflect the varying utilization of the grid over time.

3.2. Advantages of the "FEMS App Time-of-Use Tariff"

- *Fully-automatic operation*

  After initial commissioning, the app works completely automatically and selects an optimized operating mode in each case; no parameterization of threshold value electricity prices etc. is necessary.

- *You retain your independence*

  You are free to choose your electricity provider at any time. On the cut-off date, simply uninstall the previous app and install the app for your new provider free of charge.

- *One-time purchase, no recurring costs*

  After the one-time purchase, there are no recurring, e. g. monthly, costs for the app — including free, lifelong updates.

- *OpenEMS Community*

  The software is being developed further in cooperation with universities, institutes and other manufacturers of energy management systems in the global OpenEMS community.

- *Energy Journey*

  We are already thinking about the next steps in your personal Energy Journey. That is why many further developments are being planned, e. g. price-based optimization of controllable consumer loads such as EVs and heat pumps, consideration of planned power dimming in accordance with § 14a EnWG, participation in intraday trading, compatibility for other countries and BESS products, etc.

3.3. Compatible with all energy suppliers

The "FEMS App Time-of-Use Tariff" is compatible with all energy suppliers:

rabot.energy

- https://www.rabot.energy/dynamischer-stromtarif/

Country | System	Industrial S	Industrial L	Industrial XL
Germany	✅	✅	✅

Table 1. Compatibility: rabot.energy / Industrial

Country \ System	Symphon-E	Germany	✅

LUOX Energy

- https://www.luox-energy.de/en

Click here for the installation instructions of the FEMS App Time-of-Use Tariff with LUOX Energy.

Country | System	Industrial S	Industrial L	Industrial XL
Germany	✅	✅	✅

Table 2. Compatibility: LUOX Energy / Industrial

Country \ System	Symphon-E
Germany	✅

Tibber

1. By directly integrating the pricing interface from Tibber, the app can use the actual retail prices.
2. During installation, you'll need a personal access token for your Tibber account. You can create one at https://developer.tibber.com/settings/access-token.

Country | System	Industrial S	Industrial L	Industrial XL
Germany	✅	✅	✅

Table 3. Compatibility: Tibber / Industrial

Country \ System	Symphon-E
Germany	✅
Netherlands	✅
Sweden	✅

EWS Schönau

- German
    1. During installation, you will need a personal access token for your EWS account. You can obtain this from EWS Schönau: By e-mail to api@ews-schoenau.de

tado° Hourly

- https://energy.tado.com/tariffs

aWATTar was one of the first providers of a dynamic electricity tariff in Germany and Austria.

Country | System	Industrial S	Industrial L	Industrial XL
Germany	✅	✅	✅

Table 4. Compatibility: aWATTar / Industrial

Country \ System	Symphon-E
Germany	✅
Austria	✅

STROMDAO Corrently

STROMDAO Corrently takes an innovative, grid-friendly approach that uses regional electricity generation and consumption to calculate a "Green Electricity Index." This index is used for optimization within the app instead of a price per kWh. When installing the app, simply enter your ZIP code.

Country | System	Industrial S	Industrial L	Industrial XL
Germany	✅	✅	✅

Table 5. Compatibility: STROMDAO Corrently / Industrial

Country \ System	Symphon-E
Germany	✅

Octopus Go

- https://octopusenergy.de/octopus-go

1. Octopus Go offers a lower energy price **between 00:00 and 05:00 h** that is individual to the customer.
2. When installing the app, the standard price and low price must be entered once.

Country | System	Industrial S	Industrial L	Industrial XL
Germany	✅	✅	✅

Table 6. Compatibility: Octopus Energy / Industrial

Country \ System	Symphon-E
Germany	✅

Octopus Heat

- https://octopusenergy.de/octopus-heat

1. Octopus Heat offers a low working price for 8 hours a day, customized for the customer.
2. There is a higher working price for 3 hours.
3. Standard, low and high prices must be entered once when installing the app.

Country | System	Industrial S	Industrial L	Industrial XL
Germany	✅	✅	✅

Table 7. Compatibility: Octopus Energy / Industrial

Country \ System	Symphon-E
Germany	✅

Stadtwerk Haßfurt

In the service area of Stadtwerks Haßfurt, you can choose between "haStrom Flex with a price cap" and "haS-

trom Flex Pro without a price cap".

Country | System	Industrial S	Industrial L	Industrial XL
Germany	✅	✅	✅

Table 8. Compatibility: Stadtwerk Haßfurt / Industrial

Country \ System	Symphon-E
Germany	✅

Groupe E VARIO — Switzerland

- Groupe E VARIO — Switzerland

Country | System	Industrial S	Industrial L	Industrial XL
Switzerland	✅	✅	✅

Table 9. Compatibility: Groupe E VARIO / Industrial

Country \ System	Symphon-E
Switzerland	✅

Exchange electricity price — ENTSO-E

Most energy providers currently pass on the day-ahead prices from the electricity exchange on a 1-to-1 basis in their time-of-use tariffs. The energy management system receives these prices directly from the European electricity platform ENTSO-E and is therefore compatible with all energy providers. Please note that this means ancillary electricity costs (grid fees, etc.) cannot be taken into account.



One of the following price bidding zones can be selected during installation: Germany, Austria, Sweden (1, 2, 3 or 4) and the Netherlands.

Country | System	Industrial S	Industrial L	Industrial XL
Germany	✅	✅	✅
Austria	✅	✅	✅
Netherlands	✅	✅	✅
Sweden	✅	✅	✅

Table 10. Compatibility: ENTSO-E / Industrial

Country \ System	Symphon-E
Germany	✅
Austria	✅

Netherlands	☑
Sweden	☑

3.4. Functionality

The "FEMS App Time-of-Use Tariff" consists of:

1. a specific section that is used to read in the individual dynamic electricity prices depending on the energy supplier or electricity tariff. The prices are usually made available from 2 p.m. in quarter-hourly or hourly resolution until the end of the next day.
2. the visualization and configuration view, the control algorithm, etc., which are uniform for all tariffs.

The control algorithm runs through the following steps:

1. Forecast of local generation and consumption based on historical data
2. Artificial intelligence links these forecasts with the dynamic electricity prices and determines an optimized energy plan. This defines an operating mode for every quarter of an hour of the available period:
    a. **Self-consumption optimization**: The electrical energy storage system operates in normal self-consumption optimization mode. Consumer loads are supplied from the PV system and battery if possible. If this is not sufficient, the remaining energy is drawn from the grid.
    b. **Delayed discharge**: Instead of supplying consumer loads from the battery, discharging is delayed — with the aim of reserving already stored energy for times when prices are higher.
    c. **Release charging from the grid**: The battery is actively charging from the grid in order to use the charged energy to supply the predicted consumption during significantly more expensive times. (Only available if "Active charging from the grid" has been activated).
3. These steps are repeated every quarter of an hour in order to continuously adapt the energy plan to changing framework conditions (e. g. if actual generation/consumption deviates from the forecast).
4. In real-time control, the control algorithm always applies the mode planned for the current quarter of an hour.



In order to guarantee optimal functionality, all external producers must be integrated into EMS.

3.5. Visualization and configuration in Online Monitoring

After installing the "FEMS App Time-of-Use Tariff", you will see the following widget in your live monitoring:

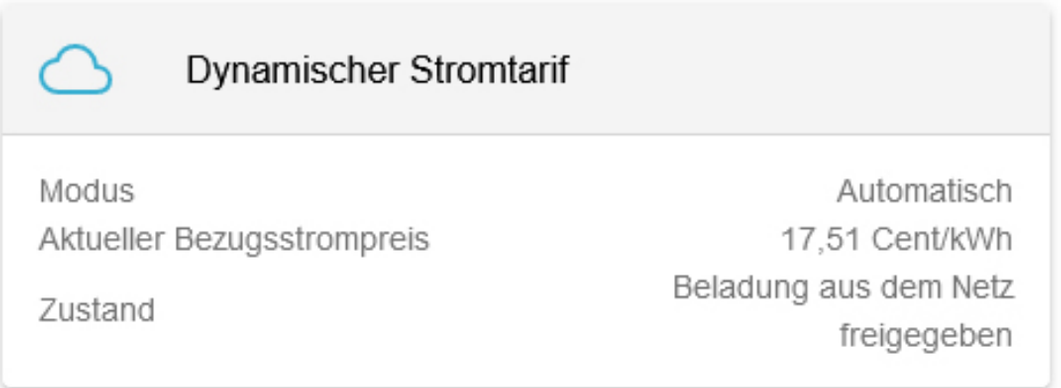


Image 5. Live Flat Widget

Click on the widget to open the detailed and configuration view:

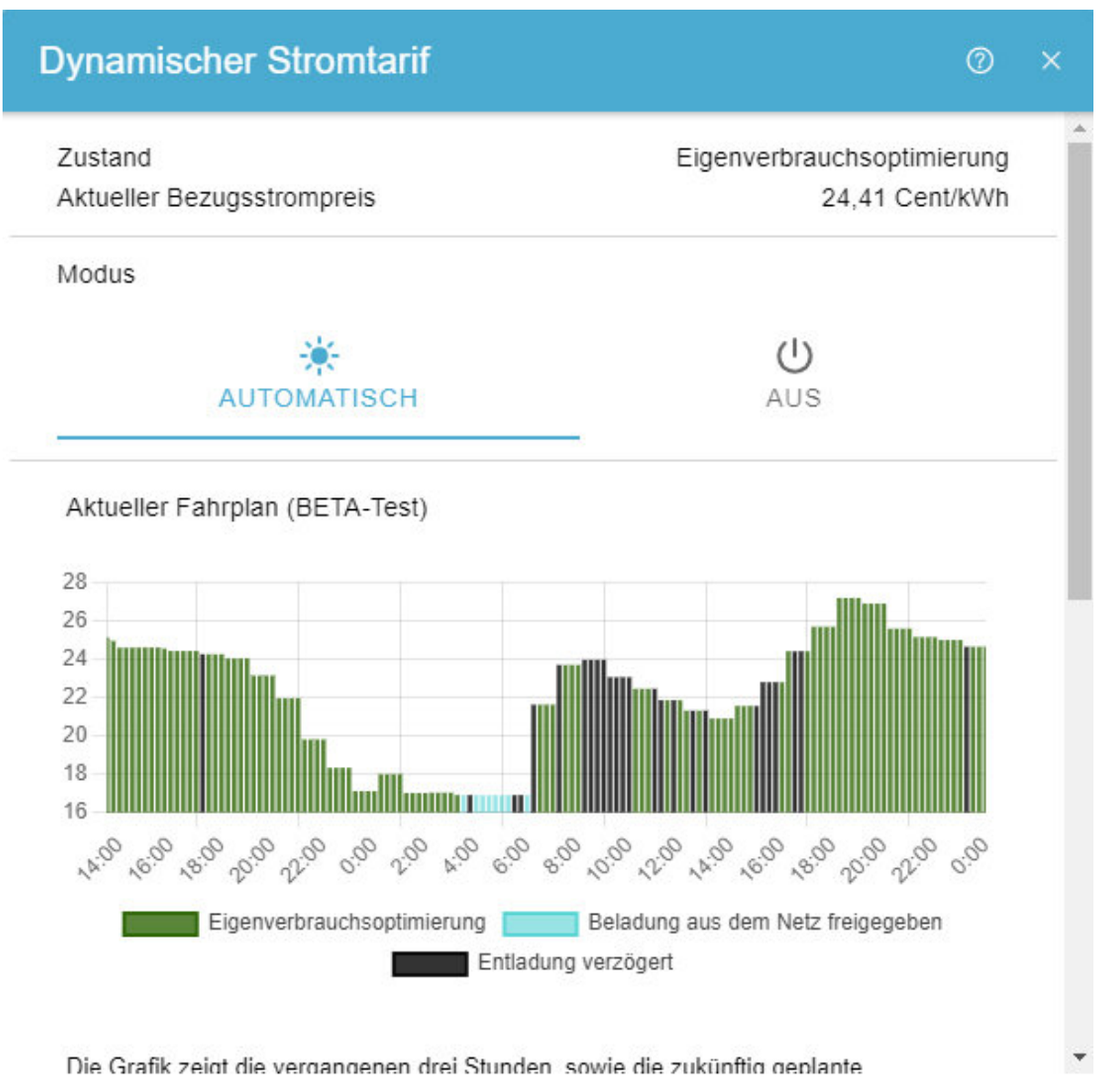


Image 6. Live Detail Widget

Select the mode of the app here:

- OFF

  This mode deactivates optimization according to a dynamic electricity tariff. Prices are still recorded, but the electrical energy storage system works permanently in self-consumption optimization.

- AUTOMATIC

  This mode activates automatic optimization. Optionally, the "Active charging from the grid" function can be activated.

The history shows the recorded data for "FEMS App Time-of-Use Tariff" in the selected time period:

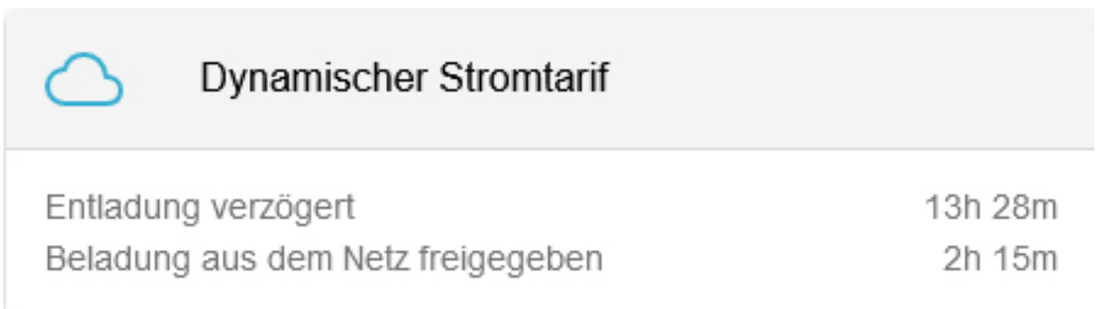


Image 7. History Flat Widget

Clicking on the widget also opens the detailed view here. This shows:

- State of Charge

  the State of Charge of the electrical energy storage as a percentage [%]

- Self-consumption optimization

  Time periods in "self-consumption optimization" mode

- Discharge delayed

  Time periods in "Delayed discharge" mode

- Release charging from the grid

  Time periods in "Release charging from the grid" mode (only available if "Active charging from the grid" has been activated).

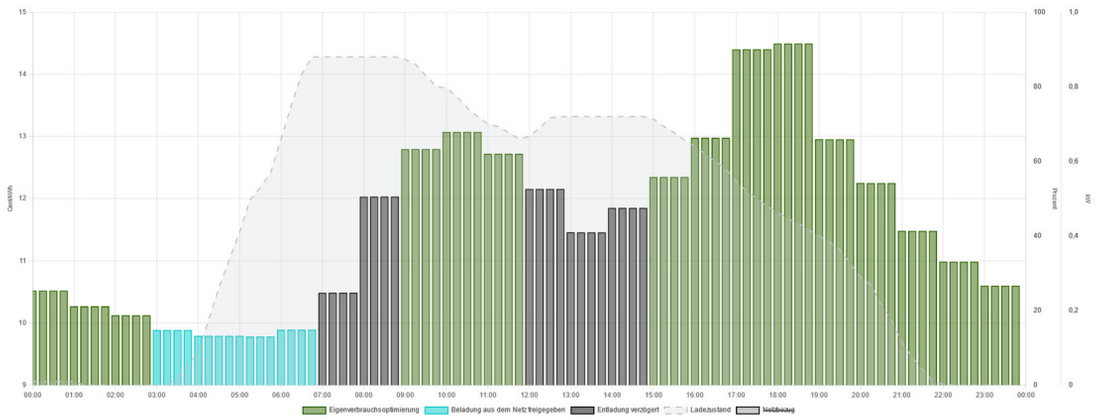


Image 8. History detail widget

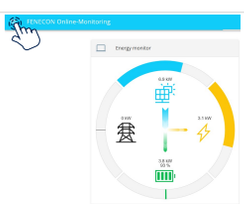
The graph shows a day with an automatic energy plan. The height of the bars shows the electricity price per quarter of an hour or hour.

- In the morning, the battery is initially empty. From 3 a.m., the blue bars show that the battery is actively charging from the grid and the state of charge — the dashed line — is increasing.
- From 7 a.m. to 9 a.m., prices are average, so the AI decides to supply consumption from the grid during this time. The app works in "delayed discharge" mode and the state of charge remains constant.
- During the high-price phases from 9 a.m. to 12 p.m. and from 3 p.m., the electrical energy storage system supplies all consumer loads and there is no draw on the grid — until the battery is empty again in the evening.

3.6. Limiting the maximum amount of electricity drawn from the grid

To change the limit on the maximum amount of electricity drawn from the grid into the electrical energy storage system, please proceed as follows.

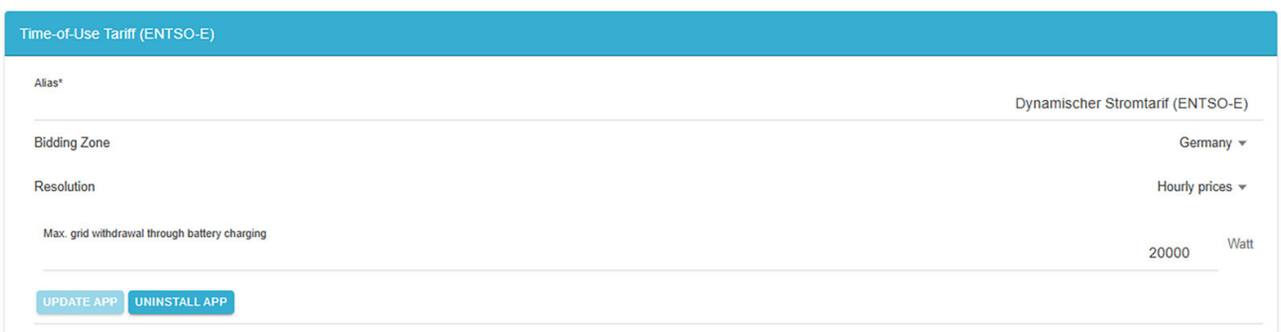
Using the example of ENTSO-E:

	1. Click on the burger menu in the Online Monitoring. 2. Select the "Settings" option.
	3. Click on the arrow of the "FEMS App Center" button.
	4. Scroll down to the "Time-of-use tariffs" category. 5. Click on the "ENTSO-E" tile.



6. Select "EDIT APP".

This settings window appears:



The **Maximum grid withdrawal** can now be set here by battery charging.



The value must not be set higher than the dimensioning of the corresponding miniature circuit breakers in the household.

3.7. FAQ & Troubleshooting

Is a permanent internet connection required?

Yes, our storage systems also work without a permanent internet connection. However, in order to read in the variable prices from the energy supplier, a permanent internet connection is absolutely necessary for the "FEMS App Time-of-Use Tariff".

Charging Behavior & Troubleshooting

What source of power is used in "Allow charging from grid" mode?

The charging power is calculated adaptively in relation to the available capacity and predicted consumption.

The behavior of "FEMS App Time-of-Use Tariff" is not comprehensible or illogical.

For various reasons, the behavior of the "FEMS App Time-of-Use Tariff" sometimes appears illogical. Since the app depends on the quality of the consumption and generation forecasts, there is always a certain inherent "fuzziness" in the behavior that can appear illogical in retrospect.

However, such behavior can usually be traced back to one of the following problems:

Complete recording of local generation

The consumption and generation forecast is based on local historical data. It is therefore essential that generators are fully recorded. Regular substantial 'negative consumption' in the historical view is an indication of such an error.

EV charging
Even if the current version of "FEMS App Time-of-Use Tariff" does not yet actively control EV charging, the measurement data from compatible EV charging stations is already processed in the consumption forecast. We therefore recommend using a compatible charging station and purchasing the corresponding app.

Teach-in time
The local consumption and generation forecast requires a learning time of at least 24 hours.

Restart or system update
After a restart or a system update, the AI algorithm needs some time to determine an optimal energy plan. During this time, the app works in "Self-Consumption Optimization" mode.

No charging at the lowest price
The "FEMS App Time-of-Use Tariff" takes into account efficiency losses that occur when charging and discharging the battery from the grid. Charging is only carried out if the price difference over the course of the day justifies it.

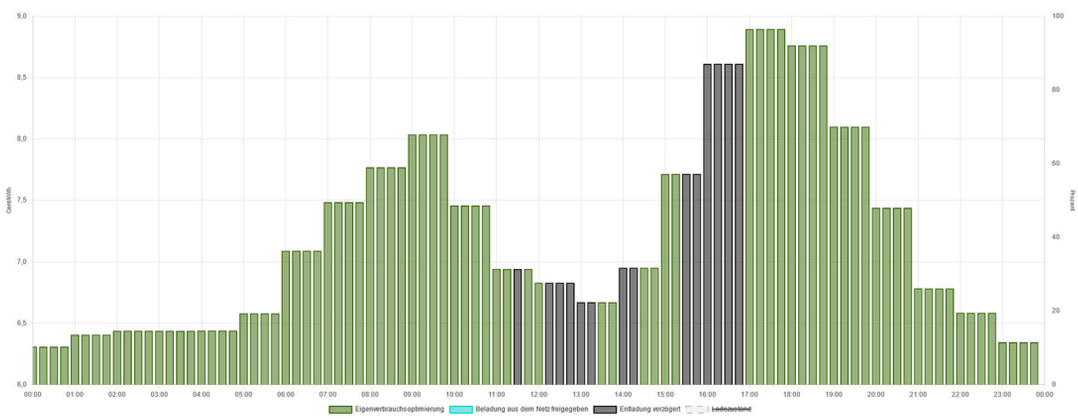


Image 9. No charging at the lowest price

The screenshot shows a corresponding daily curve. The price peak in the afternoon can be bridged by surplus PV generation and delayed discharging. This means that only the hours with a low price in the early morning would be suitable for charging from the grid. In this case, however, the price difference is too small (approx. 6.5 cents/kWh at night and 8.0 cents/kWh in the morning), so charging is not carried out.

Fill electrical energy storage system from the grid
To minimize forecast errors, the app stops at a state of charge of 90 % in "Allow charging from the grid" mode.

3.8. Further information

- We develop the algorithms and connections used in the "FEMS App Time-of-Use Tariff" in cooperation with universities, institutes and other manufacturers of energy management systems in the global OpenEMS community.
    - For more information about OpenEMS, visit www.openems.io

- If you’re interested, feel free to join the English-language discussion at OpenEMS Community
- For detailed background information on electricity prices on the exchange, visit Energy-Charts.info

4. Contact us

For support, please contact:

Symphon-E Service

Service phone: +49 (0) 371 45 85 68 - 100

E-mail service: symphon-e@heckert-solar.com

5. Directories

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