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# **Transregional Technology and Knowledge Transfer Scenarios by 2018**

## **Questionnaire for regional validation of Transregional Scenarios and Regional Foresight design**

*ForTransRIS Project – WP3*

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## 1. Knowledge Transfer (KT) and Trans-Regional Knowledge Transfer (TKT)

### 1.1 KT

Knowledge Transfer is the process through which the scientific and technical knowledge (either tacit and codified), generated in one organization (source), is exploited on economic (mainly industrial) ground by a firm, by means of a complex interaction and cooperation between the source and the firm and, usually, other players.

#### Motivations of KT

Today KT is a very relevant and effective tool for generating new technologies, due to the following reasons:

- technology is often a system, incorporating technical knowledge of many different disciplines coming from different specialised sources;
- technology is getting more and more science based;
- development of an innovative technology often requires a large amount of resources (professional, financial, infrastructural), which are above the possibilities of a firm;
- many paths are available for developing an innovative technology, so innovation is risky and uncertain.

#### Players of KT

- Sources of K: universities, public research centers, large firms, high-tech SMEs
- Users of K: firms of all sizes
- Intermediaries: TT centers, consultants, science and technology parks, incubators

#### Ways of implementation of KT

- Test services provided by public laboratories to firms (mostly SMEs)
- Technical consultancy services provided by public research organizations to firms
- Exchange of researchers between a public research organization and a firm
- Flow of graduates to industry
- Licensing of patents and IPR from public research organizations to firms

- R&D contracts given by firms to public research organizations
- R&D projects carried out jointly by firms and public research organizations
- Joint-labs between public research organizations and firms
- Spin-off firms, exploiting the advanced knowledge developed in a public research organization

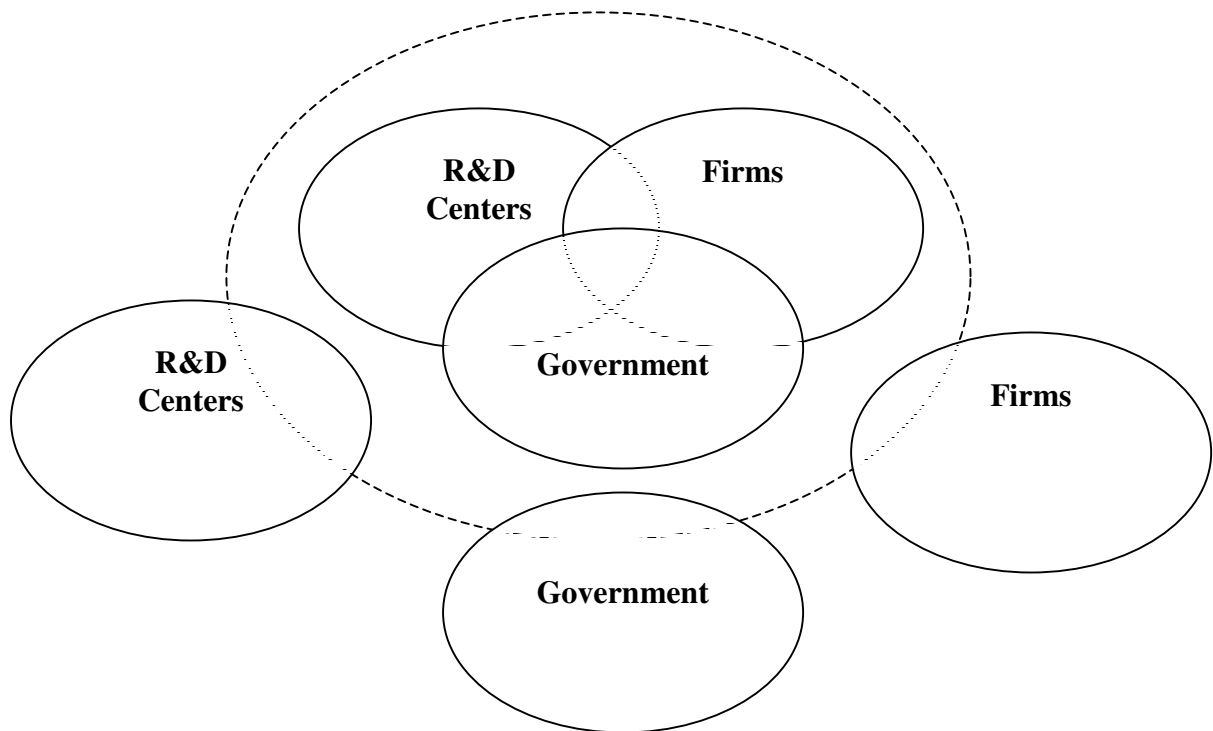
#### Critical factors of success of KT

- On the side of sources of K:
  - Quality of research
  - Responsiveness of research activities to the innovation needs of firms
  - Entrepreneurship of research organizations and researchers
- On the side of SMEs
  - Attitude towards technology innovation as a strategic tool for competition
  - Absorption capacity of K generated outside the firm
  - Trust of the research organization
  - Costs (explicit and hidden) of the interaction between firms and research organizations

#### Role of government (first of all, regional)

- To lower barriers due to differences (in terms of culture, language, approach to problem solving, propensity to risk and uncertainty, time horizon, asymmetry of information) between researchers and entrepreneurs of SMEs
- To provide financial incentives for the public research sector-industry cooperation
- To promote and to support patenting either in public research organizations and firms
- To promote entrepreneurship of public researchers

The Triple Helix model



The complexity of KT

- Non linear process
- Many feedbacks loops
- Multi-actor process
- Mismatch between offer and demand of K

**1.2 TKT**

TKT is the process of transferring knowledge into applications, which involves sources of K and firms of different regions and, most of all, countries.

Motivation of TKT

- Globalization is a general trend of the economy and society
- K is available at global scale, but there are more criticalities and challenges in searching and acquiring K at global scale

## 2. The basic drivers for the scenarios

**The evaluation of Relevance and Uncertainty of the drivers, provided by the experts and stakeholders of each region, and the discussion at the Genoa meeting, allowed to point out the drivers able to make the most relevant and uncertain impact on the TKT process.**

These drivers are “Propensity to business risk and innovation” and “Governance system in Europe”, which are selected as the basic drivers of the scenarios to be built.

It's important to note that both drivers are largely outside the control of regional governments, which can anyway design and implement policies in order to counteract the negative impacts and to foster the positive ones, so making TKT effective and efficient as much as possible.

### i) Propensity to business risk and innovation.

Innovation is a challenge, which is much riskier if resources (financial, human, managerial) of a firm are limited, as it's the case of SMEs. Therefore, development and exploitation of emerging technologies require a strong motivation to invest and to take risks in creating start-ups, looking for new markets, conceiving and implementing new business models.

But it's apparent that in many regions of Europe this entrepreneurial propensity is diminishing; particularly in young people, who often refuse to take some kind of responsibility and look for less stimulating and demanding, but safer jobs.

TKT is a much more complex and riskier process than the innovation process that takes place within the boundaries of a region; so TKT requires a high propensity to take risks. But it's very uncertain how strong will be this propensity in the next decade. So one can imagine two extreme and opposite situations at 2018.

Situation 1 (Low propensity). In this case we foresee a very low propensity for risk, so that firms tend to operate with a short/medium-term strategy, by responding to the traditional stimuli offered by the local (regional) market and by pursuing mostly incremental innovations. Competitive differentiators are the traditional ones: low manufacturing costs and ability of customising products and enriching them with services, both pre- and after sales. Speed and punctuality of delivery, flexibility and time-to-market remain crucial drivers of competitiveness. SME's entrepreneurs tend to

confine their activities to the established and well known markets, mostly regional or national. Internationalisation is an option that SME's try to avoid.

Situation 2 (High propensity). In the opposite case, we envisage a situation where the firms of the region put a lot of efforts into developing highly innovative technologies, often as part of large-scale projects involving large network of SMEs and research establishments and aiming at tackling crucial problems for the society, such as mobility, healthcare and education.

This strategic behaviour is the consequence of a greater propensity for risk of entrepreneurs, that aim at responding to the weak signals and exploiting the emerging opportunities of the market. Firms operate with a medium/long-term outlook and strive to consolidate and accelerate the structural changes of the market demand for sustainable and enhanced quality products.

Regional firms and entrepreneurs rely on radical innovations, for gaining a strong competitive advantage over foreign competitors and for conquering a position of excellence in the international arena. Internationalisation is the key-word for the firms of all sizes. A new managerial culture, targeted at innovation, is spreading among the region based firms, together with the use of advanced tools to manage innovative processes.

#### ii) Governance in Europe

There are two main dimensions in the governance structure of Europe: a vertical one, which involves many layers: Europe, national States, Regions, Provinces/Municipalities and a horizontal one, which involves many departments/ministries within the same institution, and different governmental bodies within the same layer (for instance, governments of different European regions).

It is not clear whether we are going towards a coordination or a fragmentation of the governance system in Europe in the next decade. There are efforts and trends in both ways and it's very uncertain which are going to prevail.

The structure that may come out is going to have a relevant impact on the RTDI policy of a region and on its relationships with other regions. So the implementation of TKT, its scope and relevance, are strongly dependent on the future structure of the European governance. Again, we can imagine two extreme and opposite situations at 2018.

Situation 1 (Fragmentation). In this case we imagine that, first of all, the authorities at the same local level (city, province, region) tackle common and general problems independently from each other and from the higher levels (nation, EU). So territorial thinking and search of visibility prevails and the political agenda is set up with a narrow approach, the sharing of resources, information and results among local governments at the same country and, even more, of different countries, is very rare in many policy areas. So often the policy goals and the implementation tools are divergent and contradictory. Secondly, even within the same government its departments and ministries operate in their institutional field in an autonomous way, without taking into proper account the interactions with related fields: e.g. industrial development, environment, infrastructures. This results in many cases in under-sizing the efforts, duplicating the activities and not exploiting the possible synergies.

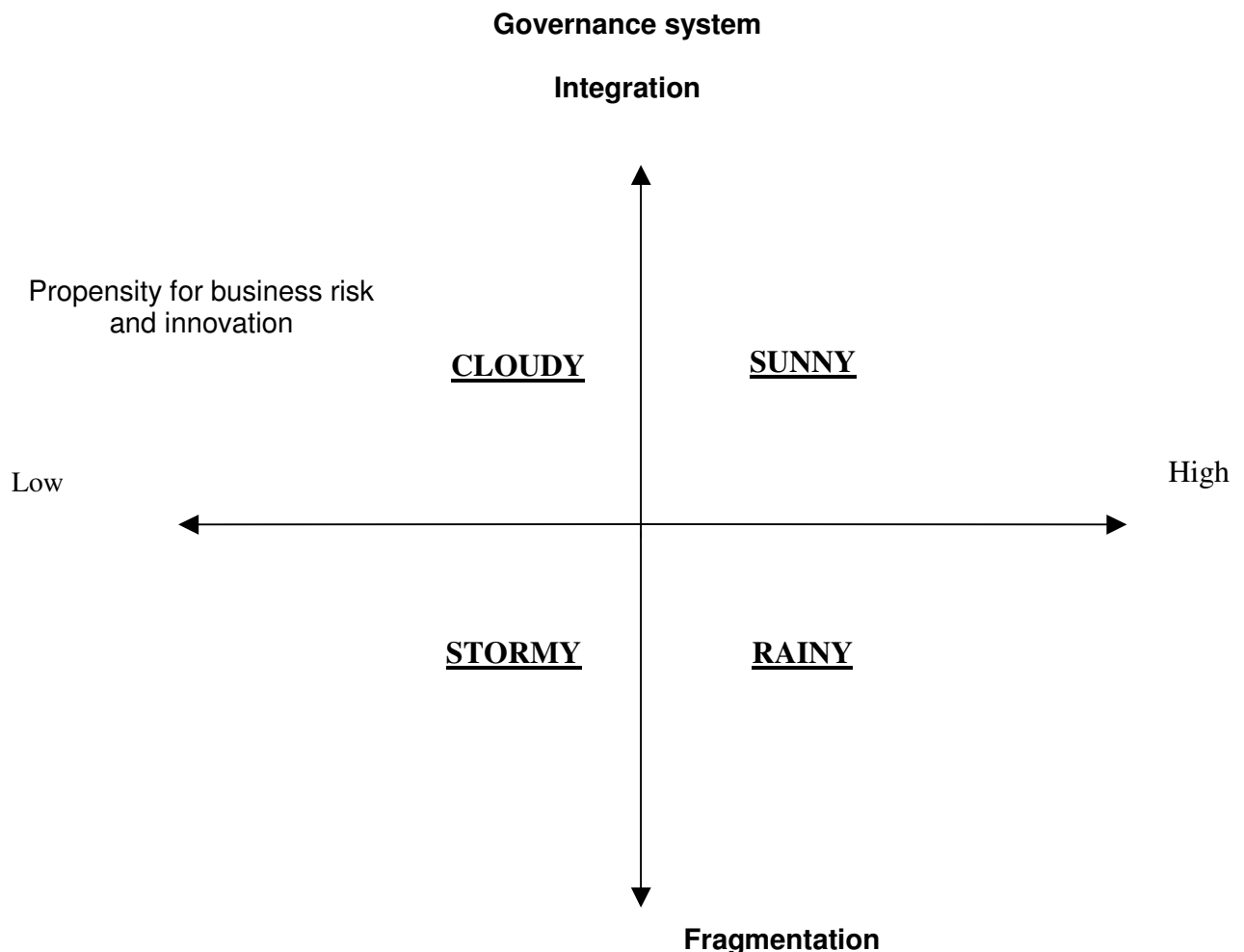
Situation 2 (Integration). In this case the local governments (city, province, region) tackle common general problems in a coordinated way, with a synergistic division of activities and integration of resources and outputs. Also, each institution adopts an integrated approach to the policy formulation and the implementation of instruments in related fields. The local governments also set up their political agenda and implement their programs and projects in consultation and cooperation with the higher levels of government.

Relations between public institutions and social and economic players are managed in an innovative way, by encouraging the consultation and the participation of all stakeholders when taking strategic decisions for the local community.

### 3. The scenarios for TKT in European regions at 2018

By combining the extreme situations for the two basic drivers, four clearly differentiated future scenarios emerge. They provide a clear picture of the directions the future may take under different conditions.

It is worth reminding that the scenarios do not describe what the future should be or what we believe the future will look like. They just provide a picture of what the future may look like if something happens.



In order to simplify the prospective analysis, only two scenarios are built: “Stormy”, which can be seen as the extrapolation of today’s situation with the

enhancement of its negative features; and “Sunny”, which can be seen as the most favourable framework for TKT (optimal scenario). The other two scenarios, “Rainy” and “Cloudy”, describe intermediate situations between “Stormy” and “Sunny”; they might be a transient state in the evolutionary process from “Stormy” to “Sunny”, or, more likely, the situations the most likely to take place. “Sunny” and “Stormy” may be used to raise awareness of the regional policy makers about the risks and the benefits of the possible futures for the competitiveness of their socio-economic system and so to stimulate them to formulate appropriate policies, mainly but not only in the RTDI and TKT fields, even if many topics that are going to shape the future are outside their influence and control.

**The main topics affecting TKT and considered in the scenarios are:**

- 1. SME’s business model (related to product/process innovation; approach to market; internationalisation)**
- 2. SME’s networking and interactions with sources of Knowledge (ways, tools, trust)**
- 3. Human resources: training and management policies and attraction of talents to a region**
- 4. New firm creation (start-ups from research, young people)**
- 5. Entrepreneurship of universities and public research organisations (responsiveness to SME’s needs, quality of research)**
- 6. Regulations (specially for IPR) and standards (for environment, communications, administrative procedures, etc)**
- 7. Infrastructures at European scale (for transportation and communication)**
- 8. Structure of European market**
- 9. RTDI policies of governments (EU, national, regional) and tools for implementation**
- 10. Territorial identification (citizens, institutions), social and political culture and consumption patterns (sustainability)**
- 11. Competitive position of regional firms against the new rivals from emerging countries**

The scenarios are built by making some hypothesis on the value that each of the above topics is going to take at 2018 and on the interactions among them.

### **3.1 The “STORMY” Scenario: situation of the main topics**

#### **1. SME’s business model (related to product/process innovation; approach to market; internationalisation).**

Firms tend to operate according to a short-sighted approach, by responding to the stimuli coming from the traditional market and by making mostly incremental and low-risk innovations. In order to be competitive firms rely heavily on the performance of their manufacturing system: quality, technical-functional performances of products, ability of customising them and quickly responding to the demand, efficiency, and cost reduction.

The business model tends therefore to sustain the traditional one based on customization and quick response, with little efforts for innovating the ways the firm is managed and its approach to the market and for exploiting the opportunities of the international market. As this market, at least the European one, is highly fragmented, due to the differences in regulations, standards and administrative procedures and to the lack of efficient integrated communication and transportation infrastructures, the firms of a region find too complex and too risky to make use of suppliers far away, even if more convenient, and to sell their products markets far away, even if they offer relevant opportunities to grow. So SMEs tend to confine their business within the boundaries of their country or of their region, remain small and turn out to be less competitive.

#### **2. SME’s networking and interactions with sources of Knowledge (ways, tools, trust).**

The exploitation of the opportunities offered by advanced emerging technologies is low as it’s highly risky and little experience is available. The related R&D projects are considered too uncertain, costly and complex as they require to search specialised scientific and technical competence and industrial capacities around Europe, eventually over the world, and to manage their coordination and integration. So incremental technological innovations are pursued, by relying on the local sources of knowledge only. Language can be a barrier to the networking of SME’s of different countries.

#### **3. Human resources: training and management policies and attraction of talents to a region.**

Since local firms are not interested of very innovative and risky projects, models for human resources management are not really improved. Although competitiveness depends to a large extent on the ability and competence of human resources, the predominant focus on operations and short-term targets leave little space for the implementation of innovative training programmes for human resources. This in turns hinders the implementation of advanced training programs.

Most regions try to attract specialised assets (talents) for increasing the competitiveness and innovativeness of their production system: mainly researchers, knowledgeable and creative people, investments of international companies. But their competitive and uncoordinated efforts result, in many cases, in the waste of resources, because the fragmentation has a negative impact on the attractiveness of a region in the view of international and mobile players, like researchers and global firms.

#### **4. New firm creation (start-ups from research, young people).**

The low propensity for risk characterises not only entrepreneurs, but also young people in the affluent society of many European regions: an “environment” that is highly diversified shows strong elements of uncertainty, and therefore is likely to push individual and corporate strategies to maintain the achieved position of well-being and to consolidate the status quo. The availability of relevant economic resources, inherited from the past, when entrepreneurship and risk-taking were a standard behaviour for most people, allows young people to avoid uncertainties and to search for secure jobs, even if not highly paid. Consumption of goods is a must; to be productive and to invest in the future is a secondary aim.

#### **5. Entrepreneurship of universities and public research organisations (responsiveness to SME's needs, quality of research).**

The universities of the region tend to continue their traditional education programs and are loosely related with the local industry as they do not adopt an active approach for the transfer and exploitation of the knowledge they produce. Notwithstanding the awareness that the main transfer of knowledge goes through the people who are directly involved in the production of knowledge (the researchers), universities are not stimulated by local governments to partner with local firms and to carry out research activities which are really coherent and responsive to the needs of the firms. The prevalent business model of the latter ones is also a huge obstacle to the successful

search, absorption and exploitation of the new knowledge generated by universities and public research centers.

#### **6. Regulations (specially for IPR) and standards (for environment, administrative procedures, etc).**

The rules about IPR are quite different in the member States of EU. Even if efforts are made towards establishing a European IPR system, diversified views and interests prevent it. The lack of a clear and coherent set of rules and conditions for IPR makes the ownership of a new technology uncertain and increases the costs of patenting and of defending the rights against infringements. All of this is clearly an obstacle to TKT and the cooperation among SMEs of different regions and countries.

Similarly, the member States of EU don't succeed in setting up common standards for matters of common interest as environment protection and administrative procedures for the transfer of goods, money, people, services, etc. This hinders the establishment of a real European market in many areas of both the manufacturing and the service sector, and therefore the growth of SMEs.

#### **7. Infrastructures at European scale (for transportation and communication).**

A very negative effect of the fragmentation of the European governance is on the development of European infrastructures, either for communication and transportation. Building the European Corridors, which consist of highways, high – speed railways, ICT networks, energy networks, finds many obstacles and is delayed, sometimes even made impossible.

The differentiation of the ICT networks of different regions and nations, which make use of different standards and technologies makes difficult for SMEs of different countries and regions to interact effectively. As a result, the chances of linking SMEs in trans-regional cooperative networks (for R&D, manufacturing, design, marketing) and achieving higher levels of management efficiency and competitiveness are very low.

#### **8. Structure of European market.**

As a consequence of the differences in regulations, standards and administrative procedures and the lack of efficient integrated communication and transportation infrastructures, a truly European market may not be created and a favourable “environment” for doing business in Europe is not established. Markets are fragmented,

firms find many difficulties in expanding their activities outside their region and/or country, the growth of their size is limited and so they are unable to face the competition of global players in an effective way.

### **9. RTDI policies of governments (EU, national, regional) and tools for implementation**

The fragmentation in the overall governance system means, among other fields, that many regional governments invest resources for R&D on the same topic without integration, so duplicating efforts and diminishing returns. In some cases the resources that a region can devote to an innovation theme, e.g. in the field of nanotechnologies, are inadequate and below the required critical mass; so these resources are largely ineffective, while they could provide higher returns if integrated and pooled with those of other regions. Every region wants to be the leader in developing frontier technologies and acts alone transregional cooperation has a small and marginal role in the political agenda of any regional government. At the end poor results are achieved.

More than this, national and regional governments provide financial incentives to RTDI projects, that are usually restricted to players (universities, research centers, firms, etc.) of their research and innovation system only. This prevents SMEs to have access to foreign sources of knowledge, which might be able to meet the innovation needs with better results. The fragmentation among regional, national and European governments lowers the effectiveness of the RTDI policies designed by the European Commission with the aim of fostering the cooperation and the integration of actions and resources among all relevant players of different States and regions. So it's difficult to conceive and to implement large R&D and innovation projects, that require many different capabilities and specialised technical skills, which could be provided by sources of different regions.

### **10. Territorial identification (citizens, institutions), social and political culture and consumption patterns (sustainability).**

European citizens go on with the traditional consumption pattern that gives priority to individual issues against environmental and social ones. Even if consumers are getting more aware of the importance of sustainability (environmental, social, ethical), however, when they have to decide which products and services to buy, they are not prepared to

pay the higher costs of sustainable products and they prefer to buy cheap products, whatever their origins.

More than this, consumers' needs are highly rooted in the regional culture and tradition; the citizens of a region are proud of having preferences and consumption patterns different from those of other regions and are afraid of globalization. Where price is not a discriminating driver, emphasis is put on using local resources, products and suppliers, which increases the fragmentation of markets.

The use of the national language, even of a regional dialect, is considered a positive feature, so another obstacle is put to the internationalization of business and the cooperation among regional social-economic systems.

### **11. Competitive position of regional firms against new rivals from emerging countries**

The competition from firms of newly industrialized countries is very fierce: Chinese firms are by far the most dangerous, because of their advantages in terms of costs, capacity for imitation (if not for forgery) of brands, constant improvement of the quality and reliability of products, ability of distributing products at international scale, access to huge financial resources supported by massive public investment in R&D, and easy access to large international logistic infrastructures.

SMEs are at danger of survival, due to their size and traditional business model and also to the little effective support they receive from the local, national and European governments, which provide fragmented, uncoordinated and many times conflicting answers to the global approach to business of the Chinese firms and government.

**SMEs find many difficulties to make direct investments in the new Asian markets either to sell their products and to have access to local sources of assets.**

**In this context, the lack of TKT and the inability of innovating products lowers the international and effective competitiveness of many SMEs and there is the risk that important industrial sectors of European regions may not survive, and new high added value sectors hardly arise.**

### **3.2 The “SUNNY” Scenario: situation of the main topics**

#### **1. SME’s business model (related to product/process innovation; approach to market; internationalisation).**

As a consequence of the high propensity of entrepreneurs to take risk and to innovate, firms, in particular SMEs, are following new business models based on product innovation (with high added value, increased technical performances and quality), on networking with suppliers of all types of inputs (including know-how and expertise) at international scale, on integration with other firms (in order to provide a more complete offer of products and services), on a controlled sale and distribution chain (towards the international market).

Such new business models are clearly more complex and difficult to manage and riskier than the traditional ones, but they are also more rewarding and allow European firms, first of all those of advanced regions, to hold a strongly competitive position in the international market and to gain a competitive edge over the firms of the newly industrialised countries.

#### **2. SME’s networking and interactions with sources of Knowledge (ways, tools, trust).**

Product and process innovation requires the development of advanced technologies, with a strong scientific multidisciplinary basis.

So SMEs need to build cooperative networks involving many different R&D players, often at international scale.

This cooperation between the public research sector and industry is favoured not only by the high propensity of entrepreneurs towards risky and uncertain innovation projects, but also by the entrepreneurial attitude of universities and research centres and of their researchers. They are strongly motivated to exploit their scientific outputs and competencies economically, by cooperating with firms, even SMEs, which are eager to get hold of advanced knowledge and to transfer it into innovative applications. The resulting net of interactions and cooperative actions between firms and research organisations of a region gives rise to an effective regional research and innovation system, which is largely an open one, as its components (firms and research organisations) interact with the players of other regional systems. A relevant contribution to wiring up the regional research and innovation system comes from the

local government, which, according to the Triple Helix Model, has an active role in formulating RTDI policies with a participative approach which involves all the relevant stakeholders of the region.

### **3. Human resources: training and management policies and attraction of talents to the region.**

The growth of the regional socio-economic system depends largely not only on the local resources and assets, but also on the ones it is able to attract from abroad or acquires through cooperation with other regions and countries. Researchers, creative and knowledgeable people, high-tech companies show a high mobility in Europe, with no barriers and low costs. They move as they are looking for the most suited environment for exploiting their capabilities and gaining high returns and benefits. The territorial marketing activities and the effective financial and operational support from the local authorities are also key factors for attracting young researchers and entrepreneurs and for stimulating multinational companies to transfer research units and to move “brain-intensive” activities to a region.

The model for managing human resources is evolving together with the business model, by paying great attention to the development of technological and managerial skills. This entails the definition and adoption of new organisational structures which envisage a reduction in the number of hierarchical levels, the expansion and enrichment of the jobs performed by the members of the organisation, their participation (or at least their involvement) in the definition of company strategies, with the stimulus of creativeness, the assumption of responsibilities and entrepreneurial initiative.

### **4. New firm creation (start-ups from research, young new entrepreneurs).**

Also young people and researchers of the public and private sector are willing to take risks and to innovate, so there is a flourishing of new firms created by young university graduates and researchers: these firms are mostly technology based and give a relevant contribution to the diversification and the competitiveness of the industrial system of a region.

The creation of these technology based firms is a risky business, as many of them fail to grow and to provide high returns; anyway the financial players of a region and the local government are willing to support innovative investment projects.

## **5. Entrepreneurship of universities and public research organisations (responsiveness to SME's needs, quality of research).**

As mentioned before, universities and public research organizations are prone to exploit their scientific results and competences in economic terms by cooperating with industry.

Entrepreneurship is a very distinctive feature of advanced universities, which consider the contribution to the economic development of a region/country one of their main institutional roles and goals.

More than the awareness of their social responsibility, the opportunities for gaining economic returns from the exploitation of their knowledge stimulate researchers to cooperate with industry.

So research programs and projects are defined with the aim of responding, eventually in the medium-long term, to the needs of advanced technological inputs from industrial firms, even SME's. This orientation of public research towards economic applications doesn't lower its quality, as feared by many traditional scholars. On the contrary, competition among universities aiming at providing industry with excellent scientific results, improves the quality of research and its academic value.

## **6. Regulations (specially for IPR) and standards (for environment, communication, administrative procedures, etc).**

A set of common IPR rules is established in EU and is implemented by all member States. So, codified knowledge can flow across countries and regions in Europe, lowering the risk of losing control over it and economic returns. There is also a common set of regulations, standards and administrative procedures for business activities, so that a single European market is no longer a concept or a wish, but a concrete reality. Capitals, goods, firms and all kinds of assets can freely move across the whole Europe, all bureaucratic rules and procedures being the same or easily coordinated.

## **7. Infrastructures at European scale (for transportation and communication).**

A relevant contribution to the creation of a real ERA and European market comes from the complex system of infrastructures for mobility, transportation and communication: no obstacles come from the local communities, which are willing to be a part of Europe and consider themselves European, which is built throughout Europe and allows the

integration of the players and their activities, whatever the region they operate, for the exchange of goods, people, information and knowledge.

### **8. Structure of European market.**

The integration between national governments EU and the harmonisation and coordination of their policies and standards enable the creation and development of a huge European market, which provides a favourable “environment” for doing business. In particular, the SMEs of a region are given real opportunities for expanding their activities outside their regional/national boundaries and therefore for growing, so being able to face the competition of global players in an effective way.

### **9. RTDI policy at EU, national, regional scale and tools for implementation.**

RTDI policy at all levels of government is coordinated with other complementary policies (mainly in the fields of education and vocational training, industrial development, infrastructures, employment, etc.) and is designed in a way that supports all applications areas (i.e. healthcare, mobility, environment, energy, etc.).

So the resources devoted to RTDI bring about optimal impacts on the performance of the socio-economic system.

More than this there is an effective division and coordination of roles, functions and activities either between the various levels of government and among institutions at the same level in different regions and countries.

Integration of resources and efforts in the same field of technology innovation is achieved, synergies are exploited and a fruitful exchange of knowledge is promoted. As a result of all of this a real European Research Area (ERA) is built, in which all national and regional research and innovation systems interact in a cooperative, but also competitive, way.

Within ERA RTDI policies in European regions tend to specialise in a selected number of scientific and technological fields: local universities and public research centres are pushed to cooperate not just with the firms of the region, but also with the firms of other European regions, in order to exploit their competencies at best.

Regional government support this trans-regional, trans-national cooperation for innovation, by opening up their system of incentives to external R&D players.

#### **10. Territorial identification (citizens, institutions), social and political culture and consumption patterns (sustainability).**

There is a strong and widespread awareness of citizens of any region and State in Europe of the European identity: even if social, cultural differences and peculiarities still exist, feeling to be Europeans overcomes local issues. In this way a European nation is built, which is at the basis of setting up a coordinated and integrated governance of Europe. National languages are no longer a barrier that separates States and regions, as multilingualism is a common feature of most citizens in Europe.

In this scenario one can easily assume that European citizens are rather aware and sensitive to the sustainability of production and consumption models. Consumers still demand products that fit their individual needs and preferences, but with a growing attention to social and environmental issues.

Manufacturing firms respond to this consumption pattern by offering high quality, high performance and high price products, which are based on advanced technology.

#### **11. Competitive position of regional firms against new rivals from emerging countries.**

By means of the radical and continuous innovation of the technical and functional characteristics of their manufacturing processes and products, the firms of a region achieve relevant competitive advantage both in the domestic market and worldwide in the most developed countries.

Low cost and low quality products from newly industrialised countries have a minority share, at least in qualitative terms, of the consumption good market in Europe, which is largely dominated by European firms.

#### 4. Outputs expected from the regional panel

It is worth reminding that a scenario is not a precise and unique prediction or forecast, but a way of organizing many statements about the future. It should be sufficiently vivid that a planner can clearly see and understand problems, challenges, opportunities and alternative of the future situation. Therefore scenarios should be judged by their ability to help decision makers to formulate policies now, rather than whether they turn out to be right or wrong.

“Good” scenarios are:

- plausible (a rational route from here to there that make causal processes and decisions explicit);
- internally consistent (alternative scenarios should address similar issues so that they can be compared);
- sufficiently interesting and exciting to make the future “real” enough to affect decision making.

As such, the TKT scenarios to 2018 are meant to challenge the stakeholders of a region and to stimulate them to build a vision of Knowledge Transfer in the region.

Through the discussion within the panel, these outputs are expected:

- a) Evaluation of the current situation of the region in relation to all the topics of the scenarios
- b) Selection of the scenario preferred for the region (the vision of the region: this scenario may be the Stormy, or the Sunny or a scenario between the Stormy and the Sunny, as it combines some features from both)
- c) Selection of the 3 topics which are considered the most important for the evolution of the region and for achieving the preferred scenario (vision). **The topics are listed at page 12.**
- d) Definition of the future evolution of these topics in the next 10 years to be pursued as an objective
- e) Barriers (cultural, economical, institutional, etc...) anticipated against this future evolution of the topics
- f) Role and contribution of TransRegional Cooperation for overcoming or at least lowering these barriers

P.S.: The two last outputs are very relevant to the Stockholm meeting and building the Roadmaps. Therefore give great attention to the selection and description of the barriers for the evolution of the three selected topics.

Examples of possible barriers for topic 7 (Development of infrastructures at European scale) may be:

- resistance of local communities in the region;
- technical difficulties due to the geomorphology of the territory;
- conflicts between the national government and the government of the region where the infrastructure is intended to be built;
- difference in standards and regulations;
- ....

Each barrier must be described in a detailed way, by providing precise information about the related situation and the trends in the region.