

The freeway as a solar power plant: producing electricity with the noise barrier

This is a translation – for the original challenge description, contacts and submission got to: <https://www.ioeb-innovationsplattform.at/challenges/detail/die-autobahn-als-sonnenkraftwerk-mit-der-laermschutzwand-strom-produzieren/>



An initiative of

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Digital and
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 Federal Ministry
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Climate Action, Environment,
Energy, Mobility,
Innovation and Technology

In cooperation with


BUNDESBESCHAFFUNG

Challenge Sponsor

ASFINAG | Autobahnen- und Schnellstraßen-Finanzierungs-Aktiengesellschaft



Background / Point of departure

The current government's program aims to increase photovoltaic generation capacity in Austria - a goal that ASFINAG would like to support. It has already tested innovations regarding this topic in the past (for example: [the solar flower](#)) and is now consistently pursuing this path. In order to avoid new surface sealing, a research project is currently testing the use of existing horizontal surfaces by partially covering the roadway with PV modules. This could possibly produce other positive effects, e.g. in the event of precipitation.

Let's take a closer look on what this IÖB-challenge is about: ASFINAG would like to be able to use the noise protection infrastructure for energy generation and contribute to CO2 reduction by offsetting polluted energy production. To achieve this, ASFINAG and potential suppliers must reconcile two goals in new facilities: the best possible noise protection and the best possible energy efficiency.

The main features of the noise protection systems currently in use are:

- Distance between vertical carrier usually: 4 to 5 meters
- Materials of the noise reduction cassettes: Wood, aluminium, wood concrete
- Height of a single cassette: between 0.5 meters and 1 meter
- Height of walls: usually from 2 to 5.5 meters
- Concrete base

Main Question

What is the best way to combine or integrate noise barriers and PV modules for highway use?

Desired situation

Several scenarios are envisaged for project implementation: Existing noise barriers could be upgraded with photovoltaic modules. On occasion, however, noise barriers designed from the outset as solar power plants could be newly placed or as a replacement for conventional noise barriers.

Depending on the location and practicality, it can vary on which side of the vertical structure the PV elements should be located: facing the roadway, facing away from the roadway, or on both sides.

In order to find the optimal and practical solution and to be flexible in the future, all resulting variants are of interest for this challenge:

1. newly designed noise barriers with photovoltaic installations
 - a. only on that side facing the roadway.
 - b. only on that side facing away from the roadway.
 - c. on both sides (useful for north-south roadways).

2. modules for retrofitting existing noise barriers with photovoltaics
 - a. on the side facing the roadway.
 - b. on the side facing away from the roadway.
 - c. on both sides.

The advantages of individual variants (more energy production) are as obvious as the challenges (noise protection, installation, statics, costs/benefits). The further project path depends on how suppliers (manufacturers or even system integrators) can deal with advantages and challenges.

In any case, a decisive factor is that residents are protected from noise (without compromises due to the additional function). In addition, cost-effectiveness is important: The additional costs must be balanced with the performance and the equivalent value of the energy produced. The life span and the maintenance of the efficiency (> 200 Wp/m², after 20 years still >80 %) play an important role.

If a photovoltaic noise barrier is to be suitable, it must be equipped with a few other properties:

- Resistance to stone chipping, corrosion and salt exposure (salt spray test according to ÖNORM EN ISO 9227), among others.
- No dazzling of the vehicle drivers (ultimately: proof by dazzle expert opinion)
- No problematic effects on the statics of the noise barrier, non-destructive integration of the PV modules into the noise barrier (for assembly and disassembly)
- Accessibility and visibility of structural parts for the inspection of the noise barriers
- Existence of a CE approval, if necessary construction product regulation (declaration of performance)
- Ease of cleaning (self-cleaning, possibly with nano-coating)
- (contamination versus efficiency)
- Largely maintenance-free
- Possibility of monitoring power production or functionality

In addition, the system must be compatible with measures of operational maintenance (route service of ASFINAG): snow removal, salt spreading, green corridor maintenance, etc..

Details for your submission (Call for proposals)

The online submission (top right button of this page) consists of:

A description

of the product regarding

- >noise protection
- >electricity production
- >economic feasibility
- >suitability for use on the highway
- >degree of maturity and realistic implementation path
- >the installation or erection (e.g. for retrofitting existing noise barriers)

and your relevant competences (double focus: PV and noise protection) supported by relevant references.

A summary of the most important points (added value): Bring your unique selling proposition and decisive aspects to the point. Short, concise!

Optional: You can supplement the two text fields mentioned with a **file attachment** (PDF). This file should complement the text fields but must not replace them. Avoid redundancies! Use the file attachment e.g. for graphics. (If you want this file to be non-public: send it to the moderator right after you finished the online submission.)

Confidential information for the jury: You make it easier for the jury to assess the submissions if you place a rough illustration of the economic efficiency for a 10 KW system assuming an east-west orientation here, among other things.

In addition, you need a **cover image** for the overview page of all submissions. This image is your visual flagship for the overview of submissions to this Challenge. It is of limited use for small-scale content presentations.

Note: Please provide us with the necessary information, but do not design a formal proposal like for a tender and do not yet perform any (paid) planning services!

Important: A joint submission of several companies is possible. Submissions of individual aspects are also permitted (companies can thus find each other and later form a consortium).

The submission **deadline** is: **January 25th, 2021.**

Benefits of the Challenge and further course of the project

With the present IÖB-Challenge, ASFINAG would like to obtain an overview of the status of developments and innovative products as well as possible partners. With the submission, participating suppliers and innovative solutions will be on ASFINAG's radar.

At the end of the Challenge, the jury would like to hold brief market discussions (innovation dialog) with the originators of the most outstanding, suitable and interesting submissions. This exchange between project managers and companies

serves to deepen the understanding and to include the perspective of selected market participants on the project at an early stage. This creates sensitivity on the part of the public sector client for suitable innovations and an appropriate design for the purchasing project.

Based on the findings, the project is to progress towards implementation following the Challenge. If necessary, several systems are to be subjected to a small, practical test lasting several months (10 KW systems). During the test operation, ASFINAG wants to gain experience with different variants. It wants to measure the effect (energy, noise protection) and gain information about economic efficiency and practicability. In this way, ASFINAG wants to develop its own technical standards and requirements for possible roll-out and tendering.

By the way: The public part of your submission will remain available after the Challenge has been completed. It is a business card for other interested parties (from the public sector in Austria) - also have them in mind when designing your submission.

Depending on the results, the further project plan provides for the following:

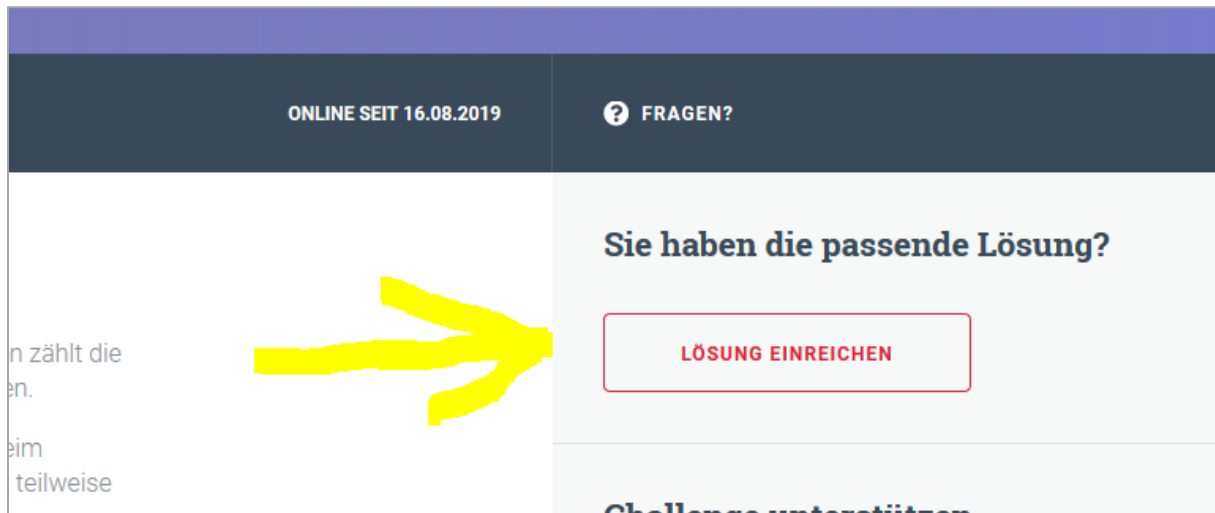
The selection for possible tests will be made on the basis of offers (presumably including delivery, installation), which ASFINAG, after reviewing the submissions, will specifically solicit from those whose solution for "noise protection with PV" is particularly promising. Companies that did not take part in the market consultation will also be considered for this.

Your Questions

Contact the moderator or [post your question about the Challenge](#). Our moderators will check, research and publish your question together with the answer. This way, all potential participants are certain to receive relevant information.

How to submit a solution/idea

Go to the challenge page. Click on the button "Lösung einreichen" on the top right side of the page.



- Beschreibung
Post a meaningful description (make references to the description of the challenge and evaluation criteria on the right side of the challenge page)
- Mehrwert
Highlight the benefits of your solution.
- Titelbild
Upload a picture to be displayed on the landing page of the challenge.
- Kooperationspartner
If you are handing in a joint contribution with other companies, this is where you make sure they are represented with logos and names.
- Dateien & Infos
If necessary in addition to the descriptions above: add pdf-files (e.g. existing product brochures). But: Keep your contribution manageable for the jury.
- Vertrauliche Infos
If necessary, place a confidential information for the jury, the sponsor and moderator (e.g. indication of approximate price range). All other parts of the contribution will be public.

Please be aware of the fact, that a challenge is market research / market engagement prior to a possible procurement. The challenge will not decide upon a contract award nor will it lead to any unfair advantage in a tender. Please balance your time and effort.

Contact Information

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