# Smart Energy Management V2.3 Introduction

Ginlong Technologies Co., Ltd.

**Smart Energy Management** is an intelligent feature launched by Solis for dynamic electricity price scenarios. This feature combines the local electricity price and uses intelligent algorithms to control the charging and discharging of energy storage power stations, which achieves the goal of improving economic benefits and energy efficiency.

**Smart Energy Management** has two functional modules:
✓ **Time-of-use tariff:** Introduce TOU electricity price data from third-party platforms(Octopus, Nordpool, and Flatpeak) to meet the needs of users to view electricity prices. Also provide a data basis for the platform's intelligent energy management algorithm.
<span style="color:red">Regions: Finland, Norway, Sweden, Denmark, Latvia, Lithuania, Estonia, Germany, France, Austria, Belgium, United Kingdom, Netherlands, Poland.</span>

✓ **Energy management:** Users can choose different modes according to the TOU tariff and their own power generation and consumption, so as to conveniently manage the energy of the power station and maximize the income of the power station.
<span style="color:red">Modes: Timed Plans, Peak-Valley Arbitrage, Solis AI.</span>

**Hybrid inverter Model and Firmware Requirements**

Currently only the following hybrid models with latest firmware version can support it:
- S5-EH1P(3-6)K-L
- S6-EH3P(3-10)K-H
- S6-EH3P(12-20)K-H
- More models will be supported ...

Only support 1 inverter per system (Parallel system not supported yet).

**SolisCloud Account Permission**

Permission can only open to users who are interested in joining the test program.

Please contact Solis local sales rep or technical support team, provide the SolisCloud account info and the specific plant ID to activate the function.

# Feature 1-TOU Tariff
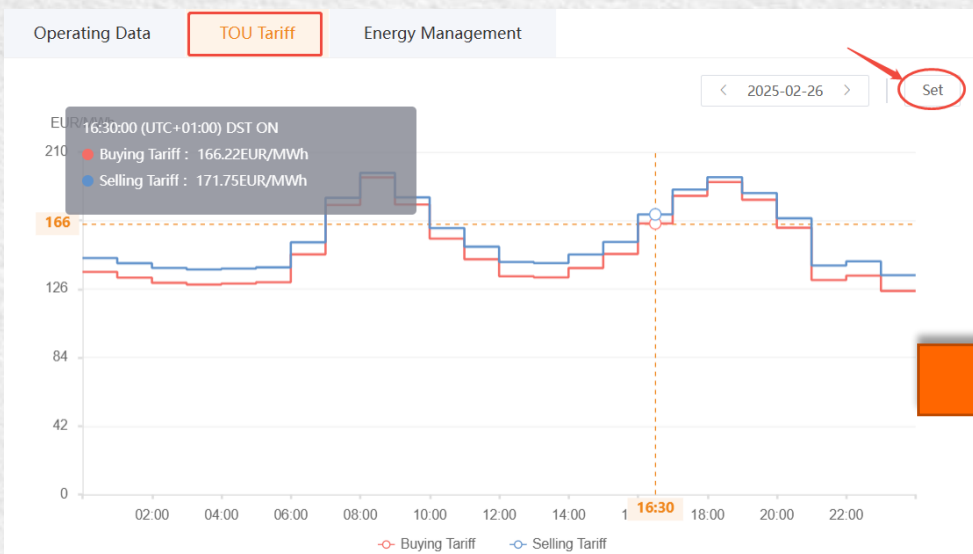


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The time-of-use tariff shows the electricity price 24 hours a day (updated every30min). It is obtained from 3rd party provider, which may vary from actual retail price, end user can add fixed value price offset or fixed percentage price offset to match the actual retail price.



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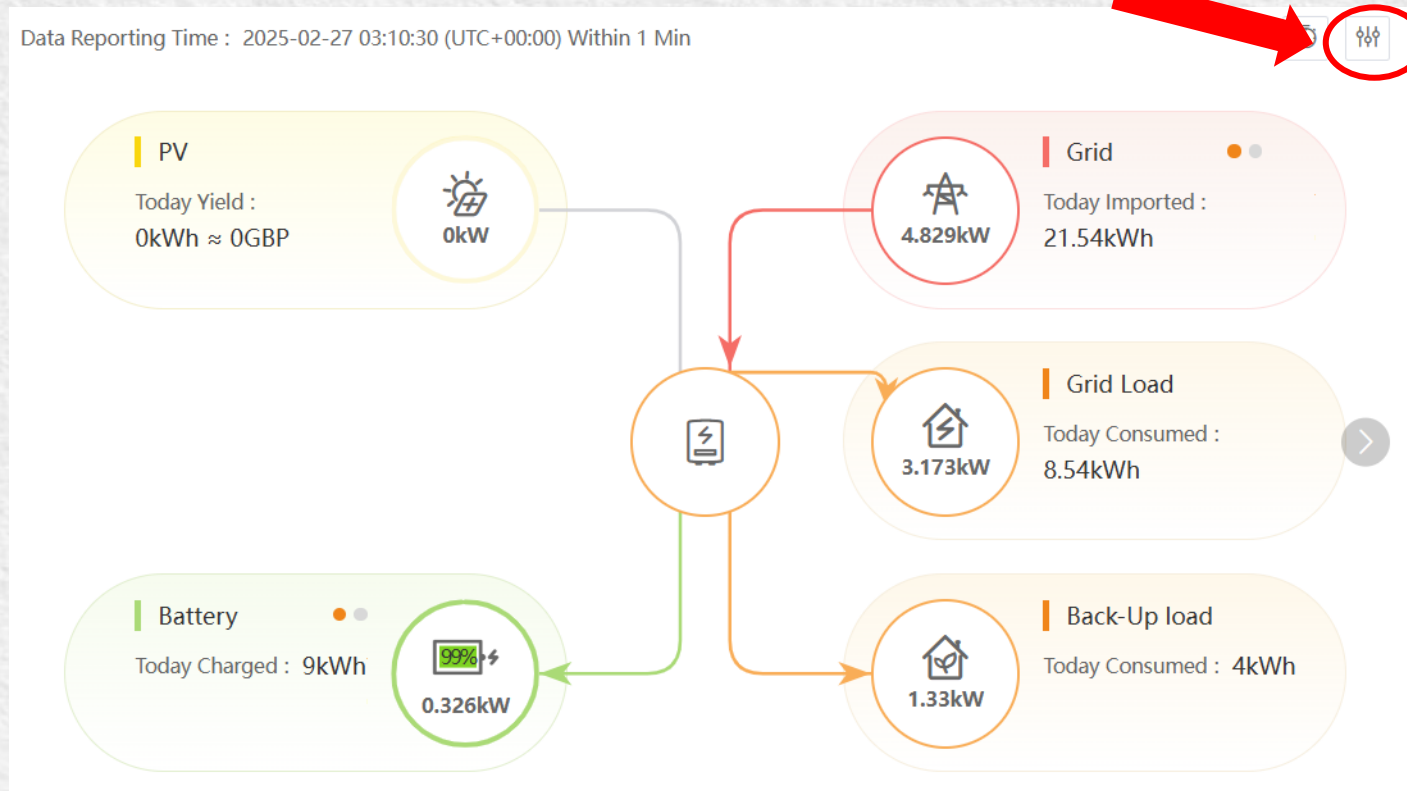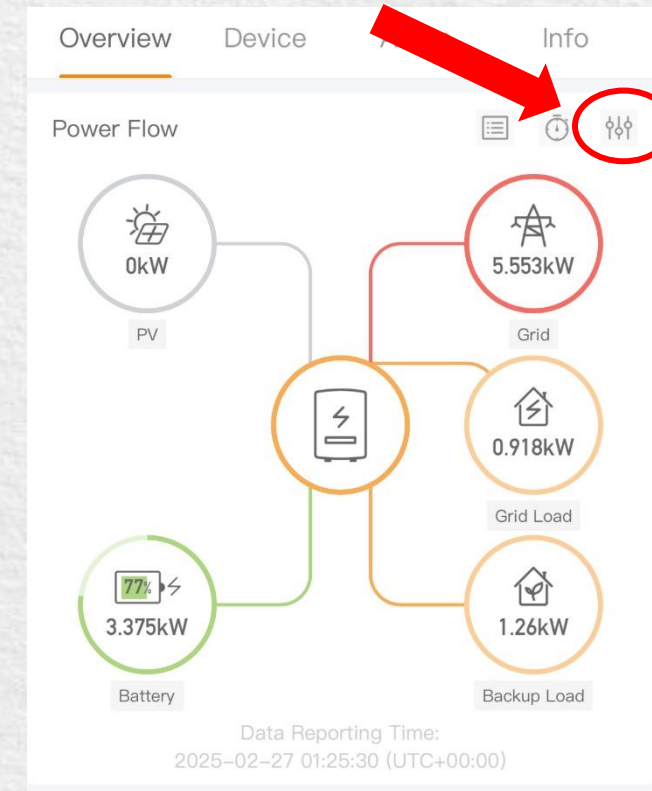| Set | Description |
|---|---|
| *Tariff Provider | Select tariff provider(Octopus, Nordpool, Flatpeak). |
| *Region | Select the country/region based on the plant location. This will allow SolisCloud to grab the correct electricity price data from 3rd party API interface. |
| Import price offset | • **Fixed Value**: Actual price=Original price + x<br>• **Fixed Percentage(%)**: Actual price=Original price * (1+x%) |
| Export price offset | • **Fixed Value:** Actual price=Original price + x<br>• **Fixed Percentage(%)**: Actual price=Original price * (1+x%) |

# Feature 2-Energy Management

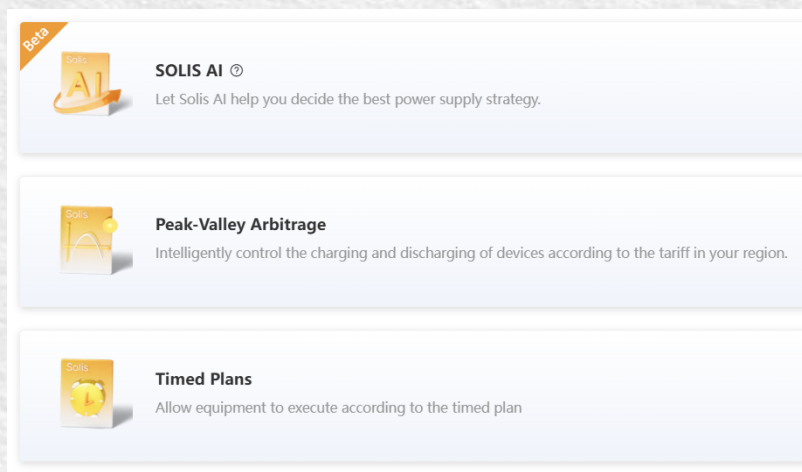Energy Management portal is on the Plant Overview page.
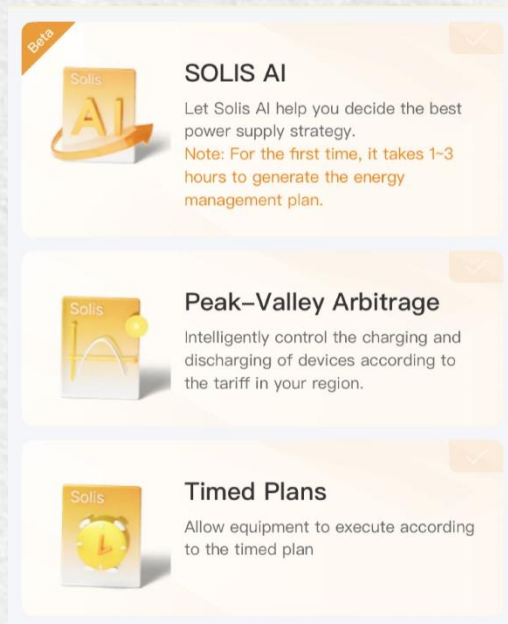


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There are three modes for you to choose from flexibly, so as to maximize your benefits.

✓ Solis AI
- **Only available for the plants with day-ahead electricity price data.**
- Solis AI can dynamically generates dispatching strategies by integrating various factors, and automatically control the hybrid inverter to charge/discharge according to dynamic electricity price data obtained from 3rd party API interface.

✓ Peak-Valley Arbitrage
- **Only available for the plants with day-ahead electricity price data.**
- Users can define the charging/discharging price threshold among with other system limits to develop a suitable control logic to maximize the benefits from dynamic electricity price data.
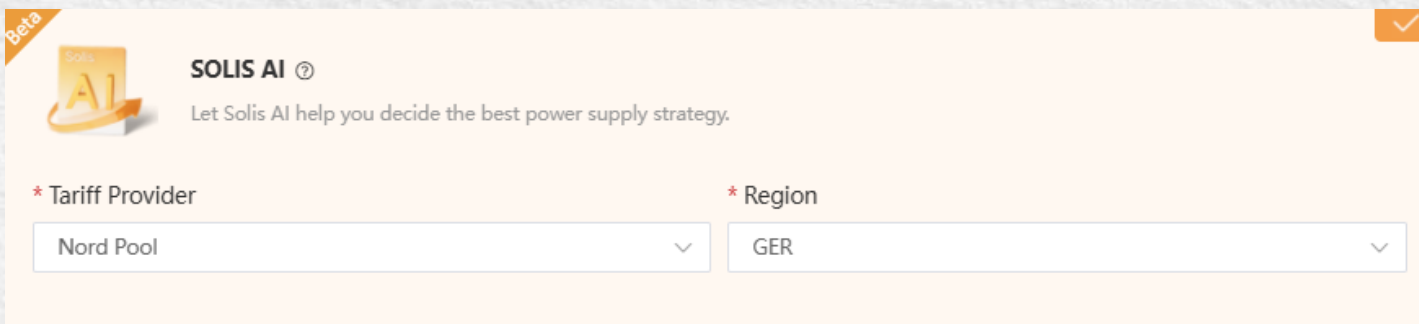
✓ Timed Plans
- Users can define a sets of flexible control logics based on different time periods.

# Solis AI

Solis AI considers various factors, like local weather conditions, grid electricity price changes, peak/off - peak hours, generation and consumption patterns. Based on comprehensive analysis, Solis AI automatically controls hybrid inverters for charging and discharging. This ensures a balanced approach between maximizing power generation yield and maintaining a stable power supply.

**Note: Solis AI logic will keep updated without change notice.**

Set Tariff Provider and Region to easily activate Solis AI.



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# Peak-Valley Arbitrage

- Simply set the charging and discharging thresholds, and the system will automatically help you achieve peak-valley arbitrage.
- When the electricity price is within the threshold, you can flexibly choose Self-use or Standby mode.
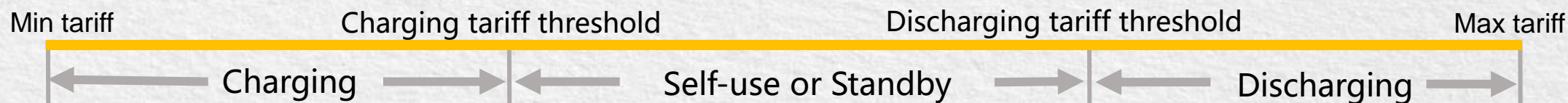


Min tariff     Charging tariff threshold     Discharging tariff threshold     Max tariff

Charging     Self-use or Standby     Discharging

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| Setting | Description |
|---|---|
| *Tariff Provider | Select tariff provider(Octopus, Nordpool, Flatpeak). |
| *Region | Select the country/region based on the plant location. This will allow Soliscloud to grab the correct electricity price data from 3$^{rd}$ party API interface |
| *Charging tariff threshold | Define when to charge the battery. Once tariff is **lower** than the threshold, battery will charge |
| *Discharging tariff threshold | Define when to discharge the battery. Once tariff is **higher** than the threshold, battery will discharge |
| *Battery operating mode | Define the battery mode when the tariff does not satisfy the charging and discharging conditions<br>• **Self-use**: when the tariff does not satisfy the charging and discharging conditions, the battery is allowed to charge and discharge with load.<br>• **Standby:** when the tariff does not satisfy the charging and discharging conditions, the battery is not allowed to charge or discharge, storing power for use during peak hours. |
| **More Settings** | |
| Battery Charge Power | If users want to set a certain charge power when charge action is activated, please click the button and set the charge power needed.<br>If the button is OFF, battery will charge at its max capability when charge action is activated. |
| Battery Discharge Power | If users want to set a certain discharge power when discharge action is activated, please click the button and set the discharge power needed.<br>If the button is OFF, battery will discharge at its max capability when discharge action is activated. |
| Battery Charge Cut-off SOC | If users want to set a certain battery SOC limit when charge action is activated, please click the button and set the charge SOC needed.<br>If the button is OFF, battery will charge till 100% SOC when charge action is activated. |
| Battery Discharge Cut-off SOC | If users want to set a certain battery SOC limit when discharge action is activated, please click the button and set the battery SOC limit needed.<br>If the button is OFF, battery will discharge till over-discharge SOC setting (Default 20%) when discharge action is activated. |
| System Import Power Limit | For systems with a certain import limit threshold, please click the button and set the limit value to the import limit required for the system.<br>For systems without import limit, please keep the button OFF. |
| System Export Power Limit | For systems with a certain export limit threshold, please click the button and set the limit value to the export limit required for the system.<br>For systems without export limit, please keep the button OFF. |

# Timed Plans

Manually set scheduled plans to meet customized requirements.
- **Battery charge/discharge plan:** Manually customize time periods for charging and discharging.
- **Demand control plan:** Manually customize time periods for grid import and export.



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## Battery charge/discharge plan Settings

| Setting | Description |
|---|---|
| *Start Time - End Time | Define the time period the control logic applies (Up to 6 time periods can be set) |
| *Action | Charge/Discharge/Standby Standby indicates battery remain idle and not charge or discharge |
| Battery Charge/Discharge Power | Define how much power the battery should charge or discharge |
| Allow grid to charge battery | Define if battery can be charged from grid power |
| Battery Charge/Discharge Cut-off SOC | Define the target SOC, charge till XX% or discharge till XX% |
| **More Settings** | |
| PV Power Generation | ON: Open the PV generation OFF: Stop the PV generation (suggest to use in negative price time period) |
| DO Control | (Only available for models with DO port) DO control to provide ON/OFF signal to turn on off external loads |

## Demand control plan Settings

| Setting | Description |
|---|---|
| *Start Time - End Time | Define the time period the control logic applies (Up to 6 time periods can be set) |
| *Action | Grid Import/Grid Export |
| Grid Point Import/Export Power | Define the power import/export limit at the grid point |
| Battery Charge/Discharge Cut-off SOC | Define the target SOC, charge till XX% or discharge till XX% |
| **More Settings** | |
| PV Power Generation | ON: Open the PV generation OFF: Stop the PV generation (suggest to use in negative price time period) |
| DO Control | (Only available for models with DO port) DO control to provide ON/OFF signal to turn on off external loads |

# Display

After settings, you can view the detailed implementation plan in Energy Management module.
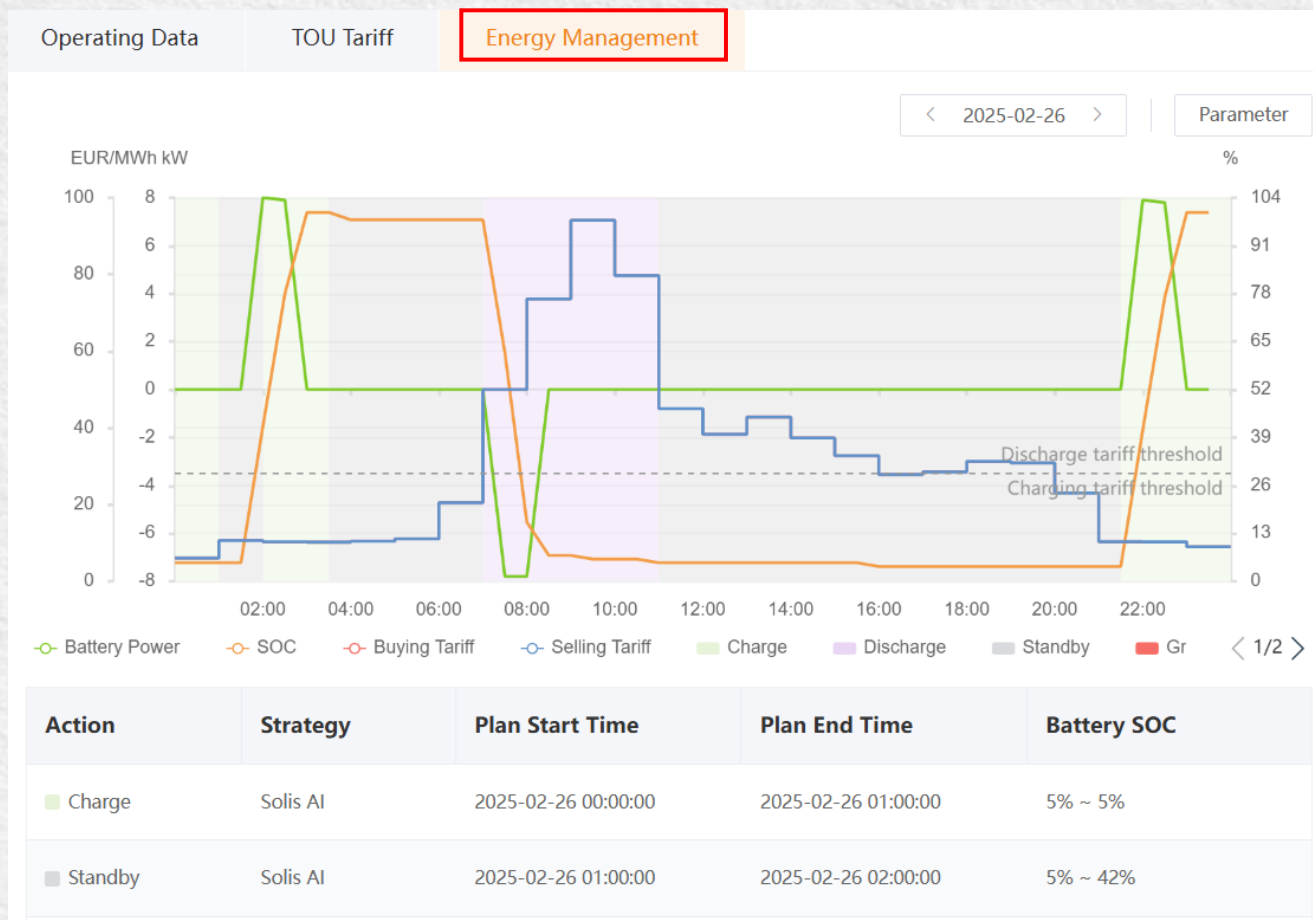


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# THANK YOU

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