

EFFICIENCY ASSESSMENT REPORT

SOLATUBE TUBULAR DAYLIGHTING

Solatube tubular daylighting devices are energy efficient green building components that bring daylight into interior spaces.

Solution ID: 600

Company: Solatube

Country: United States

Export Date: 20.06.2019

ASSESSMENT RESULTS



APPROVED

3.3

**IMPACT
RATING**

$$f = \left(\frac{\left(\frac{x1+x2}{2} \right) + \left(\frac{y1+y2}{2} \right)}{2} \right)$$

NA

**ECONOMIC
PROFITABILITY
RATING**

$$f = \left(\frac{z1+z2}{2} \right)$$

GENERAL COMMENTS FROM THE WORLD ALLIANCE SELECTION GROUP

The solution ID600 is declared by the World Alliance Selection Group as labelled Solar Impulse Efficient Solution after going through the following selection steps:

- It is falling into the eligibility scope in terms of (1) Minimum Maturity and (2) Type of solution. Moreover, the solution is owned and developed by an entity Member of the World Alliance that is operating in accordance with the Solar Impulse Foundation's ethical position.
- Two valid assessments, with valid ratings and comments for each criterion, were collected from a pool of four experts with at least 5 years of Experience in one of the sustainable development goals (SDGs) of application of the solution.
- Based on Experts deliverables, the Solutions Team concluded that the solution's assessments had been satisfactory and that the ratings meet the minimum score requirements (impact rating greater than or equal to 3 and is already profitable).
- During the World Alliance Selection Group meeting, the validity of the assessment performed and the minimum requirements in terms of ratings for the two criteria evaluated were confirmed, resulting in the solution being awarded the label Solar Impulse Efficient Solution.

TECHNOLOGICAL FEASIBILITY

This criterion captures the ability of the solution to be credible (based on a resilient technology or concept) and captures if the solution is already, or has the potential to be, scaled up and deployed in the real world (vs. in a laboratory environment) without adding constraints to the final user.

Key variables to capture the performance on this criterion are:

1. Flexibility (ability to adapt to the final user)
2. Competitiveness / Added value for the market
3. Market potential / Scope of implementation
5. Resilience
6. Social acceptance

EXPERTS REVIEWS



x1

Expert justification - The technological feasibility of the solution is rated as good based on the fact that the product itself is already available in the market although being mainly available in one region. Nevertheless, there are too many obstacles related to the design/ construction of the building (residential vs. commercial) and light output. However, the solution contributes well to a significant reduction in energy consumption and can contribute to green building solution, as light is provided in darker areas in buildings where light can't be guided through windows or roof tops.

Additional feedback / advice for the member



x2

Credibility of design: Can the technology/concept behind the solution be constructed and operated as designed? **Yes**

Expert justification - The track record of the company over 25 years, as well as competitor's technologies, proof the technical feasibility. As mentioned by the innovator, a hurdle might be that the solution has to be considered in the planning phase of buildings ideally. Overall the technology has a proven potential to scale up. Some limitations are: The solution needs to be integrated probably already early in the planning phase of buildings. Due to the volume and roof area requirement (tubes and collectors), the amount of light served with the solution might be restricted.

Scalability: Is the procurement of goods and services, manufacturing (if a product) or distribution (if a service) of the solution at scale technically feasible? **Yes**

Expert justification - The scalability is proven by the revenue over USD 100 Mio. It can be assumed that the product consists of readily available materials. Since it has to fit into the regional building industry supply chain, considerable effort has to be taken to fit into these regional heterogeneous supply chains.

User-friendliness: Is the effort required to install and operate this solution commensurate with its benefit to the user? **Yes**

Expert justification - It seems plausible that the solution requires substantial additional considerations in the planning process of buildings as compared to standard lighting and windows. When it comes to the users, those have to adapt to changing lighting conditions anyways such that this solution wouldn't need much change in behavior. The integration of LEDs in the daylight solution, on the contrary, seems to ease the user-friendliness.

Additional feedback / advice for the member

ENVIRONMENTAL & SOCIO-ECONOMIC BENEFITS

This criterion captures the solution's ability to have successfully demonstrated, at least:

One direct positive impact on the environment – referring to the scope of the following elements: energy use, CO2 emissions, water use, materials used, air quality, ecosystem preservation. The type(s) of impact(s) presented should be relevant to the application sector of the solution.

AND

A direct economic benefit – considered in the form of % of annual monetary savings to its final user, or any stakeholder that could benefit directly from the application of the solution.

OR

An indirect economic benefit that encompasses hidden economic¹ or social gains for society².

1. savings on public health or waste management expenses, increase in a region's GDP...
2. enhancing equity, creating/securing jobs, strengthening social inclusion and cohesion, promoting transparency...

Without any significant negative impact found elsewhere in the solution's lifecycle.

EXPERTS REVIEWS



y1

Solution's lifecycle: Has the innovator accounted for positive and negative tangential impact to the environment over the entire lifecycle of this solution? **Yes**

Expert justification - Explicit lifecycle analysis of the solution wasn't provided by the innovator. Health product declaration gives some information on the chemical substances used, but the main impact considering lifecycle is the extension of electric lighting and HVAC component's life time.

Environmental benefits: Can the solution deliver the stated incremental environmental benefit versus the reference case? **Yes**

Expert justification - Solatube induces significant energy savings, through limitation of electric lighting and HVAC needs. Coupling with LEDs for efficient long term lighting optimization, as well as elimination of temporary lighting installations during construction are profitable use case which could also enhance overall environmental performance.

User's economic benefits: Can the solution deliver financial savings to its customer buying the solution versus the reference case? **Yes**

Expert justification - When some favourable criterias are met (intensive sunlight, high temperature, new building), economic interest seems obvious, with typical ROI of 3-4 years. Otherwise, financial savings should strongly depend on the costs to adapt the existing building structure in order to integrate domes and tubes.

Social benefits: Can the solution deliver the stated social benefit versus the reference case? **Yes**

Expert justification - Social benefits could be significant in emerging countries, by delivering a good quality of illumination in a degraded environment with poor infrastructure. It should need however to extend products range towards a moderate cost approach adapted to these markets.

Additional feedback / advice for the member



y2

Solution's lifecycle: Has the innovator accounted for positive and negative tangential impact to the environment over the entire lifecycle of this solution? **Yes**

Expert justification - Yes it has. Even the lifecycle is not detailed enough. The innovator has described a lot of benefits particularly for the reduction of gas emission.

Environmental benefits: Can the solution deliver the stated incremental environmental benefit versus the reference case? **Yes**

Expert justification - Yes it can. There is a description of reduction of gas emission.

User's economic benefits: Can the solution deliver financial savings to its customer buying the solution versus the reference case? **Yes**

Expert justification - Yes it can. There is a huge decrease of the electricity bill (for example more than 4500 \$ per month for a distribution center).

Social benefits: Can the solution deliver the stated social benefit versus the reference case? **Yes**

Expert justification - There are different social benefits : reduction of CO2 emission, reduction of quantity of energy used, reduction of greenhouse gas emissions.

Additional feedback / advice for the member

Very good description of the benefits of your solution.

ECONOMIC PROFITABILITY

This criterion captures the potential of a currently non-profitable solution to become, profitable within a 5-year period, with regard to its business model, its positioning relative to its competition, the innovativeness of the idea, and the resources and experience of the team.

IMPORTANT

The evaluation of this criterion should consider and analyze the regulatory constraints/ external hurdles that could be overcome with the help of the World Alliance (e.g.: lack of deployment partnerships or investments, regulatory constraints or competition that could be modified/unbalanced by institutional efforts). Since the main goal is to bring solutions to relevant partners, investors and institutions, a low score on this criterion could be countered by a feasible and well-argued ideal deployment scenario.

EXPERTS REVIEWS

Z1

Are you convinced that the solution is profitable, given the information provided on the economic profitability section? **Yes**

Expert justification - The provided information shows that the solution is profitable for the innovator and probably for some users. The economic viability on the user side depends on factors like climate and type of building and could vary probably heavily. It can be assumed that the aesthetic aspects also play a role in decision making for the user. The economic viability will depend on the specific case. It is reasonable to assume that there are many situations with positive financial viability.

Additional feedback / advice for the member

Z2

Are you convinced that the solution is profitable, given the information provided on the economic profitability section? **Yes**

Expert justification - Information provided in section 4 is quite poor but the maturity of the industrial processes, as well as the diversity of addressed markets, are positive indicators regarding profitability. Repetitive business representing more than a half of total activity and moderate 3% R&D ratio are also indicative of a well-established activity with solid fundamentals.

Additional feedback / advice for the member

The information set out above, is solely for the purposes of information and the Solar Impulse Foundation does not provide any guarantee as to its authenticity, completeness or accuracy. This information is the direct outcome of the assessment performed by external non-remunerated experts that volunteered to review your solution submission form following the application of the Efficiency Assessment Process of the Solar Impulse Efficient Solution Label Standards. This information is shared to you as it might be of value for you to get the feedback provided on your application – regardless of the outcome of the general selection process.

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