

Grant Agreement number: 248855

Project acronym: N4E

Project title: Nanophotonics for Energy Efficiency

Funding Scheme: Network of Excellence

Date of latest version of Annex I against which the assessment will be made:

Periodic report: 4th

Period covered: from January 1st 2013 to December 31st 2014

Name, title and organisation of the scientific representative of the project's coordinator¹:

Dr. Gonçal Badenes, ICFO

Tel: +34 935534031

Fax: +34 935534000

E-mail: goncal.badenes@icfo.es

Project website² address: www.n4e.eu

¹ Usually the contact person of the coordinator as specified in Art. 8.1. of the grant agreement

² The home page of the website should contain the generic European flag and the FP7 logo which are available in electronic format at the Europa website (logo of the European flag: http://europa.eu/abc/symbols/emblem/index_en.htm ; logo of the 7th FP: http://ec.europa.eu/research/fp7/index_en.cfm?pg=logos). The area of activity of the project should also be mentioned.

The Nanophotonics for Energy Efficiency (N4E) Network of Excellence, a project supported by the 7th Framework Programme of the European Commission, aims to promote nanophotonics research in energy-efficient applications by bringing together different nanophotonic laboratories and research groups across Europe. 9 institutions in 6 European countries are participating in the network, representing more than 130 scientists, engineers, technicians, and managers in the field. The project also incorporates the resources and capacities of a broad network of Associate Members. Market and industrial relevance is also ensured through the involvement of a group of industrial advisors: BASF, Centrotherm Photovoltaics, Eni S.p.A., IBM Corp., Philips Lighting, Heliatek GmbH, and T-Solar Global 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.

(Photonics21 SRA 2010)

Progress during the fourth 12-month period

During the fourth year of the project, our efforts have been mainly devoted towards strengthening integration and collaboration, both within the Consortium and with key external stakeholders. Some of the key actions undertaken to achieve that goal are:

- The Associate Membership scheme has been greatly enhanced and expanded. Associate Members not only receive direct information about all Project activities, but participate to the Seed Project scheme and to the Researcher Exchange Programme.
- The number of Associate Members has almost doubled during this 4th year: it increased from 22 at the end of year 3 to 41 at the end of year 4. Associate members include industry, R&D institutions and Universities. More than 30 of these members are actively involved in project activities. Information about Associate Membership, including registration form and a list of current associate members can be found at <http://n4e.eu/index.php/get-involved/associate-membership>
- Two Seed Project calls have been published this year, with a total of 10 projects funded. An additional Seed Project call is foreseen for year 5.



- The LinkedIn <http://www.linkedin.com/groups/Nanophotonics-Energy-Efficiency-3705807> and twitter @NanoOptics accounts used to publish relevant information on nanophotonics for energy efficiency continue attracting more followers. The LinkedIn group grew from 276 to 367 members during 2013. The twitter account has now 167 followers (111 at the end of 2012).
- The project has published more than 40 papers in SCI-indexed journals in 2013, including 2 Nature Photonics, 2 Nano Letters, 2 ACS Nano, 3 Nature Communications, and 2 Advanced Functional Materials, amongst other.

All publishable summaries and reports generated within the project are available in the <http://n4e.eu/> website.

The Network organised three main events in 2013: A User's Meeting in Madrid in June, a PV-Nanophotonics Workshop co-organised with the European Photovoltaics Technology Platform and co-located with the EU PVSEC 2013 Conference in Paris in October, and an Industrial Workshop that took place in the Kista Campus in Stockholm in November. Moreover, the project contributed to the organisation of the Complex Nanophotonics Science Camp in August.

Besides the collaboration agreements with the Nanophotonics Europe Association and the European Optical Society, the long-term integration strategy of the Network consists in creating a hub of resources in nanophotonics for solid-state lighting and photovoltaics, that will integrate those of the current Consortium members and the Associate Members that wish to join the initiative. This hub, offering collaborations and services to third parties will continue operating beyond the end of the project.