



## Defining 'utility-scale' solar

### *How many megawatts is that?*

The expression 'utility-scale solar' is increasingly widely used for large-scale grid connected photovoltaic generation; but there are wide variations in the way in which this is interpreted and in particular the power capacity of systems that qualify as 'utility-scale'.

As the leading international commentator on this sector, Wiki-Solar is seeking to define this expression more precisely.

### Primary recommendations:

- 1 Wiki-Solar has historically adopted the threshold of 10 MW<sub>p</sub>, above which solar power plants are deemed to be utility scale.
- 2 In the light of the applicable legislation in various world markets, there is a case for moving the threshold to 5 MW<sub>p</sub>.
- 3 Wiki-Solar has launched a public consultation on the issue; and if there is a coherent mandate for the change, will adopt a 5 MW<sub>p</sub> threshold with effect from the end of 2013.

We have used the measure MW<sub>p</sub> for our cut-off, but the alternative MW<sub>AC</sub> could be used alternatively<sup>1</sup>. Views on this issue are also sought.

### Historical precedents

According to a recent paper<sup>2</sup>, different actors have defined the lower limits for utility scale solar anywhere between 25 kW and tens of megawatts. Wiki-Solar, at 10 MW<sub>p</sub>, has been one of the highest; the US administration's National Renewable Energy Laboratory set the limit at 5 MW<sup>3</sup>; one International Energy Agency publication<sup>4</sup> suggests 1 MW, as does the US Energy Information Administration<sup>5</sup>. Authorities like the International Renewable Energy Agency<sup>6</sup> use the term without apparently defining it.

Different world legislatures also set cut-offs for policy measures which can be loosely attributed to utility scale. The German government, for example, in 1012 removed the feed in tariffs from installations about 10 MW, leaving them in place for smaller domestic and commercial applications<sup>7</sup>. The government of Punjab designated a separate program for large-scale solar applications about 5 MW<sup>8</sup>. The UK government designated its feed in tariffs to apply to domestic and commercial applications up to 5 MW<sub>p</sub><sup>9</sup> with the Renewables Obligation deemed to serve utility scale applications of higher capacities. It is now raising the threshold to 10 MW<sub>p</sub> for some applications<sup>10</sup>.

## Capacity rating for solar generating stations

### What the words seem to mean

The expression 'utility-scale' of course implies the level at which major energy producers would supply power to the grid. In the case of coal and nuclear power stations this can be as high as 5-8 GW, and the largest hydropower plants are over 10GW. At the other end of the scale, utilities in some parts of the world routinely generate power through hydropower stations, biomass plant and diesel gen-sets down to fractions of a megawatt. The UK government, for example, records plants down to  $1\text{MW}_{AC}$ <sup>11</sup>.

In the case of solar power generation, we propose that the expression utility-scale should be should relate to the level at which systems are typically designed to feed merchant power into the grid; as opposed to those intended primarily to serve a local energy user or distributed power application. We acknowledge that such applications can spread down to the kilowatts scale but would argue that the threshold at which systems are typically designed for feeding merchant power into the grid is of the order of a few megawatts.

### Other considerations

As we are seeking to refine this definition to improve the availability of data, it is worth noting that there is a trade-off between the threshold chosen and quality of information. The lower the limit is set, the more projects fall within the definition of utility scale. From the perspective of an information resource such as Wiki-Solar, this would lead to a larger database and the probability of less complete and less reliable data.

For example, the number of operating projects of 10 MWp+ was approximately 600, as at mid-2013. If the threshold is reduced to 5 MWp+, the number of such projects doubles, although the cumulative capacity they represent increases by only 20% from some 15 to 18 GWp. Because of the high number of projects in the range 5 to 10 MWp, and the fact that they are relatively less noteworthy than the larger projects, the data in this range is likely to be less complete and less reliable.

### Recommendations

Notwithstanding the quality trade-off, there is a case for setting the threshold at a level of 5 MWp. This is in particular because a number of regulatory measures such as those mentioned above, lead to substantial regional activity in the range between 5 and 10 MWp, which should arguably be included in future analyses.

Because this is a nuanced decision, Wiki-Solar has decided to implement a public consultation on the matter and seek the views of representative parties in the industry. This survey has been established through an online portal on the Wiki-Solar website<sup>12</sup>. It is proposed that the results are analysed before the end of 2013 so that the annual figures can be presented accordingly.

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<sup>1</sup> Refer to the previous Wiki-Solar Glossary paper: [Capacity rating for solar generation stations](#)

<sup>2</sup> Patrick Donnelly-Shores, University of Berkeley: [How big is "utility-scale" solar?](#)

## Capacity rating for solar generating stations

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- <sup>3</sup> Referred to in: [Two New Reports on Utility-Scale Solar from NREL](#). No rationale is offered for the 5 MW figure, which is assumed to be MW<sub>AC</sub>.
- <sup>4</sup> See page 10 of [Technology Roadmap: Solar photovoltaic energy](#), though other parts of this report, and other publications such as [Topic: Renewables](#) seem less specific.
- <sup>5</sup> See [Utility-scale installations lead solar photovoltaic growth](#), which also clarifies that its figures are in MW<sub>AC</sub>.
- <sup>6</sup> For example [RE Technologies Cost Analysis: SOLAR PV](#) refers to utility-scale system both above and below 10MW
- <sup>7</sup> [Germany approves reduced solar feed-in tariffs](#)
- <sup>8</sup> [Request for proposal document for new grid connected Solar photovoltaic power](#)
- <sup>9</sup> [Eligible energy sources](#)
- <sup>10</sup> [More community energy projects to get support under Feed-in Tariffs](#)
- <sup>11</sup> [Electricity: chapter 5, Digest of United Kingdom energy statistics \(DUKES\)](#)
- <sup>12</sup> Available at: <http://wiki-solar.org/data/glossary/utility-scale.html>