

RatedPower enables automated design and engineering of electric substations

RatedPower automatically generates the best solution for an interconnection facility in solar farms to improve efficiency, cut costs and drive investment

Madrid, 26th October 2020, [RatedPower](#) has once more revolutionized engineering by including on pvDesign's algorithm the possibility to design and engineer the interconnection facility efficiently and accurately. This new feature was fundamental in the solar industry needs.

To connect a solar PV plant to distribution or transmission networks, it is necessary to step-up the voltage level from medium to high voltage. To do this our plant would need a substation.

Substations are therefore used to accommodate new energy generation, maintain reliability requirements to address congestion in the power grids, satisfy load growth and transmission capacity rapidly and break the power flow in scenarios of fault response.

The Power Transmission and Distribution Industry has witnessed significant upsurge due to its growing life expectancy and the rising demand for effective, safe, reliable and stable transmission & distribution networks.

The lack of an efficient electricity network worldwide has been a major investment driver worldwide. According to the [Global Market Insight Report](#), Global Substation Market size surpassed USD 151 billion in 2019 and annual installation is anticipated to exceed 24,500 units by 2026.

As solar projects get larger, it isn't rare that utility companies prefer to outsource the design of the substation. For this reason, [pvDesign](#) has launched a new feature to generate the basic engineering of some of the most common substations: line to transformer substation, single busbar substations and double busbar substations.

According to our data, **86% of pvDesign's users prefer to automate the design of the electric substation of their projects**. Of those users that choose manually their configuration, 60% prefer a single busbar arrangement. On the other hand, 9,3% of the designs simulated in pvDesign preferred to connect to the network by a switching and breaking station. These stations would allow solar plants to be connected to networks whenever the output voltage is the same, for example in the case of medium voltage distribution networks.

In a fully automatic way, pvDesign carries out the basic engineering of the substation that best suits the photovoltaic plant. Our users only need to select the substation card and introduce the high voltage level. Only with this data, our software is capable of generating in detail all the necessary documents of the step-up substation that will allow the connection of the photovoltaic plant to the distribution or transmission networks of the country.

On a study conducted by the [Agency of the Cooperation of Energy Regulators](#) (ACER), the number of transformer bays and the number of busbars are two of the most important factors

when pricing a substation. Further studied in our [blog post](#), this means that substations could represent between 5 to 10 percent of the total cost of a photovoltaic plant.

The calculation module of the step-up substation introduced in pvDesign allows in a very simple and fast way to obtain all the documents necessary for the design of the interconnection installation of the PV plant. The step-up substation or the breaking station are customized for each project. In other words, the plant's medium voltage lines, the plant's capacity and environmental conditions are taken into account.

Among the most important documents that pvDesign generates in seconds are:

1. Single line diagrams (SLDs) as a graphic representation of the electrical installation.
2. A design report that includes the descriptive memory of all the necessary equipment in the substation as well as safety distances, insulation coordination, values of short-circuit currents and characteristics of the busbar. Moreover, the design report includes the descriptive memory of all the necessary equipment in the breaking station, such as feeder, auxiliary, protection and metering cubicles.
3. Profile, top views and general sections of the substation.

To sum up, RatedPower's new feature will allow pvDesign users to design and engineer until the Grid Point expanding our software scope of work and improving the clients work experience and profitability.

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