European Commission

2035

Paths towards a sustainable EU economy

Sustainable transitions and the potential of eco-innovation for jobs and economic development in EU eco-industries 2035

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2035: Paths towards a sustainable EU economy

OBJECTIVES OF THE FORESIGHT STUDY

- Identify relevant trends and drivers
- Develop long-term visions for 'eco-industries' and more sustainable futures (Horizon 2035)
- Highlight implications for EU policies and research

SCOPE

The scope of this foresight study implies that 'eco-industries' are not a specific group of industry sectors but rather a stream of business activities across and within the entire industrial segment of society, encompassing:

- ***'Green industries'*** – environmental industries;
- ***'Industry greening'*** – other industries adopting eco-innovations;
- ***'Eco-innovative solution providers'*** – R&D, new business models, organisational/social innovation, integrators.

PROCESS

This foresight study followed a classic scenario-building methodology and used a mix of different foresight techniques that were:

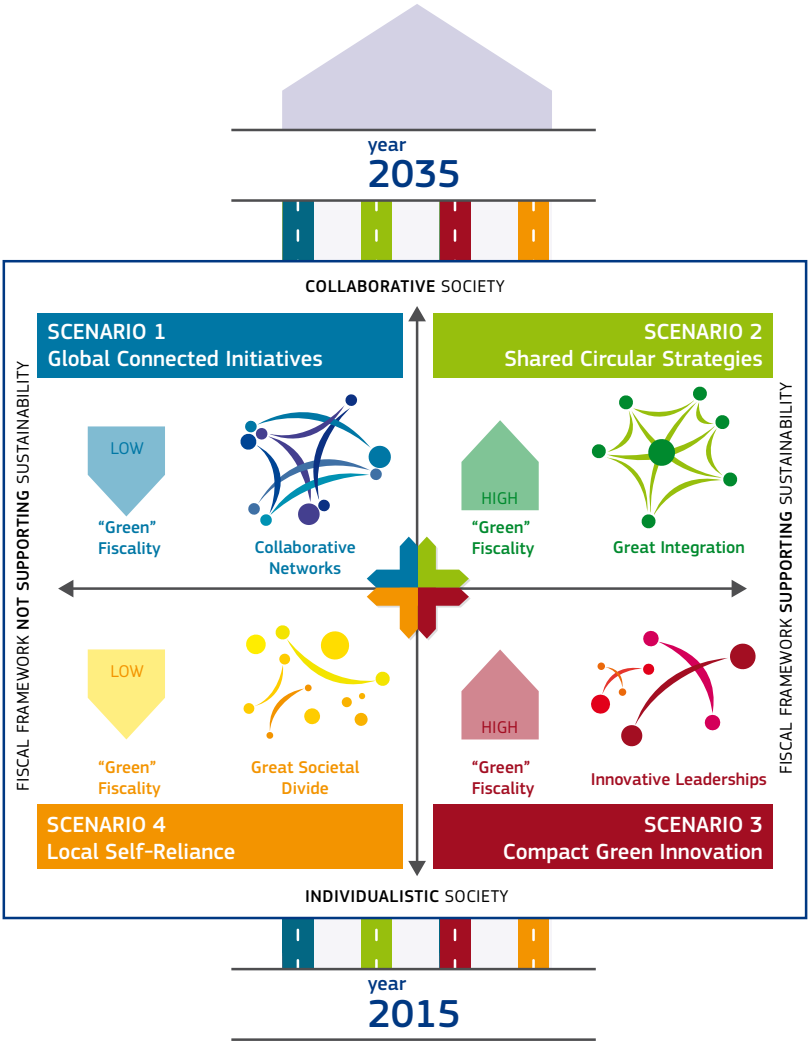
- Participatory and creative;
- Multidisciplinary;
- Based on the principle that current problems cannot be well understood if reduced to one dimension only;
- Geared towards generating systemic understanding;
- Aiming at generating insights into the dynamics of change, future challenges and options.

In the course of five workshops, a scenario logic, a set of four scenarios and four corresponding narratives, and a serious game (the JRC Scenario Exploration System) were developed. Valuable input was also gathered on a range of relevant policy issues, and under each scenario a comparative analysis of eco-industries was carried out.

This summary only gives an overview of the scenarios, a summary of the analysis for eco-industries, key points on the policy issues and an introduction to the narratives.

See the full report at http://europa.eu/!Dq36XP

OVERVIEW OF SCENARIOS



CONTEXT

"Europe needs a narrative that shows the possibilities for reducing global emissions, fighting climate change locally, securing energy supplies, promoting wider socio-economic interests and increasing competitiveness – all at the same time."

Annika Ahtonen-Hedberg | European Policy Centre

Comment on the EU 2030 framework on climate and energy, Brussels, January 2014

KEY MESSAGES

Throughout the scenario development, the expert panel expressed a number of key ideas:

- **Policy matters**
  Clear and stable policy directions can play a very significant role in managing change and steering the evolution of both society and the economy.

- **A changing world requires new forms of governance**
  The very fast pace of societal, economic (e.g. service-based business models) and technological change demands an adaptation of the current modes of governance.

- **Green taxation is a potent driver**
  Shifting to green fiscal models is a very powerful, systemic way to accelerate the transition to a sustainable economy. Such a shift would facilitate the introduction of new business models and potentially have a very favourable impact on employment for everyone in Europe.

- **New metrics are needed**
  Measuring activity through GDP is not enough when managing a sustainable economy. Other indicators are needed to develop an integrated view of the life cycles (of products, of business units, etc.) and value chains.

- **We need new financial models and new ways to invest**
  For a sustainable transition to be successful, investment models and financial rewards must be coherent with the whole range of new metrics required by a sustainable economy.

- **Education is essential**
  Education is the basis of societal values, environmental awareness, innovative capacity and other fundamental factors shaping society's future.

Back in the 1980s ...

SOPHIA March 2015,

... we were just kids. Clement lived in the terraced house over on Chestnut Street, Leonardo in the red-brick house near the park, and I was the girl from the apartment complex on the east side. Leila lived really far out but we were all in school together. Those were the days when we were learning and taking our first steps towards trying to make sense of the world.

Looking back on them today, the 80s were an exciting time. Stock markets in industrialised countries were setting new records. There were solutions for acid rain and the ozone hole. There was talk of the emergence of China, and poor countries were still poor. Eastern Europe and the Middle East were unstable, but little did we know how things would change! The fall of the Berlin Wall and in 1989, the setting up of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations ushered in a new era.

The 1990s, our teenage years started to bring out our true characters. This became obvious during the environmental science project we did in our last year at high school. Clement loved working with people and bringing them together! He pushed to elect a class committee to organise the collection of waste and old clothes from home. Paper, glass and metals could be recycled. Usable wood and plastic would be used to create art pieces and jewellery for our school art exhibition. We also repaired things and awarded a prize for the most creative use of waste.

Leo's interests focused on technology. He invented an irrigation system for a school rooftop greenhouse built from waste. Food waste was composted into fertiliser. His system really mobilised teachers and parents. He also tried to build a clothes recycling machine! I am sure Tekno, our science teacher, still remembers how his favourite jacket didn't survive!

Leila had an eye for business and luxury. To make some profit, she proposed that every month one class would sell leftover food from lunch at the school sport competitions. She sold sorted used metal and glass to local recyclers. She also organised sales at the school art exhibition! Leila wanted to use the money for a cool class trip. Her concept was very "we did the work, we should benefit" ... typical!

I wanted to tackle the problem from the core: reduce our consumption. Thanks to my image of "best in class", the director trusted me with data on how much office and food supplies our school consumed. I implemented a new weekly calendar system whereby students filled out their lunch requests: we succeeded while giving the students a say. I loved the responsibility!

It was clear that we were on different paths. The next millennia started with the burst of the dotcom bubble and the launch of the euro, followed in 2004 with a 'big bang' EU enlargement. By that time, two of us had finished university and the other two had started their professional life. Then came 2008 ... financial crisis, credit crunch, bank bailouts ... It was clear – our school days were well and truly over.

Read in the full report what Clement, Sophia, Leo and Leila became in 2035.

ELEMENTS COMMON TO THE FOUR SCENARIOS

The four scenarios were built around two drivers: societal values (individualistic or collaborative) and the fiscal framework (supportive of sustainability or not).

A set of key drivers and megatrends will affect all scenarios. By 2035, the global population will probably reach 8.6 billion, with an ageing population which is stable in Europe but growing strongly in Africa and parts of Asia. Worldwide, the number of consumers is expected to increase by 4 billion, mainly in emerging economies, resulting in strong demand for raw materials and energy. The first generation of 'digital natives', with their new approach to social contacts and mastery of digital technologies, will be in power. Global warming could very well have already reached 2°C, with an accompanying rise in sea level and damage to agriculture and infrastructure. Urbanisation will also continue unabated, leading to megacities in the developing world and larger mid-sized cities in Europe. All of this will happen in a context of continuing technological development (ICT, biotechnologies, materials, mobile technologies, sensors, etc.) that will lead to a hyper-connected world.




THIS IS THE BEGINNING OF FOUR STORIES ILLUSTRATING THE SCENARIOS

Who will be most successful in each scenario?





CENTRAL RAIL STATION

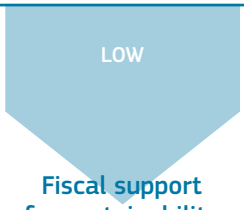
SCENARIO 1

MULTIPLE CONNECTED INITIATIVES

Collaborative networks

COLLABORATIVE society

European society has shifted from competitive to more collaborative values. Informed and empowered individuals self-organise through globally connected local initiatives. Social networks play a key role in supporting direct democracy. The sense of collective identity extends to the global village, but cooperation within Europe remains predominant for addressing societal challenges.



Fiscal support for sustainability

Fiscal framework NOT SUPPORTING SUSTAINABILITY

Societal awareness of environmental issues is strong. However, the urgency for national and European governments to cope with the financial crises of the 2010s prevented the evolution towards a strong green fiscal framework. As a result, total environmental tax revenues in EU Member States range from 4 % to 9 % of total tax revenues. This remains too low to have a significant impact on purchasing and investment behaviour.

COOPERATION 2.0

Disenchanted by centralised policy institutions and strongly connected by social media, a vibrant, informed and empowered civil society takes the lead in addressing societal, economic and environmental challenges.

A well-shared sense of common good fosters the evolution of individual and collective behaviour towards a more sustainable society, in spite of the fiscal system not delivering strong economic signals.

This trend has emerged in the context of a radical reshaping of the employment scene resulting from technological change. Many jobs in manufacturing have disappeared.

Local authorities and Euroregions are aligned with this movement through innovative policy-making and new funding mechanisms.

Cooperation fosters cooperation!

A bio-inspired technology, a local initiative and some collective action will help us make a giant step forward.

People want to collaborate, they just don't know how or on what. So we took the initiative to put these new mindsets to good use.

GETTING TO KNOW SCENARIO 1

Society

Moved by a deep sense of responsibility and solidarity, conscious and empowered citizens self-organise to address the social and environmental shortcomings of national and European policies. They routinely use social networks and collaborative platforms to launch strong social movements, create powerful influential groups, and to trigger bottom-up initiatives related to issues of sustainability and social inclusion. Social and ethical norms and values have evolved, leading to the mainstreaming of new modes of production and consumption based on sharing and open collaboration and creating ways to deal with ageing and population challenges. Free circulation of information and trust facilitate the broad dissemination of best practices and voluntary standards on all kinds of issues.

Policy

The role of national governments and traditional political parties has become weaker to the benefit of other levels of decision-making bodies. Subsidiarity has been redefined. Euroregions have become the most prominent actors as they allow decisions to be taken closer to the citizen. Policy-making processes are also more participatory with direct democracy starting to be more prominent. The EU level of governance is focusing more on global issues and on ensuring a minimum level of long-term coherence between all the scattered policy initiatives throughout Europe. International governance has been transformed, with a much more balanced distribution of powers between all continents.

Economy

Trust and reputation are key parameters for new business models, forcing companies to become more transparent. Corporate Social Responsibility (CSR) had never had such a high profile, and corporate reporting now routinely goes beyond financial data. Crowdfunding has emerged as a popular funding mechanism for innovative projects and research. Alternative currencies have also found fertile ground in which to develop. Legal working times have been reduced, work contracts

are more flexible, and many non-commercial activities have developed. Formal jobs rely on highly skilled, creative profiles. Many cooperatives and peer-to-peer production platforms have emerged for a wide range of purposes: banking, do-it-yourself material, transport, food production, energy, etc. Alternative ways to fund pensions have had to be devised in view of the ageing population.

Technology

Over the last 30 years, the transformative role of ICT and the Internet of Things has accelerated the socio-economic evolution within European society. Strong concerns around ethical and cybersecurity issues, especially related to privacy, surveillance and identity, have arisen throughout society in line with the development of artificial intelligence and robotics. Many public ethical debates are being organised. European citizens already have the right for self-determined use of all their personal data. Governance of the internet is now truly international, with much more internet infrastructure outside the United States. Technology is increasingly open-source, bio-based, and socially-oriented. Social preferences drive the selection of successful technological innovations, implemented thanks to new financial instruments geared towards the long term.

Environment

Resource and energy efficiency have improved thanks to a change in behaviour and the combination of high public, private and crowdfunded investments in R&D over the last 25 years. Smart resource management is a strong focus of environmental policies. New urban planning and industrial symbioses make it easier to close material and energy loops. Planned obsolescence is becoming less and less acceptable to society. The 'throw-away' culture has receded. Products are either being shared, replaced by services, or repaired by Fab Labs, and local manufacturers are recovering more and more materials. Environmental and health policies are being designed jointly, leading to a general improvement in public health.

ECO-INDUSTRIES IN SCENARIO 1

Eco-innovation

In the absence of any 'green' fiscal framework, strong environmental awareness throughout society fosters more open and scattered eco-innovation patterns coming from a wide range of actors (individual makers, community-based fab labs, SMEs, large companies, public research institutions, etc.). Enabled by local innovation networks and new funding schemes, social innovation is at the root of most initiatives contributing to the transition towards a more sustainable economy.

Dynamics

Pulled by a strong demand, eco-industries are flourishing on an ad-hoc and local/regional basis:

- ☐ Development of regional eco-strategies and industrial symbioses;
- ☐ Rise of crowdfunding schemes and people-private-public partnerships (PPPP);
- ☐ Development of group-based sustainability and self-sufficiency initiatives at local level;
- ☐ Greater merging of environmental and health-related activities.

Industrial landscape

The overall industrial landscape is fragmented geographically and heterogeneous in terms of size of companies and the origin of investments (i.e. public vs. private vs. crowd). Business is very demand-driven and service-oriented. Society stimulates businesses to develop CSR schemes.

POLICY RECOMMENDATIONS TO PUSH SCENARIO 1 TOWARDS SUSTAINABILITY

- **Research and Innovation**
  prioritise policy interventions in a very heterogeneous European eco-innovation landscape, foster open innovation and civic science, and create synergies between many islands of actors, fields and local initiatives;

- **New business models**
  foster clusters of activities and partnerships along the value chain (e.g. through green public procurement), and promote a new European business culture to develop sustainable modes of production and consumption;

- **Education**
  support new, inclusive educational models and lifelong learning opportunities to raise environmental awareness and help build consensus across European society on long-term visions for sustainability, and align skills and talents with demand;

- **Transparency**
  establish and use transparent governance models to ensure trust between governments, local authorities, companies and citizens, in particular in the field of natural resource management and new business models;

- **Regulation**
  engage citizens in the design, implementation, and evaluation of outcome-driven regulation based on a shared prioritisation between all environment-related issues; ensure transparency of corporate sustainability performance;

- **Employment**
  merge education, employment and social security policies to foster the creation of new green and social job opportunities for young and unemployed people.


CENTRAL RAIL STATION

SCENARIO 2

SHARED CIRCULAR STRATEGIES

Greater integration

HIGH

Fiscal support for sustainability

COLLABORATIVE society

Beyond the family, people come together in strong, cohesive groups according to geographical, professional or opinion affinities. Contrary to the support and advantages individuals derive from these groups is the pressure to be loyal alongside some restrictions on individual freedom.

Fiscal framework SUPPORTING SUSTAINABILITY

The fiscal framework delivers market signals that stimulate the development of a resource-efficient, service-based and sharing society pushing the economy towards sustainability. At least 50 % of total tax receipts come from green taxes (< 9 % on average, EU 2014). Taxes on labour or on income from labour are relatively low.

TAKING RESPONSIBILITY

A string of devastating weather events led EU policy-makers to develop long-term visions on sustainable development and boosted the collaborative ethos in society. Solidarity mechanisms remain strong. Social innovation has transformed European societies radically.

Strong policies are in place to reduce resource and energy use and to develop services. Green markets are mature. Public authorities are investing in large infrastructure projects for sustainable development. Integration of systems across society and the economy has made Europe very resource efficient. Industrial symbioses are the norm. Cost-reduction advantages have led large companies to push new sustainable business models worldwide.

A smart systems approach, careful planning, collective action and green public investments helped us get on the path towards sustainability.

People like their daily life to be convenient, so we encourage services.

Shared use is a great way to green our society!

GETTING TO KNOW SCENARIO 2

Society

Strong and widely shared values structure the way people behave. Thanks to developments in information technologies, people are well informed, can mobilise quickly and engage easily with authorities and private actors. The realisation that recent environmental disasters are a consequence of past development models and that solidarity is humankind's best chance for long-term survival has encouraged European citizens to give a broad mandate to the EU to rethink the economy. Openness and sharing are the new mottos; Euroscepticism has receded. Strong social movements, some global, push for ever-lower environmental impacts from human activities, promote sharing and collaboration, demand sustainable procurement, and request 'circular products'. People are used to sharing.

Policy

Strong governance has placed resilience and sustainability at the core of EU policy development, with equal importance being given to economic and societal aspects. Policy-makers have set long-term visions. The EU Treaty has evolved. Subsidiarity has been redefined and bold European fiscal measures have been taken to address sustainability and tackle unemployment. Embracing green taxation has given the EU a new clout on the international scene, unlocking further negotiations on greenhouse gas emissions and a new round of trade talks. The EU has kept its socio-economic model, and now has an import/export regulation system. Green public procurement is the norm. The EU has an active migration policy. State systems are both optimised and flexible. The functions of the state are transparent and subject to regular quality reviews. Citizens put a lot of trust in this e-government. Mainstream political parties have embraced new collaborative solutions in response to successful social initiatives.

Economy

The EU economy is adapting very quickly to the dynamic 'green' tax system. The EU has strategically pulled out of existing free-trade agreements. The consumer market has changed. Many companies now sell services deriving from their traditional products. To a large extent, production and consumption in the EU is local, helped by lower taxes on labour. The EU is much less dependent on international markets for raw materials and hydrocarbons, resulting in both economic and geopolitical benefits. Across the board, financial data are being complemented by comprehensive social and environmental accounts. With their strong tradition in forward planning and risk taking, entrepreneurial companies have played a major role in exploiting economic incentives, influencing public and private investment decisions. The EU is clearly on its way towards a circular economy.

Environment

Environmental protection is a core concern for any political and commercial decision. Governments are investing heavily in large infrastructure systems to protect the environment and solve complex problems. The mining of old waste, eco-design and new technologies have made all activities much more environmentally benign and have led to the cleaning up of many black spots across the EU.

Technology

Over previous decades, large public investments in R&D coupled with the 'green' fiscal framework and new standards have not only yielded many technological innovations in biotechnologies, new materials and information technologies, but have also spurred private actors to make significant progress on material and energy efficiency. Many systems have become 'smart' and integrated, feeding 'big data'.

ECO-INDUSTRIES IN SCENARIO 2

Eco-innovation

All sectors of the economy are operating within a framework very favourable to eco-innovation with respect to technological and regulatory developments, economic incentives and social acceptance. Investments in infrastructure adaptation and development make for a swift transition to a sustainable economy. Local specificities give rise to adapted solutions.

Dynamics

As both economic and social conditions are very favourable, the transformation of the EU economy towards sustainable development is progressing swiftly:

- ☐ Policy development is voluntary, possibly driven by an existential threat;
- ☐ Legislation and standards are favourable to energy and resource efficiency;
- ☐ Public R&D investments and green procurement reinforce the dynamics.

Industrial landscape

Resource efficiency and closed-loop approaches, supported by public action, are stimulating the rapid transformation of the economic and industrial landscapes:

- ☐ There are many public-private partnerships;
- ☐ Large companies operate in close cooperation with local actors;
- ☐ Manufacturing is decentralised, often in industrial symbioses;
- ☐ The economy is servicised to a large extent;
- ☐ Large cooperative organisations focus on environmental and social sustainability.

POLICY RECOMMENDATIONS TO PUSH SCENARIO 2 TOWARDS SUSTAINABILITY

- **Research and innovation**
  put a strong focus on resources and energy efficiency to wean the EU away from non-renewable resources; investigate the dynamics of renewable resources;

- **Natural resources management**
  take a transboundary eco-system governance approach that values genetic biodiversity and delivers signals to reduce the use of resources to fit within the limits of environmental sustainability; tax the consumption of primary resources;

- **Education**
  give education a more long-term, sustainability-oriented outlook while making it adaptable to fast-changing technologies and circumstances; educate and train people both in the skills needed for a green economy and in adaptability;

- **New business models**
  make public financial support and new legal arrangements available to 'green' start-ups and help businesses switch to service-based and 'circular' business models;

- **Systems integration**
  launch programmes to support systemic approaches to the greening of the economy, raise efficiency gains, and improve resilience (e.g. smart grids, industrial symbioses);

- **Employment**
  lower taxes on labour further, promote green and service-oriented jobs, address the green skills gap, and stimulate entrepreneurship.


CENTRAL RAIL STATION
30
30

SCENARIO 3
COMPACT GREEN INNOVATION

Innovative leadership

INDIVIDUALISTIC society

Personal choice and advancement guide people's behaviour. Individuals are creative and entrepreneurial and many initiatives emerge bottom-up. They act responsibly towards the environment because it makes economic sense, but they do not engage much in social initiatives, and social safety nets are weaker than they were 20 years ago.

Fiscal framework SUPPORTING SUSTAINABILITY

The fiscal framework delivers market signals that stimulate the development of a technology-based resource-efficient economy. At least 50 % of total tax receipts come from green taxes (< 9 % on average, EU 2014). Taxes on labour or on income from labour are low.

GREEN-TECH ENTREPRENEURS

The weakening of social protection systems has made the digital natives creative, innovative and entrepreneurial. They respond to the new market signals by developing small businesses oriented towards services. Lower labour costs have turned the social sector into a large (mostly low-skilled) employer while higher taxes on resources have spurred innovation towards becoming frugal. As waste disposal is heavily taxed, recovery schemes also avoid costs.

This drive towards frugality has unleashed a new wave of green technological innovation in European industry which in turn is pushing the whole society towards sustainability. European companies are green and competitive but the new European society is experiencing high levels of inequality.

No greening without technology!

Private and public investments support technology, our green fiscal framework creates market demand and individual action is steadily taking us closer to sustainability...

People like choice, so i create products that are customised and repairable; good for my green bottom line!

GETTING TO KNOW SCENARIO 3

Society

The desire to be free to undertake and enjoy the benefits of one's own work has led to a 'live and let live' society in which people try to ensure that they and their family have the best-possible prospects. The education system is open to competition with many functions being privatised. Free education is limited, as is access to the highest levels of learning. There are strong elites, and trust in political parties and state functions is low. Behaving sustainably is a sound approach because it offers the best value for money and protection for future generations. People have a high mobilisation power when faced with real, engaging concerns.

Policy

Policy-making follows a socio-economic vision that addresses climate change and unemployment. With a green fiscal framework, taxes on resources are high while taxes on labour are low. Most other important issues affecting EU citizens are handled at local/domestic (relating to quality of life) or global level. International negotiations take place at EU level. Government is small and the state system is flexible.

Social spending is low, kept in check by pressure to keep public debts low. Transparency is paramount and tools are in place to monitor public spending, such as procurement and governmental operations. Development of infrastructure is limited to what makes economic sense and industrial symbioses, while initiatives for more sustainable cities depend on private interests.

Economy

On the internal market, the production of products and services inside the EU is competitive versus low-wage countries, due to high long-distance transport costs, high material efficiency and low labour costs. EU exports mainly consist of services

and high-added-value specialised equipment which is difficult to substitute. A global redistribution of manufacturing has reduced imports of manufactured goods in the EU with beneficial effects on the balance of payment. Rapid advances in robotics and IT have led to the disappearance of many middle-class jobs and most jobs in manufacturing, promoting highly skilled creative jobs and opening a large market for menial, low-paid jobs. Adaptability and flexibility are key, but training needs are often difficult to determine as technology is moving quickly. There is tension between global corporations and start-ups as innovation and independence are highly valued.

Environment

Environment and health protection is driven by people's desire to take care of their immediate living conditions and environment. A strong trend towards more resource efficiency, especially through technology, is mainly privately supported and driven by a need to maintain competitiveness in the context of high raw-material prices. All opportunities to make money from material recovery are seized upon: more urban mining, pressure to minimise waste, attempts to produce products that are both cheaper to make and to use. Some aspects of the circular economy are starting to appear, driven by prices.

Technology

In general, innovation and developments in technology are very well advanced, eco-friendly and frugal. The systemic effects are limited, and industry is focused on mass customisation as the high use of ICT has enabled tailor-made lifestyles. Service-oriented business models emerge when it makes economic sense, but the sharing business is small in an individualistic context. Most technological developments occur in the private sector, while green public procurement and green risk finance from banks are helping to overcome the 'valley of death', from innovation to market.

ECO-INDUSTRIES IN SCENARIO 3

Eco-innovation

The 'green' fiscal framework creates the market signals to which an individualistic society is reacting. Technological eco-innovation is stimulated by economic incentives. Individualistic lifestyles adapt and business models based on sharing only develop where there are strong financial incentives.

Dynamics

Industries are being transformed in response to changing market signals:

- ☐ The high taxation of fossil fuels and other scarce or dangerous resources is giving the market signals for innovation in efficiency and closing material loops as far as possible;
- ☐ The creative, innovative and entrepreneurial high-tech society is spurring new business models;
- ☐ Public R&D funding, green public procurement and risk-finance capital bring innovation to market;
- ☐ The internal market is driven by the desire for the ownership and consumption of green products.

Industrial landscape

Resource efficiency and private innovation, supported by public action, is transforming the industrial landscape piece by piece, even if systemic changes take time:

- ☐ There are many public-private partnerships;
- ☐ Large companies compete with, or try to buy, local sustainability initiatives and start-ups;
- ☐ Manufacturing is both global and decentralised, often in industrial symbioses;
- ☐ The economy produces green products and, where viable in the market, green services.

POLICY RECOMMENDATIONS TO PUSH SCENARIO 3 TOWARDS SUSTAINABILITY

- **Research and innovation**
  set a medium- to long-term vision and strategy, giving a systemic perspective to solve complex problems and ensure the focus is on sustainability;

- **Education**
  provide all stakeholders with knowledge about the opportunities offered by green fiscality and eco-entrepreneurialism; and hold governmental prize competitions to encourage the dissemination of ideas;

- **New business models**
  adjust the current policy framework to enable sustainable business models among start-ups and existing players in the transition from current activities;

- **Regulation**
  provide a stable regulatory environment with a long-term vision that can model markets for sustainability, to replace norms and behaviour;

- **Ethics**
  make reporting on social, environmental and economic impact mandatory for listed companies, to manage the shared and indirect effects and to guide society in the right direction;

- **Social protection**
  create a moral framework for capitalism, to redefine the role of business in society, ensuring that some wealth is redistributed; and support the creation of individual insurance systems.


CENTRAL RAIL STATION
CENTRAL TRADE EVENTS CENTRE

SCENARIO 4

Local Self-Reliance

Great societal divide

LOW

Fiscal support for sustainability

INDIVIDUALISTIC society

This is a pragmatic and flexible society in which people fend for themselves and have little interest in the provision or maintenance of public goods. Social protection systems are weak. Collective behaviour occurs when enforced by external factors or market signals. The entrepreneurial spirit is high. A sense of individual responsibility and work ethics remains which is helping to create a viable economy.

Fiscal framework NOT SUPPORTING SUSTAINABILITY

Because of a lack of political courage, the fiscal framework has remained unchanged since the 2010s and does not provide incentives to act sustainably. Labour costs remain high and the environment is bearing the cost of negligence. Resource prices are rising because of increased demand linked to greater global demand. Overall, public expenditure remains subdued.

ALL ON OUR OWN ...

Governance at EU and national levels is weak and powerful interest groups have created niches of influence. As average income levels have fallen, social protection systems have been eroded and the middle class has shrunk. As a result, inequalities have grown.

Information flows and transparency have continued to increase. Society is consumption-based, technologically advanced and business-driven. Multinational companies have grown larger and more diverse in their activities, making them powerful. Private initiatives, mainly opportunistic, have become major drivers of change. To a degree, technological progress has improved the resource efficiency of products, but the flow of raw materials across the economy is not being optimised.

Triggers for innovation are determined by immediate market potential. Eco-industries are oriented towards self-sufficiency and individual resilience.

An environmental charity visited us today, asking to check the green credentials of suppliers. Who cares as long as the price is right!

At the end of the day, business is business ...

Hard day today! But good business ... glad to be getting back to my quiet gated community. The city has become so restless and unsafe!

GETTING TO KNOW THE SCENARIO 4

Society

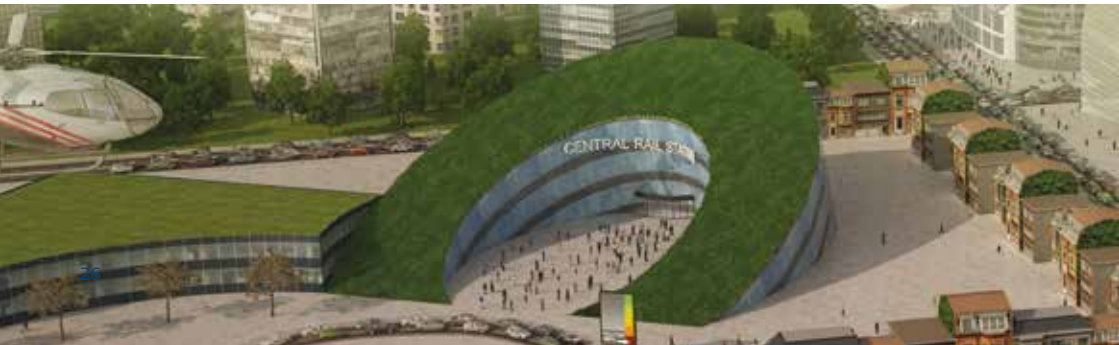
Europe has evolved into a primarily market-oriented, entrepreneur-driven, 'dog-eat-dog', competitive, high-risk society in which short-term economic considerations take precedence over environmental consciousness. Demand and behaviour are linked to market prices and the supply/demand balance. Many people now have a global outlook on the state of the environment. They identify themselves as citizens of the earth but they put their own well-being and their own environment first. There is little interest in devoting time to the community or investing in infrastructure.

Policy

The EU has lost a lot of influence and has become a modest player on the international scene. Rather than trying to reform central government, this generation has been keen to repatriate some powers from national governments to local and individual levels, thereby weakening centralised modes of governance. Powerful ICT tools and platforms have allowed referenda and direct democracy to develop, although this has not lead to coherent sets of policies. Decision-making is difficult.

Economy

Through the shrewd use of social media and money, powerful interest groups have created niches of influence, encroaching on areas previously within the public domain. Some of these are animated by multinational corporate interests, which provide social protection for their members. Trust is an issue. As banks tend to lend only to trusted parties, their lending practices remain timid, and alternative funding platforms are emerging (e.g. private investors, private equity, venture capitalists, and crowdfunding campaigns). Although this is creating new job opportunities, unemployment is high as the cost of labour remains high, especially when compared to ever-more capable robotic systems. Employment is shifting towards menial



services and creative jobs. The resource intensity of the European economy has declined to some extent as a result of R&D efforts and high raw-material prices, but the path to sustainability remains long.

Environment

The gradual increase in natural disruptions resulting from climate change has yet to generate truly catastrophic events, giving the impression that adaptation to and mitigation of climate change can be achieved with little effect on the way society and the economy operate. Competition between trading blocks and protectionist tendencies has prevented the easy optimisation of raw material flows in the global economy, thus hampering sustainable development. Resource efficiency can be characterised as opportunistic, with cherry-picking where possible, depending on market drivers.

Technology

Over the last 30 years, R&D has continued, especially in new materials, ICT, artificial intelligence, robotics and biotechnologies, and has had significant effects on employment. In 2035, all these sectors have made significant progress, leading to technologies that provide opportunities for small-scale eco-industries and innovative SMEs to create viable sustainable solutions. In the area of renewable energy and energy efficiency, 30 years of technological progress coupled with a lack of investment in infrastructure has led many people to go 'off-grid'. A backlash against giant wind turbines was followed by R&D efforts focused on individual-scale technologies. At the same time, continuous improvements have made photovoltaic and solar thermal technologies cheap. A fall in the reliability of the grid combined with increasingly frugal appliances and lighting technologies completed the circle. Overall, continuing technology development has transformed society into a high-tech, connected, flexible world.

ECO-INDUSTRIES IN SCENARIO 4

Eco-innovation

The general economic and societal contexts are not very favourable to systemic eco-innovation which occurs mainly to reduce one's own costs, whether individually or in companies, and to ensure one's own resilience.

Dynamics

The absence of a fiscal framework favourable to sustainable development in Europe does not prevent raw material prices from increasing due to global demand. Therefore:

- ☐ Some degree of material efficiency increase is achieved;
- ☐ People invest in individual resilience;
- ☐ There is more adaptation to climate change than mitigation;
- ☐ There is a drive towards short-term returns on investment.

Industrial landscape

Governments remain secondary players as regards shaping eco-industries. Competition for resources plays a larger role, together with cost cutting and resilience building.

- ☐ The private sector tends to dominate and public services are in retreat;
- ☐ Service-based business models only appear where there is a strong short-term business case;
- ☐ There is a preference for independence and little appetite for CSR.

POLICY RECOMMENDATIONS TO PUSH SCENARIO 4 TOWARDS SUSTAINABILITY

- **Research and innovation**
  be strategic and engage in public-private partnerships to stimulate private R&D to work on more-sustainable solutions and avoid overlaps;

- **Education**
  promote independence as well as multidisciplinary and long-term perspectives to ensure a basic skills set and core values in favour of sustainability;

- **New business models**
  encourage networking and coordination and highlight good examples to drive innovation towards sustainability; make sustainable finance available;

- **Natural resources management**
  set more stringent standards and develop good practices and certification schemes;

- **Regulation**
  implement a framework with strict liabilities and internalise externalities to guide/constrain individual and business behaviour (e.g. minimum recycled content);

- **Ethics**
  highlight role models/leaders and provide local sanctions, e.g. name and shame, to encourage more responsible individual and corporate behaviour and link it with profits/fines;

- **Governance**
  co-create multi-stakeholder platforms and coordinated approaches to encourage long-termism and CSR, and distribute responsibility, benefits and power.

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JRC Mission

As the Commission's in-house science service, the Joint Research Centre's mission is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle.

Working in close cooperation with policy Directorates-General, the JRC addresses key societal challenges while stimulating innovation through developing new methods, tools and standards, and sharing its know-how with the Member States, the scientific community and international partners.

Serving society
Stimulating innovation
Supporting legislation

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