Scenario Report

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1. Introduction

The aim of the INFU foresight project is to explore and discuss the implications of future innovation patterns for business and policy.[1] We understand innovation patterns to be, on a large scale, the underlying principles of how innovation processes are organised, who participates for what reasons, what the regulatory and other framework conditions are, etc. Even though new innovation models such as open innovation, soft innovation, design innovation, or user innovation were intensively debated in recent years, there has been little systematic exploration of possible future innovation landscapes and their implications for economy and society.

The INFU scenarios are designed to address this shortcoming. They depict comprehensive, consistent and plausible images of possible future European innovation landscapes, showing the main actors, their societal environment, specific challenges, and implications for wealth creation, social cohesion and sustainable development. As a time horizon, we selected 2025, a year which is close enough to the present to make the scenarios relevant for today's decision making yet remains far enough in the future to make major changes in innovation patterns imaginable and even probable.

In this report, we present five scenarios, which build on the previous work of the INFU project: A reference scenario (called Scenario 0), which assumes (somewhat unrealistically) that very few changes will occur, and four contrasted scenarios. Two of the latter are extremes: Scenario one describes a general decline of innovation and competitiveness in Europe, mainly as an outcome of internal factors. The second scenario presents the opposite image, with many opportunities realised in combination. In addition, scenario three shows that innovation may thrive even under adverse conditions, esp. at the local level. Finally, the fourth scenario, based on the principle "innovation for innovation's sake", explores possible negative impacts. Two short "scenarettos", even more extreme visions of future innovation landscapes, complement the scenario portfolio.

[1] See also www.innovation-futures.org for further information on the project, its structure and methodology, its deliverables and other results.

2. Methodology: Scenario Construction

The scenarios build on and are the outcome of previous INFU work. Their main building blocks are key factors, i.e. the main factors, which shape and describe the future of innovation in Europe. The different future projections of these key factors systematically map major uncertainties concerning the future development of the framework conditions for innovation and about new promising concepts of innovation.

2.1 Identifying Key Factors

The key factors are based on different sources of information that are the result of the first three INFU work packages (see also Figure 1):

– 78 "signals of change". These weak signals were identified through a review of academic literature on innovation and by scanning various media such as newspapers, magazines and the Internet. The aim was to identify newly emerging apparent and visible innovation patterns, which have not yet reached the mainstream and may have disruptive impacts for industry, economy, and society in the future.

– 19 visions of new innovation patterns. These visions were elaborated from the signals by means of "signal amplification" (a process in which the signals are radicalised, transferred, and generalised). Each vision describes how one or several similar signals could indicate a change in the process of creating, developing and disseminating innovations in the future.

– 9 consolidated visions ("nodes of change"), which are clusters of similar visions: Clarity, novelty, impact, desirability, and likelihood of these visions were evaluated in an online survey and discussed in detail with experts from industry and academia. This led to the identification of clusters of similar visions, which were elaborated in mini-panels by self-organised expert groups.

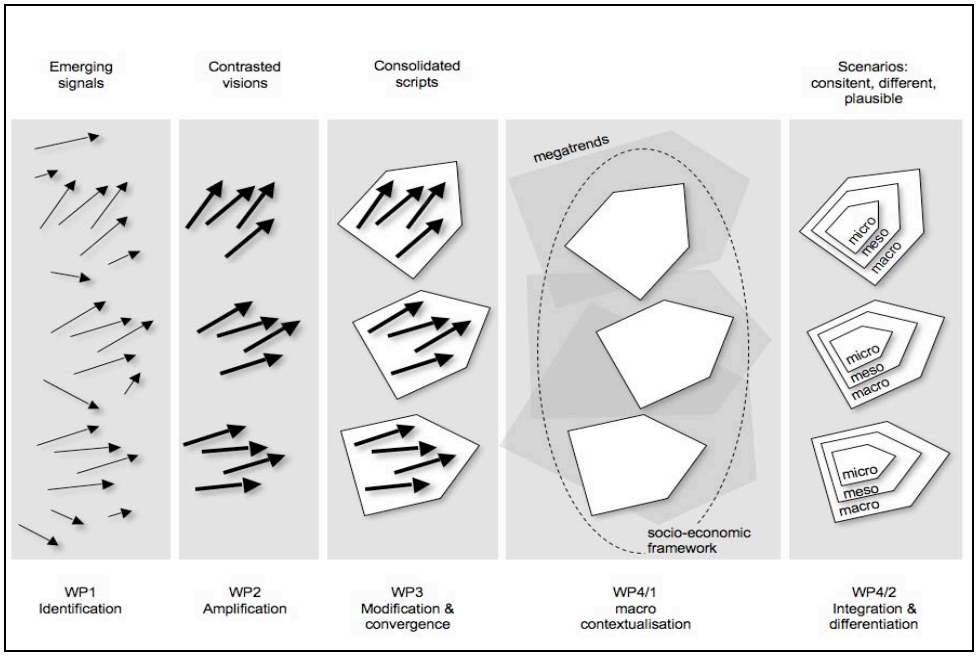


Figure 1: INFU Workplan

The main objective of the subsequent work was to understand which external and internal key factors might possibly influence the development of the European innovation landscape and how they could evolve in the future. Generally, key factors are characterised by

– their great impact strength and

– the high uncertainty about their possible future development.

The uncertainty of a key factor is expressed in alternative projections, with each projection standing for a plausible development in the field of this key factor. For each key factor, these alternative images of possible futures have to be mutually exclusive and exhaustive, at least for the most probable and plausible evolutions of the key factor. The key factors and their projections provide a comprehensive overview of the imaginable horizon of Europe's future innovation landscape.

The key factors were identified and selected in a collective and participative process. At the heart of this process was a key factor workshop involving both key participants from the mini-panels and further external innovation experts from all over Europe. This workshop was to:

1) take stock of previous work: signals of change, visions, and the outcomes of the mini-panels;

2) identify and analyse key factors; and

3) develop future projections of the key factors for the time horizon 2025.

During this workshop, visions and mini-panel findings were re-contextualised: Innovation patterns were placed within their economic and societal context, esp. by relating them to mega-trends such as environmental threats, demographic change, and globalisation.[2]

The results of the workshop were documented and analysed. Z_punkt supplemented the results with additional environmental scanning and mega-trend analysis, followed by a feedback loop with the workshop participants. Overall, nine Key Factors (KF) were identified. They relate to three levels:

– The macro level of the global context with the KFs "Global Innovation Centres", "Welfare and Growth Paradigm", and "Impact of Resource Scarcity and Environmental Problems"

– The meso level of the European societal context with the KFs "Societies' Innovation Capability", "Peoples' Inno-volvement", "Mediators of Innovation", and "Sustainability and System Thinking"

– The micro level of specific aspects of innovation processes with the KFs "Crossover Innovation" and "Innovation Facilitating Technologies"

A short description of the key factors and their future projections can be found in the Annex.

[2] The approach of building a scenario process on previously elaborated vision and mini-panels is an innovation in itself, yet to some degree similar to the method of field anomaly relaxation (FAR). See, e.g., R. Geoffrey Coyle: Field Anomaly Relaxation, in: The Millennium Project (ed.): Futures Research Methodology ver 3.0 (2009).

We considered it appropriate to connect the highest number of key factors to the European meso level. To gain further insights into the mutual dependency of the factors, the interactions between the key factors were assessed: How strong (in relative terms) is the impact of factor A on factor B? The result is the interaction graph (or network) of the key factors, given below.[3]

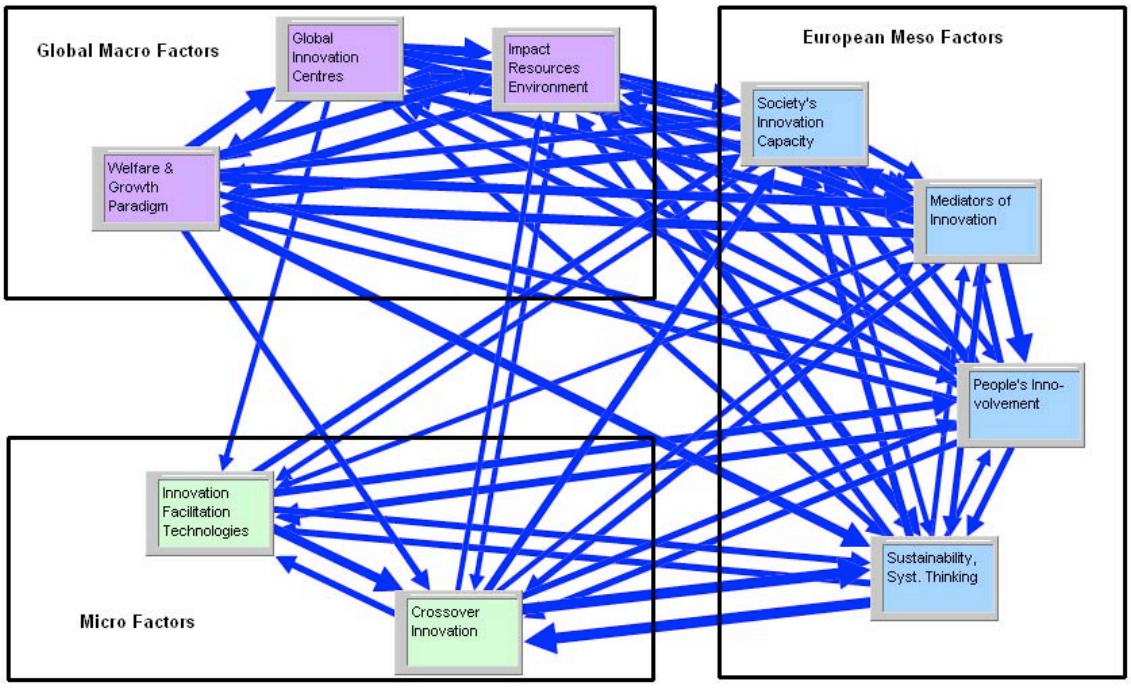


Figure 2: The Network of Key Factors

An analysis of the network of the key factors displayed the relative strength of the key factors as driving factors (active sum)[4] and driven factors (passive sum)[5]. As could be expected, the macro and meso factors are dominant in the system. Factors with low active sums are usually not included in the scenario construction. But with a relatively low overall number of key factors and for reasons of content (micro factors are related to the core of the innovation processes), the interaction analysis was not used for selection purposes, but only to better understand the system of key factors und to support the description of the scenarios.

The Active Passive Grid (below) displays on the abscissa the passive sum of a factor and on the ordinate the active sum, i.e. the "higher" a factor is positioned in the grid, the stronger is its total impact on all the other factors.

[3] To construct the interaction graph the project team assessed within a matrix to what extent a factor has an influence on any other factor.
[4] The active sum is the total value of all outgoing impact ratings.
[5] The passive sum is the total value of all incoming impact ratings.

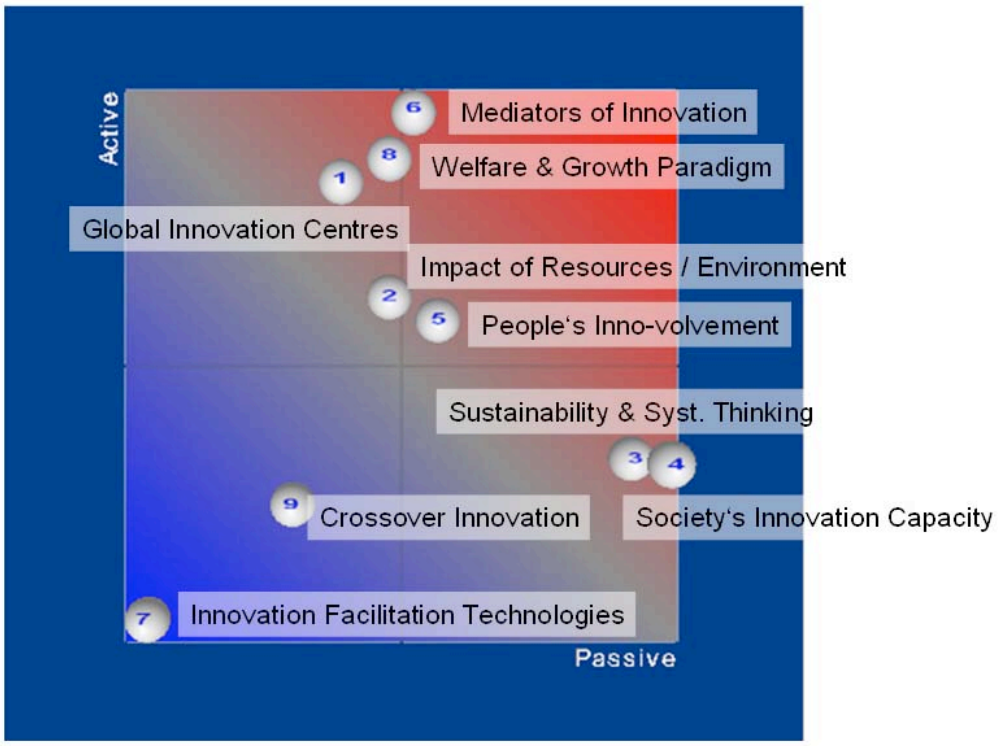


Figure 3: The Active-Passive Grid

2.2 Scenario Construction

The main step in the construction of the scenarios was a workshop involving the INFU consortium team, conducted by Z_punkt. During this workshop, the team identified and sketched a portfolio of scenarios for future European innovations landscapes based on the main uncertainties in the evolution of innovation in Europe. Driving factors and barriers, key uncertainties, main actors, possible time scales, etc. were discussed with reference to the key factors and their interconnections. In total, the workshop was to:

1) take stock of key factors and projections, re-assess uncertainties etc.,

2) identify an appropriate set of scenarios,

3) outline the most important features of these scenarios, and

4) connect the scenarios to previous work, esp. visions and mini-panel results.

During the workshop, five scenarios were identified by combining different projects of the nine key factors with the aim to build coherent and plausible pictures of the future. These scenarios capture very different future options for the European innovation landscape. In addition, two rather extreme, more ideal than realistic options were added as "small scenarios" – "scenarettos". The illustration below shows the scenarios in the so-called "morphological box". The headers list key factor names, the boxes below give the names of the respective projections. Lines connect those projections belonging to a specific scenario.

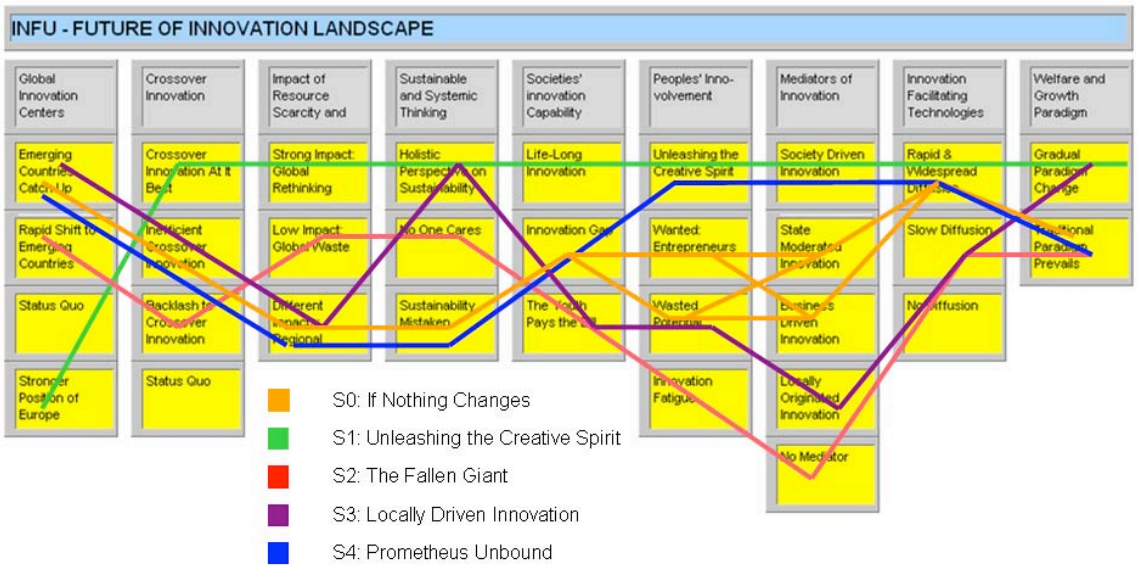


Figure 4: The Five Scenarios

Not all projections are covered. This, however, should not be considered a relevant flaw, as all three "projections without a scenario" concern the present state ("Status quo" of the KFs "Global Innovation Centres" and "Crossover Innovation" resp. "No Diffusion" of KF "Innovation Facilitating Technologies") and seem to be less interesting candidates for the description of future developments.

Scenario construction was supported by a specific scenario software (Parmenides EIDOS), which supports the search for sets of projections with high overall consistency ("projection bundles"). To begin with, the consistency of every future projection of each key factor with all projections of all other key factors had to be assessed. If the simultaneous occurrence of two projections (of different key factors) is impossible, they are considered to be inconsistent or antagonistic; no scenario is conceivable, which use this combination. If a combined occurrence is feasible they are called consistent or even synergetic[6] and may form part of a scenario's premises.

Nine factors with a total of 31 projections resulted in 51,840 possible combinations. Most of these were found to be either inconsistent or have only small overall consistency values (average consistency of all pairs of projections within the scenario). In addition to considering the scenarios' content, the following more technical criteria were applied:

- high overall consistency value,
- greatest possible difference between the scenarios (small number of joint projections),
- representation of all main clusters in the cluster map (if possible),
- coverage of all projections (if possible).

The software's mapping of the 200 highest ranked potential scenarios (the projection bundles) did not produce very distinctive clusters. Even so, the selected scenarios differ sufficiently as regards their position on the map. Scenario 4, "Prometheus Unbound", is not

[6] A combined occurrence is more probable than other combinations.

depicted on the cluster map as its lower overall consistency value did not place it among the highest-ranking scenarios.[7]

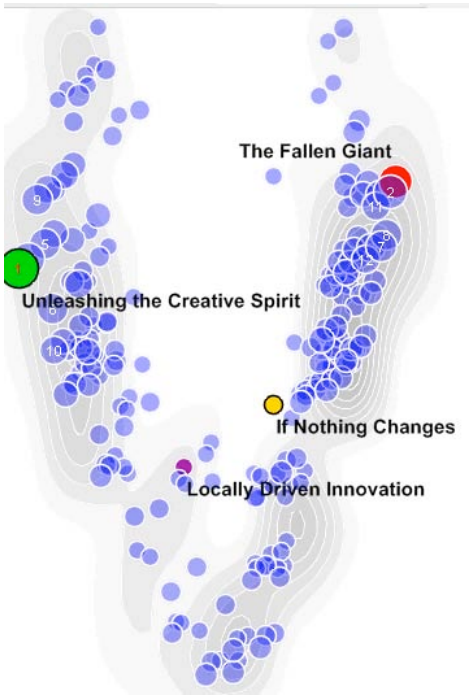


Figure 5: Cluster Map

2.3 Scenario Description

In the following, the five final scenarios are described, four of them in detail. The trend scenario "If Nothing Changes" is as such of little interest and is described here merely as a point of reference. The "scenarettos" have been added since the project team felt that these more extreme and somewhat improbable future innovation landscapes could provide supplementary material for discussion. They are developed by taking specific features of the corresponding main scenario and boosting them beyond the scope of the related projection. Additionally, each of the scenarios is underpinned by the mini-panels and visions that had previously been elaborated in the previous work packages of the INFU project[8]. Last but not least, the scenarios are supplemented by small fictional scenes, "spotlights" that focus on specific, mostly actor-related aspects and micro-level key factors. These spotlights are in narrative style and are intended to highlight actors of innovation and their motivations, the regulatory environment they operate in, places and procedures of innovation.

2.4 Next Steps

In the next work package the scenarios' key social and societal challenges and policy objectives will be assessed. This work package centres on a scenario assessment workshop where key researchers and stakeholders concerned with major societal aspects affected by

[7]This should not be considered as a significant flaw of Scenario 4. The "Top 200" consist mostly of highly similar projection bundles (combinations which differ only in one or two key factors).

[8] See for more details: Warnke, P., Schirrmeister, E., Leitner, K-H. (2010): Innovation Futures Scripts. Nodes of change in innovation patterns emerging from the explorative dialogue on the 19 INFU Visions, INFU Deliverable D 3.1,; Jégou, F., Leitner, K-H., Mahn, J., Mueller, M., Pitsci, G., Rhomberg, W., Schirrmeister, E., Watkins, V., Warnke, P. (2010): Final set of 20 amplified and contrasted visions, INFU Deliverable D 2.3, download under: www.innovation-futures.org.

the scenarios, such as environment, employment and quality of life, will evaluate the scenarios' implications. This should also spark a broader debate on the values and perspectives which the scenarios are based on, the desirability of the different future European innovation landscapes, and on the policy implications.

3. Advice to Scenario Readers – Remarks on Limitations and Scope

Scenarios are not forecasts. They do not describe "the future", rather, they depict consistent and plausible images of possible futures, of alternative future situations and the development path towards them: "This is how it could happen". They are based on a coherent and internally consistent set of assumptions about key relationships and driving forces. Which of these alternatives will be realised remains uncertain. Possibly, elements of all scenarios could materialise, perhaps to different degrees, or radically new aspects, i.e. elements of the future situation, will arise, such as new developments and trends, unpredictable innovations, impacts of disruptive events: "Something else entirely could happen."These wild cards or black swans should not be considered to lessen the scenarios' value. They are intended to tell conceivable "stories about the future", to inspire thinking about and debates on the future. They are to stimulate and to support discussions about values and guiding principles, policies and strategies, instruments and measures. Hence, some present trends and developments are carried to extremes and analysed with respect to their impacts and implications: "What if…?"

Scenarios are "stockpiled thinking", and as such aim to include possible actions of all relevant stakeholders from society, politics, and commerce as well as their mutual interactions. As a rule, one considers in scenarios even those measures and strategies which appear to be (at least from present perspectives) improbable or undesirable. Keeping this in mind, scenarios should not be misinterpreted as specific proposals. Neither do they imply that measures described in the scenarios will produce precisely the impacts of the scenarios.

The focus is on the conclusions taken from the scenarios: "How could, how should we act?" All scenarios, primarily those of a less desirable or politically controversial nature, offer useful strategic insights. As a rule, all scenarios, even "negative" or "black" ones, have positive and negative, attractive and disagreeable aspects – food for thought on risks and opportunities, options and strategies. Viewed from this angle, they are able to provide a basis for reflections on long-term oriented innovation policy measures.

Utopian dream or frightening nightmare? One should, however, bear in mind that a scenario's realism or plausibility is very much in the eye of the beholder whose judgement is coloured by his perspective, interests, preferences, and specific opinions .

Scenarios are focussed descriptions. They include contexts that will not necessarily be based on quantitative data or hard facts, but which give valuable meaning to a possible future state of affairs. They are built around an evolving core issue and cannot contain an all-encompassing vision of the future. Rather, they highlight selected prototypical non-static images of possible future developments, make future challenges and options visible and understandable. They are confined to their topics' relevant features, to the salient characteristics of their contexts, the main impacts and, last but not least, to major interconnections and links. Not all ideas collected during the previous work packages, not all insights from the mini-panels, not all aspects of the 20 visions found their way into the scenarios.

Some would simply not fit in, others were considered to be less significant and deliberately omitted to improve readability and reduce the sheer volume of text.

Some guiding questions to a first look at the scenarios can be summarised as follows:

- What are the most unexpected, most surprising, most exciting aspects of the scenario?

- Where does the scenario depend on present trends and developments, where does it fundamentally differ from these?

- How plausible is the future evolution and occurrence of the scenario?

- Which aspects of the scenario are (from the reader's perspective) desirable, which are not? And why is it that they appear to be desirable and others don't?

- Which measures could foster or support the desirable aspects, which measures could counteract the undesirable ones?

Scenarios are never intended to answer questions. Their aim is to raise questions.

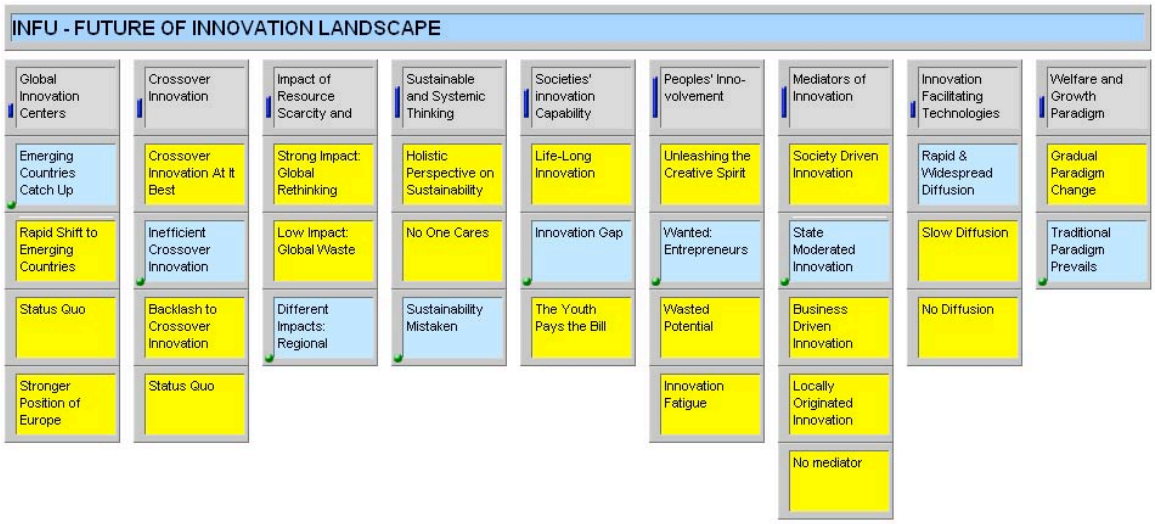
4. Scenarios

4.1 Scenario 0: If Nothing Changes[9]

Summary: The Scenario in a Nutshell

The baseline, or reference, scenario shows an almost unaltered future as regards present structures and present innovation patterns. The challenges resulting from an ageing and shrinking population, global competition, environmental issues and resource scarcity are inadequately met. Ultimately, muddling-through politics lead to decline. In the global innovation race, the European Union falls behind.

Morphological Box: The Premises*



(*Premises are highlighted in blue.)

Key Aspects of the European Innovation Landscape in 2025

- No major changes to innovation structures and patterns. The political and business communities rely on tried-and-tested models
- Internal and external challenges are not successfully addressed, leading to a slow, comprehensive decline of the EU's capacity for innovation compared to other world regions
- Innovation skill shortages and shrinking domestic markets lower the competitiveness of companies based in the EU. Europe is less and less valued as pilot market for new products

[9]This scenario is based on the assumption that key factors remain virtually unchanged. As there are major conflicts and interactions between these factors, the project team considered the scenario to be little likely and as providing little insight. Therefore, it was not developed in detail. It is used here as a backdrop for the other scenarios. Most of the challenges and problems addressed in this scenario are more closely developed in Scenario 2, "The Exhausted Giant".

- The societies' innovation potential remains largely untapped. Notwithstanding some "brain gains", less and less people are engaged in innovation, e.g. due to ageing and shrinking populations.
- Political support and funding are sufficient, yet remain unable to boost the number of start-ups significantly. Entrepreneurs grumble about 'red tape' and other limiting factors

Description

In 2025, the European innovation landscape remains almost unchanged. Naturally, there have been some gradual shifts, but nothing that would have amount to an earth-shattering shake-up.

Innovation remains high on the agenda of the EU and its member states, and governments spend a considerable part of their shrinking budgets on innovation and its prerequisites: education, research, innovation infrastructures, and subsidies for innovating companies. But all-in-all, Europe is considered to be a runner-up in the global innovation race, and important trends threaten even this less-than-enviable position. Firstly, the European population is not only ageing, but has started to shrink. Fewer and fewer children visit school, the number of students graduating from university keeps dropping. Europe has tried to attract "brains" from other continents, and it is true that its research infrastructure remains a good reason to come, as is its continuously well-running social system and highly recognised old universities. But even successful brain gains cannot compensate for the shrinking young age cohorts. Measures aimed at fostering life-long learning have provided some breathing space, and the elderly have extended their working lives considerably, but businesses complain about a dearth of recently trained and innovative staff of all age groups. For some years now, the number of start-up companies, esp. in high-tech fields, has stagnated and now seems to decline, notwithstanding a somewhat improved supply of venture capital and public funding. Society itself seems to lack innovators. While some people are naturally willing to try new models of living together, new models of care for the elderly, new models in agriculture, new forms of business organisation and new ways of collaboration in innovation, there is considerable bureaucratic interference, and risk-taking is not really encouraged. Policy-makers stick to tried-and-tested models from the beginning of the century, partly due toa fear that the electorate will not appreciate change, partly as a result of mind-numbing and lengthy deliberation procedures.

Major global companies have found that they are no longer able to rely on a sufficiently large pool of European engineers and researchers. Hence, they are looking into options for off-shoring their R&D facilities to more welcoming regions, especially in Asia, where most of them have had a strong foothold for decades. Its cautious population makes Europe little suited as a pilot market for new products – with the exception of health care services, pharmaceuticals and similar products. Europe has even lost its trailblazing position as a forerunner in the global environmental and energy technology fields. All member states and, most prominently, the Union itself indisputably promote "green" technologies. However, it often seems that without the necessary comprehensive understanding of sustainability. Occasionally, measures are taken where the effects cancel each other out. Efforts aimed at mitigating climate change hurt biodiversity, etc. One reason for this disadvantage may be that success is still measured in obsolete, purely financial terms such as GDP…

Overall, the old continent is still doing well in 2025.Yet its innovation capacity is in a gradual decline which happens at so a place that it seems hardly noticeable.

Spotlight 2025
Visit at an R&D engineer's office

Upon entering Simon Jerchow's office, you feel thrown back to the first decade of the 21st century: Large displays, keyboards and so-called "energy-saving" lamps. In Asia or Australia, the construction engineer would most likely be a retiree, but here in Southern Germany, he remains in very high demand.
"You see", he explains with a strongly pronounced German accent, "we simply lack younger people. I have been in the car business for more than fifty years; I'd like to train someone younger, but our country suffers from demographic decline. When my boss advertised the job, the salary he promised was as high as mine – for a graduate with no hands-on experience! –, but nobody applied."
Jerchow loves talking about past successes, about how he and his contemporaries improved carburator. "We really did build highly efficient engines, with lower fuel consumption, higher mileages, you know, and we are still able to sell large numbers of them in Europe. The people here like our cars, cars they have been used to since a long time. However, yes, we lost huge market shares globally in recent years. Some say on account of electric vehicles, we entered the market a little late with it and others were able to manufacture at lower cost…"
He really likes the German word "Aber", and starts every other sentence this way. "But I think that the blame shouldn't rest with us engineers. If anyone's, it is the designers' fault. They were unable to come up with design which would resonate with the Asian and African markets. Our engines remain the best in the world, I think. But our image has suffered. Latin American bloggers call our engines 'old fashioned'. But, you see, internal combustion has not changed since Otto invented it. So every non-electric car is old-fashioned per definition, not only the ones manufactured here. And we put so many new ideas into this technology. Look…"
Very proudly he points at the display. "These are micro-valves based on capillary forces. We worked on it for three years, and improved engine efficiency by 0.1%. You may consider this a negligible improvement, but it all adds up. We even collaborated with construction teams of our competitors on a joint platform called 'Motor 2040'. But don't put this in your article, it is still most secret…"
He stands up, goes to the window. "I like my work. It gives me the feeling that I am still needed. But in fact, I would also like to retire. I hope that I won't be forced to relearn my job and have to work with these novel nano-based machines that operate like muscles. I know almost everything you need to know about internal combustion engines. But – could it be possible that this age is over like the steam age? Perhaps my epoch is over – but I remain in charge…"

Basic Impacts

Positive Impacts

- Increasing business potential of globally operating European companies which relocated R&D departments and other critical business units to Asian and Latin American regions at an early stage.

Negative Impacts

- Worsening economic situation and declining European competitiveness.
- Increasing pressure on social systems and decreasing welfare spending.
- Unfavourable conditions for enthusiastic researchers due to shrinking research budgets.
- Increased risks for entrepreneurs due to lack of trained staff and uncertain financial perspectives.

- High pressure on globally operating companies from Europe which failed to relocate R&D departments at an early stage and do not manage to attract creative people from other world regions.

Main Milestones: A Short Roadmap

2010 European population is shrinking, high public debt; increasing awareness of demographic challenges.
Overall, a high level of governmental support for R&D, education and innovation.

2015 Pervasive lack of young and skilled workforce reduces the innovation capacities of some major and many small enterprises.
Declining public spending on education systems and innovation.
Insufficient efforts to streamline administrative systems.

2020 Europe has lost its pioneering role in environmental technologies.
The European Union is no longer attractive for innovators from other world regions and skilled people increasingly try their luck in aspiring third countries.

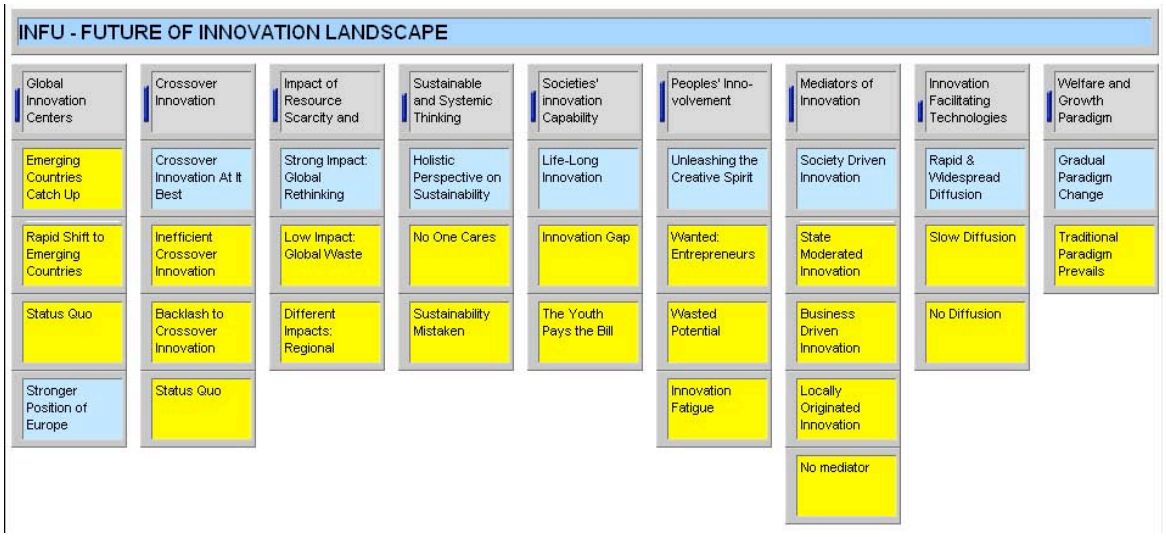
2025 Stagnation in all fields – in commerce, politics, and social life.

4.2 Scenario 1: Unleashing the Creative Spirit. Europe's Innovative Societies

Summary: The Scenario in a Nutshell

By2025, the European Union has become energised by a new spirit of creativity and has turned into the world's innovation centre, a global innovation hotspot, offering excellent research conditions and providing the world with sustainable innovations, helping it to cope with the grand challenges of our times. European societies have become a highly valued source for new product and services ideas, but above all for social innovation. In addition, sustainable business and consumption patterns have become the norm – economic growth and social welfare are no longer exclusively defined in monetary values.

Morphological Box: The Premises



(*Premises are highlighted in blue.)

Key Aspects of the European Innovation Landscape in 2025

- The European Union is one of the world's leading innovation regions, both for market-oriented and social innovations
- European STI and RTD framework programs, as well as innovation, education and research policies are improved and efficiently organised
- The innovation potential of the societies in the Union has been extensively activated - social communities and creative individuals are the main source for innovations

- Innovation patterns have changed - innovation activities happen everywhere and people are tremendously willing and highly motivated to innovate
- Companies are able to rely on a large pool of highly-skilled and creative people
- Crossover innovation has reached an apex: Extensive cross-disciplinary and cross-sectoral collaboration of policy-makers, governments, society, and the business community across all industries lead to constantly evolving insights and break-throughs
- Systemic thinking – widespread consideration of closed loop models and cradle-to-cradle design in production and innovation processes
- Gradual paradigm shift: Social welfare and economic growth are no longer exclusively measured in monetary values
- Social innovations are highly regarded and create new patterns of living together, changing the overall cohesion of society
- The grand challenges of the 21st century are fully addressed
- Advancements in innovation technologies and tools, e.g. co-working facilities, collaboration tools and rapid/virtual prototyping technologies
- Widespread and intensive use of innovation facilitating technologies on- and off-the job, such as virtual prototyping, fab labs, augmented reality and other technologies

Description

By 2025, the “old continent” has turned into something that people back in this century’s first decade might have labelled “Europe’s Dream” – or in other words: “Europe’s Ideal”. One could arguably claim that many kept on dreaming of it, but only few were truly expecting this: In 2025, the EU has become the global innovation hot spot, the global centre of creativity and design, supplying the world with breakthrough innovations and providing sustainable solutions to the grand challenges of our time. The innovation gap between industrialised “Western” economies and emerging countries has not decreased as the experts had not only to some degree expected, but rather predict with absolute certainty. By 2025,the EU has not only succeeded in catching up with and overtaking the previous powerhouses of innovation and creativity, Japan or the US, but also managed to outdistance the emerging countries, particularly from Asia and South America, where markets reach the point of saturation and labour costs rise. However, others still closely follow Europe. So in the mid-2030s, metaphorically speaking, astronauts circling the globe and gazing down on Europe at night are able to witness the constant activity in the continent’s innovation clusters. As darkness falls, a spider web of lights spreads from the distant shores of the Estonian Lake Peipus to the rocky coast of the Portuguese Algarve.-

Improvement of education and innovation activities within societies and establishment of world-class research infrastructures

To some degree, this development is a logical outcome of the ambitious measures undertaken by the European Union and national governments around 2011. An important case in point is the 2011 "Europe 2020 Flagship Initiative 'Innovation Union'" which spelled out how – even in times of tight budgets – Europe's potentials could be realised. Over the years, new education models and the promotion of life-long learning concepts actively addressed the mounting challenges of demographic change such as the aging of societies. Today, the solutions to these challenges are within our reach. The innovation capability of European societies is on a level never previously achieved.

It always starts with education. By 2025, education primarily focuses on developing creativity skills and innovative mindsets. The art of thinking has been turned into a science. With traditional classes and teachers abolished, new teaching methods such as edutainment (education based on entertainment), tutors and coaches have become common and widespread.. Starting in the first years at kindergarten, children are trained in skills related to innovation and creativity. Kids are motivated to stay curious and learn how to question facts and see things differently. Many kindergartens in the EU closely collaborate with academic institutions and offer traineeships and playful creativity workshops specifically designed for children[10]. The integration of kindergarten classes into research and innovation projects can be increasingly observed across the whole continent. But not only education policies have been tailored to demographic change and fostering of innovative capability. Companies have redefined their corporate structures and offer their employees a broad portfolio of opportunities to improve qualifications, skills, capabilities, and competencies. Life-long learning is considered a key driver for corporate competitiveness and long-term success. At the same time, temporarily expanding public debt, the EU launched an extensive innovation package. In addition to incentive programs, e.g. innovation contests offering considerable prize money and tax reliefs for companies with high innovation rates and investments in local R&D and researchers' education, large sums were spent on high-performance research infrastructures. *Innovation Camps*, where people gather for specific innovation tasks for a certain time are becoming increasingly popular. Often the idea is linked to the *open source society*, where a number of products and services are developed in close interaction among users. This extensive set of complementary measures had the aim of creating a competitive edge in the global economic race, in particular with regards to the ever-growing pressure from the emerging powers in the Far East and South America. Besides these jointly designed education and innovation policies, changed, more favourable, immigration policies that had been adapted to social and political struggles caused by pro-democracy movements in the near east have attracted large numbers of foreign experts and workforce. They find high educational standards and excellent conditions for carrying out scientific research. Effective policies of integration enable immigrants to quickly to get in with private and professional life and to contribute to innovation and progress.

[10] For more details see the box on the next page.

Spotlight 2025
Interview with Mathilde Knudsen (37), childminder of the Svendsen kindergarten in Copenhagen

The Copenhagen Post: "Dear Mathilde, you and a group of ten children have just returned from a two-day innovation workshop at LEGO to develop ideas for a new range of building blocks. How did that come about, doesn't it seem to be a strange idea to make kindergarten children a part of the business world?"

Mathilde: "Oh, that's old hat for us here at the kindergarten. Each month, businesses invite the children to do things like that. Last month, VELUX asked them to join an innovation workshop. The company wanted the children to support their R&D department in developing new eco-efficient flat roof concepts. For the children, visiting a company is always a great adventure, to see the high buildings and to check out the big machines. And, of course, to sample all the sweets and lemonade on offer! But going to Lego was something special, to create ideas for toys rather than ideas for, as the children always say, "boring" stuff like rooftops or computer chips."

The Copenhagen Post: "Yes, I can imagine that. When I was a young boy I would also have much rather played with LEGO than designed rooftops, that's for sure. So what is your impression, why would major companies like LEGO or VELUX ask preschoolers to support highly business-relevant innovation activities?"

Mathilde: "Well, I would say that children are just that much more creative and imaginative than adults. Here at our kindergarten, the children have picked up a lot of innovation and creativity-related skills and competencies over the last year. We collaborate with the University of Copenhagen. A research assistant from the University comes here every week to teach creativity techniques to the children. At VELUX, for example, our children used the synectics method and built different analogies in order to develop new rooftop concepts. And the results are outstanding, every time…

Facilitation of cross-disciplinary cooperation

In addition to the political measures, actions by economic actors have greatly contributed to the EU's new standing as the global innovation hot spot. A new spirit of cross-disciplinary cooperation and open-mindedness has entered day-to-day business life. An ever-increasing number of companies, research institutions, and independent think tanks began to set up inter- and cross-disciplinary R&D cooperation networks, integrating all kinds of actors in multi-faceted and diverse settings and group constellations. Holistic and well-integrated age and diversity management practices are widely regarded as key strategies to improve creativity and innovation. Collisions between different mindsets and disciplinary backgrounds were not only not avoided but encouraged and they quickly started to pay off. As a result, radically new types of knowledge combinations and breakthrough innovations emerged from the long lasting trans-disciplinary cooperation efforts. This is supported by a number of new techniques of *"automatised innovation"* such as semantic web analysis and digital systems that randomly create and test innovation variants before selecting the "fittest" for further interdisciplinary development. Enormous amounts of variants are tested often with an unexpected outcome. Sophisticated semantic web-filters track changes in consumer preferences and new ideas in real time, and automatically extract innovation perspectives with outstanding market potential.

Today, one can say that the alarmist warnings forecasting Europe's innovation decline have not only been heard but also were also given full consideration. The EU and the business community paved the way to this development; fostering the European Research Area (ERA) by fully integrating education, research, and innovation policies made Europe a place where scientific research, technological development and innovation thrive.

Spotlight 2025
Interview with Jose Ernesto de la Mora (26), cross-innovation manager at an Estonian packaging manufacturer

The Innovator: "Mr. de la Mora, upon on completion of your degree in business administration at the "Benito Juarez" University at Oaxaca, you received several interesting job offers from major Mexican companies. What prompted you to opt for a small packaging manufacturer in Estonia?"

De la Mora: "Oh, the decision wasn't that difficult to make. I made up my mind almost immediately. A fellow student from my university had completed a one-month traineeship at the company's innovation department half a year before and he came back impressed with the work culture, all the further education options , the free flow of knowledge, and the way innovation actually happens over here in Europe."

The Innovator: "Could you give some brief examples for our readers? What do you mean when you say "the way innovation happens"?"

De la Mora: "The whole culture of innovation, not only at my company or in Estonia but in the European Union as such is just astonishing. What really blew my mind was the total openness, the intense dialogues between different actors, the interdisciplinary cooperation, and last but not least, the incredibly high status of social innovations and sustainability.

The Innovator: "Could you give us a current example from your ongoing business activities?"

De la Mora: "We are just now conducting an open innovation project on new packaging materials. Our main objective is to finally implement full cradle-to-cradle compatibility of the materials and composites that are used in our packaging products. The whole project is wide open to internal and external sources of knowledge. We cooperate with the Tallinn University of Technology and several companies from the biotech industry. But in my opinion, the most important aspect of the project is the integration of our customers, of ordinary people using our products every day. One month ago we launched a virtual user community to get ideas on new materials and sustainable packaging solutions. The amount of feedback and particularly the ideas we have received since the launch day – it is just overwhelming. I've never expected anything like that, although it is known around the globe that Europe is a place of ideas and creativity.

Open innovation accomplished

Previously, the main actors on the innovation landscape had been business corporations, interdisciplinary research centres equipped with cutting-edge research tools, or departments of internationally renowned universities. Now, in 2025, the innovation path is increasingly defined by society as a whole. European societies exhibit a tremendous enthusiasm for innovation. As mentioned above, people gather for instance in company funded *Innovation Camps*, go freely for specific innovation tasks. Everyone, from lawyers to nurses and simple workers, wants to be involved; more and more people wish to invent and

show their creative potential. The entrepreneurial spirit transcends borders and even the most traditional companies provide conditions, which make it easy for their employees to innovate, ranging from free time for innovation activities to specific creativity tools and high-tech laboratories. Most non-creative elements of business processes have been automated and managers have taken on a fundamentally new role– rather than coordinating workflows, they have become creativity-enhancing facilitators. Employees are constantly involved in internal process and product innovation projects. For the first time, 70% of all product innovations at a major consumer goods business are based on ideas emerging from a company-wide idea and creativity contest. Almost all companies have annual innovation contests, which focus on ideas for new products or services or have the objective of improving internal processes and working conditions. During the first decade of the century, a very small number of forward-thinking companies had already started to integrate their employees in all stages of innovation processes, but even more so their customers. Virtual user communities were the core of this process, playing the role of idea generators and test markets for product and service innovations. One thing is for sure: at the time, this kind of user integration and free flow of ideas and knowledge took place mainly in scientific literature and theoretical models – in practice, this concept was more sporadic in nature. In 2025, as a key feature of corporate innovation policies, customer communities are fully integrated into innovation projects, ranging from conventional product developments to new service concepts to social innovations. One key driver for this break from the isolated innovation silos at internal R&D departments were extensive reforms of copyright and intellectual property rights. Over the years, creative commons has become the standard for the protection for original works and authorship. Free flow of knowledge is now the norm. Community members, in particular, share information and jointly innovate, triggered both by a normative pressure and pure pleasure. Key aspects are peer recognition, pride of authorship, and intellectual stimulation.

Innovating societies: Social innovation on the rise

In addition to the business-driven perspective on innovation, people frequently organise in all different kinds of social groups and communities in the social sphere. They want to invent, innovate, and shape the world they live in. The inspiration for innovation has changed – next to pride of authorship and intrinsic motivation, the contribution to addressing social and environmental challenges by innovation has become a major incentive for people to engage in innovation processes. As a result, there is a boom in social and sustainable innovations. People regularly join “Social Innovation camps”, protected spaces for experimental, collaborative problem solving, participatory decision making and learning in the social realm. Almost every region of the EU boasts one or more of these camps, most are equipped with state-of-the-art innovation facilitating technologies, e.g. “fabbers”, augmented reality systems, and rapid prototyping machines. These technologies allow camp participants to create fully functional prototypes on the spot and test them in their considered application context. People consider holding or joining an innovation camp to give new value to their lives. They want to find answers to the great challenges of the 21st century – how can we guarantee our energy supply without further harming the environment and natural ecosystems, without further exploiting limited natural resources? How can we make political decision processes more transparent and enable the active involvement of all sorts of stakeholders? How can we support a growing world population with sufficient

medical care and access to clean drinking water? These are just some of the basic questions addressed by the various social innovation camps.

Spotlight 2025
Report from the Social Innovation Blog, April 2nd 2025

"And the 'European Innovation Wizard 2025' goes to...". The glittering award ceremony provided an appropriate finale to the two-week innovation contest of the same name in Brussels, sponsored by the European Commission and the European automotive industry. At first glance, the task had looked almost impossible to solve (it should come as no surprise that not even the best and brightest at the manufacturers' R&D departments had not yet been able to provide a workable solution, which is but one of the reasons for this contest): "Develop a prototype of a megacity vehicle neither powered by electricity, hydrogen, fossil nor bio fuels". One look at the list of competitors made it clear to anyone even slightly familiar with open innovation and co-creation that if there was a solution, it would come from this crowd. At the start was the "who is who" of the European innovation scene: motivated citizens, independent thinkers and tinkerers, as well as scientists. Everyone intended on applying their creativity beyond their day job; eager for a battle of wits with other innovation colleagues from all over the continent. The list of participants comprised the "Berlin Innoboys" to the "Criadores do Lisboa". Isolated from each other in special innovation spaces, specifically built for the "Innovation Wizard" and equipped with cutting-edge innovation technologies – among them the FabMaster 2050 and the Real Environment Emulator 3.1 – the innovators set out into the world of future mobility on March 1. Two incredibly (as most participants said) intense weeks of researching, creating, fabbing, discussing, developing, and fine-tuning later, the eagerly awaited prototypes were presented to the world. And as in any other contest there could only be one winner. This year, the "Bratislava Tricky Workers" took the crown. Their triumph came as a surprise, as many still consider them newcomers to the European innovation scene. But even the old hands had to admit that their prototype of a simple pedal car couldn't be topped…

Shift towards sustainable development

Between 2010 and 2015, the impacts of the increasing scarcity of strategic resources and manmade environmental problems became considerably more severe – oil prices surged, emerging countries introduced export bans on rare earths, and environmental disasters had stopped to be merely occasional phenomena which happened to other people on the evening news every now and then. An ever-greater share of the population suffered from devastating environmental disasters. The Elbe River reached its highest mark ever, and the annual wildfires in Spain and Greece brought more devastation than ever before. Actors from all areas began to recognise the urgency of mastering these challenges and that the ambitious goals could only be achieved together. In recent years, an interdisciplinary circle of international experts developed a new system of indicators for social welfare and economic growth, a system, which no longer measures growth exclusively by monetary values, i.e. by GDP. Growth is calculated using a comprehensive set of categories, which cover all aspects that define social welfare and prosperity, such as life expectancy, environmental impacts, or the extent of volunteer work. Some experts claim that this gradual paradigm shift is merely a natural outcome of recent developments observable in several industries and last but not least in society. This 'mental overhaul' was triggered by the increased environmental impacts of industrial manufacturing and product usage and the

growing mistrust in health safety of biotech and nanotech solutions. Back in 2015, society and economy started to adapt their processes to sustainable development. Corporate environmental protection is now characterised by preventive measures in all departments and business processes. Almost all economic decision-making and new technology is evaluated prior to implementation using sustainability and safety criteria. Thus, sustainable consumption has become the established norm in 2025. The rethinking of production and consumption has brought a fundamental shift towards closed material loops and sustainable business patterns. At the fuzzy front end of innovation processes, future material loops along the entire life-cycles and all types of detrimental impacts on the environment are already assessed, recycled materials and used components regularly define the starting point of product innovation. The establishment of innovation patterns that are fully consistent with a circular flow of resources is unanimously assessed as top priority. *Waste based innovation* is the case. Cradle-to-cradle has finally become reality and the general benchmark. Interdependency has arrived at the root of society. Some innovations even only exist in virtual spheres: A further fundamental step towards even more dematerialisation of the economy has been taken.

Basic Impacts

Positive Impacts

- European societies benefit from high educational standards. Social welfare is on an exceptionally high level
- Researchers have access to superb research conditions and excellently equipped research infrastructures
- Favourable framework conditions for entrepreneurs. Very low administrative barriers and widespread presence of private and public innovation spaces
- Very high business and innovative potential for globally operating companies from other world regions that relocated R&D departments and other critical business units to Europe at an early stage
- Very low detrimental impacts of R&D and business activities on the environment. Very high impact of environmental problems and resource scarcity on business and innovation models – sustainable production and consumption is the status quo
- Social innovations have been mainstreamed

Negative Impacts

- Increased risks for companies and research institutions outside Europe (due to possible loss of skilled researchers and talent who might be attracted by European research conditions and innovation policies)
- Decreasing competitiveness of European companies that fail to open their processes to external innovation sources and stick to non-sustainable manufacturing

Main Milestones: A Short Roadmap

2011 Ambitious measures taken by the EC and national governments to improve the European Union's sustainable development and competitiveness, particularly by initiating numerous innovation initiatives such as the "Europe 2020 Flagship Initiative 'Innovation Union'. Also, a growing number of companies and other business actors start to found cross-disciplinary R&D networks and cooperation

2013 Impacts of demographic change increasingly become evident. To counteract the growing shortfalls of young skilled employees, life-long learning concepts increasingly become an integral part of the working world and culture. National governments introduce broad education reforms under the aegis of the European Union. New teaching methods, which focus on creativity skills and innovative mindsets start to achieve popularity.

2015 The increasing severity of environmental problems pushes executives to finally overhaul their business models. The goal of "Environmental sustainability" becomes one of the basic pillars of corporate strategies across all industries. Furthermore, enthusiasm for creativity and innovation increases in European societies. All sorts of stakeholders, particularly employees, customers and environmental organisations are increasingly integrated into innovation and decision-making processes

2020 Business and politics provide the most favourable conditions for idea generation, experimentation and innovation

2025 Full consideration of social and environmental aspects, systemic and crossover innovations in all areas. Free flow of information: All stakeholders are fully integrated in all kinds of innovation processes

Related Innovation Visions

The following (consolidated) visions, which have been developed and discussed in the previous INFU work packages, are particular relevant and become mainstream within this scenario:

Open Source / Innocamp Society

Innovation Camps of limited duration in which people gather to solve specific innovation tasks are becoming increasingly popular. The idea is often closely connected to the open source society where some products and services are developed in close interaction among users.

Businesses, public sector, and civil society use Innovation Camps to solve most pressing problems, ranging from coping with high-tech challenges to providing neighbourhood facilities. Most people regularly join innovation camps.

Automated Innovation

Several new techniques, e.g. semantic web analysis, make it possible to automate parts of the innovation process, from idea generation to design and testing. Sophisticated semantic filters track changes in consumer preferences and new ideas in real time, and autonomously identify innovations with exceptional market potential. Virtual-only products satisfy the human appetite for newness. They can be accessed by the public in virtual galleries or be projected on demand into homes and offices for individuals. Some of these products are never materialised.

Waste-Based Innovation

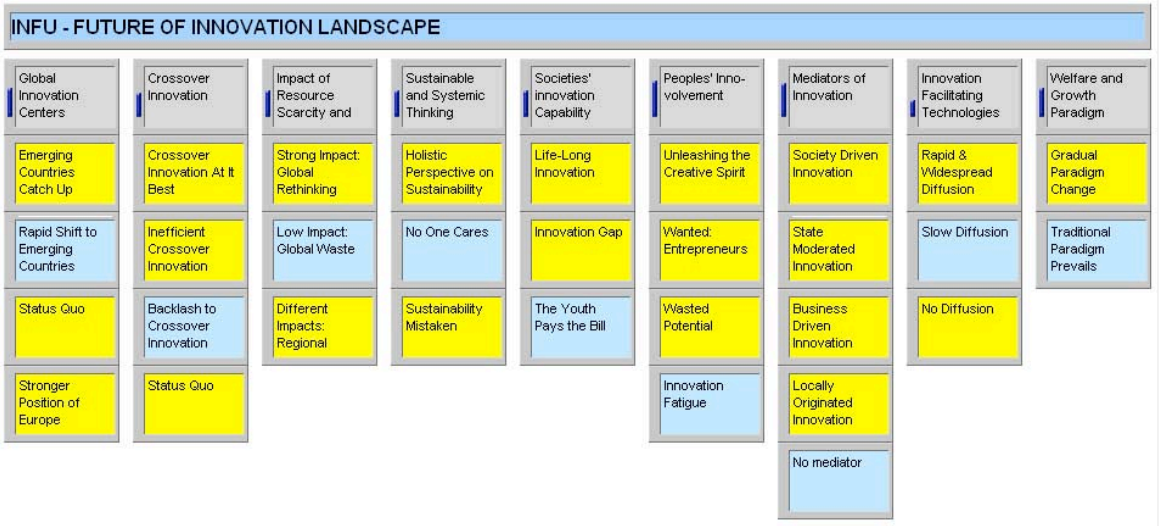
What if the principle of "waste equals food"/"cradle-to-cradle" was widely adopted? Rather than raw materials, databases with used components and materials become starting points for innovations. The whole world enters an eternal circle. Everything that is made of something is part of making something.

4.3 Scenario 2: The Exhausted Giant. European Innovation Fatigue

Summary: The Scenario in a Nutshell

Demographic ageing, inadequate policy responses, high competitive pressure from other extremely innovative world regions, and a certain "innovation fatigue" of its population cause the European Union to lose most of its innovation capacity by2025. Faced with this situation, policymakers and entrepreneurs stick to obsolete models of growth and welfare, education and innovation. The few remaining innovation activities are exclusively business-driven and not embedded in systemic approaches to sustainable development.

Morphological Box: The Premises



(*Premises are highlighted in blue.)

Key Aspects of the European Innovation Landscape in 2025

- Inefficient education systems: shortages of qualified personnel and creative workforce become more severe, the number of people working in creative industries drops.
- Brain drain: the EU has little to offer as a location for innovation for high-skilled foreign experts.
- Closed innovation: most innovation activities in companies take place in isolated R&D departments, excluding customers and other stakeholders.
- Social innovations remain the exception: too much administrative red tape and too few people with enthusiasm for and commitment to innovation.

- Very low and poorly coordinated public support of research: lack of appropriate innovation framework programs to improve international cooperation, links between academia and commerce, and knowledge production in R&D.
- Innovation fatigue: very low demand for new products and services as well as very low motivation of people to engage in innovation projects. Social initiatives and individually driven innovation projects are almost non-existent.
- Little crossover innovation: disciplinary and "silo" thinking dominates in businesses and research institutions.
- Only small-scale and inefficient use of new innovation facilitating technologies, primarily in major companies and highly specialised research institutions.
- Few efforts towards sustainable development in politics, business and society.

Description

By 2025,most of Europe's innovation capacity has been lost. A lack of students resulted in university departments being shut down, technology parks and business incubators, launched with considerable public funding during the century's first decade, have turned into (at least partly) empty wastelands with birches springing up in Eastern European business parks and cypress trees in Southern European ones. In the cities, the premises of fashion and game designers, the offices of architects, and the practice rooms of bands lie abandoned or have been transformed into large lofts. A major part of the so-called creative class and many post-grads have escaped to hot spots in Asia and Latin America, not least to flee increasing tax burdens. In addition to the R&D outsourcing wave that was already visible in the beginning of the 21st century, most of the companies have relocated their R&D units to Asia or Latin America, where they do not only find young, well-trained and innovative employees and markets of early adopters and fast followers but strategic resources that are limited to the rest of the world due to export restrictions as well. What happened to the continent that had been the cradle of invention? That supplied the rest of the world with innovations – and its spirit of creativity? Some may say that this exhaustion is part of a natural cycle, of growth, maturation, and decay. Others may go so far as to actually welcome it, bringing an end to "change for change's sake". Life has become quieter and a lot more calculable, following the age of consumerism and hectic hustle, heralding in a spiritual dimension, which affects large parts of societies and of people's lifestyles.

Making old-fashioned goods

For the European economy, this turns out to become a problem. During the past decade, exports plummeted and domestic markets are in decline. Europe is predominately producing uninspiring, old-fashioned, non-innovative products. A *"No-Innovation*" attitude gains rising popularity and product cycles are becoming longer again. For relative market success especially on domestic markets, unchanging quality is more important than ever-new offers. Efforts to develop trend-setting services have met with little success. Some ten years ago, European goods may not have been cutting edge, but definitely state-of-the-art. Today, they are obsolete, attractive only for a population buying what it always has and unwilling to experiment, no novel glittering gadgets from overseas that might force you to

jump through new hoops. Small wonder that European products have little appeal on the world market, even with the euro as weak as it is and at prices below production costs. Some traditional brands will certainly survive but economic growth cannot rest on this type of activities and traditions.

Decline of the innovation framework

Early in the second decade, the writing on the wall was clear to anyone who wanted to see. In the EU, workforces began to shrink in 2011. Europe's populations were ageing. Companies complained about a lack of young, well-trained and creative workers that could replace retiring skilled workers, engineers, and researchers. Everybody was aware of this: The EU was facing a demographic challenge, yet counter measures remained insufficient and inadequate. There were more than enough people willing to immigrate, but social integration schemes still did not work out as desired. No political Sunday speech was without calls for more children, better education, higher work participation of women and elderly people, work-life balancing, life-long learning, and more innovation. But when it came to realising actual improvements, the prevailing mood seemed to be that reforms are the replacement of a state with known disadvantages by a state with unknown disadvantages.

Also, the burden of accumulated public debts prevented any significant investments into the future. Soaring welfare costs – pensions, unemployment benefits, and health care spending – left no scope for manoeuvre. Quite literally, the European Union was paying for past inactions. Yet it still hoped to maintain its lofty status quo and said so. However, initiatives such as the "Europe 2020 Flagship Initiative 'Innovation Union' came and went with hardly an impact. As a consequence, the EU and the member states increasingly failed to promote the needed innovation programs, to introduce new, in particular more efficient educational models, and to fund high-class research infrastructures – and this was precisely what formerly "emerging" countries were doing. Populations with little trust in their governments continued to react with confusion and mass demonstrations. Thinkers who continued to lecture about the need for reforms remained unheard while enjoying a high reputation abroad.

Spotlight 2025
Automatised Innovation by Auto-Inno 3.0. Advertisement

Suffering from a lack of young and inspired innovators? Feeling the pressure of global competition when developing new products and services? Auto-Inno 3.0 is here to help. Virtual Innovation Inc.'s latest release of its innovation toolbox for enterprises is the finest creation ware on the European market. As a self-adapting innovation suite, it can be customised to 29 languages and it is able to run in any software environment, no matter how old your cloud application may be. Auto-Inno 3.0 is based on the most advanced insights of brain research, simulating cognitive processes in the human and higher animal mind. It combines the adaptiveness of a cat with the panoramic view of an eagle and the sense making of a human being. Auto-Inno 3.0 not just supports innovation processes, it replaces employees and external experts in all stages of the innovation process. It is open and closed innovation in one piece. Just as its mega-selling predecessor Auto-Inno 2.7 (released in 2024), Auto-Inno 3.0 outdoes any other web-based innovation tool. It identifies bright ideas even within hidden domains of the Web. It extracts inspirations from everywhere in the virtual world, but with its TRIZ-based ideation-generator it also combines and transforms findings into novel concepts, novel products, novel services, and novel business models. Virtual products created with Auto-Inno 3.0 can be exported to any current fabbing machine.

Services and business models can be transformed into virtual business platforms of advanced standard. Innovation may be 5% inspiration and 95% perspiration, but Auto-Inno 3.0 with its artificial intelligence can handle both sides: having an idea and seeing it through to market maturity. Auto-Inno 3.0 helps you adapt innovations to your customer base. Depending on your preferences, innovations too radical and too novel are filtered out, and moderate innovations which suit the needs of old and conservative clients given priority.

Urgent need for researchers

Companies first tried to compensate for the lack of public innovation engagement and the shortage of young innovators. Often, researchers would postpone retirement till 70 – well beyond the official retirement age of 65 to 67. Occasionally, a business would try to involve – more or less by force – all of its employees, from janitor to board member, in innovation activities. The result was often only an increased reluctance to innovate. Others experimented with web-extracted innovation: Intelligent software agents search the web for useful ideas, unmet needs, changing consumer preferences, inventors who lack capital, etc. But in general, the expensive technologies that could foster innovation remain out of reach for all but a small share of major companies. And of course, even the best technology cannot replace the "human factor".

Spotlight 2025
Go East, Young Man.
From the 3D-edition of The Singapore Times (TST), March 29, 2025, 9 p.m.

TST: Mr. Miller, there have been complaints about the harmonised ASEAN immigration regulations…

Miller: This does not affect me. And, honestly, do you feel that an IQ threshold of 110 according to the Pacific standard scale is too high for immigrants? I passed the test without much effort. Inventing a new name for some high-tech suitcase is not exactly a brain-twister, is it?.

TST: So you feel comfortable with the Innovativeness Quotient…

Miller: Sure.

TST: And what are your reasons for leaving Europe?

Miller: Primarily, it was the feeling of decline, both in my company as well as in society in general. The GDP is stagnating at best, pension schemes are highly disputed and exports are dwindling, and nobody really seems to care. Europeans are so risk-averse that they are unaware of the greatest risk of all – and that is not taking any risks at all.

TST: Could you provide some more detail for us non-Europeans?

Miller: It is the mentality. Most Europeans prefer things to be tried-and-tested. I am also speaking of regulation. You'd be mistaken to believe that Europe had little regulation based on the fact that people are allowed to eat on European commuter trains. Rather, quite the opposite is the case. There are directives and laws and decrees for everything. I am specialised in a very specific field of nano-structured surface technologies. My team invented a number of ways to … Well, I'd better not bore you with too many details. But none of our five key inventions made it onto the market. My employer's pencil-pushers "de-prioritised" one since they had no idea of the potential market size, two are still being tested for the potential emission of harmful nano-particles, one won an innovation award but fear of possible interactions with some detergents finished it, and the last one made it to the market only for public mood to turn suddenly against nano-machines, relegating all nano-enabled products to becoming shelf-warmers.

TST: So frustration made you leave your country.

Miller: I am now fifty-five, just the right time to start a business of my own. It is so much easier to set up a company here. I am well connected globally. With my experiences in innovation management, I am going to offer my services as an "innovation chain manager" for companies who want to globally source innovation resources. Perhaps I will even succeed in luring some of my old European colleagues into the network.

Sustainability neglected

Ultimately, top management has to answer to its shareholders and to provide convincingly high quarterly profits. According to the traditional growth paradigm, only short-term success counts, not long-term competitiveness. And why should a company stick to a European city as headquarter, if profits come from elsewhere, if markets develop elsewhere, if its workforce originated elsewhere, if R&D and innovations were made elsewhere – or on the web, which belongs nowhere? As the climate for growth and innovation worsened in Europe, many companies looked for more promising lands.

By about 2020, executives and policymakers began to feel that sustainability had ceased to be desirable and become a kind of luxury, something from a period with plenty of capital available. Of course, people continued to pay lip service to saving the environment, saving the climate, saving the planet, but this did not amount to much, and most Europeans no longer expected their leaders to realise key measures. Other countries, in particular these latecomers in Asia, were worse polluters. Other continents – like South Asia or Africa – were far more affected by climate change. So, why bother? Why take the lead? Why shoulder the burden of environmentally correct behaviour? Most European elites assumed that piecemeal measures would suffice to prove their good intentions and that a real systemic approach to sustainable development would overload all sorts of capacities, financial, personal, organisational. Even adherents of sustainability admitted that implementing new sustainable business models and processes causes high initial costs and increases complexity and market risks.

In former times, NGOs and even the European Commission had elaborated on the benefits of environmental investments and calculated the net economic gain from redirecting investments into "green" growth. But in a period of shrinking or – at best – stagnating economies, this message seemed more and more utopian, wishful thinking from days past. The primary concern of large parts of the European population and of most companies remaining in the old continent was simply to muddle through in dire times. Day-to-day thinking and living dominated. Some called it "flow" and considered it a re-discovered virtue. Most people, however, were little inclined to reflect on their situation in this way. They found themselves absorbed in carving out a living or getting access to adequate medical care. Perhaps one should emphasise that there were two fields in which innovation continued to flourish: the subsistence economy of poor people and organised crime.

Basic Impacts

Positive Impacts[11]

- Increasing business opportunities and sales potential for foreign companies using Europe as a mainstream market for extended product life cycles and to install an additional long tail for their strategies.
- High competitive strength of globally operating European companies that relocated R&D departments and other critical business units to "emerging" countries such as Asian and Latin American regions at an early stage.

Negative Impacts

- Deterioration of Europe's economic situation and declining welfare spending
- Lack of appropriate framework conditions and opportunities for young creative people (who leave the European Union in ever greater numbers)
- Gloomy outlook for researchers, teachers, and professional coaches as research budgets shrink and automatised innovation efforts increase
- Much-needed entrepreneurs face increasing administrative and financial obstacles
- Unfavourable conditions for citizens with ideas for social innovations who face a risk-averse social environment reluctant to innovate
- Negative business environment and bad conditions for carrying out R&D for globally operating companies from Europe that failed to relocate R&D departments to other world regions at an early stage
- As tax revenue declines, public funds suffer
- Society, commerce, and politics pay little attention to environmental aspects. Dramatic loss of Europe's former leading position in clean-tech

Main Milestones: A Short Roadmap

2010 European population is shrinking; high public debt become impossible to reduce or even contain, notwithstanding the EU's official incentives and regulations.
European Union and member states still pursue an agenda of innovation and competitiveness.

2015 Innovators start to leave Europe; large companies shift their innovation activities to emerging markets.
Full impact of budgetary problems on the economy: Health and pension spending absorb (deficitary) governmental budgets.
Dramatic lack of a young and skilled workforce. Teachers and trainees fail to renew their skills and competencies.

[11] For further positive impacts, please also see the Scenaretto "When the race is over" on page 32.

2020 European competitiveness in decline
Exports and domestic markets begin to shrink
Sustainability is no longer seen as an imperative
State-driven innovation programs and excellent educational conditions mean that "emerging" countries outperform industrialised countries in breakthrough innovations.

2025 Dramatic lack of innovations and creativity in the EU.

Related Innovation Visions

The following (consolidated) visions, which have been developed and discussed in the previous INFU work packages, are particular relevant and become mainstream within this scenario:

Automated Innovation

Several new techniques, e.g. semantic web analysis, make it possible to automate parts of the innovation process, from idea generation to design and testing. Sophisticated semantic filters track changes in consumer preferences and new ideas in real time, and autonomously identify innovations with exceptional market potential. Virtual-only products satisfy the human appetite for newness. They can be accessed by the public in virtual galleries or be projected on demand into homes and offices for individuals. Some of these products are never materialised.

Innovation Chain Integration

Innovation is expected to become globally dispersed. But what mechanisms will be used to integrate the distributed and diverse elements and to match ideas and solutions with problems and needs?

Combined with Europe's decline, the global integration of innovation chains means that the bulk of successful and disruptive innovations comes from today's emerging markets. The West becomes a follower and having to face products primarily designed for different cultural contexts. Western companies wishfully look to Asia, often with the help of industrial espionage. Creative people migrate to the new innovation hot spots in Asia and send back remittances to their aging relatives in the US and the EU.

No-Innovation

What if innovation fatigue takes over and No-Innovation becomes en-vogue? The innovation rush is finally slowing down. Product cycles are extended. For market success, unchanging quality is more important than ever-new offers.

Scenaretto: When the Race Is Over

Shouldn't this be considered a natural development, or, even better, a sign of maturity? The EU has given much to the world, and now it takes a backseat and lets others take the lead. After more than two centuries of progress, economic growth, acceleration in all spheres of life, Europe is opting for a slower pace. Let the strong and young compete. "Living better with less" is one of the slogans of this new spiritual age. The digital lifestyle, once the sign of the time, has ceased to be desirable. Less media use, more real communication – face-to-face, this is one step on the way to a life of physical and spiritual health and happiness. "You are producing electro-smog" has become an oft-issued warning…

Innovation has lost its positive connotation and is increasingly considered an unwanted burden, something that unnecessarily shakes up society and makes difficult things even more difficult (evident in the constantly growing number of manuals). Companies feel that they are better off if they limit the number of people involved in their innovation processes and voluntarily abandon all attempts that aim at the opposite. Products may be less innovative and less "cutting edge" as they used to be, but quality has increased, they last longer, offer real usage and emotional values for owners and users – let the economists argue whether the value added has in- or decreased. Europeans are producing less waste, less CO_2, cause fewer environmental problems. – "If you want to grow", they say, "grow spiritually, and your ecological footprint decreases." Perhaps some day, other people will begin to envy Europeans for their relaxed, spiritual, calm lifestyles.

4.4 Scenario 3: Locally-Driven Innovation – Cities Go Ahead

Summary: The Scenario in a Nutshell

In 2025, Europe's innovation landscape has changed significantly. Cities, agglomerations, and regional governments have replaced European or national bodies as the most important mediators and facilitators of innovation. They made up for the lack of national and EU guidance and the entrepreneurs' growing reluctance to innovate. Thanks to local citizen initiatives, Europe's innovation capacity has returned to a high level while companies play only a moderate role for pushing innovations. In 2025, innovation is realised and organised at the local micro level and provides solutions mainly, but not only, for urban challenges.

Morphological Box: The Premises

INFU - FUTURE OF INNOVATION LANDSCAPE								
Global Innovation Centers	Crossover Innovation	Impact of Resource Scarcity and	Sustainable and Systemic Thinking	Societies' innovation Capability	Peoples' Inno-volvement	Mediators of Innovation	Innovation Facilitating Technologies	Welfare and Growth Paradigm
Emerging Countries Catch Up	Crossover Innovation At It Best	Strong Impact: Global Rethinking	Holistic Perspective on Sustainability	Life-Long Innovation	Unleashing the Creative Spirit	Society Driven Innovation	Rapid & Widespread Diffusion	Gradual Paradigm Change
Rapid Shift to Emerging Countries	Inefficient Crossover Innovation	Low Impact: Global Waste	No One Cares	Innovation Gap	Wanted: Entrepreneurs	State Moderated Innovation	Slow Diffusion	Traditional Paradigm Prevails
Status Quo	Backlash to Crossover Innovation	Different Impacts: Regional	Sustainability Mistaken	The Youth Pays the Bill	Wasted Potential	Business Driven Innovation	No Diffusion	
Stronger Position of Europe	Status Quo				Innovation Fatigue	Locally Originated Innovation		
						No mediator		

(*Premises are highlighted in blue.)

Key Aspects of the European Innovation Landscape in 2025

- The importance of cities and regions as efficient mediators of innovations is fully recognised within the Unions' innovation framework.
- Higher importance of local innovation initiatives within the European innovation policy. Only few top-level innovation guidelines.
- Role and structures of cities and regions have evolved. Open knowledge cities are the most important innovation enablers and employ the best creative heads.
- Participatory innovation: citizens and all other urban stakeholders are empowered and directly involved in innovation processes.

- Europe is characterised by a large number of new social innovations. Most social, economical and ecological challenges are addressed (locally).
- Shortened decision-making chains: businesses and entrepreneurs have easy access to innovation funding and support.
- Neighbourhoods and councils have free access to public data and co-developing places which in return makes it easier to diagnose urban challenges more accurately.
- Thanks to local initiatives, the European Union is able to compete with other regions. European cities serve as role model for a sustainable development.

Description

In the run-up to 2025, Europe's innovation landscape has fundamentally changed, and the most crucial changes have come from a rather unexpected direction: From city governments and citizens. Cities increasingly play a major role as innovation drivers. In particular, systemic sustainability innovations are best be implemented on a city level. In 2025, almost all innovation is local. It is performed right where the need for change, for new ideas and concepts is greatest – in the streets, in neighbourhoods, in local communities. People make their voices heard and shape the future in collaboration and interaction with their fellow citizens. In this process, cities, i.e. their leaders and administrative machinery, have also changed. They have re-defined their paradigm from control to enablement. Referred to as 'open knowledge cities', they bring forth new ideas of public life and participatory democracy and encourage urban social innovations in all areas of life. They have become the most important centres of innovation and change. Within these cities all urban stakeholders co-decide on urban issues, co-develop and co-operate urban services, and have an intrinsic motivation to permanently innovate services and the delivery of services. Projects of all kinds are supported by shared hard and soft infrastructures, including co-production places such as Fab-Labs and access to public data. The city takes on the role of mediator rather than service provider and focuses on organising and enriching democratic life.

How did this come about? The answer is grassroots pressure; combined with distrust in governments and the feeling that self-support is better than waiting, triggered by the deteriorating social and economic situation in many cities. But getting there was neither easy nor straightforward.

At the beginning, no priority for locally organised innovation

For years, the European Commission put a clear focus on R&D and market innovations in its research and innovation plan. Doubtlessly, both were generally regarded both those things as pivotal to Europe's global competitiveness; nonetheless, frustration grew in town halls all over Europe. At the time, local governments at that time felt that they were getting the short end of the stick. Hadn't many innovations come from cities during the last decade? Hadn't cities achieved a lot in areas like transport, education or public services?

Should this not have been celebrated and honoured in the same way as innovations originating from the private sector?

Moreover, national governments passed ever more social, ecological, and economic responsibility to the local level. What had sounded desirable at first sight resulted in constantly increasing financial burdens for many cities which were already short of money. Mayors and town councils from Gibraltar to Cologne and Tallinn decided that they had to intervene and make their voices heard within the European Commission. Using their network "Eurocities", they requested an open dialogue and more decision-making freedom organising innovation activities. At the time, however, opinions on the right design for Europe's innovation policy varied widely. The commission remained convinced that innovations needed could only be the result of grand projects and was unwilling to give more priority to locally and citizen driven innovation projects. It took more years before things finally changed.

Spotlight 2025
Report from the Innovation in Europe Today Magazine, April 06, 2025

Local city innovations make the difference!
Today, you would have a hard time believing that in 2012, Cork in Ireland and Haarlem in the Netherlands shared the same problems. The cities' budgets were rapidly dropping towards zero, there was rampant unemployment, and the challenges of demographic change were constantly more pressing.
Thirteen years later, and the two cities could not be more different. But how could, over such a comparatively short period of time, one city manage to completely reinvent itself, change its fundamental structures and return to a path of economic and social prosperity, while the other continues to, possibly even more so, suffer from the problems mentioned above? The answer is "local city innovations".
Cork's mayors were among the first to take up the idea of empowering local communities and neighborhoods. "I clearly remember how some of my colleagues ridiculed our 'citizen innovation campaign', says Mr. Smith who headed Cork's innovation program from its start in 2018 until recently. The campaign's core, he explains, was to provide citizens with the money and tools to take matters into their own hands. Mr. Smith points to a long list of success stories: Cork's unemployment rates are the region's lowest, with more and more social start-ups providing people with solutions for care services or utilities. "I was impressed with the number of ideas people have, how motivated they are, and how their intentions benefit our social and economic situation", he reminisces. But why did the approach never really catch on in Haarlem? Mr. de Haal explains that "We also tried to activate the innovation potential of our communities. But obviously we didn't go at it the right way". Looking back, he mentions a lack of trust and too strict guidelines as main reasons. "We should have trusted people more. Our framework turned out to be just so much administrative red tape. You have to give people the freedom to handle things themselves".

Europe's innovation capacity threatened

In 2015, Europe's situation was characterised by a slow yet steady economic decline and worsening social problems. No answers were forthcoming regarding the shrinking public budgets or the increasing prices of natural resources, the pressing climate-change related issues, or increasing unemployment rates. The analysis was sobering. Europe was on the way to lose its leading position in many future growth fields. It became increasingly clear that after failing to achieve most of its Lisbon Strategy objectives, Europe would also meet

only a minority of its 2020 plan targets. The reasons were a combination of economical and political aspects. Efforts to create a coherent European R&D policy framework had not been successful, and most national high-level innovation strategies had failed.

Political struggle over the European innovation policy

By 2015, notwithstanding prolonged efforts on all levels, the policies of most member states remained essentially nationally oriented. This resulted in duplication and fragmentation and the "Innovation Union" was even more out of reach than it had been in 2011. On the EU level, designing the relevant political and administrative structures and support instruments had proved to be a complex, maybe even too complex process. The governance mechanisms introduced, such as policy warnings, turned out to be too soft to seriously impact national policies in practice. Repeatedly, quite the opposite happened. Also due to financial constraints, member states refused to implement EU targets in their national strategies, e.g. increasing investments in R&D to 3% of their GDP. In addition, innovation and R&D investment levels had less and less correlated since 2010. Also, there was a general reluctance to push through difficult and unpopular reforms which undermined the whole 'Europe 2020' strategy. Conflicts of interest prevailed. Within the EU parliament, adherents of the intergovernmental method won a broadening supremacy over those who favoured the community approach. Calls for more coordination and less bureaucracy went unheard. By 2017, most European institutions and governments had failed to sufficiently adapt their structures and policies to the new requirements resulting from a changing global innovation landscape. However, national innovation strategies also did not result in the expected, or rather hoped for, improvements and turned out to be largely inefficient. Many national high-level strategies remained political rhetoric or lacked a clear definition of responsibilities and comprehensive reforms. No European country was able to successfully face on its own the growing competition from rapidly advancing Asian countries. Furthermore, complex decision structures created bureaucratic hurdles, especially for smaller companies. Even with interdisciplinary research high on the agenda in many regions, the results of top-down prescribed cooperation only seldom justified the increased efforts and expenditures.

Industry and governments hinder each other

At the time, more and more innovation experts called for a sea change in strategy. Why focus on national agendas when the problems, partnerships and potentials are right here at the local level, they asked. Most structural social and economical problems seemed too diverse or too complex to be solved centrally.

Unfortunately, the business community failed to act. Entrepreneurs were waiting for a clear signal from the political sphere to steer investments or where they could get needed funding from. Financiers were reluctant to invest into what they called "uncertain future business perspectives". National governments on the other hand were overtaxed by the growing complexity of problems and demanded the private sector to provide solutions.

Cities feel the pressure, more focus on local enabling

The cities, on the other hand, felt the pain much more acutely. They suffered from shrinking budgets and an increasing pressure to achieve more with less. Additionally, European cities feared to fall further behind in the intensifying global competition for the creative class. Cities all over the globe had realised that their prosperity relied strongly on skilled people and invested heavily into attractive living and working conditions. Local governments were also concerned that global warming had not been successfully addressed on international and national levels. While on the international level especially the United States and China boycotted agreements, most national governments were afraid that voluntary emission reduction targets would weaken the competitiveness of their domestic economies. In an increasing number of cities worldwide, concerns about security and sustainable development began to be heard. Around 2020, Europe's cities and citizens were finally allowed to shoulder more responsibility for innovation matters, which was also a consequence of the successful addressing of corruption and the competition of specific interests across particularly affected regions in the EU. The new EU innovation policy reflected that innovation processes take radically different forms in different regional contexts and sectors. General innovation policies were replaced by local innovation strategies. Furthermore, it was acknowledged that central governments are unlikely to have the capacity to govern diversity of local conditions or local requirements.

Spotlight 2025
Extract from the Nou Barris greener living blog

I am new in Nou Barris – looking for clean neighborhood power
von Corta Cordalis 13. April 2025 18:23 Uhr

Hi, my name is Corta and I just moved to lovely Nou Barrios. I have heard about your exciting community-lead clean power initiative and would like to know more. How can I join you guys? Can you guarantee my power supply and how much would it cost?
Thanks and to good neighborly relations - Corta

Welcome to Nou Barris
von Samantha Lopez 13. April 2025 18:51 Uhr

Hi and welcome Corta. Great to hear you've moved here and there is nothing easier than joining us – just come along to our comunida pabellón ;-). As you might be aware, our initiative is supported by the city council and aims at providing people with clean and affordable power. All of us are very proud that we have installed more than 250 MW of solar panels in only six years and that we have been able to link them to create a local virtual power plant – completely independent from sales-driven utilities and rising coal and gas prices.
Remember how our energy minister said that there is nothing we can do against expensive electricity and growing CO_2 emissions? We proved him wrong and did what no major utility ever believed to be possible :-). Thanks to the ideas and efforts of many of us, we can guarantee reliable and affordable clean energy. All you have to do is sign a contract with us and allow us to connect your smart appliances and your e-car to our network. The more people join us, the better we can manage our power supply and demand. So, see you soon.
Samantha

Municipalities as innovation facilitators and mediators

What followed was an unprecedented innovation push, driven locally by the citizens. Today, the slogan: "This idea is brought to you by your fellow citizen and supported by your local city council" has become as commonplace as were private enterprises' commercials two decades before. Cities now no longer administer a region, they manage it. They act as cluster development agencies for their regions, creating networks and bringing people together to facilitate the birth of new knowledge. To make this possible, local governments also improved their metropolitan innovation governance and invested into staff and structures. In 2025, the most talented people opt to work for cities and local governments rather than for private enterprises. To facilitate innovation within their districts, cities use a broad variety of tools and processes. They act as consumers, project partners, enablers, as well as facilitators.

Business partnerships and grassroots initiatives

Cities fostered partnerships with local business companies. The idea behind this was to directly address the most urging urban challenges where they occur. Many tasks had to be solved: managing shrinking or rapidly growing townships, handling budget cuts, providing clean and affordable energy and transport, healthcare and social services, maintaining critical infrastructures, but also promoting the creation of new employment.

Munich partnered with Siemens in the development of energy-efficient buildings, Paris with PSA Peugeot Citroen on new mobility concepts, and Madrid with T-Solar Global to shift the city's energy system to 100% renewable power. In addition to existing, long-time partnerships with larger companies, cities supported chiefly pioneering initiatives to develop locally adapted solutions. They created favourable conditions and opportunities for entrepreneurs to implement new ideas and concepts. For instance, companies would profit from access to public data, start-up financing, or would be guaranteed minimum order quantities.

However, what was most remarkable – and, possibly, the game-changer – was the empowerment of the citizens. Finally, the belief prevailed that citizens were more than consumers and that their influence should not be limited to casting ballots. Local authority changed towards more participatory governance and co-design. In 2025, citizens are directly involved in shaping the way a project, policy, or service is created and delivered. Cities provide public spaces, such as sites for *social experimentation*, where people can interact with each other, experience the value of experimental knowledge, and harness the power of collective imagination. Neighbourhood councils and informal communities are given tools and data in order to do their work much more efficiently, to go beyond discussing issues and formulating advice, to actually design and implement solutions to local problems. By 2025, Europe is characterised by more social cohesion and there is plenty of local social venture capital available. Innovation at the local level is a two way process: There is, on the one hand, the city administration who's job it is to facilitate new public and economic innovations from which their citizens profit through new jobs, reliable public services or education. On the other hand, citizens help cities diagnose problems more accurately and independently develop sustainable solutions.

2025: Europe is back on track

From a global perspective, the innovation gap between industrialised and emerging countries has been narrowed significantly. However, in 2025, there is clear evidence that Europe has returned to the right track. Following short period of economic hiccups, Europe has regained its strong position in the global innovation landscape. Worldwide, European cities and companies are recognised and by some admired for the way they develop sustainable solutions for many issues. Thanks to local actors, the talented global youth migrates to Europe.

Basic Impacts

Positive Impacts

- Local governments and local communities have more decision-making freedom and are able to design their innovation strategy based on local needs and conditions. Affected Citizens profit from effective working solutions
- Improvement of social cohesion due to high degree of collaboration between citizens
- Successful social innovation projects provide new stimuli to other cities and regions with similar problems
- Free flow of knowledge and open access to public data in urban areas
- Productive cooperation and competition between urban areas across the European Union

Negative Impacts

- Unfavourable frameworks for supporter of a centrally organised European-wide innovation strategy or common innovation landscape
- Disadvantages for larger multinational companies which might find it more difficult to get R&D funding for large-scale projects
- Increased risk of redundant innovation and waste of resources should cities fail to collaborate to a certain degree and refuse to circulate knowledge and data

Main Milestones: A Short Roadmap

2010 European population is shrinking and social and economic problems start to become worse; innovation capacities threaten to decline; political innovation focuses on market innovation. First attempt of Europe's cites to claim more decision-making freedom in innovation matters

2015 Conflict over right direction of Europe's innovation strategy intensifies between supporters of trans-governmental and community-based approach. Neither side is able to assert itself; social problems become even worse

2018 More and more cities start local innovation campaigns. Plans to foster the innovation potential of citizens prevail

2020 The new European innovation policy acknowledges that local innovation campaigns have a competitive advantage and shall be encouraged

2025 Europe is back on track. Mainly facilitated by new technologies, city and citizen driven innovation processes help to regain control of most social and economic problems

Related Innovation Visions

The following (consolidated) visions, which have been developed and discussed in the previous INFU work packages, are particular relevant and will become widely diffused and a pillar of innovation in the context of this scenario:

City-Driven Systemic Innovation

Cities are increasingly expected to play a major role as innovation drivers. Systemic sustainability innovations, in particular, may best be implemented on a city level. Cities have to develop adequate mechanisms to reap the benefits of this potential.

Social Experimentation

Social innovation is more and more recognised as highly relevant for developing innovative solutions addressing societal challenges. New modes of innovation are required to align social and technological innovation activities. Participatory experimentation will play a key role, provided that the right instruments and levels required for successful solutions exist.

Citizens' Role in Innovation

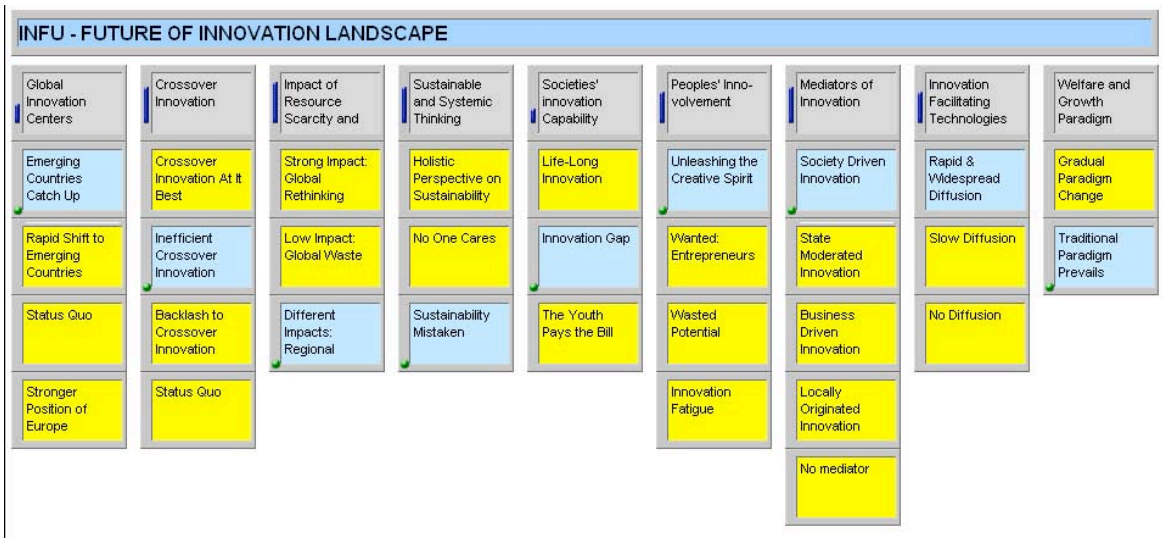
It is widely expected that citizens will play a more important role both in governing and implementing innovation activities. Civil society is involved in defining purposes of innovation and in deciding on every major investment in innovation. The whole process revolves around the citizens' panel, but also includes experts, stakeholders, and politicians.

4.5 Scenario 4: Prometheus Unbound: Innovations for Innovation's Sake

Summary: The Scenario in a Nutshell

Europe has set the course for innovation and competitiveness. All major actors – from commerce, politics, and society as such – collaborate to open and streamline innovation processes, overhaul rigid administrative systems and promote innovation at every level, financially and by providing good framework conditions. Europeans are highly motivated to contribute ideas. Since innovations are guided mostly by an economic rationale, environmental problems are not addressed in a comprehensive and effective way and a part of the population drops out of this fast-paced lifestyle.

Morphological Box: The Premises



(*Premises are highlighted in blue.)

Key Aspects of the European Innovation Landscape in 2025

- Strong focus on economic growth and innovation. Overall, Europe retains its competitiveness compared to other regions.
- Optimal conditions for people to engage in innovation projects and processes – inside and outside companies.
- Open innovation: Users and communities are important sources of innovation. They are often integrated into both public and private R&D processes.
- Best available technologies: Innovation facilitating technologies are in widespread use. High degrees of information flows and open structures.

- Economic success and the imperative to innovate come with some severe drawbacks.
- Increasing innovation gaps: education systems hardly focus on life-long learning and fostering old peoples' innovation-related knowledge. More and more people feel left behind and unable to keep up.
- Only moderate awareness of sustainable development: solely isolated and technology-based measures to improve environmental sustainability of business activities. No change towards sustainable consumption patterns.
- Only few new social innovations; most innovations are market-oriented.

Description

"Innovation is the way." By 2025, this slogan is not only widely accepted, but also implemented in the European Union. Faced with a lack of natural resources, a tremendous demographic burden, increasing global competition, Europeans simply have to be creative. And that's what they are. The evidence is everywhere from Lapland to Malta, from the Algarve to the Black Sea.

All major cities boast "citizens' innovation labs", "open technopoles", "innovation incubators", or R3F "rapid future fabrication facilities". Even small villages proudly present their "fab shop" or "inno playground". Companies regularly invite customers to "co-innovation days" or "prosumer workshops". "Create It Yourself" has become an important social movement with over 15 million official members throughout the Union. Fabbing is one of the most important leisure time activities (second to only football) – with a European CIY Contest that attracts at least as many spectators as (and far more participants than) the traditional European Song Contest.

"Europe: The future happens here." Innovations may be created all over the world, and many former developing countries have placed themselves well on the OECD's Innovation and Competitiveness Map. However, in particular with regard to its demographic challenge, the now literally old continent has succeeded marvellously. Globalisation has brought a level playing ground, and competition is no longer a race between countries or continents with jubilant winners and sorry losers but between global companies and their regional footholds. And good global networking is one of the main European assets.

Human capital is the key

At the beginning of the century's second decade, when the storms of the financial crisis had only just been weathered, companies all over Europe complained about a lack of well-trained young people. There were at least two reasons for that. At first, the younger age groups were much smaller than their parent "baby boomer" age groups. Already in 2011, much more old people left the labour market than young ones grew into it. The second problem was education and training. An important part of the younger generation lacked even fundamental "3 R" competencies, and others were well trained, but not in the professions needed, or they lived in regions without sufficient jobs. This mismatch produced per-

sistent high unemployment rates among the young. Thus recruitment became increasingly problematic, and economists were already calculating the impact of vacancies esp. in high tech industries: loss of value creation, setback to competitiveness and –secondary job loss! Companies themselves started training programs, often in combination with public vocational training schemes. Years previously, education, research, and innovation had been humdrum topics in almost all political Sunday speeches. Yet now, driven by an economic rationale, governments in the EU realised key efforts to bring the Bologna process to fruition, to foster professional training, to refurbish the high school system, and to increase the mobility of researchers – in a nutshell: to make the "Single Market for Research and Innovation" a reality. After years of debates about working languages and legal subtleties, even the European patent finally saw the light of day.

It had become common wisdom that human capital combined with a new spirit of entrepreneurship and innovation are the key factors to cope with the huge challenges of ageing and global competition. One, perhaps oversimplified, argument was the following calculation: Due to the ageing of the European population, retirement and health costs are rising, while workforces, despite migration, are shrinking in almost all EU member states. Every year, each member of the European working population has – on average – to pay about 1.5% more for the retired population. Rather than cutting pensions or increasing the retirement age, the suggested solution was boost productivity to compensate for ageing. Estimates ranged from 1.5% to 5% annual increase of productivity...

A spirit of innovation

In the second decade of the century, reforms and joint efforts of policymakers, the business community, and private citizens came to fruition. The most significant change was possibly a change of mentality, the optimistic attitude of "We can do it" which prevailed in the Union, a spirit of creativity and experimentation. Creative people no longer considered the risk of failing to be a barrier. Failing implies learning. Dust yourself off and try again. Not every fascinating idea makes a good product or service. But without fascinating ideas and without the courage to realise them you will never get to anywhere.

Naturally, Web 3.0 helped a lot. The web helped to make the new, positive perception of "trial and error" popular, brought people together, improved networking between users and producers, companies and citizens, but above all, it promoted a new kind of cooperation. In the beginning, *open source* was all the rage, with a focus on sharing software code, enabling specialists to contribute. In the 2010s, some pioneers inside and outside corporations already experimented with *"open innovation"* – users and communities became important sources of innovation. The "wisdom of the crowd" was more and more frequently integrated into public and private research and development processes. This could be done in the form of *innovation on request*: A user might register a task on one of the numerous innovation forums or platforms or, the other way round, an innovation manager in a company would start an open competition for the best idea to solve a technical problem. Remuneration schemes, of course, were and are highly disputed – and itself a field for innovation.

Many municipalities and a number of companies run *"innovation shops"* or *"innovation labs"*, either in city centres, close to large shopping malls, or within technology parks. People, ordinary citizens from young children to the elderly, are invited to experiment with new products – or to invent new solutions themselves, things they miss in their everyday lives. In most cases, these shops or labs are equipped with standard innovation facilitating technologies: virtual design and construction toolkits, rapid fabricators (fabbers) for 3-D printing of objects, diverse measuring instruments, etc. Trained staff – "innovation midwives" – help young and old innovators, e.g. by moderating brainstorming sessions or rapid creativity workshops. As a rule, contracting models are used to finance municipal innovation facilities, since most cities continue to suffer from budget constraints.

Previously, many promising inventions never made it much further than the drawing board: They perished in the "valley of death" between research and market. This valley has lost its terror. Businesses are far less risk-averse and venture capital is in sufficient supply, often from funds which combine private equity and public monies. Many regions in all parts of Europe rightly claim to be "innovation hot spots" and compete – modelled on the Silicon Valley – for titles such as "European Biotech Valley" or "Northern Robotics Valley".

The European Union contributes greatly to fostering the appropriate framework conditions for innovation through several programmes that build on the "European Research and Innovation Partnerships" from the 7th Framework Program with its Lead Market initiatives, the European Technology Platforms, Joint Technology Initiatives, and – last but not least – the Flagship Initiative "Innovation Union". The EU does much to ensure the coherence and focus of national and European research and development programmes, esp. with demand-side measures such as public procurement, standardisation, and regulation. It has also brought forward the GIN – Global Innovation Networks – so that neither Europe nor its overseas partners significantly suffer from brain drain, but benefit from cross-continental cooperation and mutual learning.

Spotlight 2025
"If you feel that a community rules a whole industry– you're not crazy, you're just part of Innounity". Report from KölnerStadtAnzeiger, June 30, 2025

Cologne. The idea is not new. "Open Innovation" is a 20th century buzzword. But current developments in Cologne finally seem to make it reality. During annual "InnoUnity" conference, the largest such gathering of communities involved in idea generation, a new project was announced: the development of Intelligent Road Markings and Pavements.
It's not the topic that makes this project revolutionary, it is how the project evolved. In recent history, it was mostly businesses that initiated innovation projects, launched innovation contests and rewarded the best ideas. But the initiator of this particular project is neither a company nor a public institution; it is an innovation community itself.
Roger Flock, speaker of the EU Node of InnoUnity, explains "We had never expected anything like this. At the beginning, we simply recognised the high market potential of intelligent road marking and pavement solutions. We saw this as a major opportunity and couldn't see why market research departments hadn't picked up this future business potential." So InnoUnity began to ask companies to put out tenders for innovation communities. Today, Mr Flock says, more than hundreds of companies from different sectors have contacted InnoUnity, seeking for solutions to their specific needs and business units. He considers this to be the first time the entire community is

collaborating on a single project. “All of a sudden, demand for creativity skills in our communities skyrocketed.”
Where does the business community’s interest come from? Professor Born, Managing Director of Goolyota Corp. and winner of prestigious awards for his company’s innovativeness, sums it up: “Today, the strength of a community, especially of InnoUnity should not be underestimated. Many companies lost their ability to come up with groundbreaking innovations years ago. Now the community sets the pace. If there is evidence of this kind of momentum, entrepreneurs know that they have to become part of it, that they have to participate and to collaborate – or they will be left behind. If there is a way to get things done in the future, this is the way.”

The economic imperative

Europe has regained and retained its competitiveness, but this has come at a price. With everything subjected to a purely economic rationale, non-monetary aspects often are neglected. Sustainability may remain on the top of the political agenda, yet it has been downgraded to mere ideology, to which lip service is paid, but something that is disregarded in everyday life. Sure, the EU may continue to promote the transition to renewable energy and adhere to CO_2 trading schemes, but all measures taken remain half-hearted, short-sighted, and non-systemic. There are some innovative solutions, e.g. carbon capture and storage in bio-systems and minerals, but these are temporary efforts and isolated solutions – and some environmentalists argue that they ultimately extend our dependency on fossil fuels. In principle, European societies have implicitly decided to employ only technology fixes for all environmental and resource problems and to retain their lifestyle. – “We can do it” with innovations!

Another dark side is what is often referred to as “acceleration”. Many, in particular the elderly, find themselves outpaced by innovation. New communication devices, new kinds of food, new medical treatments, new means of transportation, new ways to pay for goods or services, in other words: there is too much newness. Most elderly feel disconnected; they increasingly lose their links to the past, to their roots, to their region. Old people just feel cut off. Most schemes to integrate them into innovation processes fail; life-long learning is more of a duty than an opportunity. Even among young people, many feel challenged by a life of constant change. Politicians discuss “flexicurity”, e. g. flexibility in the market for researchers with security for the individuals. In fact, however, the security side remains underdeveloped, and many suffer from burnout syndromes…

As a whole, Europe has gained a lot in 2025; thanks to its renewed spirit of creativity and innovation. Unaware of quoting Shelley, observers from other continents sometimes even invoke the metaphor of “Prometheus Unbound”.

Spotlight 2025
A trip to the “Rapid Fabrication Land” in Lyon, France. Report from Christian-Jaque Beauchamp, self-styled DIY-enthusiast from Charleroi, Wallonia.

I can’t tell you how long I had been waiting for this special moment. It was a dream come true. All my colleagues from the DIY-club in Charleroi had already visited this holy grail of every single DIY-enthusiast in the world. To me and my colleagues, this place is so important….it is like

Mecca to the Muslims. Last Friday, finally, in the very early morning hours my family and I packed our van, entered the address in the navigation system and hit the road. Destination: Rapid Fabrication Land. Distance: 636 kilometres. Pulse: 180 bpm. Some 7 hours on the highway and a short stop at a mustard shop in Dijon later (my son would kill for mustard) we finally arrived at the pearly gates of the "Rapid Fabrication Land". The park was originally built by GlobFab United, the world's largest manufacturer of fabbing systems. It was not supposed to be a public service: they reserved to commercialise the "fab-ulous" stuff fabbed in the park area. Before entering the park we had a short stop at the "FabVille" to drop off our baggage and check our rooms. The "FabVille" is the park's own hotel complex holiday homes solely created by the latest version of the world's largest 3D printer, the "FabZilla 4.2", one of the many attractions one can explore in the park. Having paid the entrance fee, we received a map of the park and headed to the first station of our visit, the CAD-Land. The pyramid-shaped buildings are located in a pleasant park area and surrounded by monumental statues of previous winners of the annual European CAD championships. Inside the buildings are some 100 terminals with the latest state-of-the-art computer systems and CAD-software applications. There is even a CAD-area for kids, which quite reminded me of the kids' corner of Ronald McDonald ;). While my wife and I jointly designed new luggage racks for our pedelecs, our son Francois designed a mustard mill (I told you, he is crazy for mustard). The great thing about the park is how the areas are interconnected. Our designs were automatically sent to the Fab-O-Universe, the park's fabbing area. Here, you can find the world's largest collection fabbers. Our designs of the luggage racks and the mustard mill were printed by the FabFox 3.3, one of the most powerful small-scale fabbers ever built. After we picked up our new printed acquisitions we went to the restaurant to close this wonderful day with a dinner….Well, at this point I had actually planned to tell you about our great experience at the Virtual Simulation Paradise and our visit at the "Fast-Fab – Fast Waste-Centre", a kind of museum where you can find an exhibition of all the useless stuff that had been designed and thrown away by their makers, but unfortunately we had to leave early on Saturday morning. My son was sick, and guess why…he had really eaten the entire can of mustard we had bought in Dijon…

Basic Impacts

Positive Impacts

- Increasing business opportunities and sales potential for European companies with high innovation rates.
- Public budgets recover as tax revenues increase.
- Innovative people, in particular of younger generations, find excellent conditions for sharing and develop ideas.

Negative Impacts

- Older Europeans feel increasingly "cut off" as life-long learning concepts bring little help.
- Increasing risks for small and medium-sized companies with insufficient capacities for generating high numbers of innovative products and services.
- Negative environmental impacts as the wasting of resources continues and awareness of CO_2emissions remains insufficient. No change in lifestyles and lack of shift towards sustainable consumption patterns.

Main Milestones: A Short Roadmap

2010 European population shrinks, high public debt; increasing awareness of the demographic challenge.
European Union and member states effectively pursue an agenda of innovation and competitiveness.

2015 Dramatic lack of young and skilled workforce. Increasing number of joint vocational training programs.
Companies recognize the importance of users and communities as sources of innovation and develop models for user integration and remuneration.
Open innovation as dominant mode of innovation, mostly conducted in large EU-networks.

2020 Notwithstanding strong innovation activities in all fields, increasing environmental problems (esp. climate change) and challenges of resource scarcity.
Some open and user-driven innovation processes are even detrimental to sustainability.

2025 Europe among the leading world regions in innovation.
First protests against the exploitation of peoples' ideas for purely economic reasons rather than for the benefit of society.

Related Innovation Visions

The following (consolidated) visions, which have been developed and discussed in the previous INFU work packages, are particular relevant and become mainstream within this scenario:

Open Source / Innocamp Society

Innovation Camps are becoming increasingly popular. Here, people come together for a limited time to solve specific innovation tasks. Often, the concept is linked to the open source society where a number of products and services are developed in close interaction among users.

Innovation camps are used by companies, the public sector, and the civil society to solve problems which range from coping with high-tech challenges to providing neighbourhood facilities. Most people join innovation camps regularly.

Laboratory Stores

What if stores were to become laboratories where companies and customers co-develop innovations? Laboratory Department Stores would offer theme worlds such as "Family Life" or "New Sports" and offer customers an opportunity to experience unreleased products, individualise existing goods, and get access to products which better fit their needs and desires.

Innovation on Request

What if companies generated most innovations on special request from user communities? Together with sociologists, designers, and developers, communities of users develop innovation scenarios and sell them to companies.

Scenaretto: Closed and Gated Innovation

Open innovation is fine, but closed is better. During the 2020s, many companies experienced this platitude the hard way. Most Eurostoxx companies experimented, for a while, with opening their innovation silos, with integrating citizens – and their ideas! – into corporate invention, research, and development processes and made much (marketing) ado about "user designed products". Ultimately, however, the detrimental effects of throwing away intellectual property became too much. Asian competitors quickly learned how to leech off open innovation processes and often were first on the global market with products developed in Europe. European IP initiatives were no real help, prosecution of infringements was slow and inefficient. As a consequence, companies shut their doors again. Of course, users – ordinary citizens and consumers – are still invited into the labs, but no longer have access to data and other processes. Even worse: The public labs and creativity parks established during the "innovative tens", applied the same "data protection" rules as private companies. Innovation may not have stopped; perhaps it is even more valued as before. But if any real or would-be innovator can claim to be a "bearer of secrets", innovation has lost much of its social charm and is now distinctly commercial in character.

5. Annex: Key Factors

Key Factor 1: Global Innovation Centres

This Key Factor describes global innovation centres. In the past, innovations came predominately from industrialised and highly developed world regions such as the United States and Japan, followed by the European Union. Today, new innovation clusters are on the rise, primarily in emerging regions such as China or India, and play an increasingly important role in the introduction and success of innovative products, services, and processes.

Projection 1: Emerging Countries Catch Up

The innovation gap between the industrialised and emerging countries shrinks. Innovation rates in industrialised countries stagnate on a relatively high level. Lagging behind the U.S. and Japan as the world's main innovation centres, Europe's contribution remains more or less on today's level. The emerging countries succeed in catching up as a result of extensive publicly funded research programs and huge investments in future technologies.

Projection 2: Rapid Shift to Emerging Countries

Emerging countries outperform industrialised countries. Failed innovation policies and a lack of forward thinking and effective R&D in private businesses lead to plummeting innovation rates in industrialised countries, particularly in Europe. As a consequence of an intensive development of personnel and technical capacities, innovation rates in emerging countries increase rapidly. The future innovation path is increasingly defined by emerging countries.

Projection 3: Status Quo

The innovation gap remains constant. Budget constraints lead to cutbacks in or stagnating public development funding for R&D and future technologies. Companies are highly risk-averse.

Projection 4: Stronger Position of Europe

As European governments realise a large number of incentive programs and provide extensive funds, many cross-national research programs are carried out and high investments made into high performance research infrastructures. Europe becomes the world's preeminent innovation centre. Emerging countries fail to improve their R&D infrastructures and do not take innovation projects to the next level.

Key Factor 2: Crossover Innovation

This key factor describes to which degree innovation processes will be characterised by cross-functionality, multidisciplinary or transdisciplinarity (with regard to disciplines such as, e.g., biology or social sciences), and multi-organisational (e.g. between different industries) cooperation. Also, on an individual level, the degree of diversity we will see in innovation teams. Furthermore, this key factor deals with the effectiveness of said crossover innovation processes.

Projection 1: Crossover Innovation at Its Best

A constantly increasing number of businesses, research facilities, and think tanks rely on multi-disciplinary innovation approaches in research and development. The number of all types of crossover, inter-, multi- and transdisciplinary innovation processes within the EU skyrockets. Their output exceeds that of comparable "non-multi-disciplinary" approaches; most common obstacles are overcome.

Projection 2: Inefficient Crossover Innovation

Even as the number of transdisciplinary and crossover innovation processes increases significantly within the EU, their results only seldom justify the greater efforts and expenditures. Inadequate communication, cultural misalignment, and unsolved legal issues are the most common reasons for failing projects.

Projection 3: Backlash against Crossover Innovation

The intensity and effectiveness of transdisciplinary and crossover innovation and product development processes within the EU drop below today's levels. Crossover partnerships remain limited to only a few industries or issues and the results are mostly not worth the extra effort (compared to traditional approaches).

Projection 4: Status Quo

Overall, the degree of crossover innovation patterns remains more or less on today's levels and is limited to specific innovative branches or collaborations. However, the results of crossover and transdisciplinary processes exceed that of traditional approaches.

Key Factor 3: Impact of Resource Scarcity and Environmental Problems

This key factor describes the extent to which the (limited) availability of natural resources and the severity of environmental problems (such as global warming) affect future patterns of manufacturing and consumption. In turn, these also impact on the underlying innovation processes.

Projection 1: Strong Impact: Global Rethinking

The growing scarcity of strategic resources and the increasing severity of environmental problems lead to a global change of course and a shift towards closed and efficient material loops. This attempt is promoted by growing sustainable consumption patterns. Some countries act as trailblazers, others follow their lead and also adopt sustainable values. Cradle-to-cradle design becomes the dominant paradigm.

Projection 2: Low Impact: Global Waste

Resource supply constraints neither affect consumption patterns nor do they impact on product and services design. Environmental problems are tackled mainly by end-of-pipe solutions. Global production is characterised by an extensive exploitation of natural resources, ignoring the future needs of coming generations.

Projection 3: Different Impacts: Regional Rethinking

How product and service design is rethought differs from region to region, in parts a result of differences in the geographical distribution and concentration of scarce resources and/or environmental problems. This concerns, for instance, scarce materials such as copper, lithium, or cobalt and rare earth materials such as neodymium. Countries with high depos-

its of such materials tend to retain classic production patterns, while others strive to realise alternative concepts.

Key Factor 4: Sustainability and System Thinking

This key factor describes the extent to which the concept of sustainability impacts economic, social, political, and innovation-related decision-making and behaviour within the EU. Furthermore, the factor concerns the concept of systemic thinking and illustrates how often sustainability-driven decisions are made and evaluated from a holistic and systemic perspective.

Projection 1: Holistic Perspective on Sustainability

In the European Union, the concept of sustainability becomes the dominant paradigm of decision making. Society and economy extensively transform and adapt their processes. Sustainability criteria are used to evaluate almost all decisions prior to implementation. Here, a holistic perspective is used to assess sustainability which takes into account as many systemic dynamics and consequences as possible.

Projection 2: No One Cares

The concept of sustainability fails to achieve a dominant position. Rather, stakeholders lose interest and stop pressuring businesses and politicians to change processes and make sustainability criteria a part of decision making. As a consequence, no systemic perspective emerges.

Projection 3: Sustainability Mistaken

In the European Union, the concept of sustainability is accepted and adopted as the leading paradigm for all activities and decision-making. Sustainability becomes a kind of ideology. Sustainability criteria are just as soon used to evaluate projects as are economic ones. However, this extensive use occurs without systemic thinking. Sustainability evaluations remain limited in scope. As a result, many well-intentioned new ideas exacerbate the problems their inventors were hoping to address, as they do not take into account possible negative impacts in other areas or in other ways. Many measures taken in the name of sustainability actually work against it.

Key Factor 5: Societies' Innovation Capability

This key factor concerns the ability of Europe's society to innovate. The level of innovation capability is seen in relation to today's level and that of other world regions. Key influences are social conditions and the way major challenges, which result from demographic change and changing social conditions are mastered – e.g. to what extent the elderly and young people are included in innovation processes, and how their potential is utilised.

Projection 1: Life-Long Innovation

People may be older on average and yes, there are more people above 60 than young people of 20 or less. But who cares? Innovativeness is not an issue of someone's age, rather a question of attitude. Europe's society has mastered the challenges of demographic change. Life-long-learning is the magic bullet and both young and old people play a part in the innovation process. The social innovation climate is favourable.

Projection 2: Innovation Gap

Europe's innovation capacity is significantly reduced. As societies age, their innovativeness declines, as even the well-educated younger generations are unable to compensate for the lower innovation efforts of most elderly. The education system has been successfully reformed to boost of the youth. However, older people still have to do without appropriate life-long-learning offers – and, more importantly, lack the willingness to innovate! Europe is characterised by a worsening social innovation climate.

Projection 3: Young Pay the Bill

Europe's capability for innovation has almost completely disappeared. The share of Europe's financial resources spent on healthcare services and social benefits keeps growing. Neither elderly nor youths receive the educational training necessary to improve their innovation capacity. The most talented people leave Europe, as they feel that they have to foot the bill of an ageing population and ailing system.

Key Factor 6: Peoples' Inno-volvement

This key factor describes the degree to which European citizens participate in innovation processes, and their willingness to do so. Their level of "Inno-volvement" depends to a large degree on both their motivations and on the availability of innovation-encouraging and, in particular, innovation-enabling tools and methods. The latter consist chiefly of specific innovation techniques.

Projection 1: Unleashing the Creative Spirit

Europeans wish to innovate and are highly enthusiastic about innovation processes, either within existing organisations, as independent entrepreneurs, or in the social sphere. Simultaneously, they operate in the best possible conditions. Companies provide the necessary resources and tools, such as time off for innovation, training, labs, and creativity workshops and adapt their corporate structures. Local governments are also committed and facilitate the establishment of public and private innovation spaces. The European potential of creativity is largely utilised.

Projection 2: Wanted: Innovators

No matter what companies and local governments do to motivate people to innovate and field their ideas, most refuse to participate or to take the entrepreneurial or social risk. Most people feel that it is not worth to take the extra workload or risk failure. Even large-scale encouraging campaigns fail.

Projection 3: Wasted Potential

Many Europeans would like to contribute, take part in innovation processes, or to start independent innovation projects. However, they lack urgently needed resources, a reliable and supportive regulatory framework, tools and infrastructures, in particular networks and communities to cooperate with.

Projection 4: Innovation Fatigue

There is no real interested in boosting the people's involvement in innovation processes. People exhibit strong innovation fatigue – innovation has lost its positive connotation and is increasingly considered an undesired burden, something that results in unnecessary disturbances and makes difficult things even more difficult. Companies feel that they are better off if they limit the number of people involved in innovation processes and voluntarily abandon all attempts to do the opposite.

Key Factor 7: Mediators of Innovation

This key factor deals with the main mediators of innovations and describes the social groups, which have the greatest influence on the innovation landscape. In public perception and common management literature, innovations are considered a somewhat exclusive result of commercial activities. There are, however, other kinds of innovations, in particular social and process innovations that originate outside the business sphere. They may also lead to new concepts and products and services provided by companies and social groups. In this context, customer groups, NGOs, citizens, local and central governments, small and big business, as well as transnational bodies can be mediators and organise the innovation process.

Projection 1: Society-Based Innovation

Social communities and users are emerging as an important source for innovations of all kinds. Groups of citizens invent new models for living together, for organising communities and for democratic participation. Additionally, users of products and services publish ideas and concepts and jointly refine them in user communities and social networks. Main drivers are latest developments in regulating IPR, the omnipresence of digital information, improvements in cross-disciplinary tools, and dissatisfaction with existing solutions.

Projection 2: State-Moderated Innovation

Governments and transnational decision-making bodies progressively influence or even determine social innovations and technology development programs. Main drivers for this shift are growing demands for systemic and coordinated approaches. Business enterprises are occasionally even forced to conduct R&D in specific fields. Social innovations are encouraged, fostered, and, to a degree, controlled by national and EU regulation.

Projection 3: Big-Business-Driven Innovation

Internal R&D departments of SMEs and major companies dominate the development of new products and services. Traditional market research are used to obtain customer demands for product design and functionalities. Social fragmentation and individualism mean that social innovations play a minor role.

Projection 4: Locally-Originated Innovation

Persistent urbanisation and the dynamic growth of metropolitan areas drive the demand for solutions of urban issues. With national governments failing to put in place a suitable framework, municipalities and neighbourhoods take matters in their own hands and fill in the gap. In learning and exchange processes, municipal institutions and local stakeholders jointly develop new ideas for managing the growing challenges.

Projection 5: Unmediated Innovation

Neither companies nor governments or societal groups take on responsibility as the main mediators and organisers of innovation. Each group refers to and points to the others. There is a lack of commitment to and motivation for innovation.

Key Factor 8: Innovation Facilitating Technologies

This key factor concerns the diffusion of innovation facilitating technologies. Relevant technologies support and facilitate the effective implementation of innovation activities along all steps of innovation processes, from idea generation and evaluation to concept development and finally market launch. The degree of diffusion primarily depends on price, availability, effectiveness, and operability.

Projection 1: Rapid & Widespread Diffusion

A growing number of companies focus on developing and commercialising facilitation technologies, such as augmented reality systems, next generation data mining tools, and high performance digital fabricators. Relevant technologies are available at low prices and are characterised by high effectiveness. They diffuse rapidly along business actors, user communities, and individuals.

Projection 2: Slow Diffusion

Only a small number of companies are specialised in producing facilitating technologies. No major technological breakthroughs are achieved. Only few effectively working solutions exist on the market at high prices. Technologies are mainly used in the R&D departments of major companies and specific research organisations. Small and medium-sized enterprises and individuals are unable to afford them.

Projection 3: No Diffusion

Available technologies are characterised by high prices, low quality, and low effectiveness. Their use does not provide worthwhile support and additional value to innovation processes. Uptake of existing technologies is low, both among business actors such as companies and research institutions and among communities and individuals.

Key Factor 9: Welfare and Growth Paradigm

This key factor refers to the future's prevailing growth and welfare paradigm. The traditional, "pure" growth paradigm is exclusively based on one quantitative indicator to measure social welfare – the gross domestic product. Social welfare is merely linked to material prosperity and monetary value. Current debates involve the consideration of additional qualitative indicators as well, or a general reorientation towards non-material values.

Projection 1: Gradual Paradigm Change

As sustainability aspects and non-monetary values gain in importance, the growth and welfare paradigm also gradually changes. Social welfare is no longer exclusively measured by the gross domestic product – additional "human development" indicators such as environmental pollution, life expectancy, achieved educational levels, or even traffic accidents and crime rates are increasingly taken into account and gain weight. Business activities are progressively more driven by stakeholder values and other factors of sustainability. As values and standards change, ideas, concepts, and processes are evaluated differently.

Projection 2: Traditional Paradigm Prevails

The gross domestic product remains the predominant indicator for social welfare and economic growth. Sustainability aspects such as social and ecological impacts are of minor importance. Shareholder value and corporate growth are the key objectives for business activities. Innovations are evaluated under those conditions.