solar edge

SolarEdge Site Designer

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Important Notice

Introduction

The SolarEdge Site Designer analyzes your planned PV site: location, size, module models and orientations, and then recommends one or several system designs: the SolarEdge inverter, power optimizer model and string sizing most suitable to your site requirements. The Site Designer can also verify any site design and it supports unequal string-length layouts and multi-orientation systems.

After installation, open the Site Designer from the desktop icon .

Site data is input in the **Choose Location**, **Define PV Arrays** and **Get Design** screens. In the latter the recommended designs are displayed. Designs can be edited and verified in the **Design** screen. An overview of the system can be seen in the **Summary** screen, and a system report can be created using the **Generate Report** button.

After creating a project you can save it by clicking on the application icon at the top left of the window and selecting the **Save** or **Save As** options. A saved project can be opened by selecting the **Open** option from this menu.

Starting to Use the Site Designer

Before starting a new project with the SolarEdge Site Designer, familiarize yourself with some of the icons used in the application and with the main menu.

Icons

The following icons are used throughout the application:

 Add

 Edit

 Remove

 Set as Default

 Clear Default

 Restore Default

 Restore SolarEdge Default

 Add to Favorites

 Remove from Favorites

Main Menu

The main menu is reached by clicking on the application icon at the top left of the window.

The main menu has the options detailed below and shown in Figure 1.
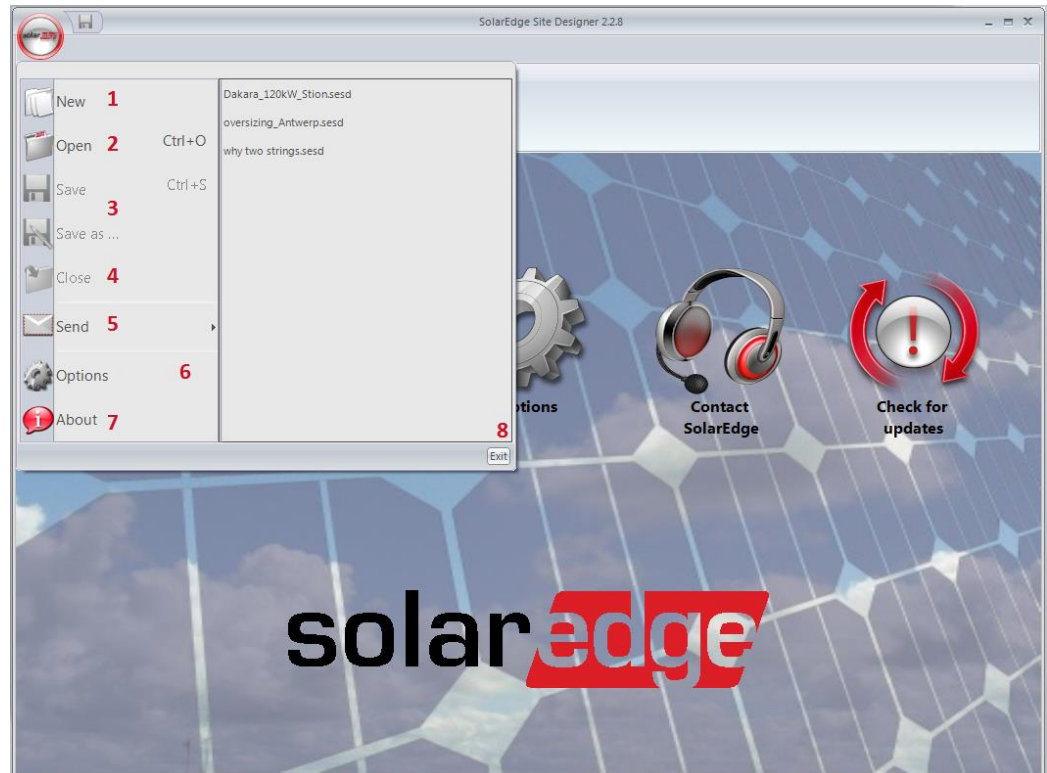
Figure 1 – Main menu

1 **New**: start a new project.
2 **Open**: open a saved project.
3 **Save/Save as**: save a project.
4 **Close**: close a project.
5 **Send**: send an email to SolarEdge support, or send SolarEdge modules that you added to the Designer.
6 **Options**: define various designer settings, as detailed below. The **Options** screen can also be accessed by selecting the **Options** icon in the opening screen.
7 **About**: software version information, and SolarEdge support contact information.
8 **Exit**: close the application.

The **Options** screen has the options detailed below and shown in Figures 2-4.

General Tab

Allows you to change your personal preferences
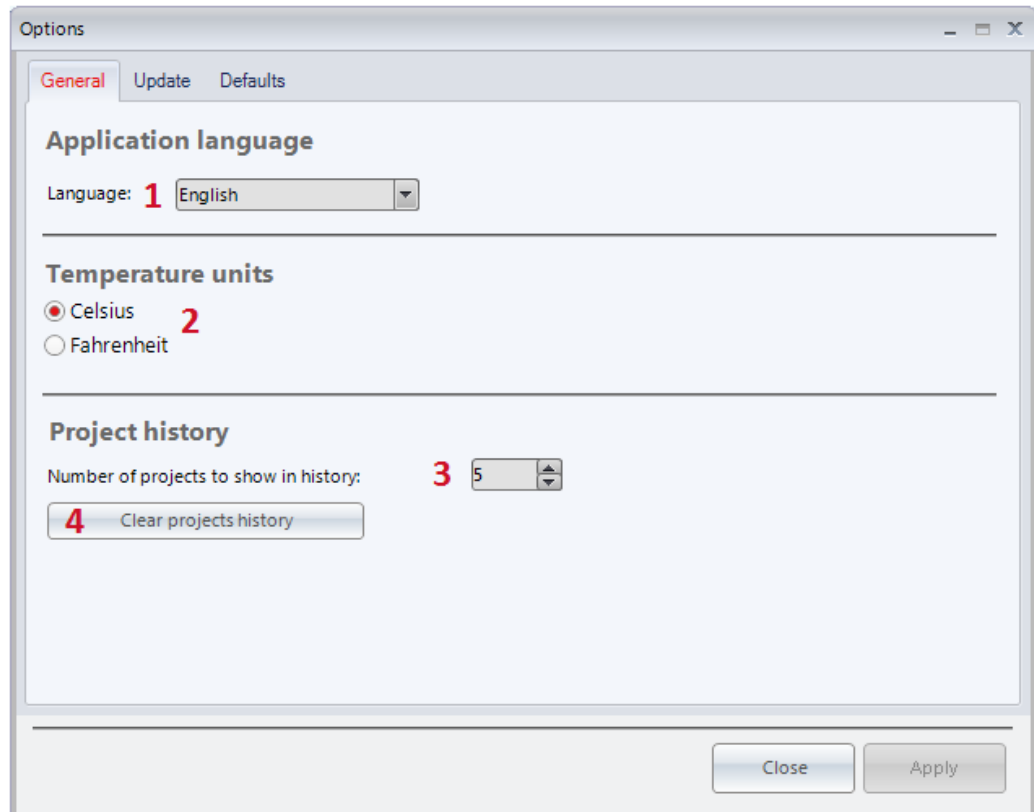
Figure 2 – Options screen, General tab

1   Change the application **Language**. The following languages are available: English, German, French and Italian.

2   Change the **Temperature units** to be used in the application: Celsius or Fahrenheit.

3   Change the **Number of projects to show in the history**. The last saved projects appear in the main menu.

4   **Clear the project history**.

Update Tab

Allows you to select whether or not to receive automatic application or database updates from SolarEdge
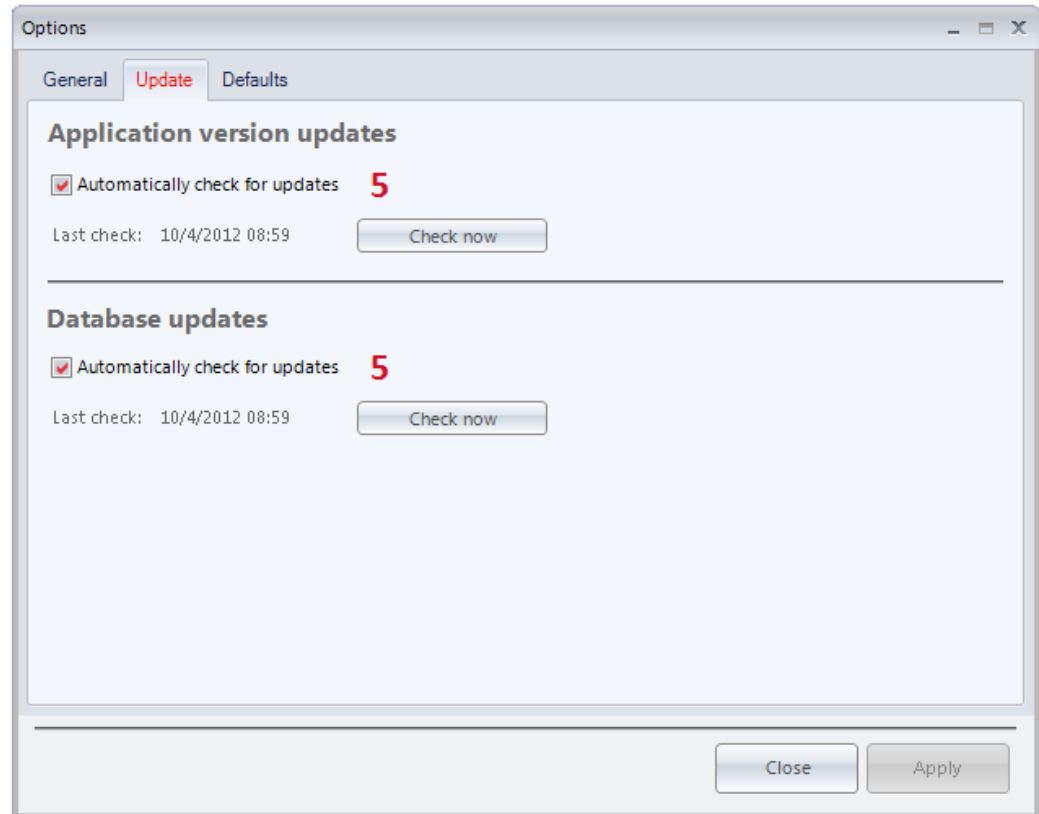
Figure 3 – Options screen, Update tab

5 Choose if the application should automatically check for application and database updates, or check if there is a new update.

Defaults Tab

Allows you to change defaults that you saved in the application.
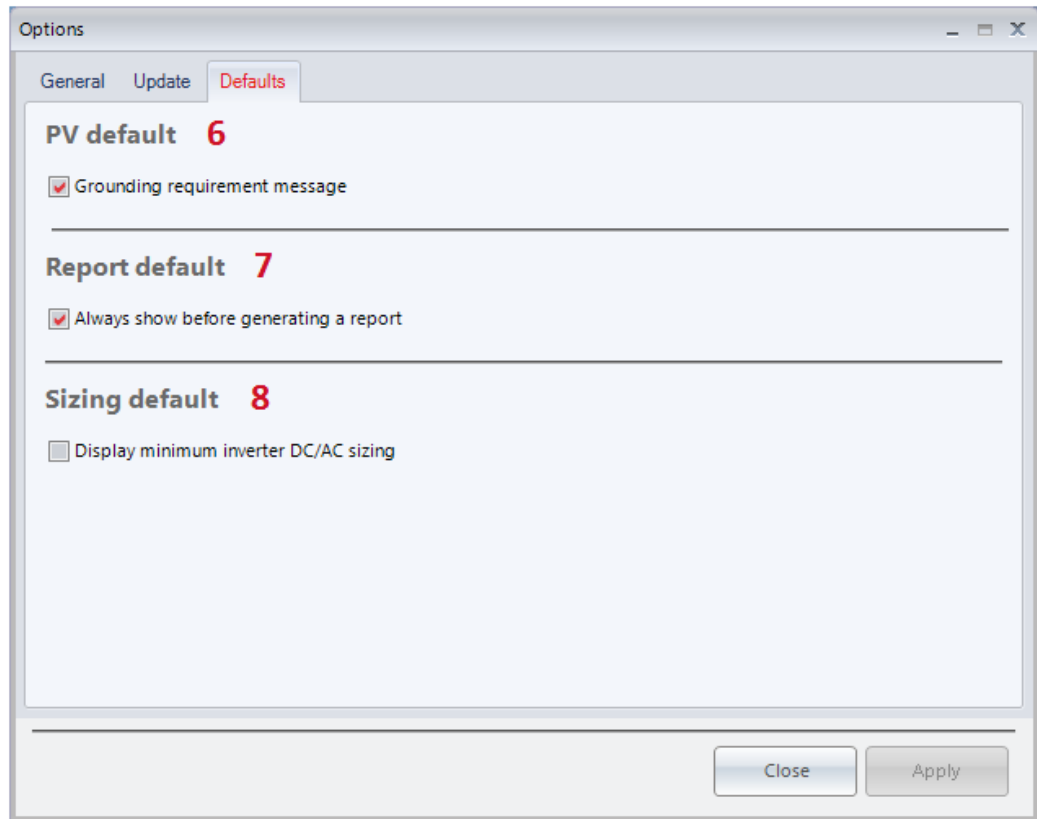
Figure 4 – Options screen, Defaults tab

The defaults that can be saved and edited from the **Options** screen are:

6 **PV Default**: display a message every time a module that may require grounding is selected.

7 **Report default**: always display the report settings before generating a report.

8 **Sizing Default**: display the minimum inverter AC/DC sizing

Other defaults that can be saved in the application can be edited in the application itself.

Begin a New Project

After opening the application, begin a new project either by selecting the **New Project** icon in the opening screen as indicated in Figure 5, or by selecting the **New** option in the main menu as indicated in Figure 1.

Figure 5 – New Project

Choose a Location

In the **Choose Location** screen you define the system location and related regional settings, as detailed below and shown in Figure 6.

Figure 6 – Choose Location

You must fill in the following mandatory fields:

1 Select a **continent**.

2 Select a **country**.

3 Select a **state/province** (where applicable).

4 Select a **city**.

You can manage the locations:

5 Save a location as the default location with the **Set as Default** icon. You can remove this selection at any time with the **Clear Default** icon. You can choose your default location by pressing the **Restore Default** icon.

6 Mark a location as favorite using the **Add to Favorites** icon. You can remove a location from the favorite list at any time be pressing the **Remove from Favorites** icon.

7 Check the **Favorites only** box to see only location saved as favorites.

You also have the option of changing the following fields:

8 Enter a project **Name** and **Description**; if you generate a report, these fields will appear in the report.

9 Adjust the **Ambient Temperature** range to which the system will be subjected.

10 If the desired location is not available, you can add a location by pressing the **Add** icon . You can later edit or delete this location using the corresponding icons (these icons appear only when using a location you added).

11 Select an electrical **grid** to ensure designs with inverters that comply with the required grid.

12 Adjust the **phase imbalance** limit which is the maximum phase imbalance permitted between phases. For single-phase inverter installations connected to the three-phase grid the application will not allow higher phase imbalance.

13 Adjust the inverter **power factor**. This field is available only in countries with reactive power requirements.

After entering all the information:

14 Press Next.

Define Modules and Orientations

In the **Define PV Arrays** screen you select a module model and define the system sizing and related settings, as detailed below and shown in Figure 7.

Figure 7 – Define PV Arrays

You must fill in the following mandatory fields:

1   Select a module **Manufacturer** and **Model**

You can manage the modules:

2   Save a module as the default module with the **Set as Default** icon. You can remove this selection at any time with the **Clear Default** icon. You can choose your default module by pressing the **Restore Default** icon.

3   Mark a module as favorite using the **Add to Favorites** icon. You can remove a module from the favorite list at any time be pressing the **Remove from Favorites** icon.

4   Check the **Favorites only** box to see only modules saved as favorites.

5   Check the **Only modules optimized by SolarEdge** box to see only modules with embedded power optimizers.

6   Define the **System size**, either according to number of modules or to system size in kWp (STC).

7   Adjust the modules' Orientation.

You also have the option of changing the following fields:

8 Edit the PV array name. This name will appear in the system recommendation and in the system report, if you generate one.

9 If the desired module is not available, you can add a module by pressing the **Add** icon . You can later edit or delete this location using the corresponding icons (these icons appear only when using a location you added). Added modules can be sent to SolarEdge for inclusion in the Site Designer after verification. To send them select **Send/Send my database to SolarEdge** from the main menu.

10 Change the **Mounting** of the system. This affects the modules' temperature.

11 For a multi-facet system, or for a system with several module models, add a **PV Array** for each additional orientation and module type. This is done by pressing the **Add** icon at the top of the screen.

After all selections are made you may view the following two results

12 View the electrical parameters of a selected module, under both STC conditions and extreme conditions at the selected location and orientation.

13 See all compatible power optimizers by pressing the **Display optimizer data**, as shown in Figure 8. A green V marks power optimizers that are compatible with the chosen modules and orientations. Hover over a red X to understand why a certain power optimizer does not match, as shown in Figure 8. Sometimes the application will allow connecting more than one module to each power optimizer input. These connections are indicated with the following notation after the power optimizer model: axb; this means that a modules are connected to the power optimizer input in parallel, and b modules are connected in series. For parallel connection you will need to use a branch-cable.

After entering all the information:

14 Press Next.

Figure 8 – Power Optimizer Compatibility Details

Get Recommended Designs

In the **Get Design** screen the Site Designer recommends one or several system designs, as shown in Figure 9, based on the location and PV array data that you input at the previous stages.

Figure 9 – Get Design

1 Review different recommendations in this area.

In some complex mutli-orientation designs the application may not offer any recommendation. In this case you can change the system settings as described below or manually design the installation by pressing **Edit Design**.

Changing the system settings:

2 Restrict the recommendation to specific **Optimizer configurations** that should be used in the design: specific power optimizer models and specific number of modules connected to each power optimizer.

3 Restrict the recommendation to specific inverter models that should be used in the design.

4 Adjust the **maximum DC/AC sizing**. This is the ratio between the rated STC power of the modules and the inverter peak AC power. Adjusting this range allows you to change the inverter over-sizing. Save a maximum sizing value with the **Set as Default** icon. You can choose your default value by pressing the **Restore Default** icon, and you can return to the SolarEdge maximum value by pressing the **Restore SolarEdge Default** icon.

5 Germany only: If the system size is <30kWp, this checkbox appears. This allows you to get designs with an AC/DC ratio according to EEG 2012. When this box is checked the inverter AC power can be limited to a value between 60-70% of inverter max AC power.

6 If you change any of these settings, press **Recommend again**.

Each recommended design includes the information detailed below and shown in Figure 10.

Figure 10 – Recommendation

1 Recommendation #. In the example, recommendation 1 is shown.

2 Inverter models and quantity. In the example, there are 3 inverters from one model and 1 inverter from a second model. Rge 3 inverters from the same model are split into two groups (inverters 1-2 and inverter 3) because the inverters in the first group have different string sizing from the inverters in the second group.

3 Number of strings per inverter, and power optimizer quantity and configuration from each array, per string. In the example, each inverter from the first group has 2 strings, each with 26 OP250-LV power optimizers from array "South", the inverter from the second group has 2 strings, one with 26 OP250-LV power optimizers from array "South" and the other with 25 OP250-LV power optimizers from the same array, and the inverter in the third group has 1 string with 35 OP250-LV power optimizers from the array "East".

4 Total per inverter:
    a. Number of modules
    b. Max achieved DC power – the maximum input DC to the inverter, at the given location
    c. DC/AC sizing – the ratio of the input DC @STC to inverter rated AC power

5 System Total – shown below the dashed line:
    a. Number of inverters, strings and modules
    b. Max achieved DC power – the maximum input DC to the system, at the given location
    c. Estimated yearly energy
    d. Clipped energy: when there is a large DC/AC sizing ratio, the inverter may clip the produced energy

Select a recommendation by clicking on it so that it is marked in red. You then proceed by selecting one of two buttons at the bottom of the screen:

6 Press **View Summary** to see an overview of the selected design.

7 Press **Edit Design** to manually change the system design.

These options are discussed in further detail in the following chapters.

View Project Summary

In the **Summary** screen you can see an overview of the selected design, as detailed below and shown in Figure 11.

Figure 11 – Summary

1 **Project summary**: STC power, max DC power at given location and orientation, inverter active AC power and inverter apparent AC power.

2 **Yearly energy**: estimated yearly energy that the system will produce.

3 **Project design**: inverter, power optimizer and module quantity; number of PV arrays defined; number of different orientations used; phase balancing requirement.

4 Environmental data: the system's environmental impact according to its estimated energy.

5 **Estimated monthly energy**: graph displaying the estimated monthly energy that the system will produce.

    a. If the inverter is strongly over-sized and as a result there AC energy is lost due to output power clipping, the monthly and yearly values of energy lost due to clipping are displayed as well, as a percentage of produced energy.

    b. Check that if a yield factor appears, it is at a satisfactory value. The yield factor indicates low energy production in multi-facet installations due to low number of modules on a facet.

From the summary screen you can generate a system report, as detailed in the **Generate a System Report** chapter.

Generate a System Report

From the **Summary** and **Design** screens you can generate a system report by selecting the **Generate Report** button at the top of the screen. Selecting this option opens a screen where you can define and input report data, as detailed below and shown in Figures 12 and 13.

Content Tab

Figure 12 – Report Settings, Content tab

1 Optional: Exclude certain sections from the report.

2 Choose the **Required power optimizer input connector** according to the modules used in the design. This is a mandatory field, ensuring that the power optimizer part number provided in the report meets the system requirements.

3 Choose the **Required power optimizer output cable length** according to the installation of the modules: portrait or landscape. This is a mandatory field, ensuring that the power optimizer part number provided in the report meets the system requirements.

4 Optional: Choose whether or not the Report settings screen should appear every time you press the Generate Report button. Unchecking this box means that the last settings will be used.

Contact Information Tab

Figure 13 – Report Settings, Contact Information tab

5 Optional: Input your **contact information**, including a logo if desired. Save a set of values as the default values with the **Set as Default** icon.

6 Save the information as the default information with the **Set as Default** icon. You can choose your default information by pressing the **Restore Default** icon and you can clear this information with the **Clear Default** icon.

7 Optional: Input the **contact information of the customer** for whom you designed this system.

8 Press **Generate Report.**

A general view of the report can be seen in Figure 14.
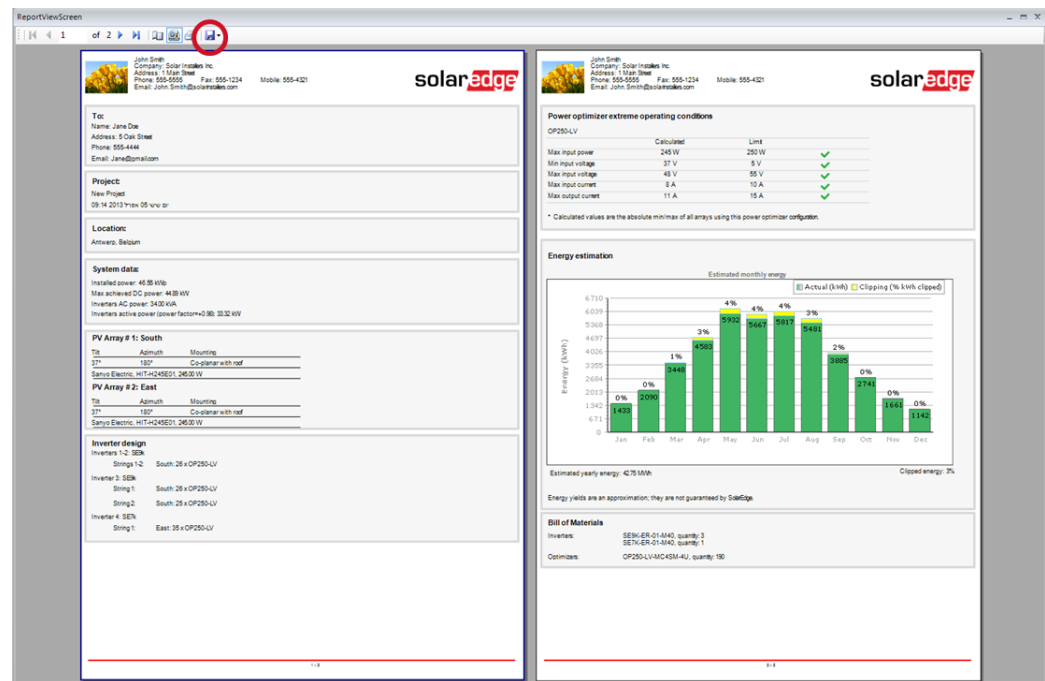
Figure 14 – Project report, general look

The report can be saved by pressing the Save icon at the top of the screen, indicated in Figure 14. The report can be saved in the following formats:

- Pdf
- CSV
- Excel 97-2003
- Rich Text Format
- Tiff
- Web archive

The report includes the information detailed below and shown in Figure 15.

John Smith
Company: Solar Installers Inc.
Address: 1 Main Street
Phone: 555-5555   Fax: 555-1234   Mobile: 555-4321
Email: John.Smith@solarinstallers.com

solar**edge**

To:

Name: Jane Doe

Address: 5 Oak Street

Phone: 555-4444

Email: Jane@gmail.com

Project:

New Project

09:14 2013 אפריל 05 שישי יום

Location:

Antwerp, Belgium

System data:

Installed power: 46.55 kWp

Max achieved DC power: 44.89 kW

Inverters AC power: 34.00 kVA

Inverters active power (power factor=+0.98): 33.32 kW

PV Array # 1: South

Tilt	Azimuth	Mounting
37°	180°	Co-planar with roof

Sanyo Electric, HIT-H245E01, 245.00 W

PV Array # 2: East

Tilt	Azimuth	Mounting
37°	180°	Co-planar with roof

Sanyo Electric, HIT-H245E01, 245.00 W

Inverter design

Inverters 1-2: SE9k

      Strings 1-2:   South: 26 x OP250-LV

Inverter 3: SE9k

      String 1:   South: 26 x OP250-LV

      String 2:   South: 25 x OP250-LV

Inverter 4: SE7k

      String 1:   East: 35 x OP250-LV

Power optimizer extreme operating conditions

OP250-LV

	Calculated	Limit	
Max input power	245 W	250 W	✔
Min input voltage	37 V	5 V	✔
Max input voltage	48 V	55 V	✔
Max input current	8 A	10 A	✔
Max output current	11 A	15 A	✔

* Calculated values are the absolute min/max of all arrays using this power optimizer configuration.
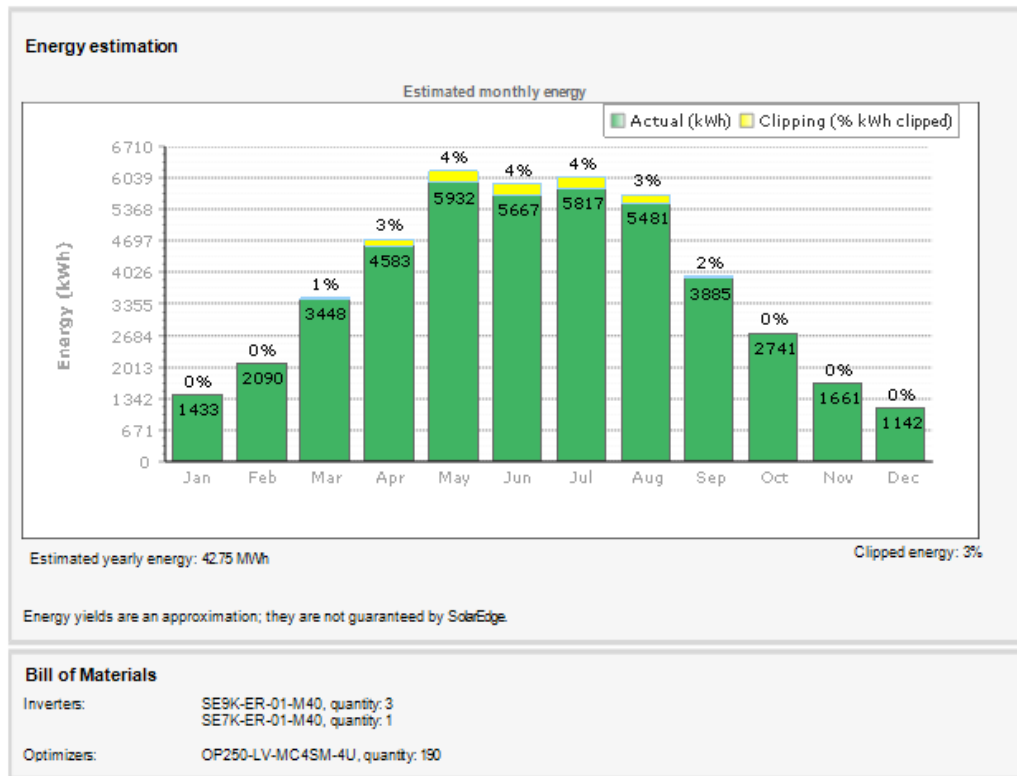
Figure 15 – Project report

1 User contact information and SolarEdge logo – this appears at the top of every page in the report.

2 **To**: customer contact information.

3 **Project**: project name, description and creation date.

4 **Location**: system location.

5 **System data**: system STC power, max DC power at given location and orientation, and inverter AC power.

6 **PV Arrays**: details of all the arrays defined: Array name, tilt, azimuth, mounting type and module model.

7 **Inverter design**: inverter models and quantities, number of strings per inverter and power optimizer quantity and configuration from each array, per string.

8 **Power optimizer extreme operating conditions**: the expected electric parameters of the power optimizer configuration under extreme conditions at the selected location and orientation, displayed next to the power optimizer limitations. A green checkmark is displayed next to each valid parameter.

9 **Energy estimation:** graph displaying the estimated monthly energy that the system will produce, including AC energy loss due to output power clipping, if it occurs.

10 **Bill of Materials:** the part number and quantity of each SolarEdge product needed for the design.

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Edit System Design

In the **Design** screen you can design any system, and receive immediate verification of the design. This option should be used if there is no recommended design or if you do not want to use one of the recommended designs because of specific design constraints.

When choosing the **Edit Design** option, the screen shows the design you chose in the **Get Design** screen. You then build and verify a design as detailed below and shown in Figure 16.

Figure 16 – Edit Design

1 Choose a different **Optimizer configuration**.

2 Adjust the **maximum DC/AC sizing**.

3 <u>Germany only</u>: If the system size is <30kWp, this checkbox appears. This allows you to get designs with an AC/DC ratio according to EEG 2012.

4 Choose a different **Inverter model**.

5 Change the **quantity** of inverters of a given model.

6 View the permitted **string lengths** for the chosen power optimizer configuration and inverter model.

7 Change the **Quantity** of a specific string design. This means that if you are designing an inverter with several strings that are identical in string length and number of modules from each array, you just increase the string quantity.

8 **Add a string** to an inverter, if you are designing an inverter with several non-identical strings.

9 Assign modules to a string; modules from different arrays can be combined in the same string.

10 **Add an inverter**, when using multiple inverter models or when having a different design per inverter (e.g. if you have an SE4000 with 17 modules and an SE4000 with 18 modules).

11 Check how many modules you have already assigned to strings, out of the total number of modules you defined in the **PV array** screen. You can check this per array and for the total system.

12 Check that the max phase imbalance you defined in the Location Screen is not exceeded.

13 Check that if a yield factor appears, it is at a satisfactory value. The yield factor indicates low energy production in multi-facet installations due to low number of modules on a facet.

14 Change the location, PV arrays or system settings that you originally input.

From the **Edit Design** screen you can generate a system report, as detailed in the **Generate a System Report** chapter.

If the design you chose is not valid, the **Generate report** button will be disabled and the non-valid part of the design will be indicated in red.

Change the Energy De-rating Factors

From the **Summary** and **Design** screens you can change the energy de-rating factors, which affect the estimated energy of the system. To do this, press the **Settings** tab at the top left of the screen, and then press the **De-rating factors** button.

In this screen you can edit the factors and save the new values, as detailed below and shown in Figure 17.

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Figure 17 – De-rating factors

1 **Module Factors**: edit the de-rating factors associated with module energy losses: **PV nameplate**, **Module Soiling** and **Module Aging**. There are no **Mismatch** losses in the SolarEdge system.

2 **Electrical Factors**: edit the de-rating factors associated with electrical components in the system: **DC wiring**, **AC wiring**, and **Diodes and Connections**. **Inverter and power optimizer** losses are system dependent and are calculated according to the models used in the design.

3 **Location Factors**: edit the de-rating factors associated with the specific system location: **System Availability** and **Shading**.

4 Save a set of values as the default values with the **Set as Default** icon. You can choose your default values by pressing the **Restore Default** icon, and you can return to the SolarEdge settings by pressing the **Restore SolarEdge Default** icon.

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If you have technical queries concerning our products, please contact our support through SolarEdge service portal:
http://www.solaredge.com/groups/support/services

North America	(Toll free) 1877 360 529 2
Australia	(Toll free) 1800 46 55 67
Germany	089 454 597 30
France	(Toll free) 0800 917 410
Italy	(Toll free) 800 784 824
Japan	(Toll free) +81.3.5530.9360
United Kingdom	(Toll free) 0800 028 1183
Belgium	(Toll free) 0800 730 41
Israel	073 240 311 8
Rest of world	+ 1 (0) 650 319 884 3
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