

Integrated PV solutions – emerging opportunities for Photovoltaic Noise Barriers in the EU and Italy in particular

Žygimantas Vaičiūnas
Policy Director



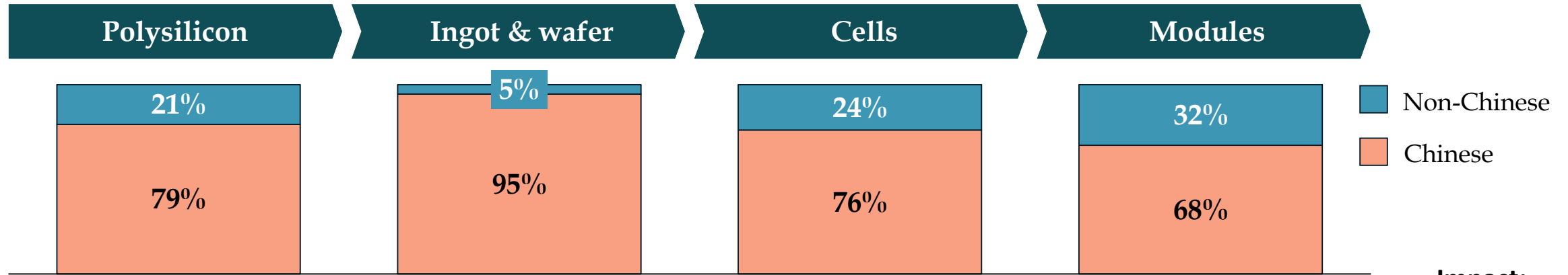
23 February 2023
Rome

Key points of the presentation

- 1. General EU support guidelines for the European PV manufacturing**
- 2. Potential EU financing for Photovoltaic Noise Barriers (PVNB)**
- 3. PVNB as an example of already developed product**

1. General EU support guidelines for the European PV manufacturing

Impact of policy incentives on local solar manufacturing cost



Impact:

~2 \$c/W_p

~0,9 \$c/W_p

~0,7 \$c/W_p

~2,1–2,3 \$c/W_p

40–55%

11–18 \$c/W_p *

~ 1,7 \$c/W_p

14,5%

~ 0,1 \$c/W_p

0–75%



Capital subsidies: cheap/free land, subsidized loan rate

Utility subsidies on electricity and water

Indirect supply incentives: relaxed labor laws, no input credits



Production-linked Incentive (PLI) Scheme — \$3.2 billion to set up PV manufacturing

Import tariffs: Make-in India safeguard duty (14.5%), Basic Customs Duty (25-40%)



Inflation Reduction Act incentives — \$48 billion till 2032, linked to primarily PV manufacturing

State-level incentives, e.g., Arizona's Jobs Credit Schemes

Section 201 import tariffs



Capital subsidies & grants, e.g., EU Innovation Fund**, < €700 million in the current large-scale call

A few member state subsidies, e.g., €400 million for Italian Development Contract grants/loan scheme for PV manufacturing granting 0–75% of CAPEX

* For EU, incentive impact (depreciation spend saved) corresponds to Enel's (€118M) received for 3GW HJT solar mfg. unit through the EU Innovation Fund

** IRA to provide 100% of the proposed incentive till 2029, phase-out linearly by 2033. Incentive breakdown: p-Si (1.5 \$c/W), wafers (5.5 \$c/W), cells (4 \$c/W) & modules (7 \$c/W).

ESMC requesting EU Member States to support European PV manufacturing in the ongoing State aid revision process

To the EU Member States

Dear Head of State or Government,
Dear Minister,



18 January 2023

EUROPEAN SOLAR MANUFACTURING COUNCIL REQUESTS MEMBER STATES TO SUPPORT EUROPEAN PV MANUFACTURING IN THE ONGOING STATE AID REVISION PROCESS

The recent actions initiated by the European Council and the European Commission on State aid exemptions for the strategic industries in Europe go in the right direction in response to the US Inflation Reduction Act (IRA). It would also address the EU's already well-identified energy security and independence weakness vis-à-vis China. Without an immediate and strong EU response, it will be difficult, if not impossible, for the EU to ensure its energy security going forward. This includes the risks of luring EU businesses into moving investments to the US – as already communicated in the recent letter from the Executive Vice-President of European Commission Margrethe Vestager on January 13. The Net-Zero Industry Act, together with the temporarily adapted State aid rules to speed up and simplify investments by increased EU funding, spotlighted by the European Commission President Ursula von der Leyen at the World Economic Forum on January 17, clearly defines a game-changing potential for European PV manufacturing.

The European Solar Manufacturing Council (ESMC) welcomes these long-awaited measures and expects decisive changes to be implemented very soon. This is crucial to reach the European renewables targets and freeing the appropriate incentives for the necessary scale-up of the European PV manufacturing capacities. Once implemented, these would secure the jump-start to scale up PV manufacturing, which is necessary, as substantially larger domestic production volumes are critical for the long-term competitiveness of the EU PV industry and economies.

By this letter, the ESMC, uniting more than 50 industrial members of the European PV manufacturing community, kindly requests you to support the actions taken by the European Commission to revise the State aid framework and support the European PV manufacturing industry, by creating State aid exemptions for PV manufacturing and constructing dedicated and concrete financial support vehicles. The ESMC proposes to implement measures as described below, while revising the Temporary Crisis and Transition Framework without delay.

Within the establishment of the IRA, the cost gap between EU producers and their counterparts in the US is estimated to be 11-18 \$ cents/W. Given the goal to establish at least 30 GW by 2025, and then grow the capacities so that at least 40-50 GW of annual PV deployment can be covered by European PV production, there is an annual competitive gap of approximately € 6 billion. Accordingly, € 6 billion on a yearly basis, or a total of € 48 billion until 2030, should be dedicated to European PV manufacturers in effective support mechanisms – e.g., state guarantees, tax exemptions, capital (CAPEX) and operational (OPEX) expenditure measures.

STATE GUARANTEES: State guarantees could be an important backup measure to function as market insurance, linking PV manufacturing and PV off-takers. At least three types of state guarantees could be applied: a) state guarantees for production (e.g. for banks); b) state guarantees for acceptance of modules for PV systems (by EPCs, electricity providers); c) state guarantees for off-take agreements (as a back-up guarantee, for situations where off-take agreements are not fulfilled).

TAX EXEMPTIONS: 5 to 10 years of tax exemption during the European scale-up period for manufacturers within the PV value chain would make a large difference for stakeholders when setting up business plans. This measure would be almost cost-neutral to the Member States, considering that the related tax income would be improbable without the incentive.

CAPEX AND OPEX MEASURES: The effective combination of CAPEX and OPEX measures would ensure the competitiveness of European PV manufacturing, and would at the same time increase the investor's trust. On the CAPEX side, the investment incentives applied for the industry would have a considerable positive impact on establishing PV manufacturing capacities, as 40-50 % CAPEX subsidies with € 10 billion fund would help build up to 40 GW European PV manufacturing capacities. Considering OPEX, potential support measures regarding electricity costs for the manufacturing industry, and support towards retraining for green jobs are key, as these are the most important cost streams of the industry.

Once implemented in an adapted temporary State aid framework, these measures would ensure energy independence, high returns to Member States in the long run by tax revenues, job creation and competitiveness of all the value chains of European economies. These measures must be in place and ready for use by June this year, at the very latest, to secure the competitiveness of PV manufacturers in the EU. In this context, ESMC has already provided 8 concrete proposals to the European Commission in December 2022, as guidance for the European Solar PV Industry Alliance. These include, but are not limited to, the creation of a special financial vehicle as a first step to de-risk investments, developing effective off-take agreements for local production, and setting EU standards on labour laws, CO2 footprint and circularity.

ENCLOSURE: ESMC Milestone Proposals for the European Solar PV Industry Alliance (5 pages).

On behalf of the European Solar Manufacturing Council,

Co-Chair
Eicke Weber

Co-Chair
Gaëtan Masson

Co-Chair
Carsten Rohr

Vice-President
Vincent Bès

Secretary General
Johan Lindahl

Target:

- Acknowledge PV manufacturing as strategic sector
- Support to European Commission's actions on State aid revision
- Express urgent need for de-risking investments by special funding (e.g. Net-Zero Industry Act)
- Requesting support for the integrated PV solutions

Communication with the Member States:

- Letters distributed on 18-20th January
- Ongoing communication with the Member States
- European Council met on 9-10th February, next meeting – 23rd March

EU is establishing financial support framework – response to IRA

Policy initiatives:

- **1st February** – European Commission adopted *Communication A Green Deal Industrial Plan for the Net-Zero Age* – general framework for financing net-zero industries;
- **1st February** – European Commission released *Guidance on Recovery and Resilience Plans in the context of REPowerEU*
- **9-10th February** – European Council confirmed the support for the net-zero industries;
- **16th February** – European Parliament support – *Resolution on an EU strategy to boost industrial competitiveness, trade and quality jobs*
- **21st February** – European Commission adopted *Communication Recovery and Resilience Facility: Two years on A unique instrument at the heart of the EU's green and digital transformation*
- **8th March** – *Net-Zero Industry Act* will be adopted;
- **23rd March** – European Council will take the final decisions.

Positive consequences:

- **EU Member States governments will be able to subsidize CAPEX and OPEX** of the companies establishing PV manufacturing and storage production facilities in the EU without State aid clearance procedures;
- **Match checking procedure will be endorsed:** Enhanced investment support schemes for production of strategic net-zero technologies, including the possibility of granting higher aid to match the aid received for similar projects by competitors located outside of the EU while ensuring the proportionality of such aid;
- **The approval of IPCEI related projects will be further streamlined and simplified:** speed up the implementation of smaller, IPCEI related, innovative projects, in particular by SMEs, through higher notification thresholds and greater aid intensities under the GBER;
- **Recommendations for the revision of their national Recovery and Resilience Plans (RRPs):** An energy hub combining the production of solar energy with an on-site large capacity energy storage as part of an industrial plant. The support could also cover certain costs related to the investment, such as the supply of spare parts, labour costs linked to the construction of the facilities and administrative costs.

Financing sources:

- REPowerEU – € 20 billion;
- Member States national RRP – up to the decisions of the Member States.

2. Potential EU financing for Photovoltaic Noise Barriers (PVNB)

European Commission's Guidance on Recovery and Resilience Plans in the context of REPowerEU

- On 1st February European Commission adopted a [Guidance](#) on the use of Recovery and Resilience Plans which allows the EU Member States increased space to invest in clean tech.
- **European Commission requested Member States to submit their modified RRP with REPowerEU chapters by 30 April 2023.**
- **Member States are encouraged to propose measures and investments in their REPowerEU chapters that would support the EU industry's transition towards zero- or low-carbon technologies on the road to net zero**, preserving the present and future competitiveness of key EU clean-tech industries, supporting the expansion of their productive and innovation capacity, including across key segment of their supply chains and, more generally, preserve the global attractiveness of the EU as an investment location in strategic clean-tech industries. **Such investment support (e.g., tax breaks or other forms of support) should be combined with additional reforms that would amplify the impact of the financial support.**
- **Member States can fund the investments in long-term assets and in specific conditions some of the temporary operational expenditures associated with those projects (both in existing RRP and REPowerEU chapters).** To be eligible for the RRF support, these operating costs should be an integral part of the reform/investment that contributes to meeting the assessment criteria of the RRF and be limited and commensurate to achieving the intended long-term results of the investment.

European Commission's Guidance – mandatory deployment of vertical double-face solar panels on highways – decision of the national governments

Examples of measures that can be included in the REPowerEU chapters (p. 17):

- 4) The objective to increase the share and accelerating the deployment of renewable energy includes measures to **increase renewable energy generation capacity**, reinforcement or upgrade of the grid needed to integrate renewables and respective storage, as well as reforms speeding-up permit-granting procedures for renewable energy projects, **including their connection to the grid.**
- (c) Addressing internal and cross-border energy transmission and distribution bottlenecks, supporting electricity storage, and accelerating the integration of renewable energy sources, and **supporting zero emission transport and its infrastructure, including railways.**
- **zero-emission rolling stock for rail as well as rail infrastructure and related subsystems for zero-emission rolling stock; electric charging points, electricity grid connection upgrades, hydrogen refuelling stations or electric road systems;**
- Article 21c 3(b) – decarbonising industry, and increasing the share and accelerating the deployment of renewable energy: **Support for manufacturing of components for solar photovoltaic systems (polysilicon, ingot and wafer, cell, module, inventor) including capital expenditures.** This could be combined with a reform setting a mandatory deployment of solar panels on roofs of large buildings above a certain surface (e.g., offices, supermarkets, warehouses, parking places) or a **mandatory deployment of vertical double-face solar panels on highways.**

European Commission's Communication *Recovery and Resilience Facility: Two years on A unique instrument at the heart of the EU's green and digital transformation*

3.2. Revision of the plans:

- **In 2023, most Member States will revise their plans to add REPowerEU chapters and access additional funding opportunities.** The revision of the plans also represents an opportunity to reflect on the lessons learned from the implementation phase and take them into account in the design of both new and revised measures, increasing the level of ambition of the plans. **The Commission Guidance on the revision of the recovery and resilience plans in the context of REPowerEU adopted on 1 February 2023 explains how to apply various elements of the Regulation to optimise the design of the revised plans and incorporate measures that can contribute the most to the RRF objectives.** The Commission will support Member States to identify and tackle potential bottlenecks in the implementation of existing measures.
- **The Commission also strongly encourages Member States to include in their REPowerEU chapters simple and effective measures to provide support to strategic net-zero industries and boost their competitiveness in the context of the net-zero transition.**
- **This in particular could include one-stop shops for permitting processes for net-zero projects or tax breaks for businesses undertaking clean-tech manufacturing investments.** The Facility can also finance investments to equip the workforce with the skills necessary for this industrial transition. Also, **REPowerEU can finance investments in zero-emission mobility to help decarbonising the transport sector.**

REPowerEU grants in RRP

Table 1- Additional REPowerEU grants per Member State

Member State	Share (% of the total)	Amount (in EUR, current prices)
Belgium	1.41%	282 138 922
Bulgaria	2.40%	480 047 020
Czechia	3.41%	681 564 712
Denmark	0.65%	130 911 150
Germany	10.45%	2 089 555 318
Estonia	0.42%	83 422 597
Ireland	0.45%	89 598 110
Greece	3.85%	769 221 929
Spain	12.93%	2 586 147 350
France	11.60%	2 320 955 407
Croatia	1.35%	269 441 467
Italy	13.80%	2 760 000 000
Cyprus	0.26%	52 487 457
Latvia	0.62%	123 982 817
Lithuania	0.97%	194 020 453
Luxembourg	0.15%	30 000 000
Hungary	3.51%	701 565 457
Malta	0.15%	30 000 000
Netherlands	2.28%	455 041 644
Austria	1.05%	210 620 057
Poland	13.80%	2 760 000 000
Portugal	3.52%	704 419 725
Romania	7.00%	1 399 326 315
Slovenia	0.58%	116 909 535
Slovakia	1.83%	366 959 257
Finland	0.56%	112 935 884
Sweden	0.99%	198 727 417

3. PVNB as an example of already developed product

2023

SoliTek Photovoltaic Noise Barriers



Perspectives of PVNB's

- The noise reduction performance of the PVNBs has not changed significantly with the retrofitting of PV modules, and the new PVNBs can be designed to meet all relevant noise requirements.
- Bifacial duplex modules ensure sufficient power generation. Further development of the modules is ongoing.
- There is a growing interest in how solar power plants can be integrated into infrastructure structures.



Noise barriers with integrated PV solutions: key numbers

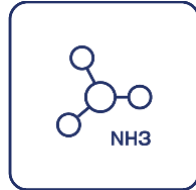
- From 2,5 to 7 meters high.
- 1 km – from 600 to 3600 PV modules (1 to 6 modules in a row) – from 0,2 MW to 1,3 MW capacity.
- Yearly electricity production output – from 130 MWh to 800 MWh.



Solar module features – Solid Bifacial (370 W)



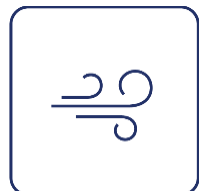
Extreme load
resistance



Ammonia
resistance



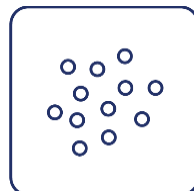
Self- cleaning
effect



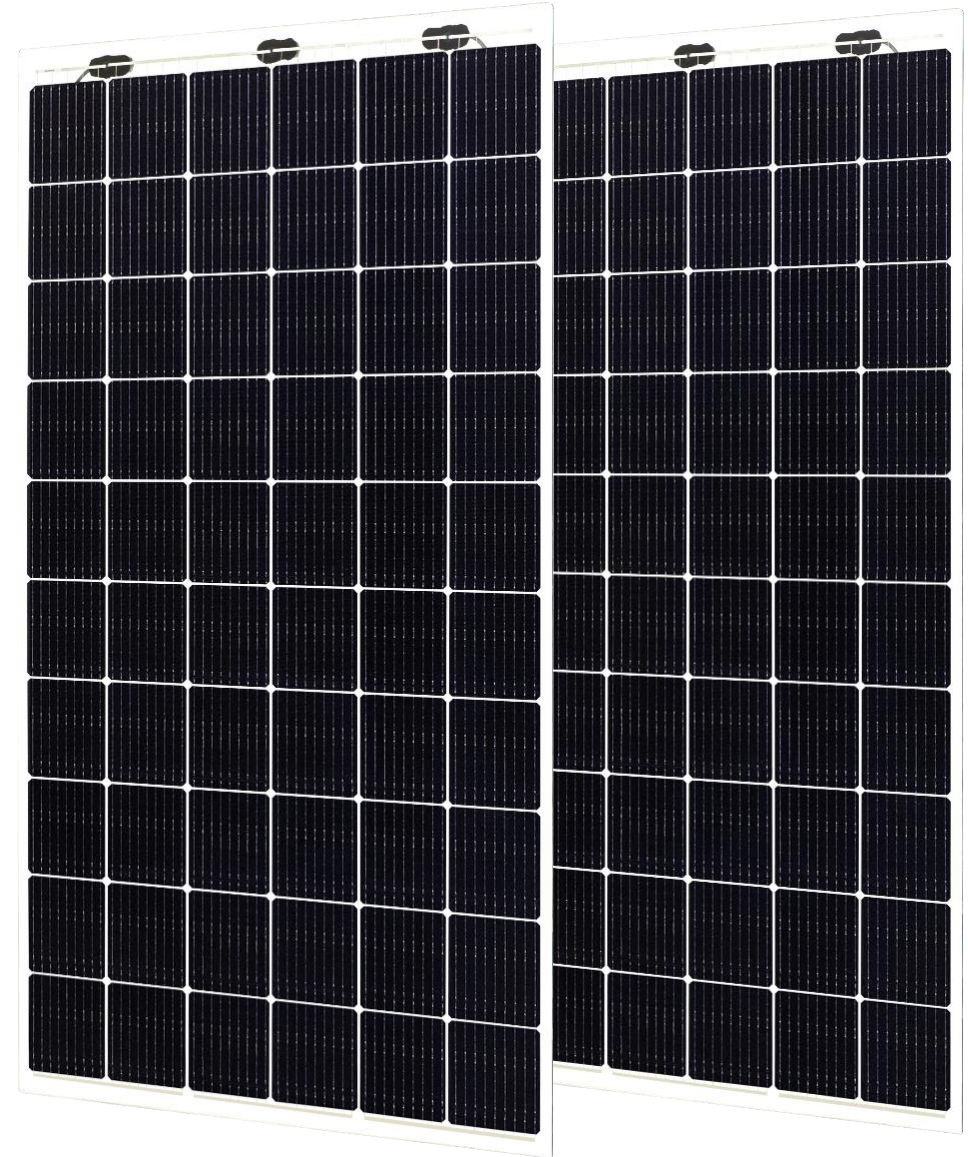
Dust & Sand
resistance



Fire class A



Salt mist
resistance



Solar module advantages

- 30-year product warranty
- 87% power guarantee
- 30-year efficiency guarantee
- Cradle to cradle SILVER certified

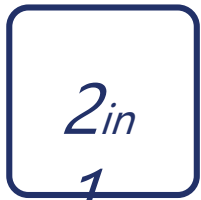


Cradle to Cradle™ certified

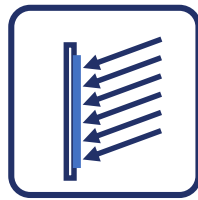
Cradle to Cradle Certified® Product Scorecard	
Material health	Silver
Material reutilization	Gold
Renewable energy & carbon management	Gold
Water stewardship	Platinum
Social fairness	Gold



PVNB's segment features



2in1: Noise Barrier
+ solar power



Vertical surfaces for
solar generation



Solar modules as a
noise reflective shield



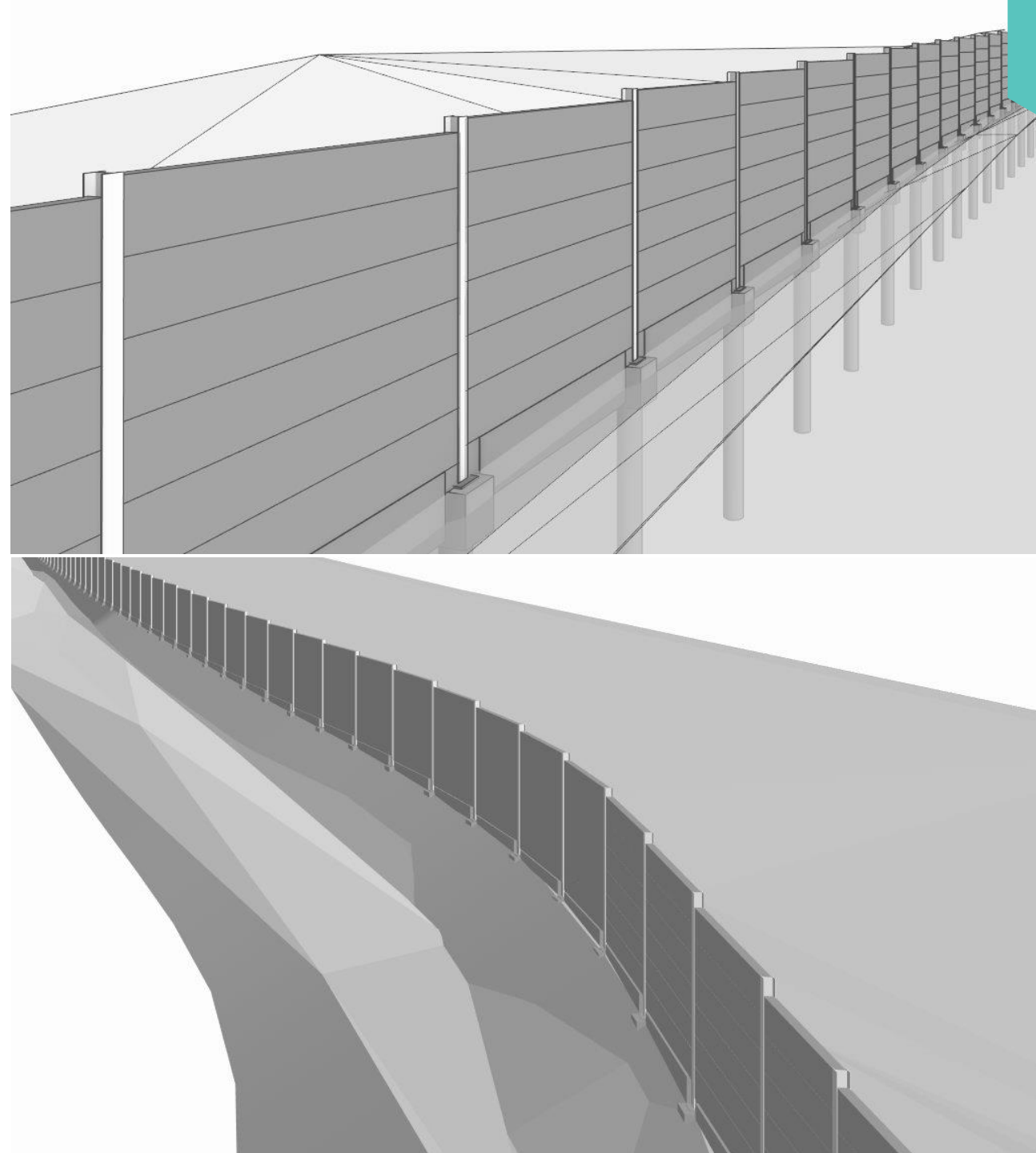
Load-bearing ALU
frame



Inserts into
HEA/HEB columns



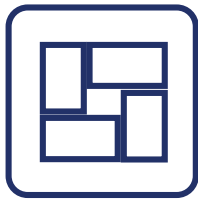
Sound insulating
mineral glass



PVNB's segment benefit



Easy instalment
and maintenance



Can be in different
module layout



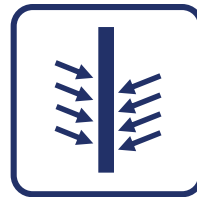
Makes decent
Insulation from noise



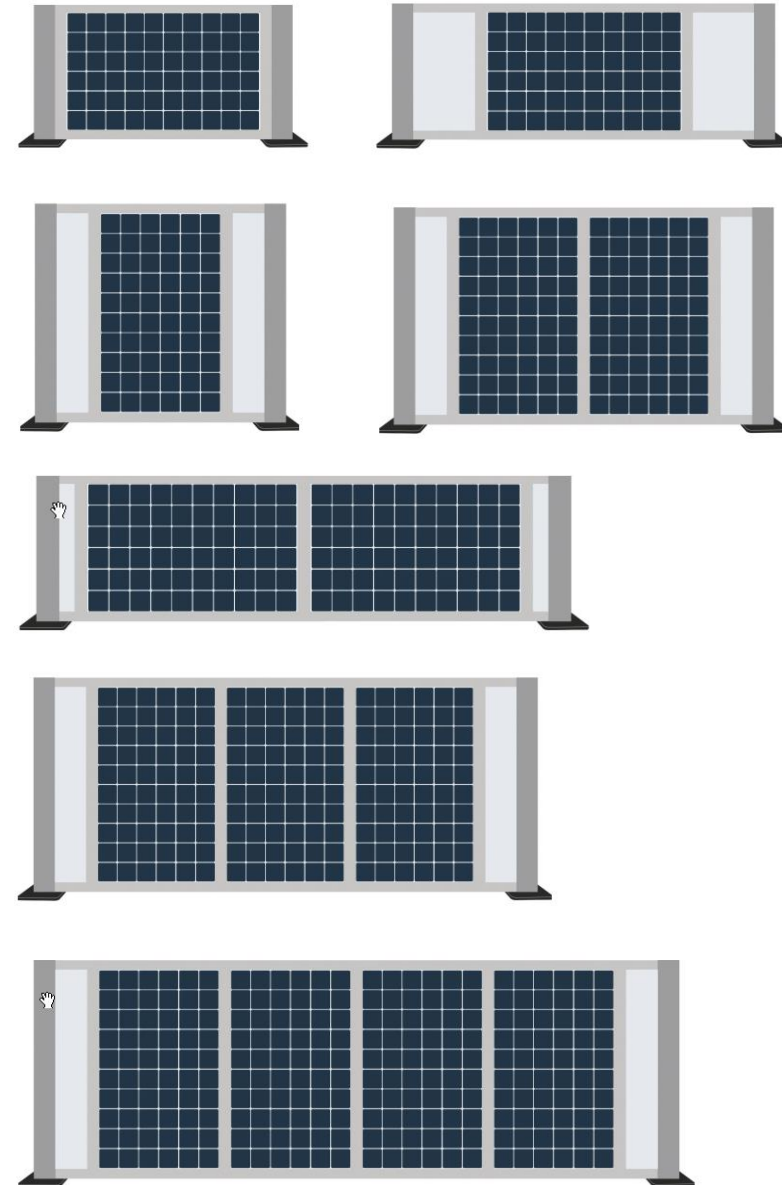
Fits with conventional
acoustic modules



Can fit to different
distances of H beams



Bifacial wall
generates up to 20%

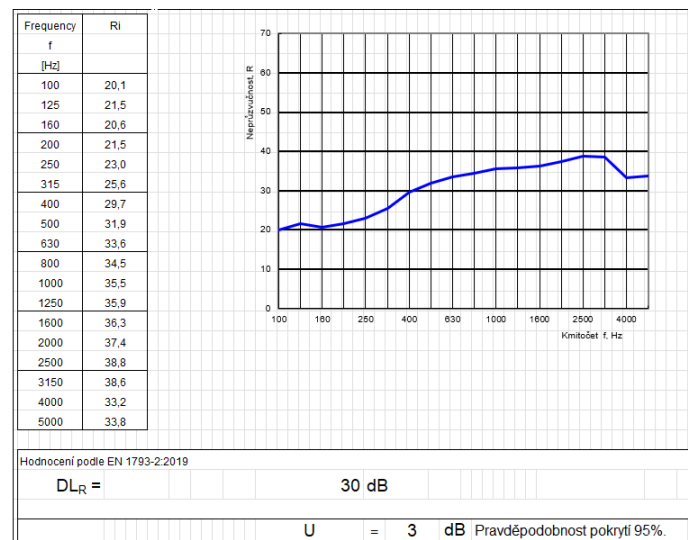


Acoustic tests are performed in accredited laboratory

- Insulation factor from noise: $DL_R = 30$ dB
- It conforms to class **B3**

PVNBs tests are performed according European noise insulation standards:

- EN14388
- EN 1793



Declaration of performance and CE marking
in accordance to harmonized standard EN
14388:2005 and Construction Product Regulation
(EU) No 305/2011
AVCP System 3 acc. Annex V of Regulation (EU) No 305/2011

DECLARATION OF PERFORMANCE

No. [.....]

1. **Unique identification code of the product-type:**

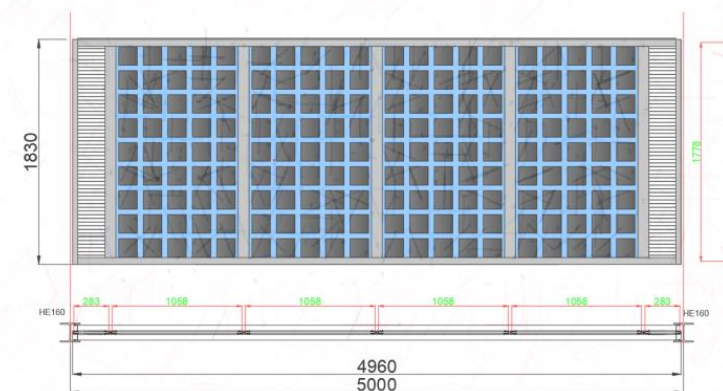
Noise insulating acoustic elements type [.....]

Project: [.....]

2. **Number of the type, series or any other element that enables identification of the construction product:**

Insulating barrier XXXX refers to insulating acoustic panel designed with aluminum load-bearing aluminum frame, sound insulating mineral glass and sound insulating photovoltaic elements. The panels are intended for building insulating traffic noise reducing barriers consisting of the panels supported by vertical steel posts.

Element scheme:



3. **Intended use/es of the construction product, in accordance with the applicable harmonized technical specification:**

To mitigate the effects caused by traffic from roads and railways. Noise barriers (anti-noise

UAB StalCorp, Org. no. 303527861, VAT reg. no: LT100009099516
J. Bielinio g. 26, LT-47255, Lithuania
www.stalcorp.eu

PVNB case key numbers

Parameters of Noise barrier

- Noise Barrier length – 500 m
- Number of sections – 100 pcs
- Section length – 5 m

Parameters of Solar power plant

- Number of Solar modules - 800 pcs
- PVNB Power – 290 kW
- PVNB generation/year – 200.000 kWh
- Revenue per year – 70.000 Eur

Return of investment

- Price difference from conventional Noise Barrier – 30 %
- Payoff from the additional investment – 7 years
- Revenue for the rest 23 years – 1.610.000 Eur



Photovoltaic segment: 3,7 x 5 meters

Make a value from PVNB

- While insulating from noise – Produce green energy
- Save the construction costs – Return your investment
- Build sustainable – Safeguard the population
- Empower EU financing through RRF – **EUR 2.76 billion potential - necessary to safeguard financing by 30 April**
- **30-40% RRF financing** would ensure the same price as of the conventional Noise Barrier (1 km – EUR 800k subsidy potential)
- **European Commission is supporting the mandatory deployment of vertical double-face solar panels on highways!**



THANK YOU FOR YOUR ATTENTION!