



Towards 2 GWp of Bifacial PV

Commercial and R&D activities of Solitek

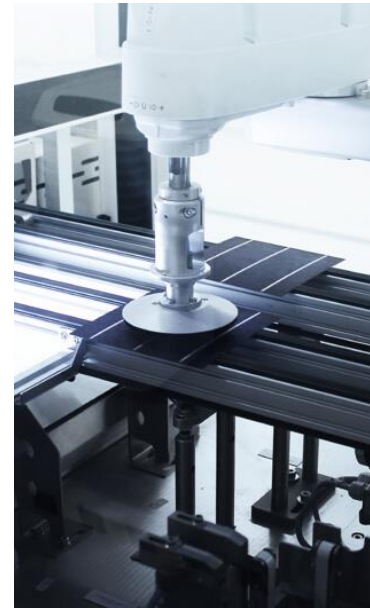
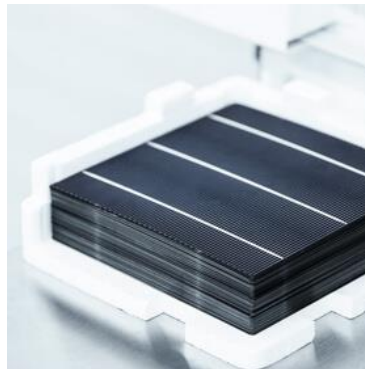
The 6th bifiPV workshop 2019



Julius Denafas, Soli Tek R&D
2019.09.16

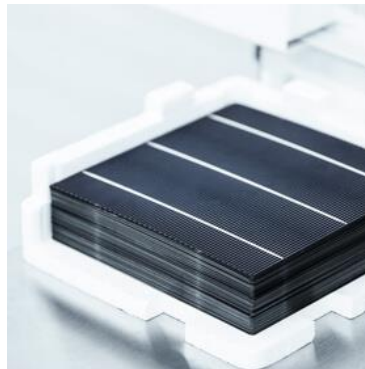
ABOUT SOLITEK

- The Northern/East-Europe leader in solar energy
- We are middle-sized and specialized.
- Main business - manufacture, sale, and delivery of glass-glass c-Si PV panels.
- All of our products are manufactured in the EU, using 100% renewable energy.



OUR CUSTOMERS

- Over 60% of our solar panels is exported to Sweden, Norway, and Germany.
- Over 90% to the EU as a whole.
- The majority are PV installers, distributors, and project developers in the EU.
- Separate business unit to serve the local market in Lithuania (household owners)



FACTS & FIGURES

SOLITEK PRODUCTION, 2018:

- 100K panels
- 27 MW total produced capacity

SOLITEK PRODUCTION FORECAST, 2019:

- 200K panels
- 50 MW total produced capacity
- Production line upgrade in 2020 Q1, 9-12 BB panels, 100 MW



PRODUCT PORTFOLIO



Glass - Foil
STANDARD
270W/300W



Glass - Glass PRO
270W/300W



Glass - Glass
SOLRIF
270W/300W



Glass - Glass
Framed



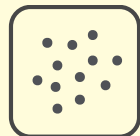
Glass - Glass
SolidWALL



Glass - Glass
BIFACIAL



SELF-CLEANING
EFFECT



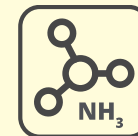
SALT MIST
RESISTANCE



FIRE CLASS A



DUST & SAND
RESISTANCE



AMMONIA
RESISTANCE

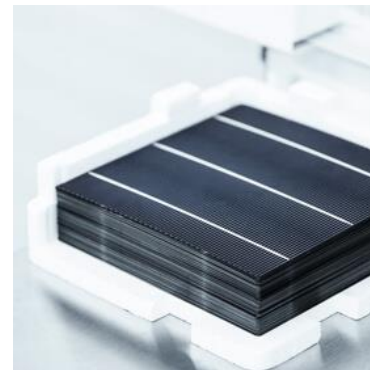


EXTREME LOAD
RESISTANCE
8 000 Pa

OVERVIEW OF COMMERCIAL N TYPE PROJECTS

Projects completed in 2019:

- 512 kWp system in Netherlands
- 2 MWp project in Ukraine



Bifacial PV projects: Ochten, Netherlands

- Operating since 2019.03.29
- Panels: Solitek Solid Bifacial
- Installed power – 512,21 kW
- Mounting system - BayWa Novotegra E-W
- Roof albedo – 0,45-0,5
- Simulated energy gain with PVSyst - +3,4%
- Monitored energy gain: +6,5%
- Contractor - Solardarity



Bifacial PV projects : Vilnohirsk, Ukraine

- Opened in 2019.08.28
- Modules: Solitek Solid Bifacial
- System size – 2 MWp
- Tracker configuration – two portrait
- Axis height – 2,5 m
- Artificial increase of ground albedo (0,5 ct/Wp)
- Tracker pitch – 12,5 m
- Inverters – ABB
- Simulated energy gain: + 40%



Glass shards

Sand

Glass painted in white, light reflective paint

Sand painted with white, light reflective paint

Sand excessively painted with white, light reflective paint

Sand mixed with concrete painted with white, light reflective paint

Sand mixed with concrete, excessively painted with white, light reflective paint

N/A

0,4

0,5

0,65

0,75

0,55

0,55



Steam film (aluminium)

0,7

White polymeric foil

1

0,7

White polymeric foil

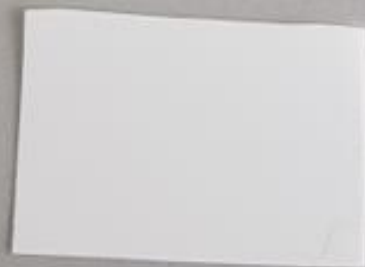
2

0,8

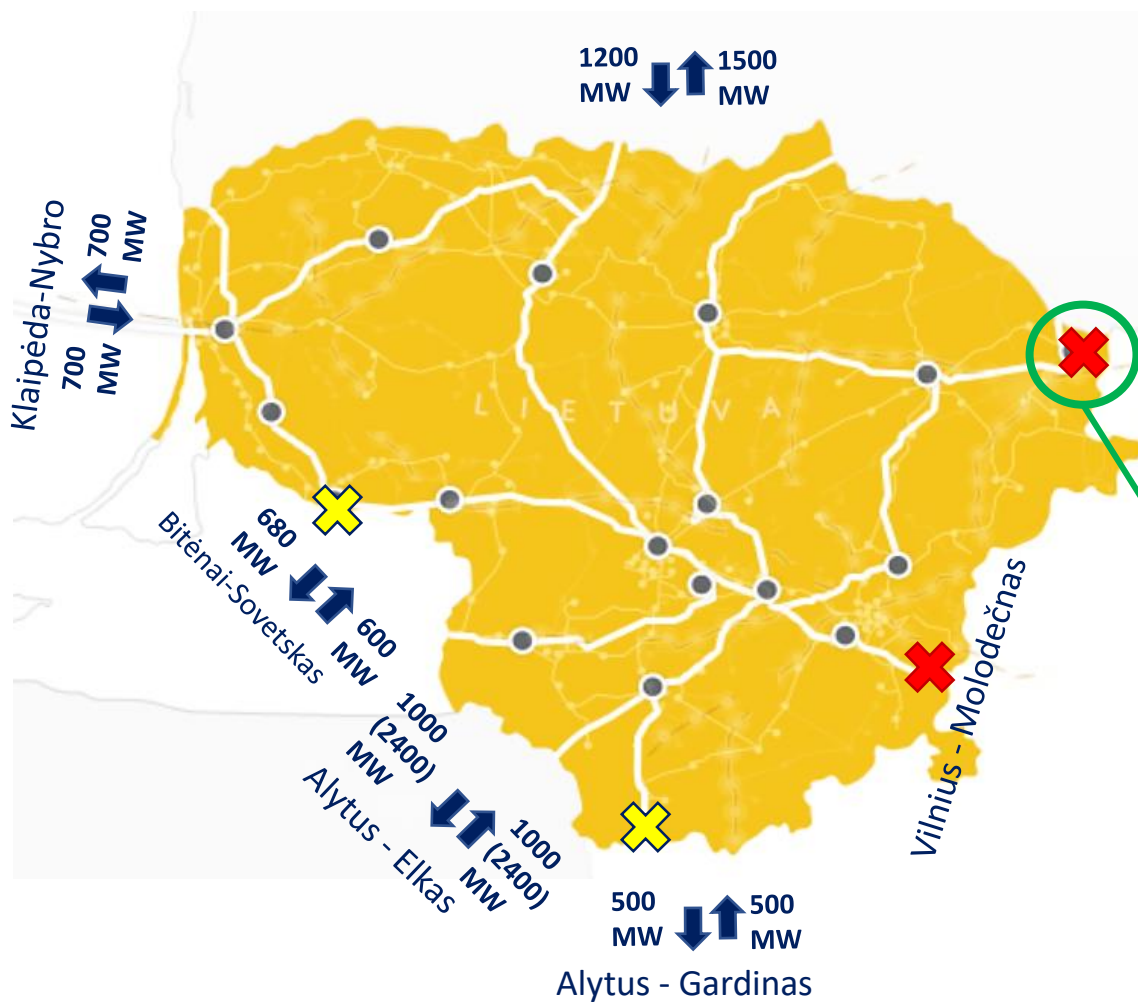
Agro textile

White, UV stable

0,7



Towards 2 GWP: Changes of Lithuanian energy system



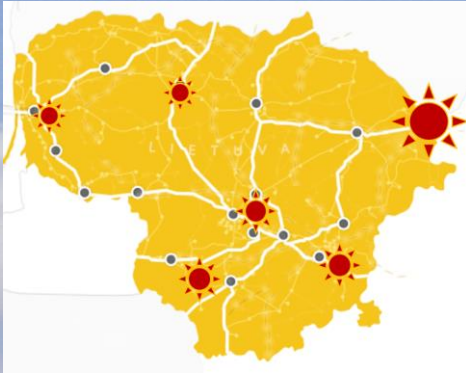
- Lithuania will be disconnected from the “east” until 2025.
- Increase in energy price expected
- National strategy:
 - 45% of electricity produced from renewable sources by 2030.
 - 100% from local production by 2050

Unused ground around a closed nuclear power plant



1.5 - 2 GW of bifacial HSAT PV systems could be installed in several unused locations across the country

- 3 GW Ignalina nuclear power plant has been shut down in 2009
- Infrastructure for power transmission is still available



Stable price for 20 years
at 4.5-5 ct Eur / kWh

Preparation for a 10 MW "pilot"
PV project is on going.



RESEARCH ACTIVITIES: SUPER PV project

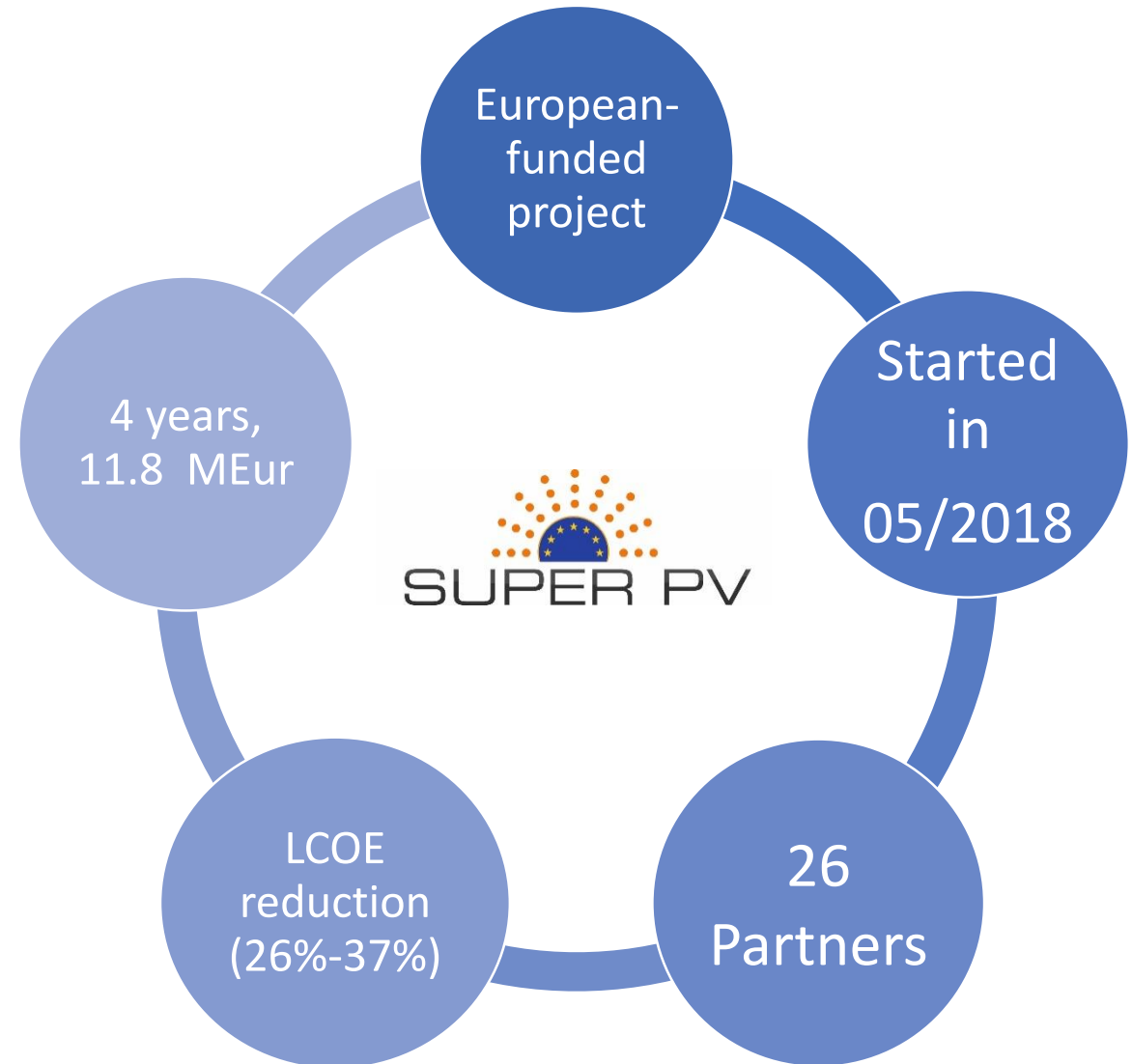


CoSt redUction and
enhanced **PER**formance of
PV systems

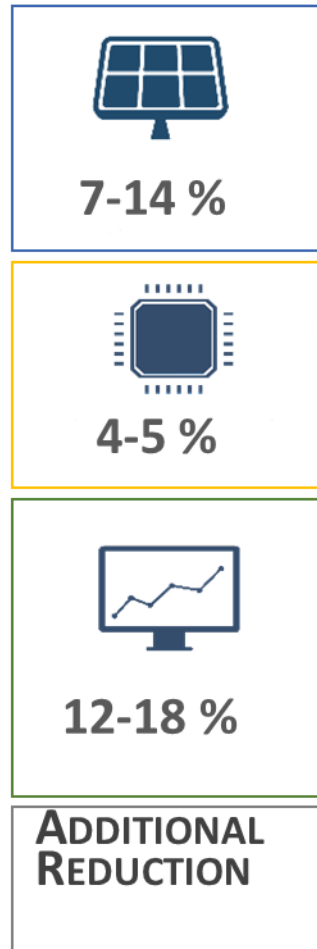
H2020-LCE-2016-2017

More information: www.superpv.eu

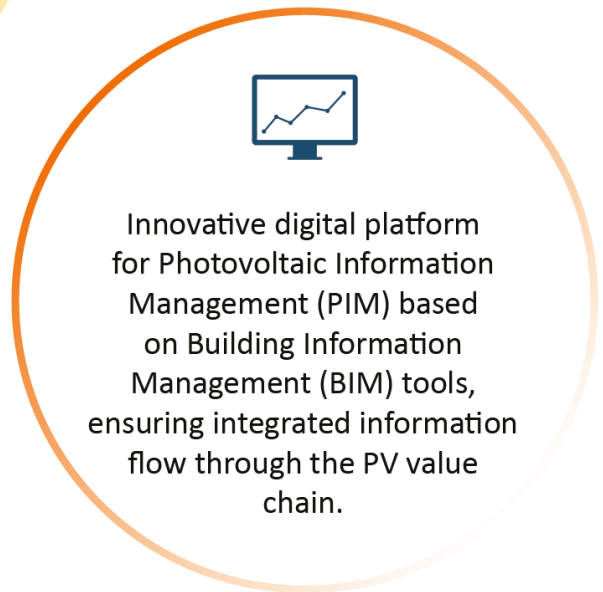
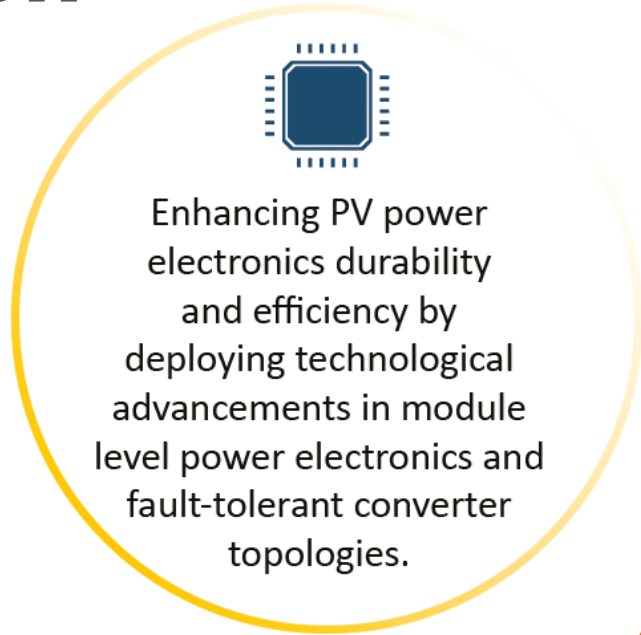
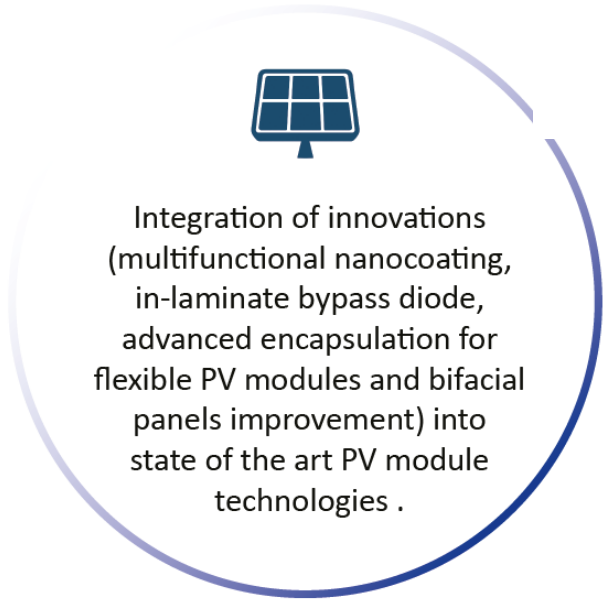
Development of superior **quality PV systems**, based on a hybrid combination of **technological innovations and business operation solutions**, aiming to **accelerate large scale deployment in Europe** and help EU photovoltaic business to regain leadership on world market.



SUPER PV project: overview

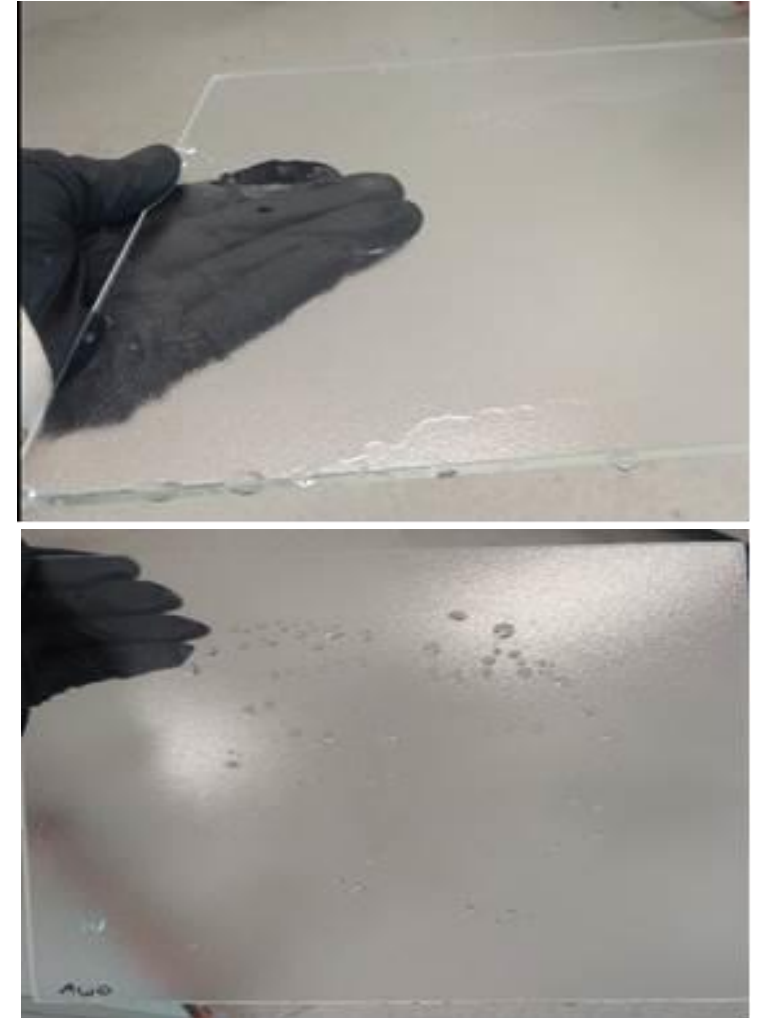


LCOE



SUPER PV project: functional coatings (AR, AS & IR)

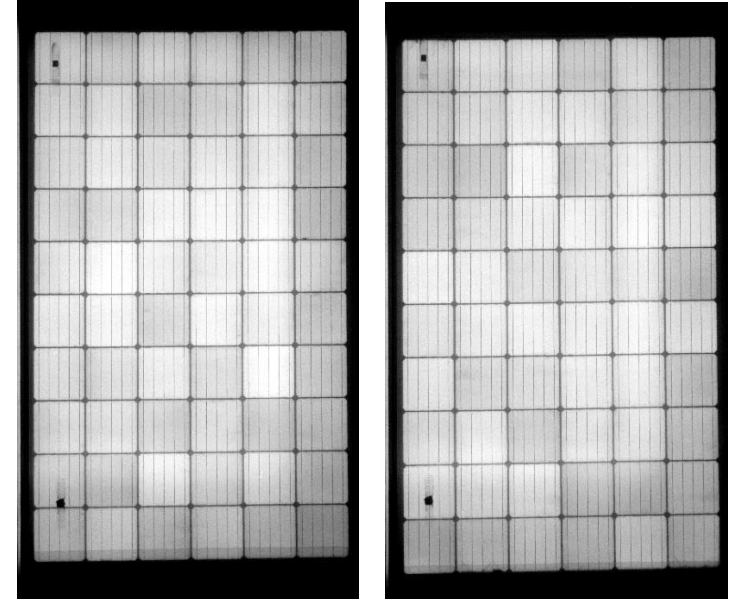
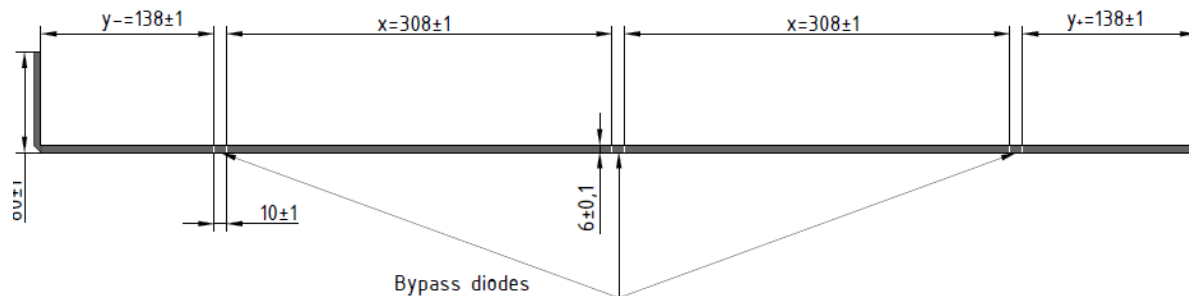
- Nanomaterial based technology
- Easy to apply with a spray gun, curing at room temperature
- AS properties developed and demonstrated on mini modules
 - UV, DH and TC resistant
- Development of AR and IR properties is on going.



COATING	TRANSMITTANCE	WATER CONTACT ANGLE
HFL	92 %	15 – 20°
HFB	91 %	110°

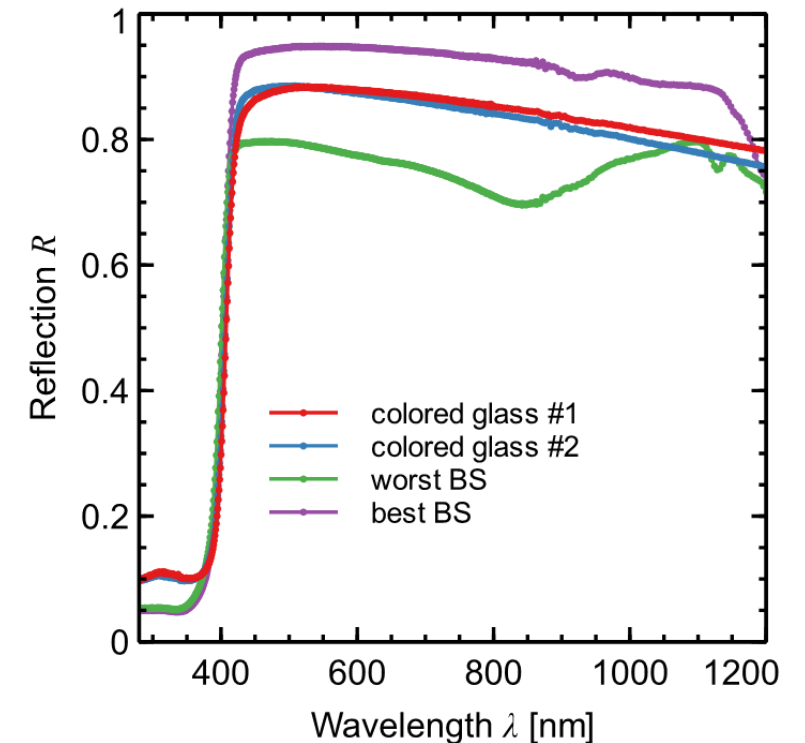
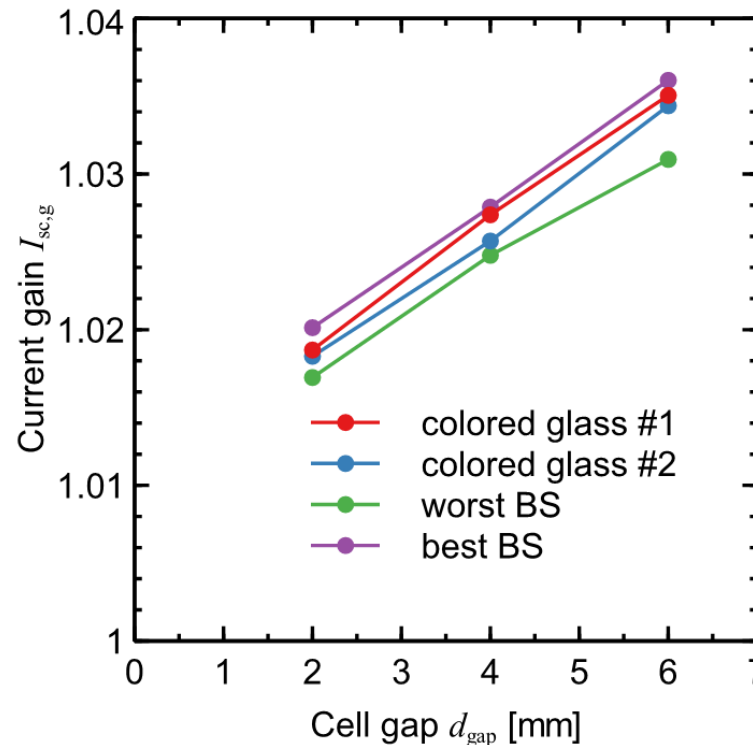
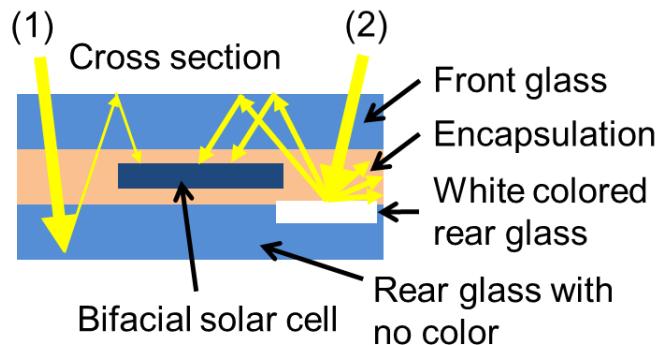
SUPER PV project: in-laminate by pass diodes

- Prototype diodes manufactured by ISFH
- Integration into standard and bifacial modules test has been completed at Solitek and Apollon Solar
- Large batch of diodes & modules to be produced at the end of 2019.
- Module cost reduction potential: 1.5 – 2.0 Eur/module

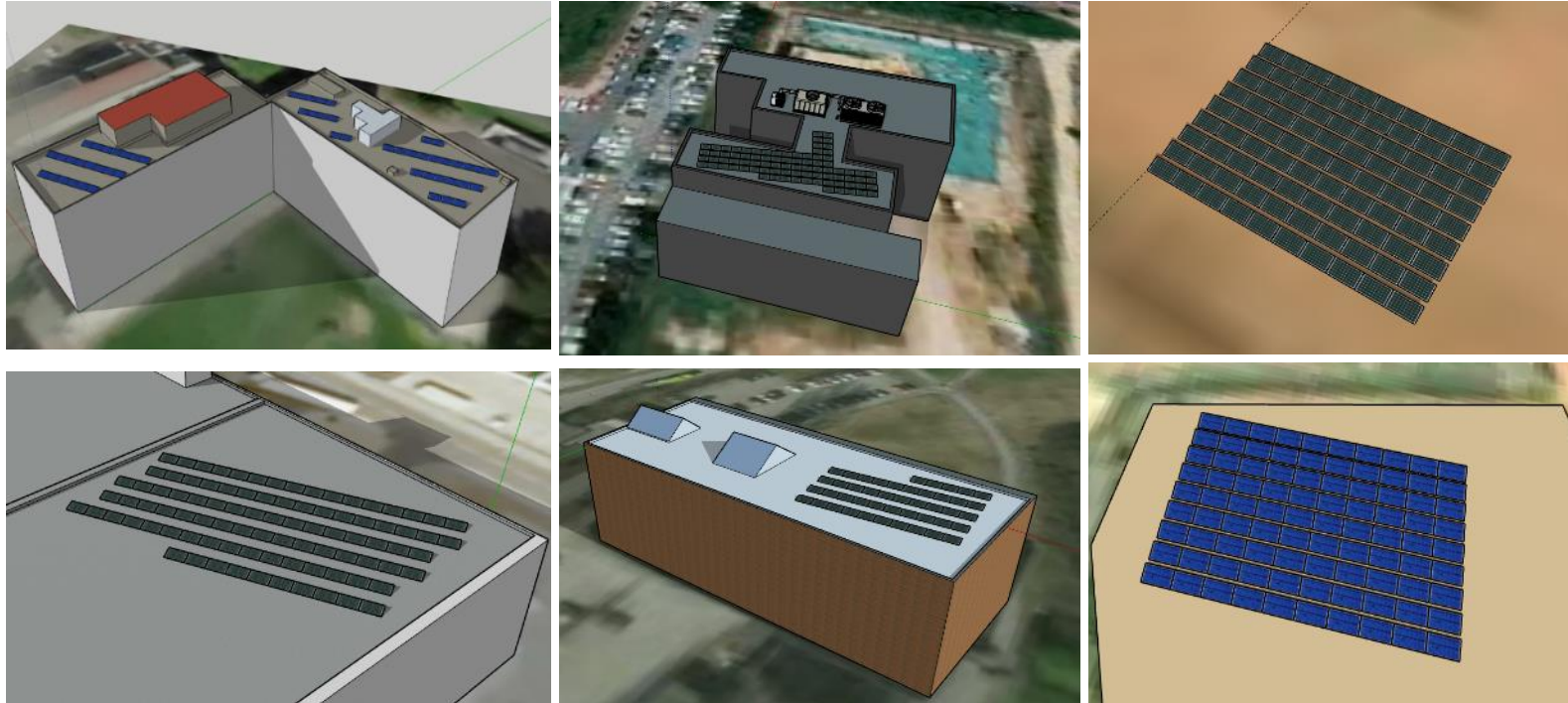


SUPER PV project: light harvesting

- Modelling and testing of light harvesting patterns on the rear side
- Estimated power gain: 5-7 Wp
- First module results expected by end of 2019, more coming 2020.



Demosites for data collection and monitoring



- Test fields: Sevilla, Oslo, Trondheim, Vilnius, Quarzazate, Rabat, Tozeur
- System size: 45-90 panels. Up to 30 kW
- Start of demosite construction in 2019 Q4.

THANK YOU!

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