European Photovoltaic Cluster
General Assembly

Building-integrated photovoltaic technologies and systems for large-scale market deployment

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Tecnalia Research & Innovation

691768 - PVSITES

25th - 26th May 2016

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With the support of the European Union

PVSITES - General data

Building-integrated photovoltaic technologies and systems for large scale market deployment

Acronym: PVSITES

Grant Agreement: 691768

Work Programme: H2020

Call: H2020-LCE-2015-2

Topic: LCE-03-2015

Subtopic: PV integrated in the built environment

Start date: 1st January 2016

End date: 30th June 2019

Coordinator: Tecnalia R&I

Webpage: www.pvsites.eu

Contact: Dr. Maider Machado – maider.machado@tecnalia.com

PVSITES - Consortium

tecnalia Inspiring Business	Coordinator Low-c product Grid interface & BEMS Testing. Simulation. Demo building	cea	Grid interface Regulatory framework Testing needs Indoor & outdoor testing
onyx	C-Si products manufacturer	acciona Infraestructuras	Demo installations management
BEAR iD	Architectural integration	FORMAT D2	Demo building
Nobatek	Architectural integration Simulation. Monitoring.	Vilogia Bien dans ma ville	Demo building
Film Optics Ltd	Fresnel lenses	R2M SOLUTION	Exploitation manager. Business models, IPR...
CTCV	Testing, LCA	CADCAMation Shaping your Ideas	BIPV software development & training
Flisom Flexible Solar Modules	Thin film products manufacturer Demo buildings	WIP	Dissemination & Communication manager
CRICURSA Inspiring Glass Solutions	Curved glass Demo building		

PVSITES - Scope

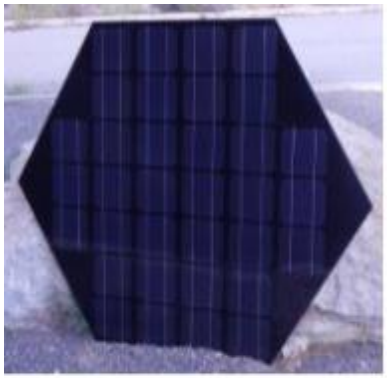
- To pave the way towards a BIPV global market uptake led by EU industry...

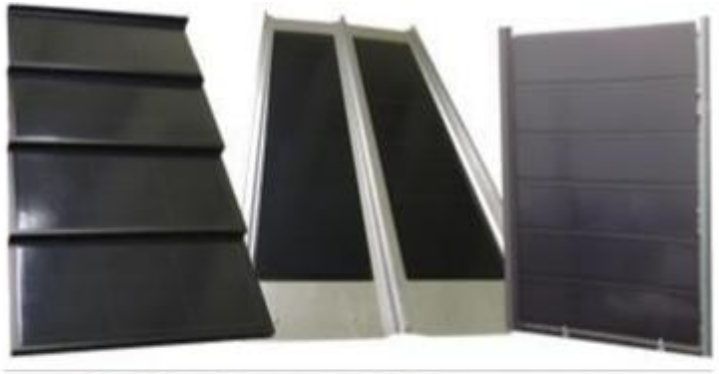
- ... By demonstrating (TRL 5 to 6 -7) an ambitious portfolio of BIPV solutions in terms of design and simulation, integration, performance, cost-effectiveness, energy management, LCA assessment, training and awareness.

PVSITES - Approach

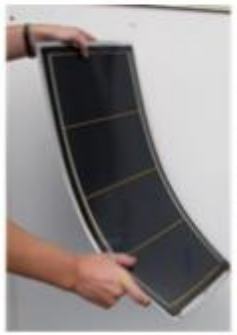
Challenge: Enhanced flexibility of design, outstanding aesthetical value, multifunctionality and increased performance

Solution: A wide portfolio of BIPV products based on c-Si and CIGS technologies complying with market requests





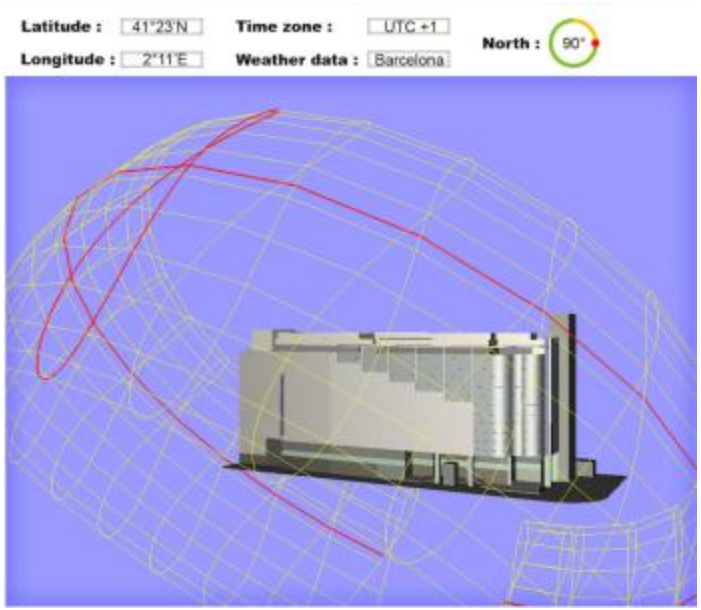


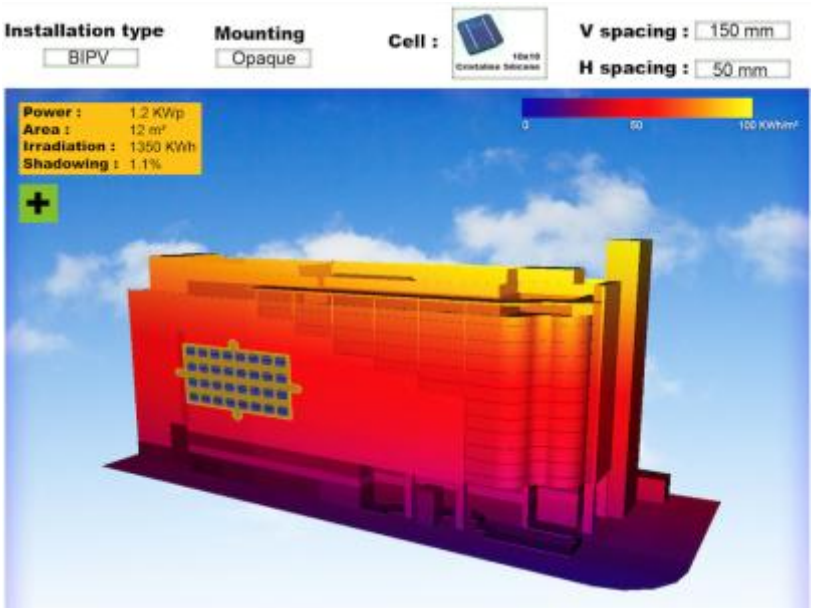



PVSITES - Approach

Challenge: Software tool for the joint simulation of BIPV products and building energy performance

Solution: An accurate, user-friendly, integrated software tool for the simulation of BIPV products performance and their impact on building energy demands

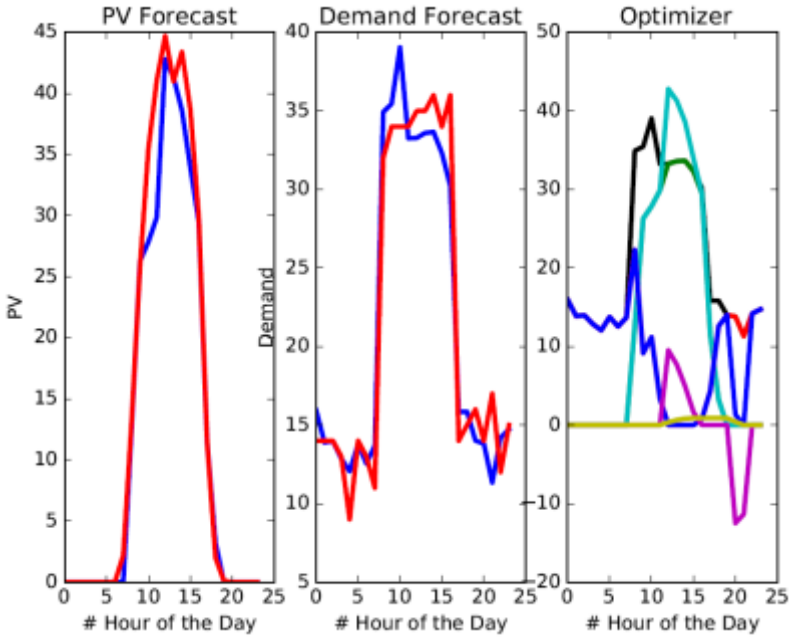




PVSITES - Approach

Challenge: More predictable, manageable, grid-friendly and profitable BIPV generation

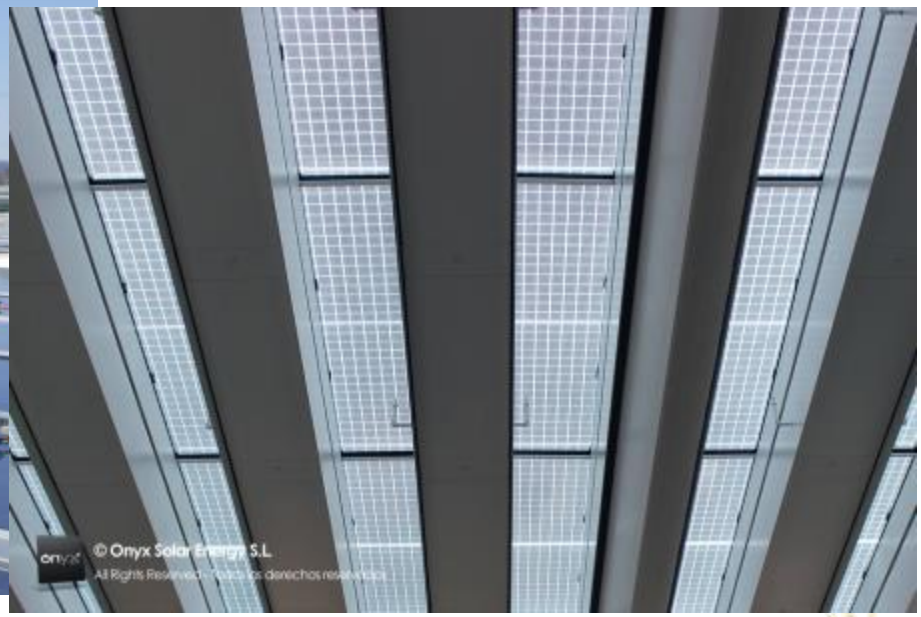
Solution: A combination of flexible and high efficiency grid interface for BIPV systems and new building energy management strategies.



PVSITES - Approach

Challenge: To demonstrate reliability of advanced BIPV solutions through effective incorporation onto real buildings

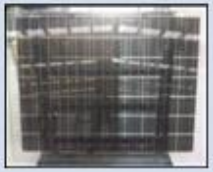
Solution: High impact, replicable demonstrations and training activities in real buildings and experimental facilities throughout Europe



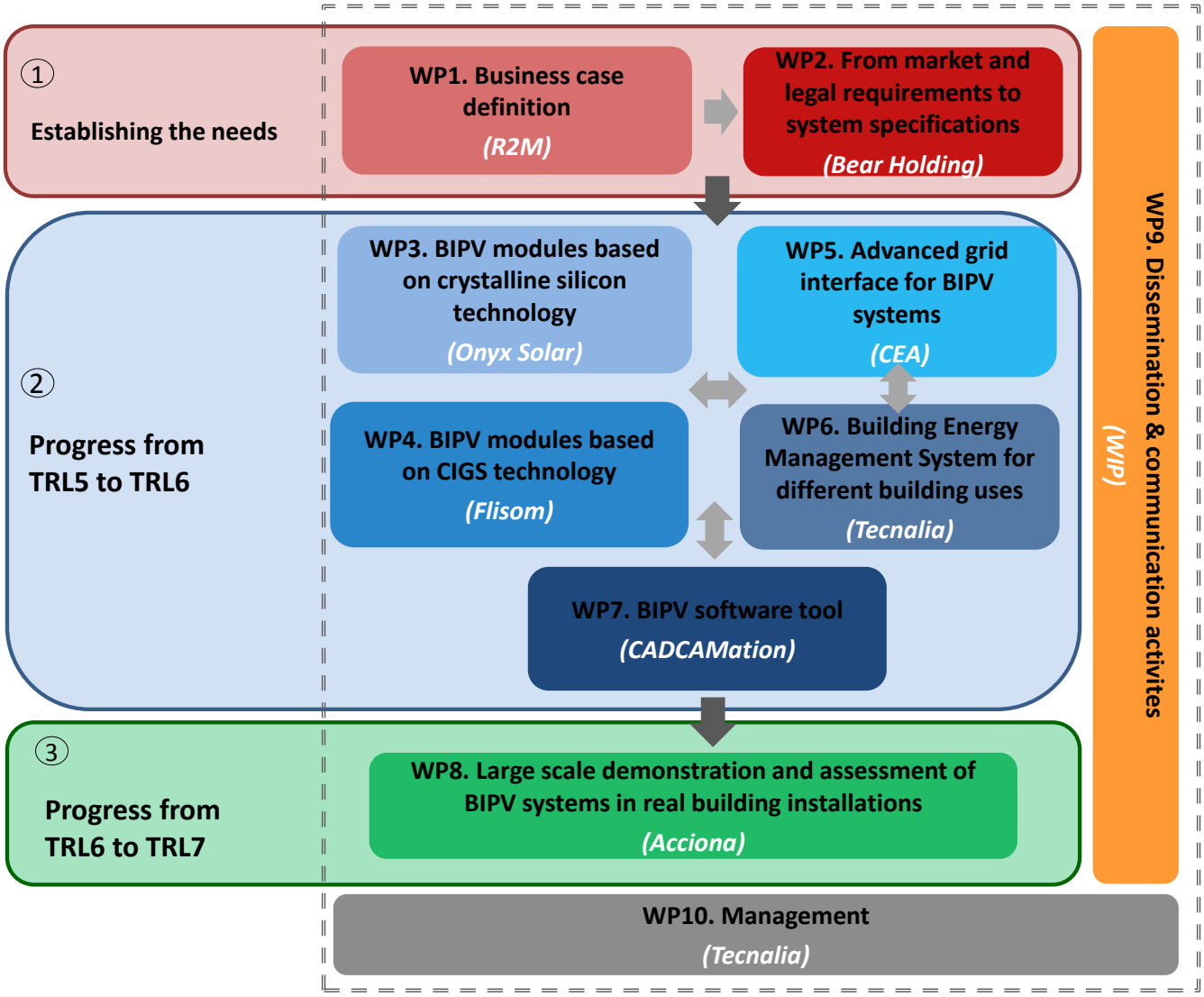
PVSITES - Approach

Demo buildings – TRL 7	BIPV product	Installation features
1.Partner: FormatD2 **Building use: residential single dwelling** **Type of building: New building,private** **Location: Grandglise, Belgium** **Climate: Cfb (Temperate oceanic)** 	**Product:** Roofing shingle **PV tech:** CIGS on steel. **Manufacturer:** Flisom. 	**Implementation:** roof **Orientation:** S **Tilt:** 30◦ **Surface:** 107 m² **Installed power:** 10kW **Grid interface:** DC coupled PV storage system.
2.Partner: Flisom **Building use: industrial** **Type of building: retrofitting, public** **Location: Zürich, Switzerland** **Climate: Dfb (/humid continental climate)** 	**1)Product:**large area tiles-façade **PV tech:** CIGS on metal substrate **2)Product (roof):** large area flexible BIPV roofing membrane **PV tech:** bendable CIGS **Manufacturer:** Flisom 	**1)Implementation:** façade **Orientation:** SSW **Surface:** 100 m² **Installed power:** 10 kWp **2)Implementation:** rooftop **Surface:** 100 m² **Installed power:** 10 kWp **Grid interface:** AC coupled PV storage system
3.Partner: Flisom **Building use: carport** **Type of building: roof renewal, public** **Location: Switzerland** **Climate: Dfb** 	**Product:** solar roof tiles of different configurations 0.5 x1 m2; 1x1 m2; **PV tech:** CIGS on different metal sheets. **Manufacturer:** Flisom 	**Implementation:** segmented roof **Orientation:** E-W **Surface:** 150 m² **Installed power:** 15 kWp **Grid interface:** AC coupled PV storage system

PVSITES - Approach

Demo buildings – TRL 7	BIPV product	Installation features
4.Partner: Cricursa **Building use: Industrial** **Type of building: retrofitting,private** **Location: Barcelona, Spain** **Climate: Csa (subtropical/Mediterranean)** 	**Product:** large area roofing shingles **PV tech**: CIGS on metal substrate **Manufacturer:** Flisom 	**Implementation:** roof **Surface:** 200 m² **Installed power:** 20kW **Grid interface:** AC coupled PV storage system
5.Partner: Vilogia **Building use: Residential multistorey** **Type of building: retrofitting,social housing** **Location: Villeneuve d'Ascq (France)** **Climate: Cfb (Temperate oceanic)** 	**Product:** ventilated façade **PV tech**: c-Si with hidden bus bars and L interconnections **Manufacturer:** Onyx Solar 	**Implementation:** ventilated façade **Orientation:** 60◦ E, 30◦W (2 façades) **Surface:** 150 m² **Installed power:** 20kW **Grid interface:** DC coupled PV storage system
6.Partner: Tecnalia **Building use: office building** **Type of building: retrofitting, private** **Location: San Sebastián, Spain** **Climate: Cfb** 	**Product:** ventilated façade **PV tech:** glass-glass back contact c-Si cells **Manufacturer:** Onyx Solar 	**Implementation:** façade **Orientation:** S **Surface:** 150 m² **Installed power:** 20 kW **Grid interface:** AC coupled PV storage system

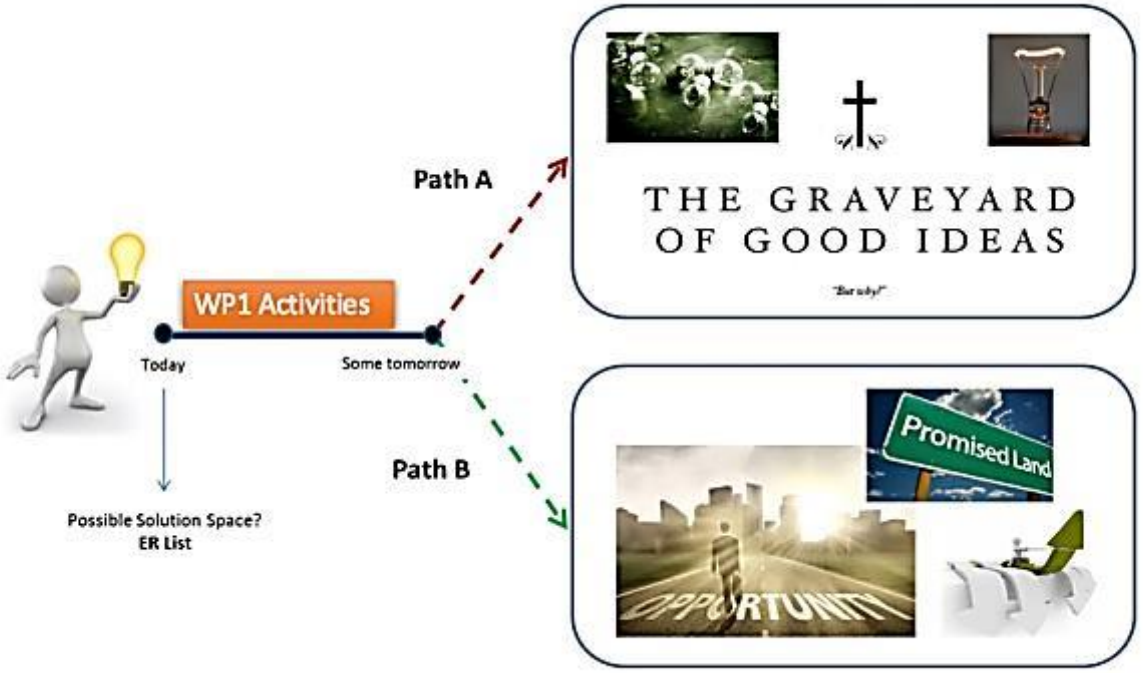
PVSITES - Implementation



PVSITES - Progress so far

- Finishing **5th month** of project execution
- **External Advisory Board**, formed by 6 respected members of the PV community, created
- **Dissemination and communication plan, website and first communication materials** launched.
- **Dissemination actions** in progress: EU PV Clusters, 32th EU PVSEC, IEA Task 15 Workshop
- **Completed:** Bioclimatic design requirements, NZEB buiding concepts, Architectural and aesthetical requirements for BIPV elements in the project.
- **Concluding (end of month 6):** Definition of technical specifications for modules and energy conversion and management systems; Regulatory framework; Standardization needs; Identification and assessment of exploitable results; First prototype of BIPV software.
- **In progress:** bulk technical work related to c-Si and thin film products, electronics and software is fastly progressing.

PVSITES - Exploitation



30 exploitable products and services identified!

PVSITES - Exploitation

Product	Partners	Exploitation route and roadmap
C-Si semitransparent low concentration and solar control BIPV system (skylights, façades and shading elements)	Onyx, TECNALIA, FOPTICS	Onyx: Direct commercialization. TECNALIA: Licensing. FOPTICS: Fresnel lens provider to ONYX Time to market after project: 2,5 years Actions: demo in real building, certification process
Glass-glass products with back contact cells	ONYX	Direct commercialization. Time to market after project: 1 year Actions: certification process
C-Si glazed products with hidden bus bars		
C-Si large area glass		
Curved glass-glass, CIGS technology	Onyx, Flisom	Onyx: direct commercialization. Flisom: module provider to Onyx. Time to market after project: 1 year Actions: certification process
CIGS roofing shingle	Flisom	Direct commercialization Time to market after project: 2 years Actions: production up scaling, certification process.
CIGS large area elements		
CIGS large area flexible roofing membrane and bendable elements		
PV inverter with DC coupled storage system	TECNALIA	Technology transfer based on royalties Time to market after project: 0.5 year Actions: certification process
Single-stage SiC based PV inverter	CEA	Technology transfer based on royalties Time to market after project: 1 year Actions: certification process
Building Energy Management System with active load management and forecasting tools	TECNALIA	Technology transfer based on licensing Time to market after project: 0,5 year Actions: Documentation and training
BIPV software tool	CADCAM TECNALIA BEAR	CADCAM: licensing on subscription basis,e-service TECNALIA & BEAR: technology transfer based on royalties Time to market after project: 0,5 years Actions: user guides, documentation, marketing

PVSITES – Exploitation

Survey on BIPV market and stakeholder analysis

www.pvsites.eu

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Thank you for your attention

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Tecnalia Research & Innovation

PVSITES project

With the support of the European Union