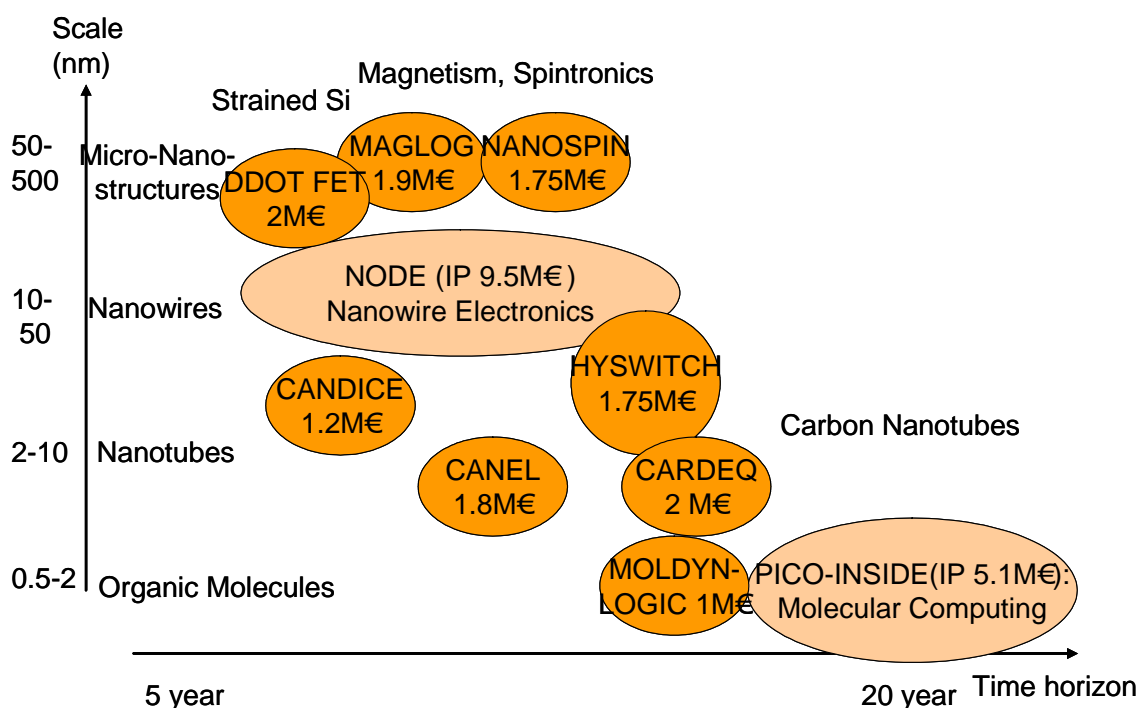


## EMERGING NANO-ELECTRONICS: AN INFOSO FUTURE AND EMERGING TECHNOLOGIES INITIATIVE

*Patrick Van Hove*  
European Commission, Office J-54 01/63, B-1049 Brussels, Belgium  
[Patrick.Van-Hove@ec.europa.eu](mailto:Patrick.Van-Hove@ec.europa.eu)

A call for proposals for Emerging Nanoelectronics was published on 15 June 2004 as part of the IST priority of the 6<sup>th</sup> Framework Programme of Research of the EU. It was clearly set in the context of the Emerging Research Devices section of the ITRS roadmap, and identified a number of important research topics to be pursued at European level. The call aimed to advance research in hybrid and molecular electronics, and prepare the bases for an extension of integrated circuit technology beyond the limits of CMOS scaling. It was implementing the new Integrated Project contracts to help create wide European partnerships and build a European Research Area in the field.

Two large projects were started in 2005 as a result of the call. The NODE project concentrates on nanowires, which are self-assembled crystalline structures with practical sizes of 10 to a few tens of nanometres, and on their applications in electronics and optoelectronics. Nanowires could be seen as a bridging technology that extends the concept of traditional semiconductor technology to new structures and materials while still being based on transistors and the transport of information by electron charges. The second project, PICO-INSIDE, supports disruptive technologies that operate at the atomic scale. These two projects are complemented by a number of smaller projects arising from the FET Open call for proposals. The smaller projects also cover research on nanotubes, which can be seen as a different bridging technology, and on different approaches including nanomechanics, magnetic logic, spintronics, or strained silicon. All these projects started only recently. An early status of four of these projects is presented in the special session on EU projects. Figure 5 depicts these projects with an approximate time scale on the horizontal axis and with the characteristic size of the active structures on the vertical axis.



**Domains covered by the FP6 E-Nano initiative (2004-2009)**

The FP6 Initiative and its projects are described in more detail on the web site of the action:  
<http://cordis.europa.eu/ist/fet/nid.htm#projects>

The 7<sup>th</sup> Framework Programme for Research and Technology Development that would cover the period 2007 – 2013 is currently being discussed. As part of the preparations for the contents of this programme, a wide consultation on future ICT challenges was organised through the [“Beyond The Horizon”](#) action and coordinated by ERCIM. This action selected nanoelectronics and nanotechnology as one of 6 strategic research areas. Six challenges were identified in this area as follows:

- System-ability of Emerging ICT Technologies and Devices;
- Interfacing Cell-Level Biology with Nanoelectronics;
- Future interconnects for System Integration;
- Post-CMOS Devices and Storage
- Nano ElectroMechanical Systems (NEMS)
- Atomic Scale Information Technology

Further details of the consultation can be found on the web site of the initiative.  
<http://www.beyond-the-horizon.net/>