

# Performance and self-consumption

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# Performance task

This guide applies to [beta.easy-pv.ie](https://beta.easy-pv.ie) version of Easy PV. The information provided here may not be accurate for [easy-pv.co.uk](https://easy-pv.co.uk), [easy-pv.com](https://easy-pv.com) and [easy.pv.ie](https://easy.pv.ie).

The performance task uses the location, roof inclination and orientation and shading information to estimate the annual output of the system. This is then used in the [consumption task](#) to estimate how much of what is generated will be used directly, used to charge a battery or exported to the grid, which is needed to estimate the [financial benefits](#) of the system.

## Navigating the performance task

The right hand sidebar contains options to switch between the **sunpaths** and the **performance results**:

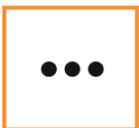


As well as the following options:



### Edit inputs

Update the location, pitch and orientation of the roofs and panel allocation



### View all options

Including editing performance preferences and opening the help page

## Editing inputs

Certain inputs are required for the performance estimate to be calculated. Designing in 3D and [configuring your settings](#) to automate panel allocation and sunpath diagram calculations will streamline much of this task.

### Location and roofs

First, if not already input when creating the project, you will need to set the location. If you are creating a flat roof system or using quick roof mode, you will also need to input pitch and orientation. Both this and the location data are used to determine the output per kWp of the system.

Both the location and roofs section may show as ticked and completed already if this information can be pulled from earlier tasks in the project.

## **Panel allocation**

This section will depend on how you have configured your settings.

- If you have selected for your panels to be **automatically allocated**, then panel allocation will show as completed
- If you have selected **suggest allocation** then here you can choose to edit the allocation or select **Done** to accept the allocation and close the window.
- If you have **manual allocation** selected then you will need to allocate the panels here. There are some cases where auto-stringing will not work and manual allocation will be required. Further information about manual panel allocation can be found [here](#).

If automatic allocation is selected and the location and roofs tabs are auto-completed, then the input window will not open. Click the pen icon to open the window and edit the inputs.

## **Sunpaths**

The sunpath diagrams maps the path of the sun across the sky at different hours in the day for different months of the year. For each point on the sunpath diagram, Easy PV calculates the amount of solar radiation reaching the panels from direct and diffuse radiation. For shaded regions, where direct radiation is radiation is fully blocked, the system calculates how much diffuse radiation still reaches the panels. The shading factor is the proportion of solar radiation that reaches the panels after accounting for these shading losses.

### **Automating with 3D**

If designing in 3D or magic design mode, the shading can be calculated automatically, provided any trees or obstructions have been modeled. Otherwise, you will need to manually draw on the sunpath diagram what shade is on the panels at different points in the year.

### **Navigating between inverters and inputs**

On the top left you will see each of your inverters, below this for each inverter you will see each input on the inverter. There is a sunpath diagram and shading factor calculated for each input.

## **Performance results**

- Section **A** details the installed capacity, orientation of the system, inclination of the system and the location. These inputs can be adjusted by clicking the pen icon in the top right.
- In section **B**, the data in section **A** is used to estimate the output per kWp for the unshaded array using the NREL's PVWatts calculator. The percentage of output lost from shade is then subtracted from this value before it's then multiplied by the kWp of the input, to calculate the estimated generation per input. To adjust the percentage lost, navigate to the sunpaths tab.

# Manual panel allocation

Manually allocating panels is slightly different depending on whether the panels are optimised or not. All panels connected to an input must be within a certain pitch and orientation threshold and panels incompatible with the selected string will be unselectable. In this case you may need to add optimisers.

## Without optimisers

1. Select the current roof and inverter input from the lists on the left.
2. Click or drag over panels to allocate them to an inverter input.
3. Once all inverter inputs have the correct number of panels, all inputs will be in green and a tick will show at the top. Below all your inverters and roofs, you can then click **next** to continue with the [performance task](#).

## With optimisers or microinverters

You can add optimisers in the inverter task by clicking **Add optimisers +** to the top right of the inverter string. This will automatically add optimisers to all panels on that inverter, if you would like to remove some, this will have to be done manually in the financial task.

When you then come to allocating the panels the steps are largely similar to non-optimised systems:

1. Select the current roof and inverter input from the lists on the left.
2. Use the **Add group +** option to sub-divide the input into shading groups and select the group you want to allocate panels to. You should group panels that will get similar levels of shade or that are on different facing roofs.
3. Click or drag over panels to allocate them to an inverter input or shading group.
4. Once all inverter inputs have the correct number of panels, all inputs will be in green and a tick will show at the top. Below all your inverters and roofs, you can then click **next** to continue with the [performance task](#).

### **Adding optimisers in the inverter task will not automatically change the generation.**

The generation is a product of the kWp of the inverter, the kk value (which is based on the pitch, orientation and location of the panels) and the shading factor. Putting panels in separate **shading groups** does not correspond to anything physical but allows Easy PV to factor in differences in the kk value and shading factor on the same string. Without shading groups the generation will not change because the kk value and shading factor will be the same on the whole string. as it would be without optimisers.

## Other options

- Use the  icon to reset the allocation on the inverter or individual inverter inputs.
- Below where it says **Next**, you also have the option to use auto-stringing. This will not work for systems that require shading groups.

# Consumption task

This guide applies to the [easy-pv.co.uk](https://easy-pv.co.uk) and [beta.easy-pv.ie](https://beta.easy-pv.ie) versions of Easy PV, references to MCS only apply to the UK site. The information provided here may not be accurate for [easy-pv.com](https://easy-pv.com) and [easy.pv.ie](https://easy.pv.ie).

The consumption task is an accepted alternative to the MCS performance table completed in the performance task. Unlike with MCS, the Easy PV self consumption task can be used for projects larger than 6000 kWh and with batteries larger than 15.1 kW.

If you would like to use the Easy PV self-consumption calculation in your project, make sure it is selected in the [financial task](#).

## Annual consumption

There are a number of options for adding the annual consumption.

- **Annual usage:** If you know the annual consumption (for example from an electricity bill) you can enter it via the 'Annual usage' option
- **Meter data:** If the property has a smart meter and you can upload half-hourly data to get a more accurate projections. This option is especially useful for commercial properties where consumption patterns differ greatly from domestic properties.

The data should ideally span at least a year, and must be a **minimum of 6 months**, although our algorithm will automatically attempt to fill in small gaps where they are detected.

The file must have a .csv file extension. If your data is in another format you can export it as csv from Excel, Google Sheets, Libreoffice or any other spreadsheet editor.

Note that there are many different CSV formats for smart meter data, and we don't support all of them yet. If your upload doesn't work, you are welcome to send us the spreadsheet at [help@easy-pv.co.uk](mailto:help@easy-pv.co.uk) or [help@easy-pv.ie](mailto:help@easy-pv.ie) and we will see if we can add the format.

- **Not sure:** If you don't know the electricity consumption in the property, you can use a typical value for the size of property.

## Tariffs

By default, we'll calculate the financial benefits using your default flat tariffs which you can specify in your [financial settings](#). Alternatively, you can create and select your own tariffs by selecting

'Create a new tariff' under import and export tariffs.

See [here](#) for a full guide on creating tariffs in Easy PV.

## Self-consumption calculation

Once you are happy with the consumption and tariffs, select submit. You can then explore how the PV generation, consumption within the property, state of charge of the battery (if a battery is included) and import and export of electricity from the property change through the seasons and over the course of each day.

To edit consumption task inputs, select the pen icon in the top right corner.

# Editing and creating tariffs

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Setting tariffs is an essential part of ensuring the financial benefits can be calculated as accurately as possible for your customer. These can be created, viewed and edited in the [consumption task](#) or the [financial task](#).

You can also set up user level default tariffs in your [account financial settings](#) or if you are a member of a Pro team, this will be set by a Pro team admin in Pro account financial settings.

This guide will detail how you can manage and create tariffs in Easy PV.

## Creating a new tariff

### Name of tariff

If this is a variable rate tariff, this name will show on the consumption section of the customer proposal. Otherwise, it is just a way for you to manage and navigate your tariffs when selecting them.

### Scope of tariff



#### Project level

- These will only be viewable on the specific projects it's created for.
- A good option if you frequently change the tariffs on each project.



#### User level

- These can be used for any projects and set as a default in your financial settings.
- A good option if you aren't sure what tariffs your customer is on so want to use standard values.



#### Team level

- If you are a member of a Pro Team, you will be able to create Team level tariffs.
- These will work much like the User level tariffs but will show for all members of your team.

Once the scope of the tariff has been set, this cannot be edited.

## Price bands

### Flat tariff

- Input a value for the base rate and select save.
- Ensure you're putting this in in the correct units, this value should be greater than 1 (i.e. 15, not 0.15).

### Variable rate tariff and tariff periods

- The first band you enter will be used as the base rate - any time period that doesn't have a price band applied will be priced at this rate.
- Add any additional rates in the price bands section.
- In the **tariffs period** section you will be able to select the different price bands and indicate when they apply. For some tariffs different rates might apply at the weekend, you can select the days for which the tariff period applies.

## Editing existing tariffs

You can view and edit your tariffs in three different places in your account:

- Within a project:
  - Consumption task
  - Financial task
- (Pro) Account settings > Financial (only User or Team-level tariffs)

When you select 'View and edit tariffs' you will see the following options:

## Electricity tariffs

### Import tariffs

The screenshot shows the 'Import tariffs' section with a '+ Add import tariff' button. Two tariff entries are visible:

- Variable example** (Project scope):
  - Base: 23.5 p/kWh
  - Night: 15.5 p/kWh (02:00 to 05:00 All week)
- Default flat tariff** (User scope):
  - Base: 20 p/kWh

Annotations in the image point to the 'Variable example' name, the '02:00 to 05:00 All week' period, and the 'User' scope. A menu for the first tariff shows 'Edit' and 'Delete' options.

When editing tariffs you can change any of the details except the tariff scope, but note that any changes you make will affect previous projects that use these tariffs.

## Using your tariffs

Once you have created your tariff either for an individual project or set a user level default, you can then select these in the consumption task and financial task.

The tariffs set in the consumption task will pull through to the Easy PV and MCS consumption methods in the financial tasks only if they are flat tariffs - if you select a varied tariff then this will only be used in the Easy PV method and your MCS default value will be selected.