Building the World’s Largest Bifacial Solar Noise Barrier

An introduction to Solar Highways

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What is SEAC?

Solar Energy Application Centre
a research organization for
Solar Energy Systems & Applications

High Tech Campus, Eindhoven

Scope:
BIPV, Infrastructure PV, Floating PV, PV in the Energy System, Storage ...
Concept developments, roadmaps, outdoor research, consultancy ...
Solar Noise Barriers

Utrecht
The Netherlands

Zürich
Switzerland

Münsingen
Switzerland

Trento
Italy
Solar Highways

Objectives

- Build a fully integrated bifacial solar noise barrier
  - Facing east and west
  - 400 m long and 5 m high
- Show technical feasibility
- Explore business cases
- Learn about O&M costs
- Select a contractor in a tendering procedure

The project was partially funded by the European Commission in the LIFE+ programme.
Using bifacial modules, a high energy output is achieved, regardless of orientation.
Smart tendering

Our “Most Economically Advantageous Tender’ (MEAT) awarded point to:

▪ High rated power
▪ Smart self-shadow mitigation
▪ O&M plan
▪ Total build cost

Timeline:
▪ Jan 2017 - Procurement published
▪ Sep 2017 - Contract awarded
▪ Dec 2018 - Noise barrier finished

Published in: Solar Energy, C. Tzikas et al., Graffiti on Solar Noise Barriers, a case study, EUPVSEC Proceedings 2017
A modular design

- 238 kWp – front side
- Full MLPM – for safety
- No exposed cabling

Concrete plinth

5m

2m

6 m

400 m
Smart stringing design

- Optimized for shade mitigation
- String and bypass-diode design adjusted to shade direction
O&M research

- Full installation monitoring
- 5 research zones – 5 cleaning regimes

<table>
<thead>
<tr>
<th>Cleaning Regime</th>
<th>Frequency</th>
</tr>
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<tbody>
<tr>
<td>Both sides</td>
<td>Every 6 months</td>
</tr>
<tr>
<td>Both sides</td>
<td>Every year</td>
</tr>
<tr>
<td>Safe side only</td>
<td>Every 6 months</td>
</tr>
<tr>
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<td>Every year</td>
</tr>
<tr>
<td>No cleaning</td>
<td></td>
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</tbody>
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> Until 2020
Building has started
Building has started
Building has started
Building has started

Grid connection and opening: December 2018