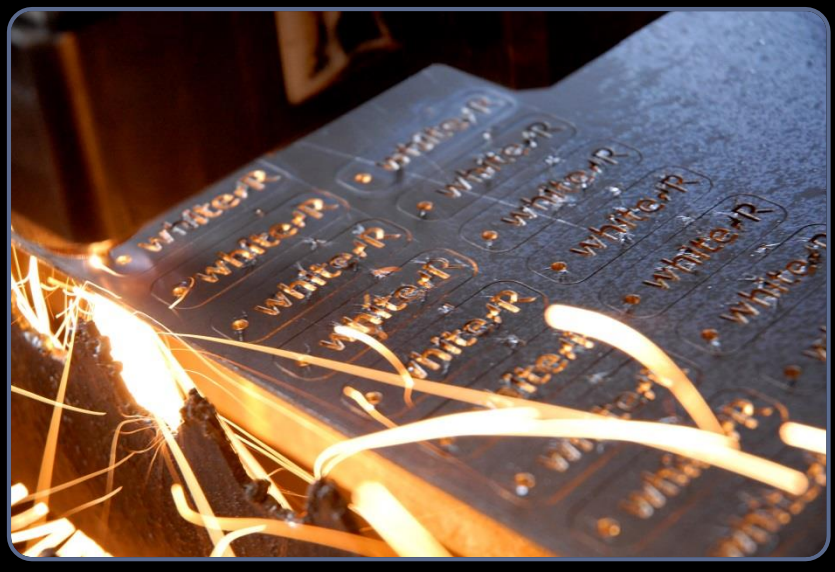
whiteR

Project brochure



FUNDING PROGRAMME

7th Framework Programme (FP7).
FoF.NMP.2013-2: Innovative Re-Use of Modular Equipment Based on Integrated Factory Design.

SEVENTH FRAMEWORK PROGRAMME

Overview

Photonic is one of the key enabling technologies which can boost the European competitive leverage worldwide with new high value added products. The young optoelectronic industry has critical mass and already impacts for more than the 10% on the European. Europe is playing a leading role in R&D and is still able to face Far East and American competitors in manufacturing.

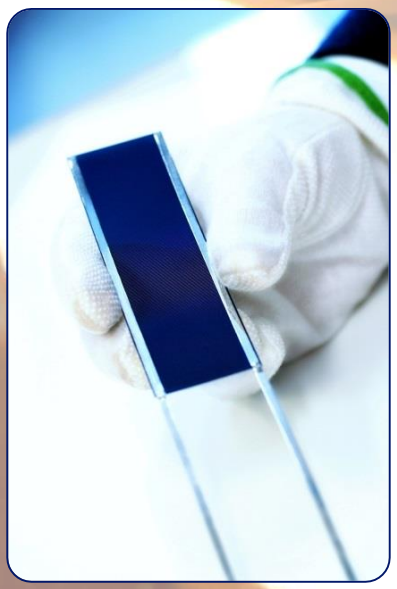
In this sector a key investment for Europe is the realization of customized optoelectronic solutions, characterized by a high production complexity mostly driven by:

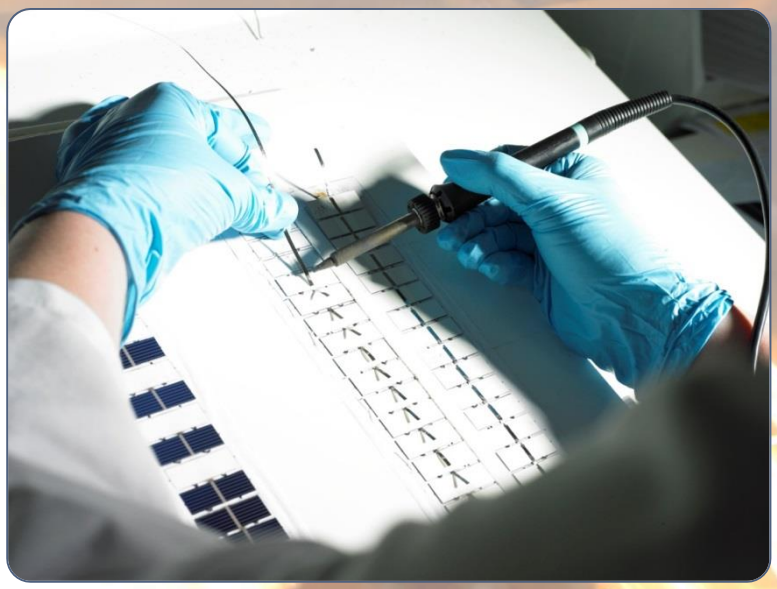
- Products with extremely complex shape and made of fragile and delicate materials;
- Highly product degradability caused by pollutants (dust and impurities) along with electrostatic fields;
- High number of product variants in relation to product geometry, technological features and performance ranges;
- Frequent product evolution over time to match the market dynamics;
- Low production volumes.

Additional aspects are

- the management of the components across their lifecycles, i.e. the so called "*green optoelectronics*". This requires the products to be disassembled, repaired, reconditioning and upgraded several times across their lifecycle before the management of their end of life (recycling and dismissing)).
- most of the production is currently manual based and executed by extremely skilled human operators. This, of course, severely impacts on the cost of production.

The utilization of automated industrial equipment whose flexibility would be capable of matching the various production requirements across their lifecycles would globally impact on the reduction of cost for the products and the production while ensuring an increased agility towards the introduction of new product versions.





Objectives

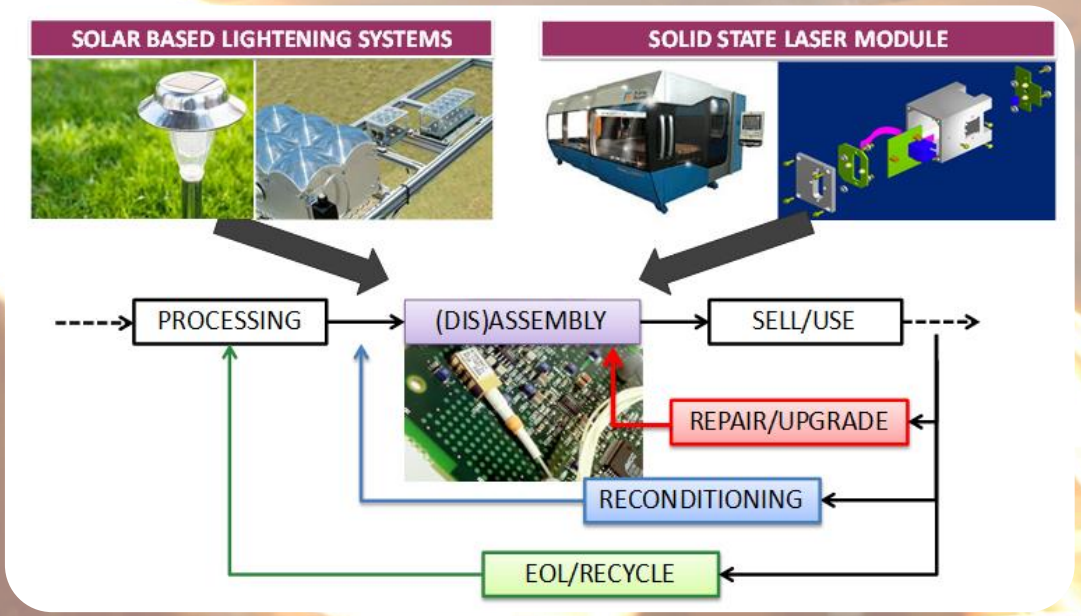
White'R production island aims to make a move away from the manual assembly processes that have characterized the industry for decades to high-accuracy, high-yield, automated methods.

White'R is a self-contained White room consisting in a *multi-robotic island* that can be easily integrated in existing production shop-floors. It empowers the handling, assembly and disassembly of high value added optoelectronic products. The island's devices - robots, operation units, transport, handling and tooling systems - are conceived as "Plug&Produce" reusable modules properly configured coherently with the production requirements.

- 50% reduction of cost compared to current productions system leveraging highly flexible automation to reduce manufacturing cost, since manual packaging accounts for 60 to 80 percent of the cost of a optoelectronic component;
- 75% set-up and ramp-up time reduction by self adaptive reconfigurability thanks to easy plug/unplug of machinery components;
- All components of the production system reusable re-assembled and upgraded in a new different to prevent the risk of dedicated equipment obsolescence;;
- Creation of a EU/International standard for optoelectronic package configuration in order to enhance equipment reusability.

The white'R solution will be realized with regard to the **renewable energy systems** and **laser industrial equipment** sectors. The identified sectors are currently the most important in the European photonic value chain if it is considered their growth rate and the related economic benefits.

The achievement of the objectives will be demonstrated by **2 different demonstrators** where the same white'R island will be reconfigured to be used in two different real industrial environments: the first one that of the production of equipment for laser processing (Prima Power) the second one that of the production of solar energy systems (NSL).



white'R results

Hardware

white'R will deliver **two physical demonstrators** of a production island realizing (dis)assembly of optoelectronic components consisting of:

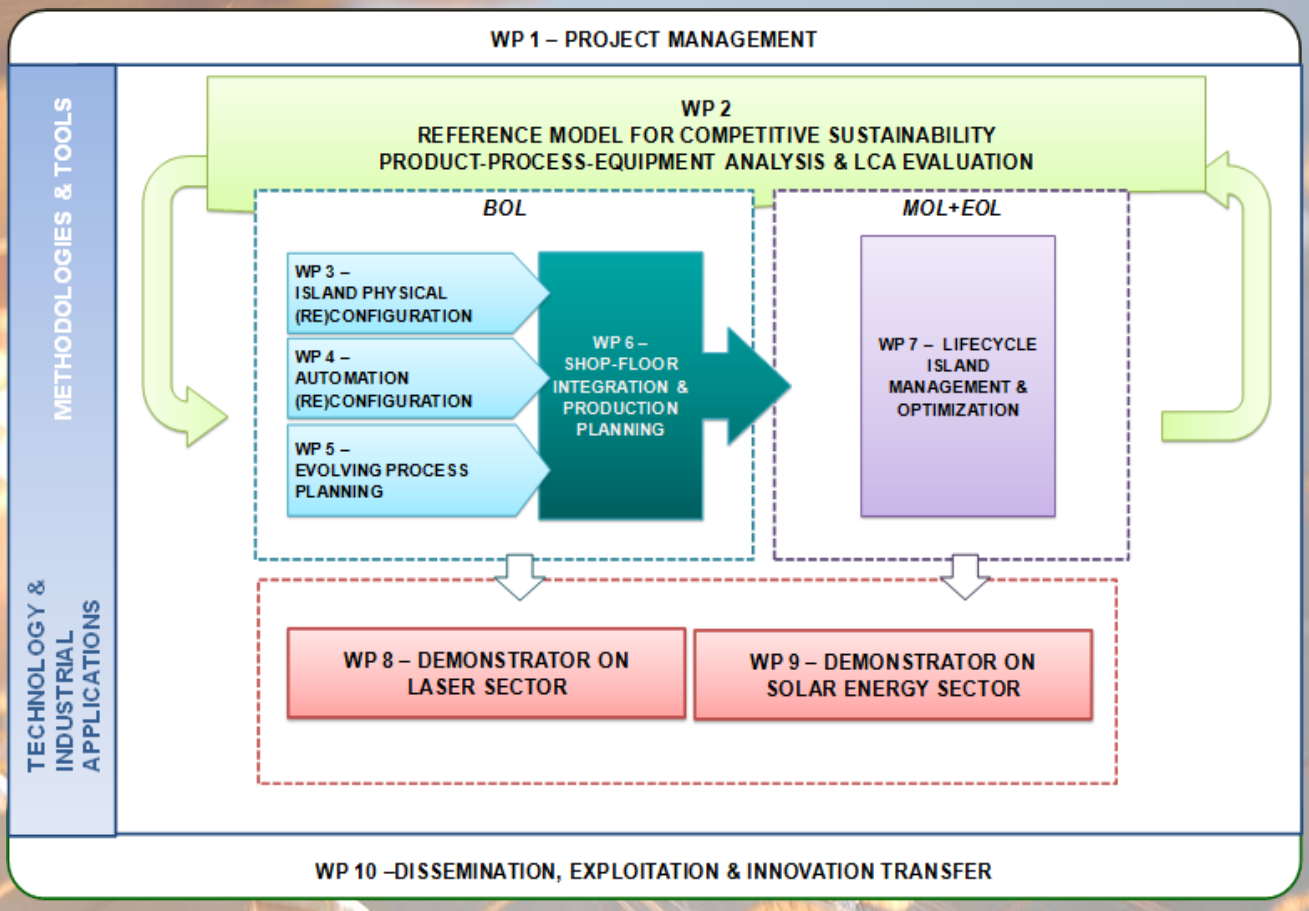
- white'R Plug&Produce mechatronic modules encapsulated in a white-room with a very compact structure;
- smart sensing system for acquiring information about the environment and adapting the island set points and sensing threshold according to the specific configuration and process

Software

white'R will release **5 software applications** integrated in a unique platform:

- mechatronic configuration environment containing Plug&Produce libraries, mathematical models and simulation tools;
- automation configuration environment, oriented to the development of software control;
- an evolving process planning tool;
- a shop-floor dynamic production planner
- and a lifecycle optimization tool

Work plan



white'R in figures

Starting date 1/9/2013
End date 31/8/2016
Duration 36 months

13 partners from 5 countries
3 research centres
8 SMEs
2 Large Enterprises

792 man months of R&D activities
Project cost 9 607 000 €
Eu contribution 6 400 000 €

initiatives

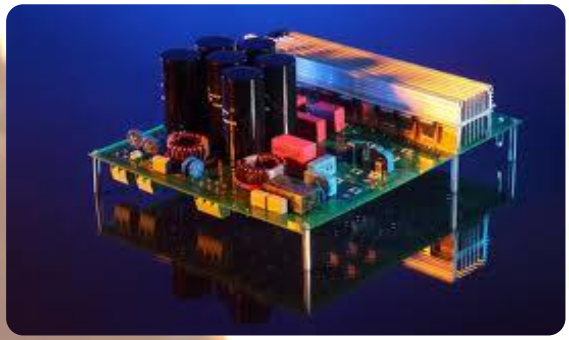
Ecolabelling
EU certification roadmapping
Resource efficiency is a must in the development and in the production of white'R island. Any environmental impact will be assessed quantified and optimized to the minimum level, beyond the current technical state of the art. The procedures and methods set to measure/certify life cycle energy consumption will be proposed as benchmark to achieve an Ecolabel for the island as a whole, resulting at the end of the project. The environmental labelling process, will be compliant with ISO 14020 and ISO14024, the ISO 14000 series of environmental standards.

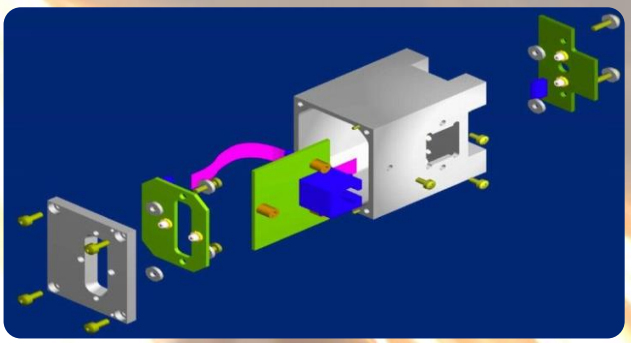
Dissemination
Trades Exhibits
Promotion and diffusion of project in-progress activities and results during photonics related workshops and trades (e.g. Laser World of Photonics, EU PVSEC and Productronica) as well as Robotics Expo.

International Conferences
white'R progress in terms of knowledge and findings will be periodically presented over time to create a constant and continuous information flow towards the potential market. Target events will IEEE, CIRP and ASME sponsored International Conferences.

International Academic and Industrial Journals
white'R relevant results will be also published on peer-reviewed International Journals (such as IEEE Transactions on Industrial Electronics and Transaction on Robotics and Automation) along with Industrial oriented Magazines (such as Automation World).
An updated list of accepted publications will be made available on this section of the website.

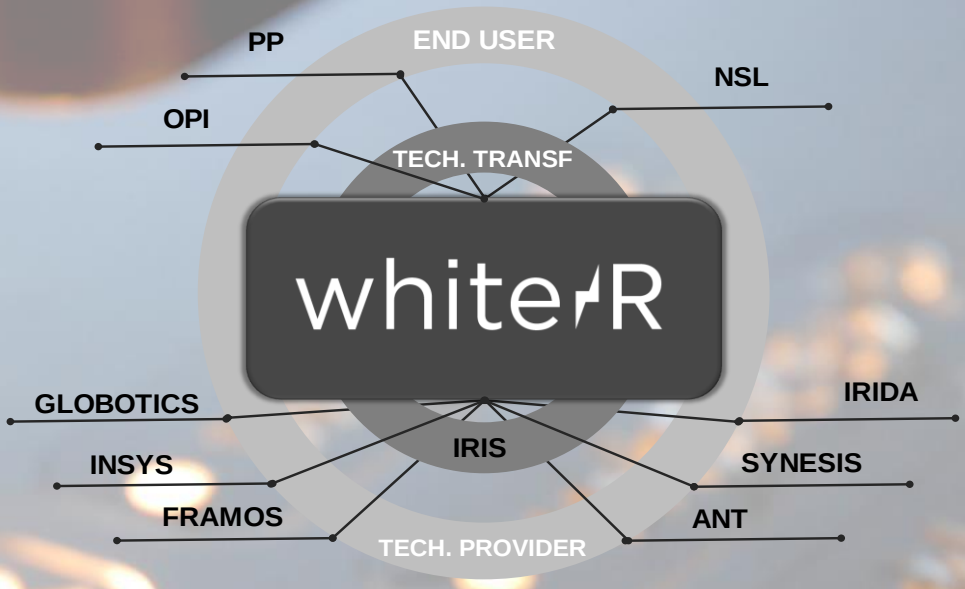
Stakeholders
Interest Groups
A specific interest group will be formed in the first 6 months activity of the project, participated by members of academies, industries and associations to establish a European network embracing existing research and production challenges and identifying the future steps to endorse the competitiveness in optoelectronics know-how and high tech solutions.





Consortium

Excellence in their respective fields of expertise has been the guiding principle in assembling the white'R team. We have strived to achieve balance among academic and research institutions, system development companies, and industrial end users to form a "Lean and Efficient Organization".



The development of white'R solutions will be endorsed by a number of technology providers on the basis of the functional, operational and performance specifications given by the end users with the support of the company enabling the technology transfer.

Prima Power

IRIDA LABS

OPI Photonics

UNIVERSITY OF PATRAS

AntOptima

solar capture TECHNOLOGIES

Globotics Industries

FRAMOS

Synesis

IRIS

SUPSI

POLITECNICO MILANO

Prima Electro

useful links and contacts

Project website whiterproject.eu/
Linkedin group www.linkedin.com/groups/whiteR-EU-Project-6544764
Factory of the future website http://ec.europa.eu/research/industrial_technologies/factories-of-the-future_en.html

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