Charge/Discharge Profile Programming through the Monitoring Portal – Application Note

Introduction

SolarEdge's StorEdge Solution can be used for various applications that enable energy independence for system owners, by utilizing a battery to store power and supply power as needed. One of the main applications of the StorEdge Solution is Charge/Discharge Profile Programming: the system operates according to a configurable charge/discharge profile, for example for time of use arbitrage (charge the battery from the PV/grid when tariffs are low and discharge the battery when tariffs are high).

A charge/discharge profile is created from a yearly calendar, repeated for 20 years as long as no profile changes are made. The yearly calendar is divided into segments, with one of seven charge/discharge modes assigned to each segment. This application note describes how to program a profile through the monitoring platform.

A profile comprises three components:

1. A daily profile type: defines the charge/discharge modes throughout a day. Different day types may be defined, for example, winter weekday, spring weekday, weekend, holiday, etc.
2. A seasonal profile: defines weekly profiles to use during specified periods of the year. These periods must cover the entire year. A typical use case is creating seasonal profiles corresponding to the seasonal changes of electricity rates.
3. Special day type: defines dates that should have a specific daily profile instead of the profile defined for the relevant period. For example, if you defined a seasonal profile from Dec. 15 to Jan. 15 but want the system to have a different daily profile for New Years, define a special day. Special days can be set as one-time events or as recurring events.

The following table describes the available modes:

Mode	Description	Example Use case
Solar power only	No battery charging/discharging; for using the system without StorEdge capabilities	To avoid excess battery charge/discharge and prolong battery life; for example, at nighttime or during the winter
Charge from clipped solar power	If PV production > inverter maximum production for self-consumption and grid export (up to the grid export limit and never more than inverter nameplate power), charge the battery	When grid export tariff and PV production are high; for example, during the summer and peak daytime production
Charge from solar power	Charge battery from PV production until it is full, and only then use PV production for self-consumption and grid export	When import rate and PV production are low; for example, during the winter and afternoon
Charge from solar power and grid	Charge battery from PV production and grid power (if needed) until it is full. Only then use PV production for self-consumption and grid export	When import rate is low and when AC charge is allowed by local regulations
Discharge to maximize export	If PV production < inverter maximum production (nameplate or limited power), discharge battery for self-consumption and grid export until the inverter reaches its power limit	When grid export tariff is high and PV production is not enough for self-consumption and grid export
Discharge to minimize import	If PV production < consumption, discharge battery only for self-consumption, not for grid export	When grid export is not allowed
Maximize self-consumption	Use PV production for self-consumption, then charge/discharge battery as needed to maximize self-consumption	When grid export tariffs are low or export is not allowed; reduce grid dependency

Configuring a Profile

This procedure can be completed before the system is installed or connected to the portal, that is, the site was defined in the monitoring portal but not connected.

→ To create a storage profile:

1. In the monitoring portal home page, click **My Account** and select the **Storage Profiles** tab.

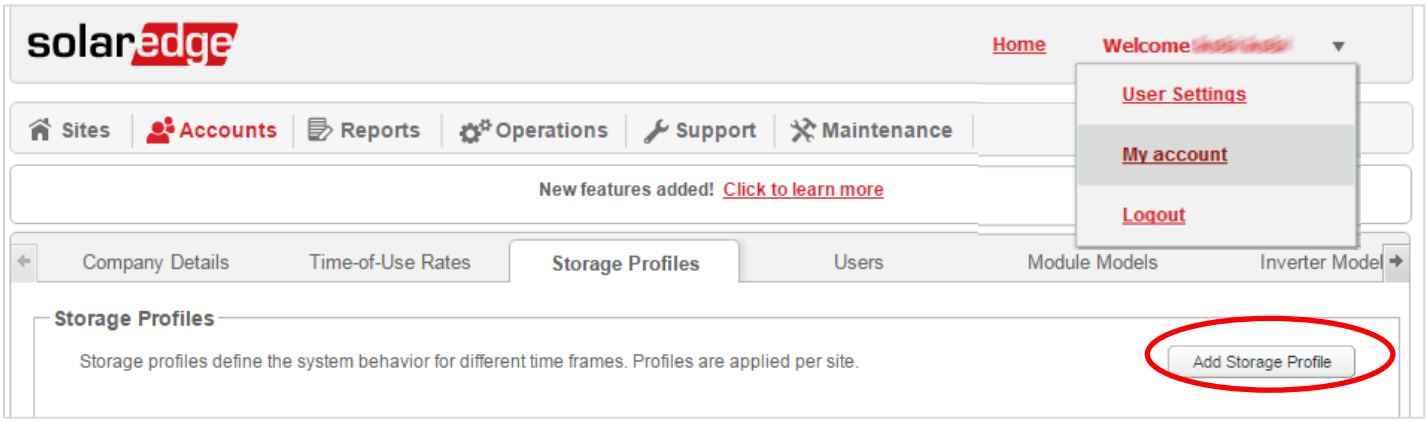

Figure 1: Storage Profiles tab and Add Storage Profile button

2. Click **Add Storage Profile**. The following window is displayed:

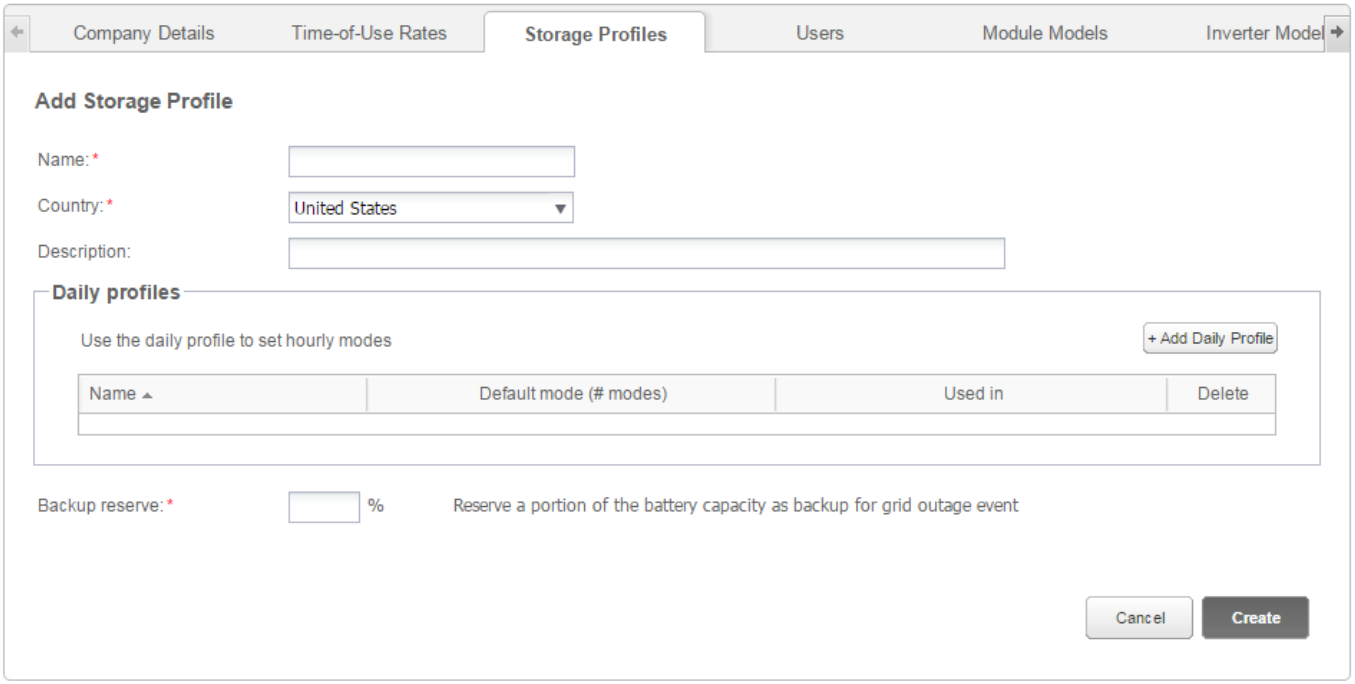

Figure 2: Add Storage Profiles

3. Fill in the profile details: name, country and optionally a profile description.
4. In the **Backup reserve** field enter the battery capacity portion to reserve for backup (in %). This is applicable only to StorEdge systems with backup.
5. Create daily profiles:
   a. Click **Add Daily Profile Type**. The following window is displayed:

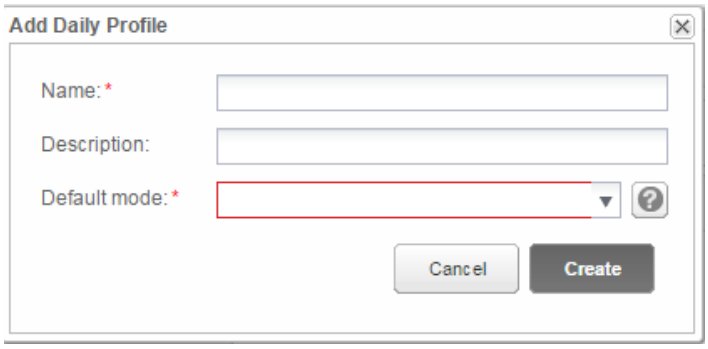

Figure 3: Add Daily Profile

b. Fill in the profile details: name and optionally a profile description.

c. Select the profile default mode from the dropdown list. The default mode will apply to the entire day; you can then set different modes for selected timeslots.

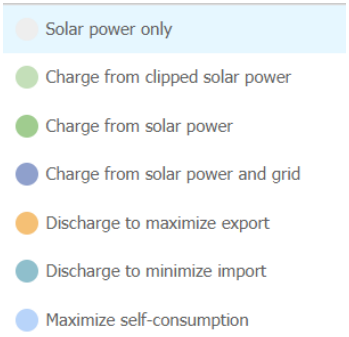

Figure 4: Profile modes

d. Click **Create**. The Daily Profile Details window is displayed:

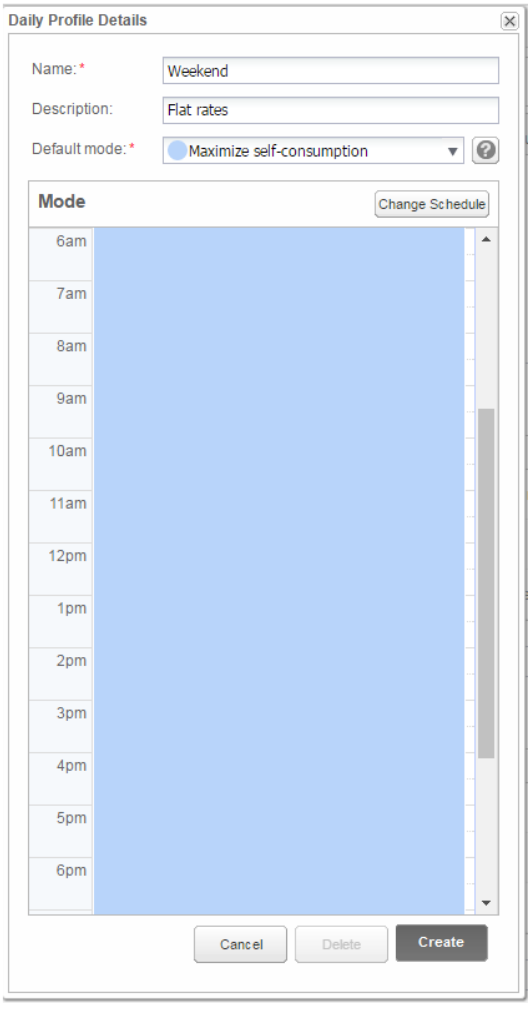

Figure 5: Daily Profile Details

e. You can set different modes for selected time slots, either by clicking **Change Schedule**, or by selecting a time slot in the window. The Change Schedule window is displayed.

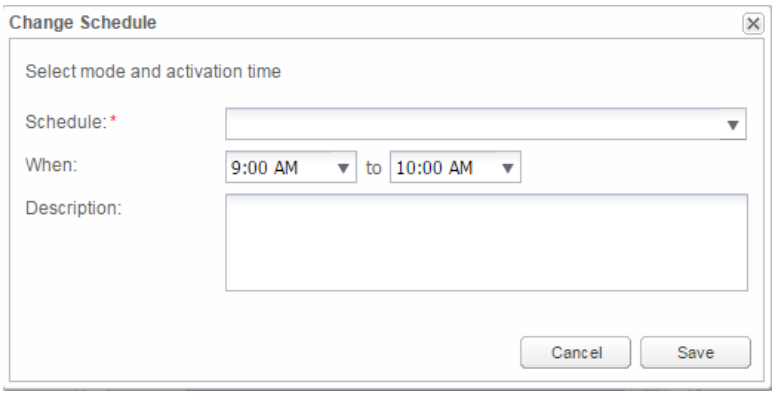

Figure 6: Changing the schedule in a daily profile

- Select the mode from the **Schedule** drop down and optionally add a description.
- Click **Save**.
- Click **Update** in the Daily Profile Details window.

f. Click **Create**. The daily profile is added to the Storage Profiles window.

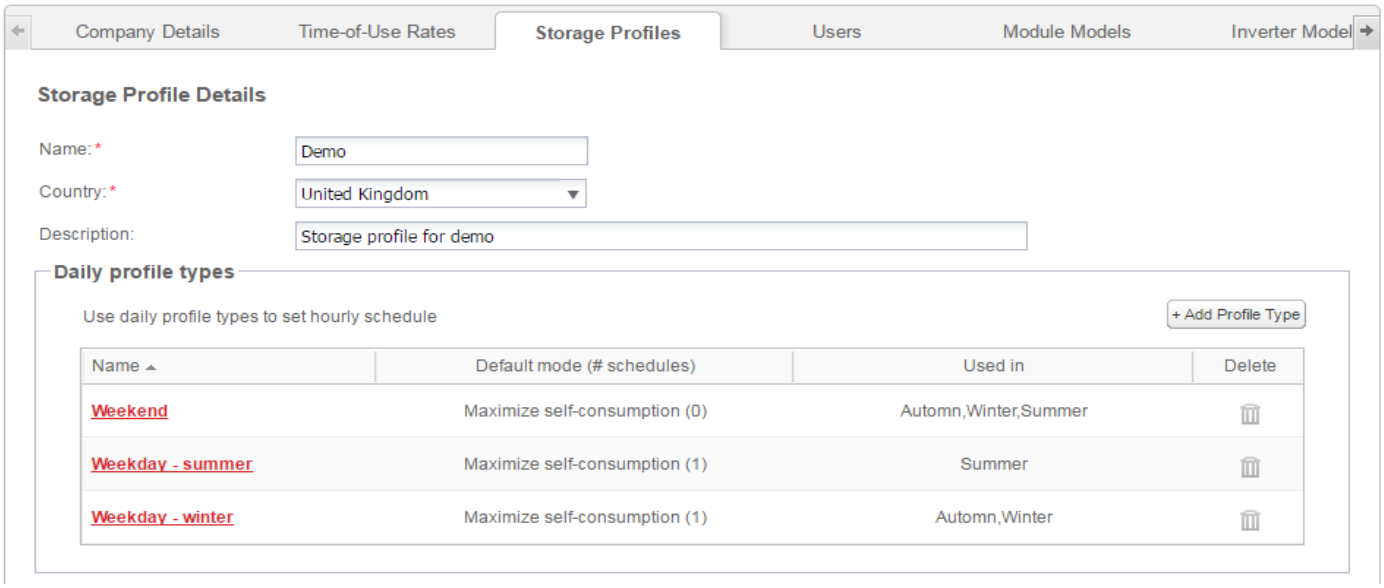

Figure 7: Daily profile types

g. To create additional daily profiles, click **Add Profile Type**. Repeat the steps above to create as many profile types as needed. For example, you can use Maximize Self-consumption mode on the weekend, Charge from solar power mode in summer mornings, or Charge from solar power mode in autumn noon hours.

6. Create seasonal profiles:

   a. In the Storage Profiles window, click **Add Seasonal Profile**.

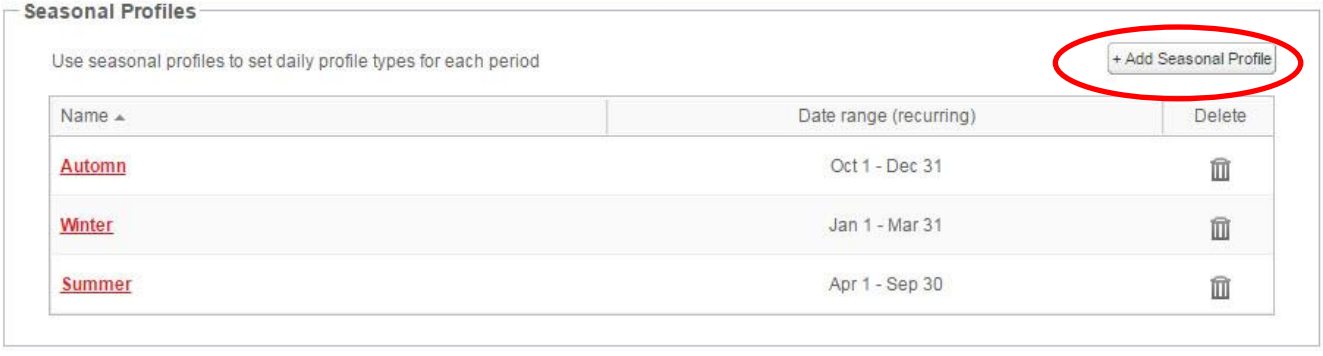

Figure 8: Add Seasonal Profiles in the Storage Profiles window

The following window is displayed:

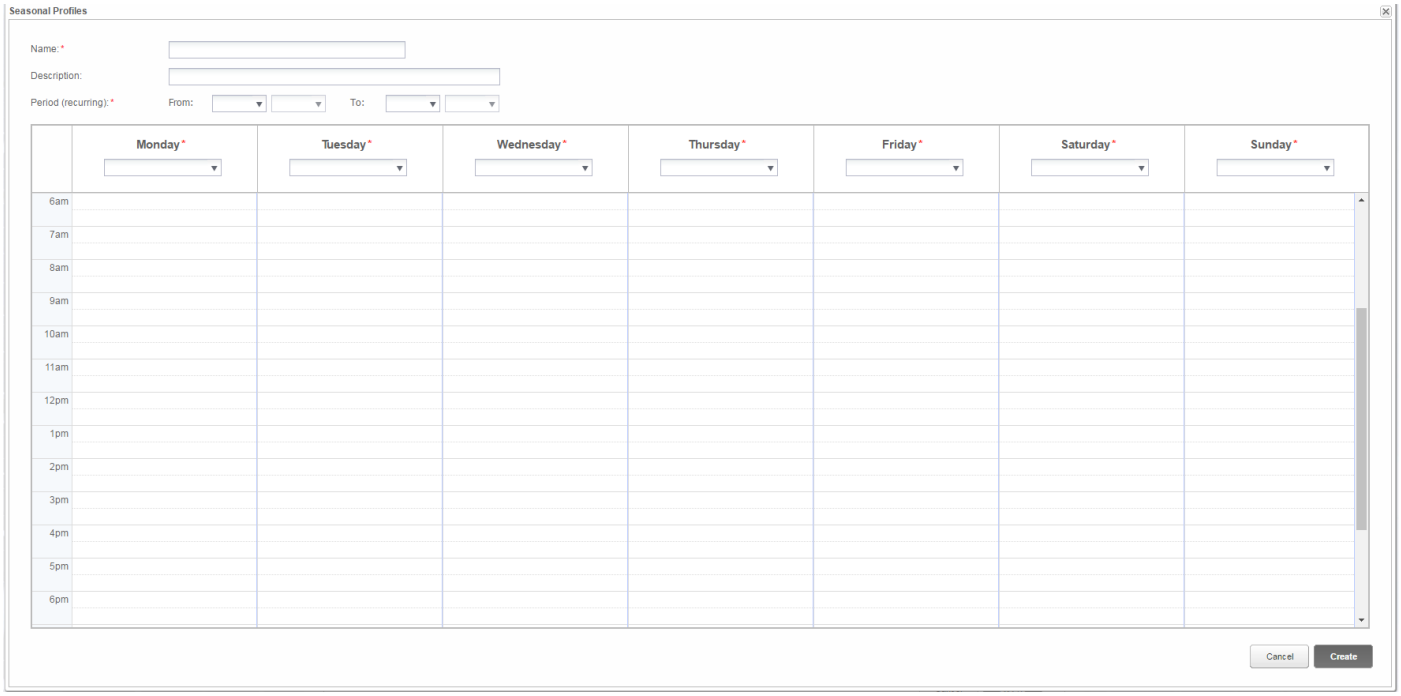

Figure 9: Adding Seasonal Profiles

b. Fill in the profile details: name, optionally a profile description, and the start and end dates of the period when the profile should be used.

c. For each day of the week, select a daily profile from the dropdown list. This weekly profile will recur each week of the defined period.

d. Click **Create**. The profile is added to the Storage Profiles window.

e. To create additional seasonal profiles, click **Add Profile Type**. Repeat the steps above to create as many profile types as needed.

NOTE

The seasonal profiles must cover the entire year, from Jan 1st to Dec 31st.

7. Optionally, create specific day profiles for holidays and other days requiring a different profile:

    a. In the Storage Profiles window, click **Add Special Day**. The following window is displayed:

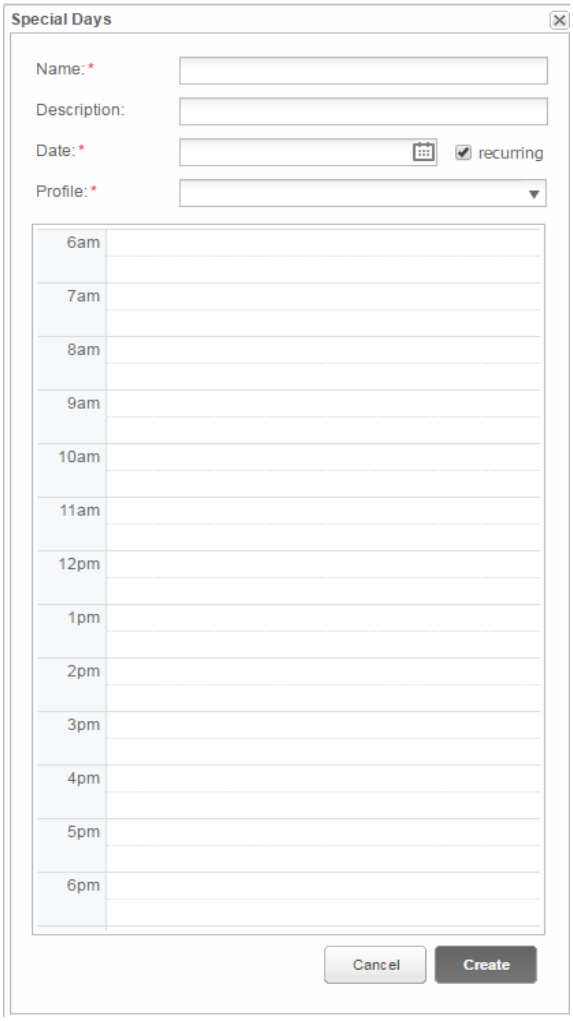

Figure 10: Creating a special day profile

    b. Fill in the profile details: name and optionally a profile description.

8. Click in the **Date** field. Enter a single date or click the calendar icon to select a date or a period that should be defined with the same settings.

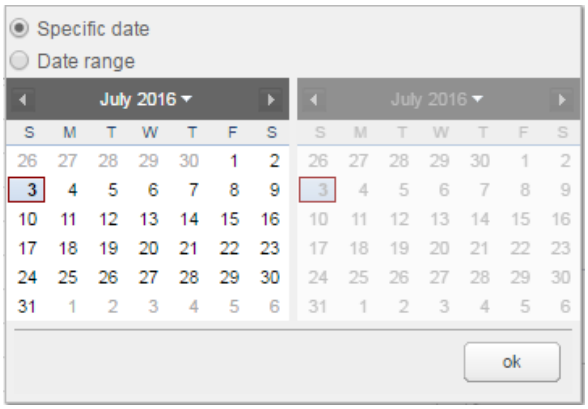

Figure 11: Calendar

    a. To repeat the profile yearly, select the **recurring** check box.

    h. Select a daily profile from the dropdown list.

    i. Click **Create**. The profile is added to the Storage Profiles window.

9. Click **Create**. The profile is saved.

→ To edit a profile:

1. Click the profile name to open its details
2. Edit as required.
3. Click **Update**.

→ To apply a charge/discharge profile to a site:

4. In the monitoring platform site page, click **Admin** and select the **Energy Manager** tab.

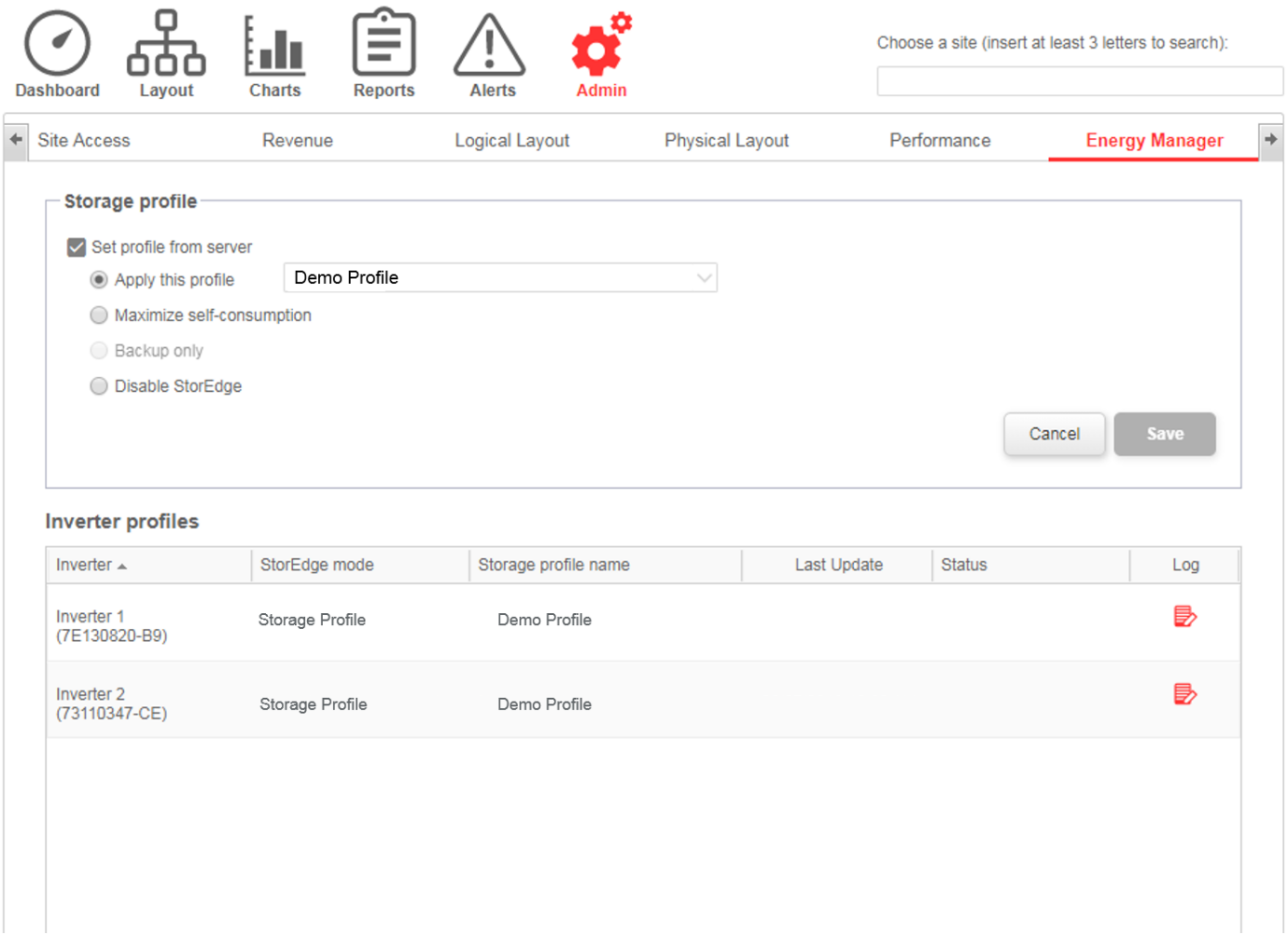

Figure 12: Energy Manager tab

5. Select the **Set profile from server** check box.
6. Select **Apply this profile** and select the profile name from the drop-down list. The profile is applied to all inverters in the site.
7. Click **Save**. The Energy Manager window displays:

   - In the Storage mode column: "Storage Profile" (if you applied a profile)
   - In the Storage profile name column: The specific profile that was applied to the site, as reported by each inverter.

   The site will use the charge/discharge profile that was defined.