Anexa 2.5

Experienta Irlandei si propunerile NANOPROSPECT
(comentarii Liam Brown, Enteprise Ireland)

1. Present status at the national level

a. numerous projects were accomplished and important acquisitions for performing equipment were financed, *but*:
b. there is no plan that would concentrate the research in specific domains, where there is critical mass and an interest from economy and society is obvious. i.e. there is a need for focus – Ref. Irish Nanotech commercialisaton framework – August 2010: http://www.forfas.ie/media/forfas310810-nanotech_commercialisation_framework_2010-2014.pdf - Page 8
c. the lack of a strategy that would cover all the important aspects for the development of Nanotechnologies at National level is also noticed Agreed- Strategy is Crucial for success and further more, there is also a need for an oversight group to ensure such a strategy is devised and implemented - Ref. Irish Nanotech commercialization framework – August 2010: http://www.forfas.ie/media/forfas310810-nanotech_commercialisation_framework_2010-2014.pdf - Page 13.
d. the fragmentation of the financing was accompanied by the difficulty to get relevant information concerning important resources and results for the actual domain: the NANOPROSPECT Project has been trying, in a very short interval of time, to counteract this last deficiency. The NANOPROSPECT databases, http://www.imt.ro/NANOPROSPECT/databases-advanced-search (in English, open to the public) already contain almost 3000 records. – Agreed – Ireland engaged Lux research as in independent external party to benchmark and develop our recently published Commercialisation framework - An international review of nanotechnology commercialisation strategies was conducted by Lux Research. In conjunction with the Project Steering Group, five countries were selected. The selected countries either shared a number of characteristics with Ireland (Singapore, Israel, the Netherlands) or are clear global leaders (U.S. and Germany). Ireland was benchmarked with these five countries (Page 8).

2. Human Resources, Education

a. demand of multidisciplinary education at different levels and interdisciplinary formation through research – Agreed – See http://ec.europa.eu/enterprise/sectors/ict/files/kets/ket-report_en.pdf - Page 103.
b. support for young researchers, as well as for specialists who have returned from abroad after a period of study or activity - Yes Marie Curie reintegration grants and Ireland's basic research funding agency SFI – run a programme specifically aimed at young or Starting Researchers – SIRG – Starting Investigator Research Grant - http://www.sfi.ie/funding/funding-calls/open-calls/sfi-starting-investigator-research-grant-sirg-programme/

c. transparent recognition of performance - Not easily achievable

a difficult problem, specific to the present situation in Romania, is the *limited* involvement of the Universities in the R&D activities and in the interaction with the industry (the reform promoted by the new Law of National Education should facilitate a higher level of ambition). – This is critical as there are 2 leading networks in Ireland, primarily funded by the Irish state to enable this - INSPIRE http://www.inspirenano.com/ for Ireland's Universities and Academic researchers and CCAN http://www.ccan.ie/ – The Nano competence centre for Ireland's nanotech companies- Their structures and activities are summarised in the KETs report See http://ec.europa.eu/enterprise/sectors/ict/files/kets/ket-report_en.pdf - Pages 102-105.

3. Infrastructure

a. Since providing complete experimental facilities is expensive and integrating human resources takes time, the most efficient way to benefit from the new equipments is to form networks of

experimental facilities, each facility working in close connection with "competence centers". – Yes as outlined in 2C above

the "networks of facilities" should provide scientific and technological services, as well as direct access –as much as possible- to equipments of the interdisciplinary research teams, Ph.D. students and innovative companies. – yes – have a look at Tyndall's NAP programme: http://www.tyndall.ie/nap/ and

b. Medical (research in nanomedicine) and Computing centers should be added to the Nanotechnology experimental facilities network. Yes both Tyndall and CRANN, Ireland's two flagship Nano Research centres – have both a life sciences and an ICT focus
c. In addition: long term research in networking (consortium, partnerships) as well as access to the respective European facilities may contribute to assuring an adequate support for research in nanoscience and nano technology. Yes for example see the QNANO EU Research Infrastructures project - http://www.qnano-ri.eu/

4. Interaction with industry

a. On a lager scale, the interaction of education and research, on one side, with industry, on the other side, is essential to develop the human resources, to provide technological competitiveness, for the knowledge-based economy (in which the knowledge must *rapidly* be transformed into economic results). – Yes CCAN http://www.ccan.ie/ – The Nano competence centre for Ireland's nanotech companies
b. R&D interaction with industry in nanotechnologies becomes really attractive through the interest shown by large companies, and also through creating clusters of companies that are interested in the applications for a certain domain. It is also worthwile to establish *scientific and technological platforms* at the national level, including R&D institutions and companies. These platforms could be similar to a certain extent to the European technological platforms, but they must be more focused on certain technologies and "niches" in the application domains: this focalization is absolutely necessary for obtaining results (a large profile would only lead to the fragmentation of the activities, discrediting in fact the advantages of the "platform") – Yes – Focus is critical
c. The interdisciplinary research complexity related to the nanotechnologies, and also the wide variety of application domains make the designing of "innovative ecosystems" very attractive, but they call for large amounts of resources, hard to get for the moment at a national level. However, we must note the project "Extreme Light Infrastructure" (ELI), in the final stage of approval, which should nucleate such an ecosystem, to be fully completed at the time horizon of 2020.
d. In absence of a critical mass for the interaction with the industry, the "small-steps method" should not be overlooked; for example: cooperation with foreign companies (i.e. not yet present in Romania), or creating "spin-offs".

5. Risks

a. The risks for using nanotechnologies and some nanoparticle-products cannot be avoided, even without a national R&D program for nanotechnologies. However, we must have a system. – Yes which is why Nanosafety needs to be tackled properly before it becomes a barrier to innovation – hence a number of our upcoming NMP topics in this area are critical, in particular the nano-regulation topic.
b. When there is a study for the product toxicity, it is recommended to correlate it with the research activity in nanomedicine. – Yes agreed
c. International cooperation in this field is mandatory. – Yes agreed

6. Prospective domains

a. A selection for the domains in which there is an active, multidisciplinary community is necessary, based on a critical mass and on competitive advantages - Yes.
b. In order to select these domains one must take into consideration the interests of large companies which are active in Romania, as well as the strategy for national development - Yes.
c. It doesn't make any sense to invest in a research that is already very advanced worldwide and where the probability to develop competitive R&D and innovation activities is low. - Yes

7. International cooperation

a. The international cooperation is facilitated by the performance of human resource (not only by increasing the number of publications, but also by excellence and "niche" specialization). The existence of well established research schools in basic sciences should be a favorable argument - Yes.

b. International cooperation (and especially participation to European programs) must be promoted through internal policies. We could mention here: financing potential domains/themes of interest in an European perspective, promoting "best practices", using material and moral incentives etc – Yes – Ireland requires success in EU programmes for a number of our national research funds as an evaluation criteria

c. Diaspora can play an important role by accelerating the contacts, initiating cooperation proposals, creating "twin" labs, participating in evaluation process in the country, and being involved in elaborating internal policies for the increase of competitiveness of Romanian research groups etc. – We have recently started to leverage further from the Irish diaspora – e.g. ITLG (Irish Technology Leadership Group) http://www.itlg.org/index.php