

Publishable summary

The focus of the Nanophotonics for Energy Efficiency network of excellence is the development of economic and energy efficient materials and devices such as light sources and solar cells: from converting light collected on building surfaces into electricity to the design of organic molecules that simulate photosynthesis in plants.



Images courtesy of TFM Energía Solar Fotovoltaica, S.A

Need for more efficient ways to produce and save energy

Switching to advanced lighting technologies, such as LEDs and OLEDs, offers great savings potential in terms of electricity consumption, while the uptake of solar cells would reduce the demand for oil and natural gases and in turn reduce CO₂ emissions. However to meet current targets certain challenges must be met. Solar cell efficiency should be improved by at least 30%, OLED efficiency and lifetime must be enhanced if they are to be used for general lighting purposes.

Switching to the best alternative existing technologies would save 30% of the energy needed for illumination...but would not reverse the trend towards higher energy needs.

The consortium consolidates know-how and resources of 9 research institutions, leaders in nanophotonics, in 6 European countries and integrates more than 130 scientists, engineers, technicians and managers in nanophotonics. Market and industrial relevance is also ensured through the involvement of a group of industrial advisors: T-Solar Global S.A., Merck Chemicals Ltd., Heliatek GmbH, Philips Lighting, Eni S.p.A., IBM Corp., Centrotherm Photovoltaics, and BASF.



Progress during the first 12 month period

During the first year of the project, our efforts have been mainly devoted towards establishing a solid basis for future integration and collaboration, both within the Consortium and with key external stakeholders.

Some of the key actions undertaken to achieve that goal are:

- *Creation of a web site (www.n4e.eu), containing a public part, with general information and announcements, and a private part, that contains restricted information for project participants, European Commission and independent experts appointed by the European Commission to evaluate the project*
- *Creation of groups in the LinkedIn (<http://www.linkedin.com/groups?mostPopular=&gid=3705807>) and Twitter (<http://twitter.com/NanoOptics>) social networks. In both cases, the groups are open to the public in general for discussions, news, jobs, etc.*
- *Creation of an inventory and database of the resources, skills, expertise and facilities available within the Consortium*
- *Evaluation of the world-wide state of the art in nanophotonics for light emission and photovoltaics, and preparation of a SWOT study*
- *Evaluation of different possible schemes towards durable integration beyond the project duration*
- *Extensive research has been carried out in innovative nanophotonics solutions and methods geared towards improving the efficiency of future light harvesting and light emitting devices. New research collaborations have been initiated and very promising results are being produced*
- *A Seed Research Project scheme has been set up, with limited funding that allows for the evaluation of disruptive concepts and ideas at the proof-of-concept level. This scheme is available to the Consortium members and also to participation of external partners*
- *The network has co-organised the Summer School Advances in Nanophotonics in Erice (Sicily, Italy), with a focus on Plasmonics and Energy Efficiency and is preparing training events for the coming years*
- *Interactions with other relevant Societies, Projects and Initiatives (e.g. Photonics21, Nanophotonics Europe Association, EPIC, EOS, FP7-PRIMA, KIC InnoEnergy, OLED100, etc.) have been established.*