

Answer to “Issues Paper No. 2: Initiative for Global Leadership in Photovoltaic (PV) Solar Energy”.

This document is intended to provide comments/feedback on Issues Paper No.2 according to the instructions stated in the document “Set Plan Actions: Implementation process and expected outcomes”.

For the Main Expected outcome, the following questions have been considered and answered:

a) Do you agree with the targets set in the issue paper?

As proposed by the European Commission, R&I actions must focus on PV system performance and cost-reduction and Building Integrated PV products.

More specifically, EC identifies the following key elements:

1. Re-build EU technological leadership in the sector by pursuing high-performance PV technologies and their integration in the EU energy system. Achieve major advances in efficiency and lifetime of established technologies (c-Si and CIGS thin film) and new concepts
2. Reduce the cost of key technologies
3. Make "(near) Zero Energy Buildings" possible thanks to Building-Integrated PV (BIPV)
4. Achieve major advances in installation

Iberdrola completely agrees with the fact that the four issues should be better developed and supported as they are crucial for the future progress of the Photovoltaic technology and industry. In addition, with regards to PV for Utility Scale, Iberdrola is of the opinion that some other aspects also play an important role and should be promoted as well:

- Together with module lifetime, the degradation rate is also an important indicator, and probably more critical for the industry. The way an specific PV technology is losing

efficiency along the lifespan of a project is determining whether or not a positive decision for investing is taken

- Concerning the manufacturing capabilities, improvement of quality control is essential, as it clearly affects the reliability of the system
- Some other relevant elements of a PV installation, different than the panels, are subject to increase efficiency and lifetime. For instance, presently it is taken into consideration a budget reserve for replacement of the inverters during the projects lifetime.
- As highlighted by the EC, innovation also must help to enhance grid integration of PV systems. In this regard, stability of national and European electrical grids can benefit a lot from energy storage.

b) Do you think that the level of ambition is correct?

The photovoltaic solar energy has a huge potential and it will play an important role in the next two decades. Therefore European Countries must have a leading position in the PV industry. This can only be achieved by increasing the efficiency and reducing the cost of the equipment , improving grid integration and getting more experienced in manufacturing and installation of PV systems.

More specifically, these are the comments for each of the proposed targets:

- Increase PV module efficiency by at least 20% by 2020 compared to 2015 levels, and by at least 35% by 2030: both targets are challenging but in line with what the foreign PV industry which has been achieving during the past 2010-2015 (with an increment of 20% in average module efficiency for this period). Similar increment around 35% was achieved in the 2000-2015 period. However EU PV industry is still one step below American and Chinese manufacturers, which have reached efficiency levels around 16,5% for 72-cell modules in 2015. That means that the target proposed sounds realistic and necessary as long as it also brings the opportunity to be competitive against the non-UE leading companies of the PV industry.
- Increase module lifetime to a guaranteed power output time (at 80% of initial power) longer than 35 years, by 2020: as explained above, the degradation rate seems to be

an indicator more convenient in this case. Some manufacturers are already offering and guaranteeing 0,5% of annual degradation. This leads to a lifetime longer than 35 years and, at the same time, enhance the feasibility of PV installations with a shorter commercial operation period.

- Increase large scale manufacturing concepts and capabilities by demonstrating PV production capabilities of at least 20 m² per minute by 2020: quality control is also a key factor of the production of PV modules. Progress in this regard would imply more reliability of the panels, inverters and others, and therefore becoming PV investing more attractive.
- Reduce turn-key system costs by at least 25% by 2020 as compared to 2015; and by at least 50% by 2030 with the introduction of novel potentially very-high-efficiency PV technologies manufactured at large scale: several studies come to the conclusion that the PV industry is able to reduce the costs of turn-key systems by 20-25% in the 2015-2020 period and above 50% by 2030 assuming learning curves and the introduction of new technologies. The targets coincide with the ones proposed in this issues paper. However, the information from the said studies is calculated under the consideration that average price of the panels in Q4 2015 is something close to 0.6 \$/W_p and an average turn-key total system price is 1.25 €/W_p. So, the EC targets are fair if starting in 2015 with similar figures, otherwise the proposal should be a bit more demanding, in order to accomplished real figures of the market today.
- Develop PV modules designed for fully automated installation for both ground-mounted arrays and building renovation, by 2020: easier or automated installation not exclusively applied to PV modules but also to other BOS components (cables pre-wired, pre-assembled racks...).

c) Are there any standing issue(s) in the way to reaching the proposed targets/priorities?

Regarding the proposed targets, **leading manufacturers from other regions are the biggest threat for the European PV industry**. One of the main objectives is to recover market share and become supplier of a relevant quota of the PV power to be installed in the future. So, the efforts need to be directed at reducing the cost of the installations and

increasing the performance of the assets but always keeping an eye on how the competitors are also performing, as target will become less useful if non-EU industry are manufacturing better.

On the other hand, proposed goals are not very much supporting one of the main pillars of the SET plan: grid-integration bottlenecks. Considering that the cumulative PV installed capacity is expected to triple over the next five years, **grid integration will play an active role** and Europe must continue investing to solve this issue. Among the different alternatives.

Finally, it is worth mentioning that it is **important to reduce and minimize regulatory uncertainties** in order to keep the required level of investments in the photovoltaic sector, while promoting the installation of new PV power in the long term.

d) What are your specific recommendations on prioritizing R&I activities on these issues?

In the short to medium term it is necessary to reduce the cost of key technologies, comprising not only the cost of the panels but also the turn-key system cost as whole (panels, inverters and BoS). Just immediately after this, improving of module efficiency and reducing degradation rates are most important aspects.

e) What are the best placed actors to implement the targets/priorities (industry, EU, Member States, regions, groups of countries/organizations/etc.)

Industry together with appropriate public investment coming from Institutions would be the leading actor to implement the targets. UE and Member States will have an important contribution by enabling the mechanisms to let the industry achieve the proposed targets and by promoting the development of more new PV capacity

f) Identify possible barriers related to regulation, cooperation issues, standardisation/industrialization/manufacturing, socio-economics, etc.

As indicated previously, stable regulation is required to guarantee the necessary level of investments required to achieve economies of scale, and reduce risks and uncertainties.