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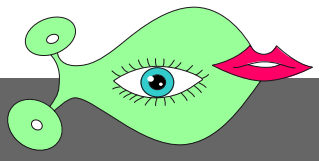
„The role of forward-looking activities for the governance of Grand Challenges”

Insights from the European Foresight Platform



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The role of forward-looking activities for the governance of Grand Challenges”

Insights from the European Foresight Platform

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FLA Anticipate Sustainable Development Challenges for Better Policy Support

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Abstract

This chapter explores current and forthcoming sustainable development challenges. By comparing the EU Sustainable Development Strategy (European Council, 2006), its related monitoring reports and the "Facing the future: time for the EU to meet global challenges" report (Boden et al., 2010), we can conclude that many future-oriented issues that have been identified thus far cover topics that are well reflected in sustainability indicator systems. Such comparisons can help policy making in terms of developing a better understanding of unsustainable trends and the respective needs for correction or prevention. Our findings also suggest that data collection could be enhanced to better monitor emerging issues that are currently not well covered by indicator systems. Today's sustainability indicator systems offer information on past and present states but provide limited support for understanding future developments. Combining sustainability monitoring with forward looking activities (FLA) could therefore enhance policy support in developing more adaptive and anticipatory approaches to better orient societal change towards sustainable development.

1 Introduction

Over the last few decades, the concept of sustainability has been high on the political agenda and in the business world. Forward looking activities (FLA) and sustainable development have been interlinked since the beginning of the 1970s, when the concept of sustainable development was first coined and supported by FLA (e.g., Meadows (1972) and various Interfuturs reports (1978). All these efforts culminated in the Brundtland report, in which sustainable development was introduced as a necessity to safeguard the interests of future generations (United Nations, 1987). Recently, Destatte (2010) stated that anticipatory intelligence could be a major tool in tackling sustainability as well as one of the best methods for preparing sustainable strategies and policies. Könnölä et al. (2011) noted that FLA are often conducted to anticipate major societal future challenges and provide support to current decision making.

In the study "Facing the future: time for the EU to meet global challenges" (Boden et al., 2010[1]), future issues and challenges for Europe and the world were identified. These are closely linked to the sustainable development indicators (SDIs) or to challenges mentioned in the EU Sustainable Development Strategy (SDS; European Council, 2006). However, the few gaps detected between these studies offer, together, a more comprehensive view of the likely challenges ahead. These are worth considering for a better alignment of policy design and implementation in order to enable the EU to maintain a continuous improvement in the quality of life for both current and future generations.

Both studies tackle similar fields of policy making but approach these fields from different perspectives when it comes to sustainability.

[1] JRC-IPTS prepared the study for the Bureau of European Policy Advisors (BEPA) of the European Commission.

The SDS is built upon a set of measurable indicators (SDI) that support the advance towards sustainable development on the basis of issues that can currently be monitored. However, these issues are considered in a fragmented way. Indicators that could be taken more or less independently are instead linked to specific policy fields.

The JRC-IPTS study considers not only issues that can be measured today (i.e., trends) but also brings into the scope of policy making those future issues (i.e., weak signals and wild cards) that are not yet factors in policy design but could be anticipated by tackling them today. Here, the main benefit is to show that different but interlinked policy fields ought to be aligned to enable policy to tackle current and future challenges (Könnölä et al., 2012).

Given the interplay of tendencies in economic decline, social instability and environmental depletion, any transition towards sustainable development faces a challenging task (Wiek et al., 2006; Rotmans et al., 2000). This chapter advocates that anticipatory intelligence is required to successfully cope with such complex challenges. This can be done through the application of a variety of FLA methods such as scenario development, content and consistency analysis, (Delphi) expert surveys, trend and structural analysis, impact analysis and brainstorming. These and other methods have proven to be valuable. Application of such methods can lead to a limited spectrum of plausible future system states, with the ability to successively integrate new insights at each stage (system analysis, future projection, consistency analysis), for instance.

Therefore, FLA that interact around a wide set of individual opinions, which might or might not be based on quantitative evidence, support the definition of adaptive strategies or policies. Hence, results cannot be expected overnight and the use of FLA cannot be a one-off exercise. It requires an ongoing and inclusive approach, one in which more attention is given to a process that should be in continual adaptation so that it remains sensitive to socio-economic changes along the way. By this means, futures research has a formal connection to the strategic planning process (Cagnin et al., 2008) and provides a framework for thoughtful discussion about moving toward sustainable development (Floyd and Zubevich, 2009).

Following a description of the methodologies and factors employed in both the SDS and the JRC-IPTS studies, a comparison between them is undertaken in this chapter. This comparison identifies common and complementary elements that offer a more robust support to policy making. Furthermore, the need to anticipate and adapt to future challenges is articulated and linked to the current monitoring of existing indicators. This effectively enables science and policy making to be in a stronger position to anticipate and address forthcoming societal challenges, and thus to correct or prevent unsustainable trends. Finally, a few policy recommendations are outlined to support policy design and implementation in the service of sustainable development.

2 Methodology

Sustainable development is a fundamental and overarching objective of the European Union, enshrined in the Treaty[2]. The EU Sustainable Development Strategy (SDS; European Council, 2006) sets out a coherent approach to how the EU will more effectively live up to its longstanding commitment to meet the challenges of sustainable development. It reaffirms the overall aim of achieving continuous improvement in the quality of life and well-being for present and future generations (European Commission, 2009). The Eurostat monitoring report, which is based on the EU set of sustainable development indicators (SDIs), provides an objective and statistical snapshot of the progress towards the goals and objectives of the EU Sustainable Development Strategy. It is published every two years and is intended to contribute to the biennial review of the implementation of the strategy by the European Council.

In an FLA study for the Bureau of European Policy Advisors (BEPA), Boden et al. (2010) identified a high number of issues that might shape the future of the EU and the world by 2025. These issues were distilled from an

[2] The Treaty is a binding agreement between EU member states and includes the setting of EU objectives.

extensive analytical review of more than 120 forward looking studies in six relevant policy areas: 1. demography, migration and health; 2. economy, trade and financial flows; 3. environment, energy, climate change and agriculture; 4. research, innovation and (e)-education; 5. (e)-governance and (e)-social cohesion; and 6. defence and security. Through an online survey, almost 400 issues were identified. These were complemented by issues from the FTA (2008) conference survey that aimed to identify trends, weak signals, persistent problems and wild cards, among others. The set of compiled issues was subsequently assessed by around 270 third-party experts according to three criteria: novelty, the probability of occurrence by 2025 and their policy relevance at the EU level (cf. Fig. 1 in which selected issues are positioned according to their probability and relevance ratings). Multi-criteria quantitative analysis (robust portfolio modelling) was used to prioritise the resulting issues (Brummer et al., 2008). The results of the literature review and the online assessment served as the basis for a further examination of the state of the world in 2025. This took place during a workshop with 19 international experts either in futures planning or in the specific policy fields considered in the study, and with 22 representatives from several Directorates General of the European Commission. Issues were clustered in an interdisciplinary way to describe novel crosscutting challenges that were considered to be relevant at the EU level and that required the alignment of policy measures.

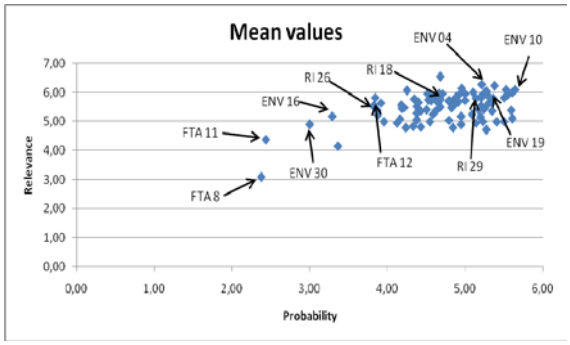

Figure 1. Issues highlighted by the mean-oriented analysis. ENV10 represents the possible impact of the energy transition on global economic development, for instance, and ENV04 represents climate impact. © JRC-IPTS

Hence, the main objectives of the expert workshop were to organise the findings of the literature review and the analysis of the online survey into clear overarching challenges and to prioritise the challenges that need to be tackled by the EU in order to secure a better future for all. At the end of the workshop, the challenges were jointly translated into policy recommendations.

As a wide variety of challenges related to the future of the world in 2025 emerged, three criteria were used to prioritise and select the most important ones to be tackled at the EU level:

- Urgency: Does the challenge provoke a likely impact that requires urgent action at the EU level?
- Tractability: Can solutions to challenges be identified and implemented, and does the EU have the institutional capacity to act upon this challenge?
- Impact: Are the actions to be taken by the EU expected to have a significant global positive effect?

This resulted in the identification of three main all-encompassing challenges as described in section 4. For the purposes of this chapter, those future-oriented challenges and the identified issues were subsequently compared with the main challenges for the EU listed in the SDS as well as with the corresponding SDIs. As a result of this comparison, the elements that complement each other in support of policy making were identified. In addition, evaluating the SDIs and the future issues that are similar to those identified in Boden et al. (2010) allows one to anticipate the point at which unsustainable trends need to be corrected. It also enables the identification of those currently favourable trends that might be at risk of deviating from a sustainable development path in the future.

In the following sections, after presenting the main challenges for the EU that are listed in the SDS and the corresponding SDIs, they will be compared to some of the results of the JRC-IPTS study. This comparison will reveal common elements that can provide clues about both their likely future development and how these studies complement each other.

3 Challenges within the EU Sustainable Development Strategy

The SDS deals with economic, environmental and social issues in an integrated way and lists the following seven key challenges: climate change and clean energy; sustainable transport; sustainable consumption and production; conservation and management of natural resources; public health; social inclusion, demography and migration; and global poverty.

The SDS also outlines crosscutting policies that contribute to the knowledge society, namely, education and training, and research and development. It advocates the use of economic instruments in implementing the strategy while calling for integrated financing mechanisms. It proposes actions towards communication and stakeholder involvement.

Moreover, the SDS requires the Commission to develop indicators at the appropriate level of detail to monitor progress toward meeting each particular challenge. A first set of Sustainable Development Indicators was adopted by the Commission in 2005 and continues to be reviewed by Eurostat every two years to adjust them to the SDS. They are presented in ten topic areas (cf. fig. 2) and used to monitor the EU SDS.

3.1 Measuring progress towards sustainable development

An evaluation of progress since 2000 that is based on the headline indicators presents a rather mixed picture (European Commission, 2011). No headline indicator shows clearly unfavourable changes – which suggests that the European Union has made some progress along the path towards sustainable development. However, when looking at the additional indicators within the individual topic areas of the EU SDI set, a number of clearly unfavourable changes persist, and the overall picture might be less positive than the impression given by looking at the headline indicators in isolation. In looking at the 11 headline indicators in Figure 2, it is apparent that progress has been mixed. There have been favourable developments in reducing the number of people at risk of poverty or social exclusion as well as in reducing the emissions of greenhouse gases and the consumption of renewable energy. However, there have been clearly unfavourable changes in the production of wealth from the use of natural resources, the employment of older workers, breaking the strong link between the energy consumed by transport and economic growth, the overexploitation of fish stocks and official development aid.

SDI theme	Headline indicator	EU-27 evaluation of change
Socioeconomic development	Real GDP per capita	
Sustainable consumption and production	Resource productivity	
Social inclusion	Risk of poverty or social exclusion (*)	
Demographic changes	Employment rate of older workers	
Public health	Life expectancy and healthy life years (**)	
Climate change and energy	Greenhouse gas emissions	
	Consumption of renewables (***)	
Sustainable transport	Energy consumption of transport relative to GDP	
Natural resources	Abundance of common birds (****)	
	Conservation of fish stocks	
Global partnership	Official Development Assistance	
Good governance	*[No headline indicator]*	:

(*) From 2005.
(**) From 2002.
(***) From 2006.
(****) EU aggregate based on 19 Member States.

Figure 2. Evaluation of changes (since 2000) © 2011 Eurostat

Moreover, given that nearly half of the headline indicators are moving in a moderately unfavourable direction (Figure 2), it cannot yet be concluded that the EU is on the path to sustainable development. Nevertheless, it should be borne in mind that the current situation has been complicated by the influence of the recent economic and financial crisis, the impact of which reaches far beyond the economy (European Commission, 2011b).

In mid-2011, when the 2011 monitoring report of the EU SDS was being finalised, the EU economy was still only showing slow growth. The impact of these events has been affecting many of the issues covered by the indicators presented in this report (European Commission, 2011).

3.2 Integrating sustainable development policy priorities

The overall aim of the SDS (European Council, 2006) is to 'achieve continuous improvement of quality of life both for current and for future generations, through the creation of sustainable communities able to manage and use resources efficiently and to tap the ecological and social innovation potential of the

economy, ensuring prosperity, environmental protection and social cohesion.' It also further specifies that 'to that end it promotes a dynamic economy with full employment and a high level of education, health protection, social and territorial cohesion and environmental protection in a peaceful and secure world, respecting cultural diversity.' The strategy therefore points to the different elements that influence human well-being, and the key challenges reflect these main components and associated threats. But these priorities cannot be considered separately since there are many inter-linkages between them, as illustrated in each of the topic overviews in the SDS monitoring report. These inter-linkages need to be taken into account to exploit the synergies between the different policy instruments that are used to implement EU policy and minimise trade-offs. The renewed strategy indeed recognises that one of the main challenges to sustainable development is the non-integrated approach to policy making.

Moreover, Botterhuis et al. (2010) note that indicators as signals of change should not be seen as independent short-term factors. Instead, there is a need to place them in a long-term perspective, thus allowing for a more valid interpretation of the signals involved.

4 SDS and Anticipatory Intelligence

Research is needed, and is underway, for a better understanding of the inter-linkages between the different issues that are relevant to sustainable development and in particular those which exist between the different priorities of the sustainable development strategy (SDS). In this respect, the JRC-IPTS study, which is presented in the following section, adds value by unlocking some of the inter-linkages between different policy fields that could be considered in alignment to help policy address effective measures that can enable a progressive leap (Cagnin, 2005) towards sustainability.

4.1 Facing the future: global challenges affecting the EU

The study "Facing the future: time for the EU to meet global challenges" carried out by the JRC-IPTS (Boden et al., 2010) provides a broad picture of the main global challenges, existing and emerging trends and how the EU could position itself to take an active role in shaping a response to them.

The benefit of this perspective is that these are all crosscutting challenges comprising several interesting issues that span different policy fields. It shows the realms in which the EU could be taking an active policy role to shape a positive global response. This is critical to ensure that its current citizens and future generations can enjoy the benefits of a world with sustainable economic growth and an improved quality of life for all.

To shape proper policy responses that address all the pressing current global challenges, especially the areas in which these can be divorced from one another, is clearly a demanding task. Moreover, the focus should be not only on the challenges that societies face today but to enable the anticipation of possible future critical challenges that can be effectively addressed before they occur, thus transforming them into opportunities rather than another pressing problem. The latter poses a further challenge to the ability of institutions to provide solutions in due time. Some form of FLA process is essential for assessing which areas are the most promising (Dearing, 1999) when formulating a response to the challenges of sustainable development.

Based on the criteria of urgency, tractability and impact (cf. section 2), three challenges with a global scope were prioritised. Their multiple dimensions and the inter-linkages between related policy fields are articulated in the sections below (Boden et al., 2010). The assessment of the type of EU actions needed to address these global challenges follows in a summarised form in section 4.1.4 (Boden et al., 2010).

4.1.1 *Changing the current ways in which essential natural resources are used*

This global challenge relates to the human overexploitation of basic natural resources that are essential for societies to function and evolve in a sustainable manner. Current conditions and patterns of behaviour need to change, and policy actions that support the

shift towards sustainable ways of living should be fostered and strengthened. Long-term sustainability is key to ensuring not only economic growth but also a better quality of life for current and future generations. This depends on the intelligent use, conservation and renewal of natural resources and ecological systems.

4.1.2 *The need to anticipate and adapt to societal changes*

For the EU to fully become a knowledge society there is a need to anticipate and adapt to political, cultural, demographic and economic transformations. Business, demography and societies as a whole are generally changing at a much higher rate than public institutions and their related decision making processes. Legal frameworks, social security systems, education and healthcare models have difficulties keeping up with the pace of these transformations. This hampers innovation and economic growth and puts great pressure on natural resources and the ability of institutions to cope with societal transformations.

4.1.3 *More effective and transparent governance for the EU and the world*

This challenge comprises the need for the EU to create more transparent and accountable governance structures and processes that can adapt to and anticipate the future, and to use this capacity to do likewise at global level. This is important to address global and common challenges and to spread democracy and transparency all over the world.

4.1.4 *Policy actions needed to enable sustainability*

In general terms, to advance policy design and implementation, it is critical to build a global balance between cooperation and competition, to strengthen multi-actor partnerships and global agreements on the basis of dialogue, shared values and common regulations. Likewise, it is essential to enable international institutions that equally represent all nations to be vigilant and to enforce widely accepted juridical approaches. Furthermore, policies in different fields should be aligned to successfully address the aforementioned three challenges. For example, policies for energy, climate, food, water and transport are very much interdependent.

Developments such as a cultural shift from individual to collective values, accounting for biodiversity or ecological flows and stocks instead of using GDP as a measure for policy design and growth, increasing governments' transparency and accountability, and empowering citizens through new ways of learning, interacting and communicating, which can be supported by ICTs (e.g., to construct a more networked world and ubiquitous healthcare), are insufficiently addressed in current policy and decision making processes.

Furthermore, a harmonised approach toward supporting the growth of developing economies and fostering their capacity for self-sustainability in addition to welcoming high-skilled immigration to the EU would be beneficial to economic and social development as well as a more intelligent global use of natural resources.

4.2 Comparing the outcomes

The resulting issues (existing and emerging trends as well as wild cards) and crosscutting challenges of the JRC-IPTS study (Boden et al., 2010) can be compared to the main challenges for the EU listed in the SDS (European Council, 2006) and the corresponding headline SDIs. This exercise is carried out to identify similar elements and how they can complement each other in offering more robust support to policy making.

There is a direct relationship between the SDS challenges and those covered by the JRC-IPTS study.

The first four challenges within the SDS — namely, conservation and management of natural resources, climate change and clean energy, sustainable transport and sustainable consumption and production — are covered by the global challenge within the JRC-IPTS study that is summarised above in section 4.1.1, titled 'Changing the current ways in which essential natural resources are used'. The most well-known of these challenges are climate change, water scarcity, decline in geographical distribution, energy shortage and lack of food. Economic growth has largely

relied on the overexploitation of essential natural resources and hence ultimately caused the disruption of natural cycles. Techno-institutional lock-in (i.e., path dependencies in the use of existing resources and building capabilities as well as the respective inertia for change in physical infrastructures and institutions) might be an important factor that compounds and intensifies the human impact on nature since it creates barriers to sustainable alternatives to existing processes and infrastructures as well as behaviours.

The next two challenges within SDS — namely, social inclusion, demography and migration and public health — are addressed within the global challenge in the JRC-IPTS study summarised in section 4.1.2, titled 'The need to anticipate and adapt to societal changes'. The multiple dimensions of those challenges include rising employment rates, ageing societies, increased migration, changing social security systems and healthcare models, education and ICT innovations, new converging technologies and a shift in global economic power.

The final challenge within SDS, namely, global poverty, is addressed in the global challenge within the JRC-IPTS study that is summarised in section 4.1.3, titled 'More effective and transparent governance for the EU and the world'. The multiple dimensions of that challenge are the need for interlinked and aligned policy responses, migrations caused by pandemics and poverty, an increasing shift towards empowerment in governance and pressures on democracy.

However, the defence and security issues covered in the JRC-IPTS study are neither addressed within the SDS nor by the SDIs. Although the 2009 review of the SDS emphasises the strengthening of the international dimension of sustainable development and the intensifying efforts to combat global poverty (European Commission, 2009c), it still does not introduce defence and security issues. At the very least, the SDS does call for the inclusion of sustainable development concerns in all EU external policies, even in the Common Foreign and Security Policy. Moreover, on the basis of the JRC-IPTS study it would also be important to identify the need to consider issues such as new, sophisticated forms of terrorism (e.g., bioterrorism, cybercrime, etc.) and the protection of critical infrastructures, among other things, together with those issues that are directly related to sustainable development (i.e., social, environmental and economic).

Globalisation has brought new opportunities. High growth in the developing world, led by China, has lifted millions out of poverty. But globalisation has also made threats more complex and interconnected. The arteries of our society, such as information systems and energy supplies, are increasingly vulnerable. Global warming and environmental degradation are altering the face of our planet. Moreover, globalisation is accelerating shifts in power and is exposing differences in values (European Council, 2008). Recent financial turmoil has shaken developed and developing economies alike.

By drawing on a unique range of instruments, the EU already contributes to a more secure world. The EU has worked to build human security by reducing poverty and inequality, promoting good governance and human rights, assisting development and addressing the root causes of conflict and insecurity. The EU remains the biggest donor to countries in need. Long-term engagement is required for lasting stabilisation (European Council, 2008). All this EU engagement is indeed very much related to sustainable development: the means to build human security are considered worthwhile enough to be mentioned in the SDS.

Finally, a deeper look at the issues identified within the JRC-IPTS study (2010) reveals the following coverage of the headline SDIs itemised in Table 1 and alerts policy makers to the areas in which they must intervene to prevent unsustainable trends or the areas in which they should continue to support sustainable developments.

It is not surprising that the issues shaping the future that have been identified in the JRC-IPTS study are very closely related to the headline SDIs. In addition, the global challenges that humanity will face in the future cover many aspects of the SDS challenges.

However, beyond those issues that fall under the defence and security aspects of the JRC-IPTS study, the elements that could be considered for inclusion in the following SDS are: 1) the specific policy fields that must be aligned to tackle specific challenges and enable a progressive leap towards sustainability and 2) the use of participatory forward looking techniques as an inherent part of policy making to build a common understanding of current situations and to translate these into common visions of the future of the world to be jointly pursued.

Headline SDI	**Corresponding issues within the JRC-IPTS study**
GDP per capita	Global economic shocks; continued economic growth of Asian countries, with China and India likely to account for 50% of the world GDP by 2060
Greenhouse gas emissions	Climate disruption; increasing EU-27 energy related CO_2 emissions
Consumption of renewables	The rising importance of decentralised power generation, with both large industrial power plants and fuel cells installed in private homes working in interconnected grids that will form the backbone of the European power generation sector; energy transition having possible impacts on the world's economic development
Energy consumption of transport	Hybrid vehicles being widely available and in use on a global scale by 2020; the crossing of "tipping" points (i.e., the points at which environmental impacts would be irreversible) towards the middle of the 21st century
Resource productivity	Increasing global application of ICTs to reduce energy consumption
Common birds	Rapid global decline in biodiversity and loss of ecosystems
Fish catches	Global decline of marine and freshwater fish availability due to persistent overfishing or overexploitation of aquatic systems as well as climate change and contamination
Healthy life years	Equal access to healthcare will see increasing support among the EU citizens; costs of healthcare are rising in the Western world
Risk of poverty	The gap between rich and poor will increase globally
Employment rate of older workers	Employment rates at the age of 60 continue to grow in the EU-27
Official development assistance	Increasing power of Europe as a global player actively engaged in dealing with global challenges as well as in defining and governing global rules that serve as models for new forms of governance for many developing states

Table 1. Coverage of the headline SDIs by selected issues identified in the JRC-IPTS study © 2009 JRC-IPTS

4.3 Implications for SDS and anticipation

Comparing the main results of the JRC-IPTS study and the SDS has revealed a close correspondence between them. This highlights the way in which the first could complement the latter in supporting policy design towards a more sustainable future.

As long as it is possible to anticipate the causes of any economic, social or environmental crisis, society is in a position to address them beforehand — either to deal with the likely consequences or even to transform them into opportunities. However, if the causes are not fully recognised, crises are inevitable. Emerging shortages of food, water and other resources on account of demographic trends and human activity will have far-reaching economic and social consequences. They will become multilevel global challenges.

Governments and companies usually react to changes by trying to adapt rather than being able to manage them properly, let alone being able to anticipate and welcome such change. Multiple factors influence the ways in which the future unfolds, and existing institutions have not yet been able to develop a fully systemic view of current and possible future situations that will prepare them to shape the future properly. There is an intrinsic need to position the EU within adaptive and dynamic global institutions to achieve global governance structures that are capable of addressing global and common challenges.

The current economic crisis has already shown that the notion that the free market will guide humanity in an optimal direction is a failure. While the free market is a good means for cultivating innovation, without regulation market forces will lead to further (over)exploitation of existing resources and an increase in the gap between rich and poor, with the consequences already described above. Moreover, the free market is unable or unwilling to fully anticipate future damage caused by climate change and other socio-ecological crises. The model of unconditional economic growth must be reconsidered by moving towards a more sustainable one that takes into consideration its current limitations (financial and trade crisis, climate change, etc.) and the need for urgent political decisions.

Policy alignment and political will are necessary to allow full transparency and social participation and thus to change the ways in which individuals and organisations behave. EU policies could embrace the multicultural and social diversity of EU citizens as a competitive advantage and move away from the traditional compartmentalisation of different policy fields towards alignment based on dialogue and new ways of communicating and interacting with different stakeholders.

It is also important to develop the necessary means to establish global partnerships between industry, government and society, with international institutions that enable the necessary framework conditions and juridical power to ensure that the above partnerships are developed and that industry plays a positive role within global societies.

In this context, to consider undertaking forward looking initiatives such as EU and worldwide foresight studies on global challenges at regular intervals is critical to building a common understanding of current situations and to translating it into common visions of the world’s future to be jointly pursued. In a decision making world, foresight does not appear naturally as the preferred method for sustainable development (Destatte, 2010). This is not surprising, because so far sustainable development is only being monitored (from the past to the present) to assess performance and decide on additional measures. FLA could anticipate the need for action and change the course of existing action, thus contributing to an ongoing renewal of the approach to sustainable development by emphasising its systemic and holistic aspects.

5 Conclusions

The foresight approach employed in the JRC-IPTS study contributes to policy making by supporting a continuous and shared approach in order to understand the present in all its complexity, to look at different future possibilities and to shape a joint direction to follow that considers different stakeholders' points of view. Coupling this with a periodic

evaluation of what has or has not been achieved (e.g., by means of sustainability indicators) enables policy to correct deviations and to continually adapt and reshape policies to address impending situations. Such an approach, which would be linked to other forward looking techniques and would tap into evidence-based research and quantitative elements, would help policy making to become more adaptive and able to anticipate and address changes along the path towards sustainable development.

Finally, to enable a clearer understanding of the possible routes toward tackling the challenges highlighted in this chapter, scenarios could be developed (as in Rotmans et al., 2000) to shape strategic agendas, decisions and policies, and at the same time to encourage stakeholders to take ownership of results so that they can be fully implemented. In addition, a periodic assessment of these scenarios would allow to update and adapt them in light of the latest world developments and to support trend-based, anticipatory intelligence that is able to guide sustainable development (Carabias-Hütter et al., 2005). Combining emerging future issues with sustainability indicators that monitor past and current situations would allow for a more comprehensive gauge and evaluation of sustainable development.

Sources and References

Boden M, Cagnin C, Carabias V, Haegeman K, Könnölä T. (2010) Facing the future: time for the EU to meet global challenges, EUR 24364 EN, Publications Office of the European Union, Luxembourg.

Botterhuis L, van der Duin P, de Ruijter P, van Wijck P. (2010) Monitoring the future. Building an early warning system for the Dutch Ministry of Justice, Futures 42, pp. 454-465.

Brummer V, Könnölä T, Salo A. (2008) Foresight within ERA-NETs: Experiences from the preparation of an international research program, Technological Forecasting & Social Change 75, pp. 483-495, DOI:10.1016/j.techfore.2008.02.005.

Cagnin C. (2005) An Information Architecture to Enable Business Sustainability, PhD Thesis, University of Manchester.

Cagnin C, Keenan M, Johnston R, Scapolo F, Barré R. (2008) Future-Oriented Technology Analysis – Strategic Intelligence for an Innovative Economy, Springer: Berlin.

Carabias-Hütter V, Kümin D, von Allmen M. (2005) Aggregating Indicators for a Sustainable Regional Development: the Checklist for Self-Declaration and the Swiss Regional-Dashboard, In Visualising and Presenting Indicator Systems, International Conference, BFS: Neuchatel.

Dearing A. (1999) Have we the foresight for sustainable development? Foresight 1, 2, pp. 131-142.

Destatte P. (2010) Foresight: A major tool in tackling sustainable development, Technological Forecasting & Social Change 77, pp. 1575-1587.

European Commission (2009) Indicators for monitoring the EU Sustainable Development Strategy, Eurostat: Luxembourg, http://epp.eurostat.ec.europa.eu/portal/page/portal/sdi/introduction [02.10.09].

European Commission (2009b) Sustainable development in the European Union – 2009 monitoring report of the EU sustainable development strategy, Office for Official Publications of the European Communities: Luxembourg.

European Commission (2009c) Mainstreaming sustainable development into EU policies: 2009 Review of the European Union Strategy for Sustainable Development, COM(2009) 400 final, 24.7.2009, European Commission: Brussels.

European Commission (2011) Sustainable development in the European Union, 2011 Monitoring report of the EU Sustainable Development Strategy, Eurostat: Luxembourg, http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-31-11-224/EN/KS-31-11-224-EN.PDF [01.08.12].

European Commission (2011b) Is the EU on a Sustainable Development Path? Highlights of the 2011 Monitoring Report of the EU SDS, Eurostat: Luxembourg.

European Council (2006) Review of the EU Sustainable Development Strategy (EU SDS) – Renewed Strategy, DOC 10917/06, European Council: Brussels.

European Council (2008) Report on the Implementation of the European Security Strategy – Providing Security in a Changing World, DOC S407/08, European Council: Brussels.

Floyd J, Zubevich K. (2009) Linking foresight and sustainability: An integral approach. Futures (article in press). DOI: 10.1016/j.futures.2009.08.001.

FTA (2008) Survey of Big Picture Trends, Drivers and Discontinuities Looking Forward to 2025. FTA Stands for Future-Oriented Technology Analysis, http://forera.jrc.ec.europa.eu/fta_2008/survey.html [02.10.09].

Interfuturs (1978) Research project on the future development of advanced industrialised societies in harmony with that of developing countries. Final reports. OECD: Paris.

Könnölä T, Scapolo F, Mu R, Desruelle P. (2011). Foresight Tackling Societal Challenges: Impacts and Implications on Policy-Making, Futures 43, pp. 252-264.

Könnölä T, Salo A, Cagnin C, Carabias V, Vilkkumaa E. (2012) Facing the Future: Scanning, Synthesizing and Sense-Making in Horizon Scanning, Science and Public Policy 39, pp. 222-231

Meadows D.L. (1972) Limits to Growth, Earth Island Ltd: London.

Rotmans J, van Asselt M, Anastasi C, Greeuw S, Mellors J, Peters S, Rothman D, Rijkens N. (2000) Visions for a sustainable Europe, Futures 32, pp. 809-831.

United Nations (1987) Report of the World Commission on Environment and Development – Our Common Future, United Nations: Geneva.

Wiek A, Binder C, Scholz RW. (2006) Functions of scenarios in transition processes. Futures 38, pp. 740–766.

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