

FORE • SCENE



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Addressing multi-beneficial and cross-sectoral strategies for sustainability

Developing of essentials for integrated sustainability scenarios with regard to goals and required measures, focussing on priority policy fields such as agriculture, infrastructure/land use, and industry/economy

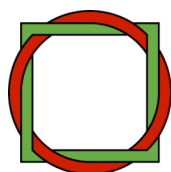
Introductionary Paper

2nd Integration Workshop, Brussels (7 March 2007)

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1 Background

The FORESCENE project aims to develop an analytical framework for consistent environmental sustainability scenario building. The project will identify different future scenarios and use backcasting techniques describing the achievement of future targets. In the course of the project FORESCENE follows the sequence of eight steps (work packages):

1. Description of the chosen environmental problems such as water, soil, biodiversity, waste and natural resources, review policy objectives and indicators, and determine the cross-cutting driving forces;
2. Development of core elements of integrated sustainability scenarios priority policy fields such as agriculture, infrastructures/land use, industry/economy (goal definition);
3. Determination of measures and processes to be considered for change (pre-backcasting);
4. Address quantitative and qualitative parameters for measurement (parameterization);
5. Development of a Business-As-Usual (BAU) scenario framework and example projections (forecasting);
6. Development alternative scenarios (incl. backcasting);
7. Checking the options for modelling, and
8. Work out conclusions.

FORESCENE organises a series of workshops to involve experts, DGs and stakeholders, to integrate knowledge on cross-cutting drivers of various environmental problems and priority policy fields, and to define essentials for integrated sustainability scenarios in terms of goals and cross-cutting policy measures.

In Work Package 1 FORESCENE reviewed and condensed past and ongoing work with regard to the topics water, biodiversity/soil/landscape, resource use and waste in order to address the key drivers of the problems, the relevant policy goals, and potential extreme scenarios for future development¹.

In Work Package 2 FORESCENE has shifted the perspective from the problem-oriented topics towards activity fields (sectors, policy fields) such as agriculture, infrastructure/land use, and industry/economy. The aim is to define essential elements of sustainable development for these activity fields in a *positive* manner, i.e. not only in the sense of avoiding and mitigating current problems but also through answering what the desired future should look like and which prerequisites are deemed essential for sustainability.

In order to do so, FORESCENE has organised three thematic workshops in October last year, one on each of the selected activity and/or policy areas. In these workshops experts contributed to the following key questions:

WHERE SHALL WE GO TO? (Developing a vision for sustainability)

- How could a desired long-term vision of sustainability for each activity/policy field look like?

¹ Further information on the project can be found on the FORESCENE web-site <http://www.forescene.net>

- Which essential Sustainability Scenarios Elements (SSEs) can be defined as integral part of the long-term visions?

HOW DO WE GET THERE? – (Measures and instruments to reach the envisioned future)

- Which requirements can be considered promising to reach the defined sustainability scenarios?

The outcome of the expert workshops and the workshop on 7th March will be used to address the key question:

- Which strategies, measures or instruments are suitable because of their cross-sectoral effect, i.e. policy measures with multi-beneficial effect

The purpose of this paper is to give a synopsis of the outcome related to the above questions of the three past workshops². It then will introduce into the tasks of the – interactive – workshop which will focus on the strategies deemed necessary to reach a desirable future situation in the three activities fields considered.

2 Policy/Activity Field Agriculture

The first expert workshop focused on the “Development of core elements of integrated sustainability scenarios for agriculture”. In two approaches the experts were asked to envision their ideas about desired long-term as well as realistic short-term scenarios of sustainability for agriculture. Both approaches resulted in rather a congruent picture. The key aspects of the long-term goals named³, where the “Integration with industrial and tourist activities”, the extension of “Green high-tech agriculture” and “Large scale farms”. Further components of the envisioned scenarios include the expansion of agricultural activities towards “Renewable energy crop production” and “Environmental services”, followed by the “Production of biomass” and “Provision of social services”. Beyond that, both “Extensive” and “Organic agriculture” were considered desirable solutions, whereas “small scale farming” and “marginal areas agriculture” were assessed to be of decreasing importance in a realistic short-term scenario.

With regard to the development of key sustainability scenario elements three aspects were seen as of greatest importance: “water management”, “quality of food production” and the enhancement of “rural livelihoods”. In contrast with this increasing social role of agriculture, the expectations in terms of jobs, production and Agricultural Used Area (AUA) were not optimistically appraised. It was presumed that the only alternative appears to be the development of high quality products and services (farm tourism, etc.), which are vertically and horizontally integrated in the market and capable of maintaining prices with a high level of value added. Hence, multifunctionality of agriculture was agreed to be a core element of sustainability scenarios. In addition role given to the energetic use of biomass (for fuel, heat and electricity) in the reconversion of several sowable lands the agricultural experts regarded it as very important in order to preserve the present levels of agricultural GDP at least in terms of value.

² The summary reports of the workshop and the input papers provided by the experts can be found on the on the FORESCENE web-site <http://www.forescene.net>

³ The reader will note that these "goals" may be rather addressed as "strategies" (to reach the goal of a viable agriculture)

With regard to measures and instruments the experts looked at the future of European agricultural policy according to the level (scale) of regulation and to the need of public subsidies. As desirable for the future, the experts position was for an increasing regional autonomy and a – slight - subsidies reduction. Yet subsidies still are regarded as important even on the long run, for instance in terms of specific payments for the production of positive externalities, for the improvement of less advantaged areas, socially interesting productions and farm investments. Further rural development would need financing for e.g. social cohesion, quality of life in rural areas, integration with non-agricultural activities, technical assistance and lifelong learning.

Three main agricultural development paths for a sustainable agriculture in the future, according to the experts opinions, could be in the combination of the following:

Scenario “Competitiveness”

- Agriculture structure:
 - Specialisation;
 - Farm size (Economy of scale)
 - Intensive agriculture;
 - Quality of food;
 - Bioenergy (if strongly financed).
- Main implementation options:
 - Investments, new technologies (e.g. precision farming);
 - Vertical and horizontal integration with other activities.
- Spatial concentration on productive sites.

Scenario “rural viability”

- Agriculture structure:
 - Extensive agriculture;
 - Organic farming;
 - Diversification of farms activities (tourism);
 - Farm household activities in other sectors (e.g. tourism);
 - Typical food, quality of food;
 - Extension of territorial potentials and strengths.
- Main implementation options:
 - Strong linkage to rural development measures: LEADER, others (e.g. INTERREG);
 - Regional networking, farmers involvement in participatory processes;
 - Quality of life in rural areas.
- Spatial concentration in areas with high level of social relevance.

Scenario “environment”

- Agriculture structure:
 - Agro-environmental programmes (AEOs);
 - Organic farming;
 - Diversity of cropping patterns;
 - Low input farming.
- Main implementation options:
 - Protected areas;

- Implementation of Cross-Compliance;
 - Natura 2000;
 - Water Framework Directive WFD, Nitrate Directive;
 - Groupement Agricole d'Exploitation en Commun GAEC (Article L323-1 du [Code rural de France](#))⁴.
- Spatial concentration on low productive sites but with high environmental values.

3 Policy/Activity Field Industry/Economy

The second expert workshop focused on the “Development of core elements of integrated sustainability scenarios for industry/economy”. The main result of the workshop was that the invited experts reached general agreement on the necessity to set ambitious targets, to implement policy measures, which send clear long-term signals to actors in different industrial sectors (in particular, through a cost shift from labour to natural resources) and to develop new resource-extensive life-styles, as eco-efficiency improvements on the micro level alone will not be capable to reach ambitious reduction targets on the macro level. Still it should be noted that some of the invited experts expressed the view that it proved very difficult to cover such a range of issues and sectoral developments (energy, transport, construction, environmental technologies, consumption, etc.).

Yet there was a consensus that maximising individuals' happiness/well-being can be seen as an overarching goal beyond concrete environmental, economic, cultural and social targets of sustainable development. In this context questioned, whether GDP still is an appropriate indicator or whether other indicators such as the Index of Sustainable Economic Welfare (ISEW) would be the better measurement.

It was generally agreed that related to the topic of industry/economy, production and consumption patterns are of key importance. In order to develop effective action plans⁵, priority areas should be addressed, because around 70% of total environmental impacts can be attributed to three sectors of transport, housing and food (which are, vice versa, key elements of the production and consumption system). The three sectors are linked to the energy sector and thus – based on the current energy structure - with global warming. Here the sustainability goal is not to overshoot global warming by more than 2°C (mean annual temperature) by the year 2050, requiring a reduction of greenhouse gas emissions by industrialised countries of up to 80%. In the course of the argumentation it became clear that more emphasis should be put on further increasing the share of renewable energies considering the whole product or service life-cycle (some experts even envisaged at least to 50% renewables in 2050, having also implications on the agricultural sector).

⁴ Groupement Agricole d'Exploitation en Commun (GAEC) are an arrangement whereby between two and ten individuals work together in a context approaching that of family workers, albeit under statutory conditions. Everyone has an equal stake in the management of the association. The aim is to maximise economies of scale across the association. Some GAECs can decide to share the proceeds of the economic activity. Currently the number of GAECs count to roughly 41.500 farmers' economic interest groupings.

⁵ such as National Action Plans for Sustainable Consumption (see UNEP 2005. Advancing Sustainable Consumption in Asia – A Guidance Manual. Paris, UNEP: 73)

With regard to resource use (and in effect, waste generation) a radical reduction of impact per consumption unit should be reached in the European Union. This includes targets for an increase in resource productivity and a progressive substitution of non-renewable resources by renewable alternatives, considering the availability and regeneration capacity of renewable resources. It also includes greater European self-sufficiency, with regard to the net trade balance on tangibles, including raw materials, mass commodities and final products.

Further sustainability goals should be the creation of a new transport culture based on proximity, slowness and sufficiency, an absolute reduction for water use (water losses in manufacturing processes of less than 0.5% per year, irrespective of the water source) and a clear goal of zero emissions of toxic substances all by 2050. Furthermore, targets should be set for the proportion of European land set aside to protect biodiversity (with possible trade-offs with the agricultural sector/land use).

With regard to the activity field “industry/economy” sustainability scenario elements should cover following transitions:

- shifts in the structure of production and consumption away from resource-, waste- and risk-intensive activities in favour of less environmentally damaging activities;
- shifts to cleaner and more abundant resources (resource switching/substitution);
- shifts to leaner and cleaner production;
- shifts in the utilisation rates of products;
- shifts from selling products to selling services;
- shifts from individual to collective provision;
- shifts from economies of scale to economies of scope;
- shifts from paid employment as the means for allocating GDP to alternatives (citizens’ income, individual tradable resource permits);
- shifts to more flexible working arrangements;
- shifts in patterns of time and space use;
- shifts toward greater local and regional self-sufficiency;
- shifts in the use of capital (for example, to restore and augment ecological capital and resource stocks).

With regard to measures and instruments the experts commonly agreed that instruments to internalise external costs would be most effective to reach the envisaged sustainability goals. Among these instruments, an ecological tax reform (ETR) is regarded as effective to promote eco-innovation and energy/resource efficiency, by shifting taxes from labour to energy and natural resources, and thereby being economically and in terms of employment beneficial at the same time. With regard to transport taxation and subsidies are seen as feasible measures, as they do not only influence the individual choice of transport modes, but also can influence complete transport systems. The aim of these measures should be to reduce transport volume in total (esp. of freight transport), as this is relevant for the level of resource consumption (e.g. the need of transport infrastructure). Economic instruments such as taxes and emission trading were further regarded as useful tools to enhance the development of environmental technologies. Beyond that, standard policy instruments, such as technological and emission standards should be further developed in that direction.

Another effective instrument was seen in a sustainable public procurement. Public authorities, as one of the major players in investment and consumption should make a strong commitment towards the EU Sustainable Development Strategy. Beyond the existing EU Emission Trade

System the implementation of a system of individual tradable resource or pollution permits tied to consumption was reflected as a key measure with high potential for transformation towards sustainability.

4 Policy/Activity Field Infrastructure/Land Use

The third expert workshop focused on the “Development of core elements of integrated sustainability scenarios for infrastructure and land use”. In the course of the workshop the invited experts agreed that the transition process in the field of infrastructure and land use would need an overarching sustainability goal that is applicable for the different topics, such as urban sprawl, transport infrastructure, resource and waste management in the built environment (including water management) and sustainable construction. This priority goal could be formulated as:

- to create and maintain greater biodiversity within our agro- and urban ecosystems, and
- to preserve the surrounding (and enclave) natural and semi-natural ecosystems as sources of ecosystem services for they are indispensable in the maintenance of manmade ecosystems.

Under this general frame the experts outlined several sectoral sustainability goals on the issues dealt with at the workshop. An ambitious goal to reduce urban sprawl would be to reduce the current rate of land consumption from around 100 ha a day to only 30 ha a day in 2020 as set up in Germany. This inevitably includes the need to address multifunctional optimisation of land use, e.g. for food, energy and tourism. With regard to the transport sector an important goal would be to curb the overall volume of transport, requiring an integrated approach on all planning levels, e.g., the increased multifunctional land use in urban areas. In the context of resource management in the built environment the experts agreed that there is an exigent need for goals to shift from non-renewable sources to renewable ones and progress on absolute decoupling of resource use and GDP. With focus on the topic sustainable construction, it was envisioned that construction industry should become capable of delivering its services to costumers with zero negative impacts on the environment, society and the economy.

The invited experts proposed a broad variety of potential sustainability scenario elements covering the scope of the workshop. As an abridgement the following should be mentioned:

- internalisation of environmental and social external cost becomes a norm;
- risks and hazards to populations are lowered to manageable levels, unacceptable risks will not be posed or transferred to other populations in time and space;
- governance principles of precaution, prevention, proximity, producer responsibility, polluter/beneficiary pays, etc. prevail;
- rate of land consumption for creating addtional artificial, human-made environments decreases until eventually no more virgin land is consumed for human purposes (e.g. no more greenfield development will be possible without justifications measured up to robust sustainability criteria, and at the macro level balanced through the deconstruction of buildings/infrastructures at other sites);
- the “Refuse then Reduce then Reuse then Recycle” principle prevails;
- multifunctional (e.g. for food, energy crops, tourism and natural habitat) optimisation of land use becomes norm;
- shift from supply side to demand side management in transport planning;

- decrease in commuting-related energy consumption and no further increase in leisure related energy consumption.
- radical increase in the productivity of resource use;
- shift to biologically inspired production (biomimicry) with closed loops, no waste, and no toxicity;
- shift in the business model away from the making and selling of "things" to providing the service that the "thing" delivers;
- shift to a higher share of renewable resources;
- The "embedded view of sustainable construction", in a sense that sustainable construction is more than just the environmental performance of buildings and the use of resources but also embraced contributions to people's well-being (quality of life) and, beyond individual buildings, to neighbourhoods and to cultural heritage, i.e., to a 'sustainable communities' level.
- Gradual shift towards zero fossil CO₂ emissions and waste to landfill from new and existing buildings;
- Gradual shift towards 100% use of sustainable materials in construction activities and of whole life costing in the procurement of public and private assets.

With regard to measures and instruments the proposed tools can distinguish in three modes of intervention:

- Measures of regulation or ban, such as restricting the development of land and thereby reducing the availability of greenfield land, measures to changing the temporal characteristics of transport (e.g. limiting traffic in certain periods or corridors) and regulations to decrease pollution generated by vehicles, and the energy and material consumption of buildings,
- Measures of persuasion/management/planning, such as raising the awareness of politicians for the negative effects of sprawl, improving the quality of the inner city environment and meeting the demand for housing in the inner city, measures aiming to change the spatial characteristics for transport and towards the social integration of transport, national planning regulations, and the Code for Sustainable Homes and public sector sustainable procurement practices,
- Measures of modification of incentives, such as abolishment of economic incentives for suburban development and mitigating the competition between municipalities by restraining the desire of local authorities to grow; economic instruments influencing the modes of transport, e.g., personal vs. public transport, freight transport on roads vs. rails and waterways, which requires substantial modernisation of these alternative systems, and providing attractive alternative to private car and truck transport by sophisticated, integrated, fast, safe and comfortable future transport systems.

5 Tasks of the workshop

It is the overall aim of the workshop to define a limited number of overarching goals and targets for orientation required for policy makers and decision makers in industry, which at the same time lead to manageable action for implementation in a "directionally safe" manner. The workshop will discuss these, based on the outcome of the three previous expert workshops. The results of these workshops will be presented by outlining the desired long-term visions or goal of sustainability, the essential Sustainability Scenarios Elements (SSEs) or strategies to achieve the envisaged goals

and the required measures and instruments, which can be considered promising to reach the defined sustainability strategies. The presentations will be made from the targeted view of each of the selected the priority policy fields agriculture, infrastructure/land use, and industry/economy

It then will be the essential task of the workshop to delineate those strategies that are important for one of the selected sectors, others that have a cross-cutting effect for two sectors and as third category are deemed multi-beneficial for all three sectors. In order to clarify the task of the workshop, some examples may be given in the following.

Out of the range of strategy elements, such as organic farming or diversity of cropping patterns will be of specific importance for the agriculture sector but are not likely to be tangent to the other sectors. The same would count for a strategy to decrease the rate of land consumption for creating additional artificial, human-made environments in the case of the sector infrastructure/land use.

On the other hand, some of the elaborated can be assessed to be cross-cutting two sectors, e.g. in the case of the agriculture sector the experts were predominantly in favour of a higher regional diversification of production oriented towards local and regional marketability. This strategy is overlapping the target of shifting towards greater local and regional self-sufficiency, which was named for the industry/economy sector. Another example is associated to the sustainability goal of absolute decoupling of resource use and GDP. Here for both the sectors industry/economy and infrastructure/land use, a drastically increase of resource productivity was assessed by the experts as a key strategy.

Furthermore and related to the above goal as well, a progressive substitution of non-renewable resources by renewable alternatives was seen as strategic approach of high importance for the two sectors. This strategy might also be seen as an example for a multi-beneficial strategy overlapping all three sectors. The agricultural experts regarded an increase of biomass production for energetic use and for other purposes as very important in order to preserve the present levels of agricultural GDP at least in terms of value.

In addition it also will be task of the workshop to assess possible trade-offs of these strategies. Looking at the above multi-beneficial approach it can for instance not be overseen, that a biomass strategy might be conflicting with goals, e.g. to maintain greater biodiversity within our agro- and urban ecosystems

The results of this workshop will serve as basis to development narratives of integrated Sustainability Scenarios and subsequent then be used to analyse the options for parameterization and simulation/modelling, develop a Business-As-Usual (BAU) scenario, as well as alternative scenarios, which proceed towards sustainability.