

## Waste Challenge Title

### *Reducing Packaging Waste from Photovoltaic Solar Panels*

#### Introduction

*Global heating is one of the most urgent challenges we currently face as a society. Greenhouse gases such as CO<sub>2</sub> and Methane are the main drivers of climate change. Over 73 % of the world's global greenhouse gas emissions stem from the energy sector. Within this, transportation and buildings are responsible for over 32 %. The creation of more sustainable communities based on renewable energy provide an enormous opportunity to tackle global greenhouse gas emissions and therefore the phenomenon of global heating.*

#### Problem Definition:

*Building Integrated Photovoltaics (BIPV) play a key role in future renewable energy generation. Solar facades in particular can form both an integral part of the building while producing electricity throughout the day. Current packaging systems for transporting PV-Modules to building sites are either single-use or reusable. Reusable packaging is durable and generally provides good protection from the elements (wind, rain, etc.), but it is also expensive and the logistical hurdles for returning it back to the PV module producer for re-use are complicated and costly. Often reusable packaging is discarded after only few uses due to insufficient logistics and return options. Though cheaper, single use packaging provides little protection against the elements (wind, rain, etc.) on a building site and leads to large volumes of waste.*

#### What is the waste challenge?

*Your challenge is to develop a novel packaging design for BIPV façade modules and a corresponding business model.*

- ➔ *How can the packaging be made more sustainable?*
- ➔ *What could a return infrastructure for BIPV-packaging look like?*
- ➔ *What materials are most suitable for re-usable packaging?*
- ➔ *How can the durability of re-usable packaging be improved?*
- ➔ *Can re-designed single use packaging be a sustainable alternative?*

#### Who is behind this challenge?

*ENVELON offers an innovative system for solar active façades under the umbrella of the multinational Grenzebach Group. Since its founding, a team of experienced experts from various fields of automation as well as the glass and solar industries have been working together on a common vision: to provide Germany, Europe, and the world with technology that will make it possible to generate sustainable energy directly on buildings over the long term. In this context, we blend tradition and innovation to deliver products and services of the highest quality and performance – we deliberately produce our façade panels in Hamlar, in the Donau-Ries region of Bavaria. As a family business with strong convictions, we are therefore bringing the solar industry back to Germany and offering a flexible system “Made in Germany” – combined with an experienced and highly skilled network of international partners.*

Topic domain of challenge: Cities, Energy or Consumption

1. *Consumption*
2. *Energy*

Desired Impact of Challenge:

*The aim of the challenge is to design a prototype packaging system and, in the case of reusable packaging, develop a return system from the building site to the PV-module producer.*

Skills needed/recommended

*Any background from engineering to sociology is suitable for this project. We are looking for a diverse team with both technical and non-technical backgrounds*

Relevant considerations for the challenge / theme:

Relevant links:

[ENVELON | Solar-active façades from Germany](#)

➔ Dr.-Ing. Thilo Becker, [thilo.becker@grenzebach.com](mailto:thilo.becker@grenzebach.com)