

Solution Assessment Form

Part 1: Solar Impulse Label Attribution Criteria

Please fill in your answers for the criteria below, to determine whether the Solution you are assessing will be awarded the Solar Impulse Label based on the following rules:

- A solution is awarded the Solar Impulse Efficient Solution Label when it receives a minimum of two "YES" answers from two different experts (out of three) on all three criteria.
- A solution is rejected if it receives at least two "NO" answers from two different experts on one or more criteria.
- Experts are expected to assess each criterion independently.

Criterion 1 – Feasibility

Is the underlying concept of the Solution technically and commercially viable?

Assess whether the solution can be effectively operated and scaled –either to maintain or enhance its market relevance– from both technical and business viewpoints.

YES

Please explain your choice.

(i) Provide a comprehensive justification that clearly articulates the reasons behind your decision to select 'Yes' or 'No.' Your explanation should include a detailed analysis that reflects your expert judgement and opinion. It should offer valuable insights to the innovator and demonstrate your expertise in the field. Highlight key factors and considerations that influenced your decision, ensuring your rationale serves as a constructive contribution.

The solution uses a common PV technology, which has been proven to function and deliver the performance promised by the innovator. The PV modules can deliver a power of around 200W per m² depending on the conditions, which is aligned with industry standards. Therefore, the Solution is feasible on the technical point of view. In addition, there is a growing market for those alternative Photovoltaic modules, which seem to have some advantages in their integration compared to more conventional modules, due to their visual aspect, and the materials to produce those modules follow a robust supply chain with little risk of important shortages that could hinder the expansion of the solution. Consequently, I believe that there are no important barriers in the scalability of this Solution and the business case seems credible enough for this Solution to be successful.

Criterion 2 – Environmental benefits

Does the Solution provide a net positive environmental impact compared to the mainstream alternative across its lifecycle?

Assess whether the Solution, over its entire lifecycle from production to disposal, results in greater environmental benefits than its negative impacts. This includes factors such as emissions, resource usage, energy efficiency, waste production, and conservation efforts.

YES

Please explain your choice.

(i) Provide a comprehensive justification that clearly articulates the reasons behind your decision to select 'Yes' or 'No.' Your explanation should include a detailed analysis that reflects your expert judgement and opinion. It should offer valuable insights to the innovator and demonstrate your expertise in the field. Highlight key factors and considerations that influenced your decision, ensuring your rationale serves as a constructive contribution.

Even though silicon modules are very energy intensive in their production, it is widely accepted that they have a very interesting energy payback time, and that overall the electricity they will produce over their lifetime will be on average “cleaner” than most of the grids today and considerably cleaner than any type of fossil fuel based electricity production. The specific usage here of the Solution makes me confident that those panels will be effectively used and will pay back the impact of their production in a relatively short amount of time. In the SEI document provided, some plausible assumptions were made and it is true that in a lot of cases the solution can bring an impact of around 80% less CO₂eq than the alternative.

That said, it should be kept in mind that in countries where the electricity mix is relatively clean (for example Switzerland or France), the impact of those solutions is not as strong, but the solution still delivers a net positive impact, knowing that the electricity demand is rising, it is always useful to have cleaner production added to the already “clean” grids, to avoid compensating the raise with fossil fuel production.

Criterion 3 – Client's Economic Incentive

Is the Solution cost-competitive compared to the mainstream alternative either today or in the medium term?

Assess whether the Solution is less expensive, equally priced, or offers a positive return on investment despite a higher initial price when considering the Total Cost of Ownership (TCO). Evaluate if it has the potential to become cost-competitive or achieve cost parity in the medium term, taking into account all associated costs over its lifecycle.

YES

Please explain your choice.

(i) Provide a comprehensive justification that clearly articulates the reasons behind your decision to select 'Yes' or 'No.' Your explanation should include a detailed analysis that reflects your expert judgement and opinion. It should offer valuable insights to the innovator and demonstrate your expertise in the field. Highlight key factors and considerations that influenced your decision, ensuring your rationale serves as a constructive contribution.

The Solution requires an important investment from the customer at first, but thanks to the savings enabled, I believe that the solution can indeed have a lower total cost of ownership compared to the mainstream alternative. It should be noted that the innovator did not take into account the decrease of efficiency of the Module over the years, which is not negligible, and the electricity price prediction used is not the most conservative one (although plausible). In general, the savings assumptions provided by the innovator are slightly optimistic in my point of view, but I still believe that the Solution will be able to pay itself during its lifetime in most implementation cases, even if it happens in 8 years instead of 5 as predicted by the innovator. With prices at around 20cents EUR per kWh (in Europe) and at current prices for the Solution, it is definitely an interesting implementation to consider to generate savings on electricity consumption. This is an overall safe investment for the adopter even if the electricity prices stagnate in the next few years.

Part 2: Additional Qualitative feedback

Thank you for the completion of part 1 of the Solution Assessment Form, your assessment is now closed, it will be reviewed by our team for quality. The information will be used to deliberate on whether to award or not the Efficient Solution Label to this Solution. In this second part, we are asking for specific feedback below for the innovators and for us, independently of whether they get the Solar Impulse Label or not.

What advice would you offer to the innovators seeking to improve their Solution? Please notice this information will be shared with the innovator.

Even if crystalline silicon modules remain the dominant choice due to their established performance, reliability, and scalability innovators should keep an open eye on other types of solar technologies, such as thin-film solar cells, that have been developed. The solar industry is dynamic, and new technologies may emerge or gain prominence in the future. The PV market is really competitive, and although the Solution clearly has some advantages over other alternatives, it is important to keep improving the product and look into new PV technologies in the long term that might offer better price/performance combinations.

Also, to keep up with the competition, it would be interesting to incorporate smart features into the PV panels, such as embedded sensors for monitoring energy production, temperature, and performance. Integrate connectivity options to enable remote monitoring and control via smartphones or other devices. This enhances the user experience and allows for proactive maintenance and optimization of the system.

Are there any barriers or challenges that might hinder the successful implementation of the Solution by adopters (public and private entities, individuals)? Please notice this information may be shared with potential adopters.

One of the most significant barriers to PV panel adoption is the initial investment required. While the long-term savings on electricity bills are substantial, the upfront cost of purchasing and installing PV panels can be prohibitive for some individuals and organizations, especially for larger installations.

How can the Solar Impulse Foundation's team encourage greater adoption of this Solution if it obtains the Label?

To address the upfront cost barrier, the Solar Impulse Foundation could find some financing institutions or encourage adopters to collaborate with this Solution (leasing contracts or rent to own). In addressing the upfront cost barrier associated with PV panel adoption, the foundation could leverage its network to facilitate partnerships with financing institutions. By connecting adopters with financial entities that offer favorable financing options such as leasing contracts or rent-to-own agreements, the foundation can help mitigate the financial burden on individuals and organizations interested in installing PV panels.

Would you be willing to be contacted again if there is an adoption case for this solution, and the Solar Impulse Foundation requires your assistance?

