

30 YEARS OF BIPV IN THE NETHERLANDS: MARKET DRIVERS AND REMAINING RESEARCH QUESTIONS

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Aim and approach

The goal of this work is to create a new update on the view of the Dutch market on BIPV and to place it in perspective of the 30 years of BIPV in The Netherlands. For this purpose, we held 10 interviews with clients of recent BIPV projects.

Back to 1995: pioneering in BIPV



Architect:
Han van Zwieten

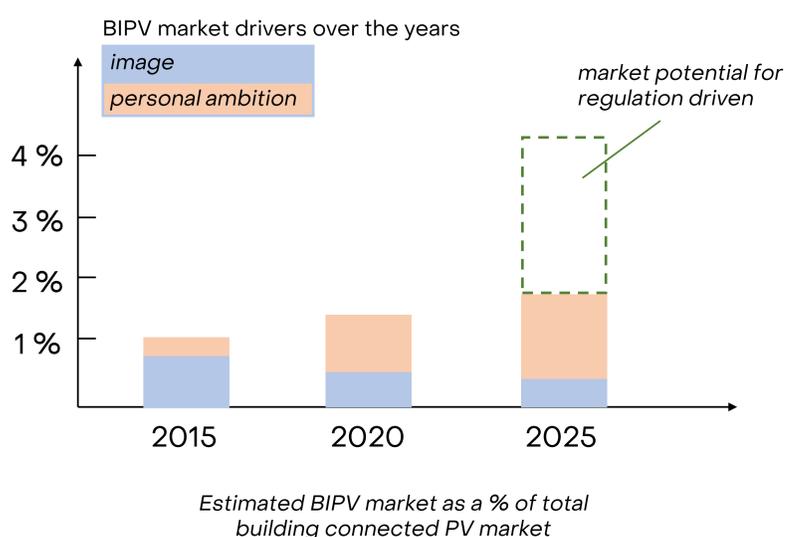
Location:
Veenendaal (NL)

Motivation:
To show an innovative, optimistic and sustainable image.

Market drivers for BIPV

3 main driving factors for the application of BIPV instead of BAPV in commercial projects:

1. The client wants a PV system that attracts the attention and communicates a message or an image for the owner or user of the building (motivation **"image"**).
2. The client wants to meet certain energy performance goals, and regular PV does not meet the criteria for architectural quality (motivation **"personal ambition"**).
3. The client needs to meet certain regulations on energy performance of buildings, and regular PV does not meet the criteria for architectural quality (motivation **"regulation driven"**).



Selected BIPV projects, all built in 2023



Factory of Soltech in Genk
Market driver: image

"We had to deal with panel-to-panel differences. The solution was to match them on current. One needs technical understanding to install a BIPV façade."



Innovation hub building in Den Haag
Market driver: image & personal ambition

"We wanted to minimize the net energy consumption. Most of the generated energy comes from the PV panels on the roof. The BIPV helps a bit but is also for the sustainable appearance."



Private villa in Heemstede
Market driver: personal ambition

"I wanted to maximize sustainability, and I love technology. It is expensive, but I can afford it. The installers made a lot of dust. It took 6 months to have the rain clean away the dust."



Private villa in Amersfoort
Market driver: personal ambition

"I wanted to have a sustainable house, but architectural quality is even more important. The installers did not have enough experience. That gave some trouble."



DSM headquarters in Amersfoort
Market driver: personal ambition

"The tenant DSM wanted to reach BREEAM Outstanding, but the roof was too small, so we had to add BIPV on the façade. We need good PV windows. NL regulations are too lax. It makes our sector lag behind."

BIPV Research: a recap

Research questions that have been solved

- Technology to make colored BIPV and optimize its efficiency and esthetics.
- Performance modelling and performance prediction of BIPV.
- Design-in software for BIPV in facades.

Main remaining research questions

- How to achieve a major cost breakthrough in BIPV: target is to be below the BAPV + 50% cost level.
- How to make PV windows for the market (color neutral, visual homogeneous and with substantial kWh yield).
- How to make the installation process plug-and-play, even when combining BIPV components of different sizes.