SMEs and Ems: The Crossroad of R&D and ICTs

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Slide 1: Plan

1. Starting from a synthesis of the actual realities summarising the strong and fast processes which dominate the changes in our relative economy and world,
2. I will present you the principal characteristics and place of SMEs acting in the global economy and especially in relation with EMs.
3. I will underline the importance for SMEs to be part in the global r&d processes and I will indicate some of the potential options we dispose for supporting this request.
4. I will finish with the presentation of some key issues and a set of selected potential measures we could propose for the design and the implementation of appropriate policies.

Slide2: Societies, ICTs, and shared Infrastructure

1. ICT is not a goal in itself but a strategic enabler towards long-term socio-economic objectives. From the actual situation where ICT is just an economic sector and information is a commodity (I am referring just to what we called *information society*), the tenders show:
the need to use such enablers and the integrative capacities of peoples for conducting and managing the changes following two axis:
The Economic axis: value creating knowledge/products/services and for a competitive K-based economy.
The Social axis: Where we move from a situation of sharing information to a next where we share culture of life-long learning & innovation sharing and towards a sustainable quality of life sharing.
In broader terms, the principal rule is '*the general transformation of all resources to meet human needs'* and this is why a smooth relationship must exist between supply and demand.
The main elements and interactions we need to underline here are the following:

- The first is that the international context is evolving, primarily due to the emergence of new actors in x-ing and to economic fluctuations;
- The second is that the need for innovation is increasing, while the complexity of problems to be solved is growing, and;
- The third is that customers' demands are increasing. In addition, individual needs have to be balanced with the necessity for products and production processes to be safe and eco-efficient.
- This is why *'produce'* is so important for European society. It should not be allowed to deteriorate, or simply to move to other parts of the globe.

Towards a K-Based society there are two change axes:
European: Through synergies and sharing strategies: While developing societies offer labour, information and entrepreneurs, industrial and developed countries can offer Technology, capital and available knowledge.
Worldwide: Through change-based strategies: Information and knowledge remain the key factors for new value and change.

Slide 3: Societies, ICTS, Infrastructure
The experience of the last 15 years showed that the role of infrastructure within this change processes and in order to support the new value creation and sharing (From Information society (acces to information) to K-Based society (culture and life-long learning and innovation), is to integrate more and more the necessary innovation and become more and more accessible to all. So, an important point to observe is its Integration Capacity which can be also viewed as the capability to migrate and change.
The aim of R&D is to produce new knowledge, new components, new systems, and new technologies. For that R&D is the basis for any change and strategy. We can observe on this slide the effect of the economic forces which serve as gravitational for attract technology rains. It's the term I use for make simpler the complex relation between Technology LifeTime - Utility - Market and Innovation

Slide 4: Societies, ICTS, Infrastructure
This slide makes more comprehensible the previous one and shows that towards to a future situation where Integrated socio-economic values and services use a very powerful infrastructure equipped with government / legacy / economy / and any other utility in accordance with the demand, the content of our relations must be enriched appropriately conducting from a knowledge-base structure to a KnowledgeService structure.
This transformation contains basic work (development, Engineering, market-driven r&d, fundamental r&d, etc) but it demands, like a hike in mountain, to observe the field to 1 meter, up to 10 meters and up to 1 km and this is the roadmapping.

Slide 5 : Societies, ICTS, Infrastructure
Except basic requirements like security, trustability, safety, privacy, integrity, manageability, flexibility, extensibility, transparency, agnostisme, which are very well occupied r&d fields, for such integration rate significant effort must be allocated for interoperability, and seamless service creation, service provision and standards.
Build and share means not only commercialisation but the inclusion of the necessary features for the adoption of the aimed technologies. (As strategists can say, "the goal is not to win the hill but to hold on to it"). Technology wars are expected not only for win places in the global infrastructure but also for introduce accelerations / decelerations where appropriate against to the falling technology rains. Surely the role of roadmapping is clearer in such contexts.
Depending on the choice of the R&D motivation (discovery-driven or engineering-driven) we need organised science or organized engineering. In any case we need organised collaboration. It's obvious that a good roadmap implies prior synergies and cooperation with others within the strategic contexts.

Slide 6: SME in EU
SME is the center of technical changes in emerging markets.
SMEs are also the factors of driving the diffusion of ICTs and the links with productivity.
In a K-based economy SMEs are essential.
SMEs can render realist Innovation steps
SMEs can adapt and transform r&d in economic value.
SMEs are central and strategic pieces for entering Emerging Markets
SMEs are flexible face to policies and regulations
SMEs are very appropriate for leapfrogging strategies.

Slide 7: SMEs in globalisation

Without appropriate inclusion within the global European strategy SMEs in Europe are like pawns and so they present the characteristics we know.

Slide 8: Emerging (or developing) Markets

EM is defined as a place which has an economy with low-to-middle per capita income. Such countries constitute approximately 80% of the global population, representing about 20% of the world's economies.

EME's are characterized as transitional, meaning they are in the process of moving from a closed to an open market economy while building accountability within the system.

One key characteristic of the EME is an increase in both local and foreign investment (portfolio and direct). A growth in investment in a country often indicates that the country has been able to build confidence in the local economy. Moreover, foreign investment is a signal that the world has begun to take notice of the emerging market, and when international capital flows are directed toward an EME, the injection of foreign currency into the local economy adds volume to the country's stock market and long-term investment to the infrastructure.

For foreign investors or developed-economy businesses, an EME provides an outlet for expansion by serving, for example, as a new place for a new factory or for new sources of revenue. For the recipient country, employment levels rise, labor and managerial skills become more refined, and a sharing and transfer of technology occurs. In the long-run, the EME's overall production levels should rise, increasing its gross domestic product (GDP) and eventually lessening the gap between the emerged and emerging worlds.

Portfolio Investment and Risks: Because their markets are in transition and hence not stable, emerging markets offer an opportunity to investors who are looking to add some risk to their portfolios. However, the bigger the risk, the bigger the reward, so emerging market investments have become a standard practice among investors aiming to diversify while adding risk.

Local Politics vs. Global Economy: An emerging market economy must have to weigh local political and social factors as it attempts to open up its economy to the world. The people of an emerging market, who before were protected from the outside world, can often be distrustful of foreign investment. Emerging economies may also often have to deal with issues of national pride because citizens may be opposed to having foreigners owning parts of the local economy.

Moreover, opening up an emerging economy means that it will also be exposed to not only new work ethics and standards but also cultures as well: indeed the introduction and impact of, say, fast-food and music videos to some local markets has been a by-product of foreign investment. Over the generations, this can change the very fabric of a society and if a population is not fully trusting of change, it may fight back hard to stop it.

Conclusion: Although emerging economies may be able to look forward to brighter opportunities and offer new areas of investment for foreign and developed economies, local officials of EMs need to consider the effects of an open economy on its citizens. Furthermore, investors need to determine the risks when considering investing into an EM. The process of emergence may be difficult, slow, and often stagnant at times. And even though emerging markets have survived global and local challenges in the past, they had to overcome some large obstacles to do so

Slide 9 : Evolution des strategies de r&d des entreprises et leurs conséquences sur la politique des pouvoirs publics

All statistics everywhere show the general growth of industrial r-d activities in the world with a situation a bit controversial for Europe, because of the significant reduction of r&d budgets of France, Italy and UK. Same statistics from Organisation for economic cooperation and development (OECD) emphasize on national and sectorial disparities: National disparities : From the r-d execution point of view European industries is ranked after Japanese, American or Scandinavian. Sectorial disparities: For exemple the growth of r-d activities in several domains is pulled essentially by ICTs. Same statistics show that for r&d development and strategy the example to follow is the development of risk-capital which showed that it could be an efficient contributor for such developments (USA case). The restructuring of innovation processes, essentially of multinational companies, is a fact which has an importance for the understanding of these tenders. Many companies have had difficulties to exploit their r-d results and in any case the promotion of these results is realised by their competitors. These statistics talk about New financing models, Articulation with the market, Reorganisation of human potential, Exploitation of the intellectual properties. It seems that such measures helped enterprises to grow their r-d

But all these statistics are based essentially on the tenders followed by multinational companies and because of the real difficulty to observe and measure the SME's r&d activities.

In general for building strategies the viewpoint of enterprises is to be strongly considered because it shows the tenders observed by responsibles of r&d monitoring and execution. At the same time, we need to know if there is compatibility with public actions, and if not, how to integrate in efficient roadmaps the main constraints of public authorities. SMEs can provide relevant information of how to adapt the public forces to the r&d tenders and roadmaps. By taking into account such observations, public authorities could enlarge their role outside of the only stimulation of the linking with research centers.

Is there a new r-d enterprise model? The answer is YES. SMEs can form networks of creation and acquisition of knowledge. SMEs are leaders of the globalisation, they know catalysers and obstacles and they have knowledge and experience on the innovation processes and their impacts. Thanks to SMEs we can have a better knowledge on the r&d transformation tenders in industry and their impact on public policies and we can elaborate a precise description of the perspectives in industry / sciences and technology.

Slide 10: OPTIONS

Research Team: In any case, a major emphasis is to be given to understand the role of government, public policy and private initiative in driving the growth of the sector.

Implications for Innovation, Strategy and Policy: How have technology roadmaps affected innovation, strategy and policy in the s/w industry? What role has the AS&D actors played in the overall s/w innovation enterprise?

Roadmap to roadmapping: Communicate visions, attract resources from business and government, stimulate investigations and monitor processes.

Context : Acceleration Technology

Answers: Engage discovery research in areas where evolutionary research failed to find solutions for anticipating problems.

Integrate the Industry motivation in terms of :

- **Strengths categories:** Develop policy on collaborative and consensus processes, Engage broad participation, Organised structure, Focuses effort on technology needs, Coordination /pooling of resources, Widespread communications
- **Weaknesses of roadmap process:** stifles innovation or emphasizes only incremental , innovation, Inadequate participation or unbalanced (supplier community), Roadmap term misleading or misunderstanding, Narrow interests sometimes prevall, Process becomes too rigid, bureaucratic detailed, cumbersome, Economics are not considered, Process are not consistent, Forecast inaccuracy, Consensus hard and may produce mediocrity, Limitation of volunteer participants.

Success factors: Active and support role of research consortia, Authoring of roadmaps (economic intelligence associated to know-how), Adopt proven process which must be public allowing freedom to agree/disagree. Driven in industry's common purpose

Slide 11: Key Issues

Innovative SMEs are essential. Towards a full participation of SMEs in the field transformation as key issues we can mention the

- *Development of the financing of innovation,*
- *The Creation of an environment more favourable to innovation,*
- *The fostering of the participation of SMEs in the 6th and 7th European r&d frameworks, and conceive new funding instruments more adapted for SMEs.*

Slides 12-13 : **Potential measures**:

1. Use R&D as roadmapping and management tools. The good knowledge of SMEs' activities is essential for that.
2. Develop mechanisms for/against acceleration technologies. The involvement of SMEs is necessary.
3. Engage discovery research and Create well conceived ICT incubators: Participation of SMEs in design of strategies.
4. Improve capabilities on Software engineering and Facilitate e-everything demand
5. Build and structure economies through the building and the exploitation of well conceived ICT incubators
6. Improve the capabilities on Software engineering (production and use)
7. Facilitate the adoption of e-work, eInclusion, ePolitics and e-business solutions
8. Promote advantages from Information technology online programmes
9. Liberate and support the access and the participation in large ICT projects and R&D programmes, essentially for software and services.
10. Give special attention and support to the commercialisation of emerging technologies
11. Create a special Innovation Fund
12. Facilitate the access to capital for Innovative SMEs: by creating venture capital limited partnerships (VCLPs) and pooled development funds (PDFs)
13. R&D Taxation concession: This help can allow to companies to deduct up to a significant percentage (some countries go up to 200 – 300 % in certain circumstancies) of qualifying expenditure incurred on R&D activities. Importantly certain ICT SMEs that are not yet making a profit, need to have the option of taking the tax concession as a tax offset providing cash to fund their r&d activities.
14. R&D Start Programme for non-developed r&d activities: provision of a range of financial grants to business to research (B2R), develop and commercialise ideas and products.

15. Commercial Ready Programme: provide innovative European companies with financial support to undertake r&d, proof of concept, technology diffusion and early-stage commercialisation.
16. Engage discovery research in areas where evolutionary research fails to find solutions for anticipating problems
17. Structure by building adequate forms of small / medium / large industries and research centres. Put in operational schemas these buildings by networking with appropriate EM actors.
18. Contribute to the definition of public policies (adapted regulation, synchronised education programme)