



LIFE Solar Highways - Solar panels as integrated constructive elements in highway noise barriers
LIFE13 ENV/NL/000971



[Project description](#) [Environmental issues](#) [Beneficiaries](#) [Administrative data](#)

Contact details:

Contact person: Dirk VAN DER GRAAF
Tel: 0031887972287
Fax: 31887974014
Email: dirk.vander.graaf@rws.nl

Project description:

Background

Highway noise is a serious environmental problem in urbanised areas. Noise barriers, of various shapes and design, have been erected along highways in densely populated areas for over 20 years. These have lowered noise levels and can make a contribution to improving air quality. Meanwhile, electricity is being increasingly produced from solar power using Photovoltaic (PV) cells, which help to lower greenhouse gas emissions. Solar panels have been installed on existing noise barriers, but the results are sub-optimal. In many cases, the use of solar panels is adapted to the chosen type of noise barrier or the noise barrier is adapted to the requirements of the solar panels. In recent years, bi-facial solar cells have been developed that can produce electricity from light falling on both sides of the PV module. Such a module can produce over 30% more power on an annual basis compared to a standard module with a white back-sheet. Furthermore, the power output of the module is also less sensitive to orientation, and the module does not need to be placed facing south: east-west is also possible. These modules have great potential for integration with noise barriers.

Objectives

The main objective of the LIFE Solar Highways project is to demonstrate the technical feasibility and the environmental, social and financial benefits of using multifunctional constructive elements for building highway noise barriers, in which bifacial PV modules have been integrated. A successful demonstration would simultaneously accelerate the use of PV modules and noise barriers along Europe's highways, greatly contribute to the achievement of EU objectives concerning climate change, reduce noise levels and improve air quality.

Specific objectives of the project are:

- To demonstrate the technical feasibility of integrating PV cell technology in widely applicable highway noise barriers. The PV element will be a modular building block, which can be accessed and replaced if required, and it can be applied in any orientation of the noise barrier;
- To develop a technological-financial model to convince investors that the return on investment is sufficient to open up new business opportunities and to facilitate broad implementation;
- To develop, install and test a 450 m long prototype with an integrated bifacial PV solution along the A16 highway in the Netherlands;
- To demonstrate the energy yield that can be achieved during an 18-month testing period in the field; and
- To elaborate a business case, demonstrating that the tested integrated PV noise barrier has a lower total cost of ownership than currently used solutions. The proposed integrated solution will lower the financial threshold for noise barriers and solar panels.

Expected results: The main expected results of the LIFE Solar Highways project are in order of importance:

- Demonstration of a 450 m long prototype noise barrier, 6 m high with 4 m high PV panels on both sides, along a north-south stretch of the A16 near Dordrecht. Target performance is 90% of time in use and output of 300 MWh/year based on full time performance during the 18-month testing period, yielding approximately 356 tonnes CO₂ reduction in the demonstration period (based on solar energy produced);
- A convincing business case for the technical and financial feasibility of the prototype, based on reliable monitoring and clear evaluation of energy performance, air quality and noise reduction during a 18-month demonstration period. The beneficiaries expect to achieve a cost reduction of 20% compared to PV added to existing noise barriers;
- Design of a module, based on bifacial PV cells, which can be integrated in highway noise barriers. This module will be prototyped and tested using accelerated lifetime methods such as damp heat testing. Associated beneficiary ECN will also deliver six PV elements that will be monitored at ECN for the remainder of the project; and
- A comprehensive benchmark study on PV elements and their use as integrated construction elements in highway noise barriers.

Results

[Top](#)

Environmental issues addressed:

Themes

Air and Noise - Noise
Climate change - Energy - Energy supply
Climate change - Energy - Reduction of greenhouse gases emissions
Land-use and Planning - Urban design (urban-rural)
Risk management - Pollutants reduction

Keywords

emission reduction, noise reduction, greenhouse gas, road construction, transport planning, renewable energy, traffic emission

Natura 2000 sites

Not applicable

[Top](#)

Beneficiaries:

Coordinator	Rijkswaterstaat
Type of organisation	National authority
Description	Rijkswaterstaat (the department of public works and water management) is the executive arm of the Dutch department of infrastructure and environment. It is responsible for the design, construction, management and maintenance of the main infrastructure facilities in the Netherlands: the road network, waterway network and water systems. One of its programmes concerns air quality and noise reduction measures, such as noise barriers and quieter asphalt surfaces, to meet legal requirements.
Partners	ECN(ECN), Netherlands SEAC(Solar Energy Application Center), Netherlands

[Top](#)

Administrative data:

Project reference	LIFE13 ENV/NL/000971
Duration	01-JUN-2014 to 30-JUN -2020
Total budget	3,740,724.00 €
EU contribution	1,404,837.00 €
Project location	Groningen,Friesland,Drenthe,Overijssel,Gelderland,Flevoland,Noord-Brabant,Limburg,Utrecht,Noord-Holland,Zuid-Holland,Zeeland

[Top](#)

[Project description](#) [Environmental issues](#) [Beneficiaries](#) [Administrative data](#) [Read more](#)