

Inventory of Forward Looking Studies with a focus beyond 2030

Annex to the paper "State of the art of international
Forward Looking Activities beyond 2030"

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National Forward Looking Activities

Country - Organisation - Reference	Background + Vision
<p>Australia Department of Immigration and Multicultural and Indigenous Affairs</p>  <p>http://www.cse.csiro.au/publications/2002/fulldilemmasreport02-01.pdf</p>	<p>Future Dilemmas: Options for 2050 for Australia's population, technology, resources and environment.</p> <p>Description Using an analytical framework which represented the physical transactions underpinning the Australian economy, this study compared the effect of three population scenarios on infrastructure, resource and environmental issues out to the year 2050. The three population scenarios were determined by net immigration rates of (i) zero persons per year, (ii) 70,000 persons per year, and (iii) two thirds of one percent (0.67%) of the current population size each year. These population scenarios were meant to reflect approximately (i) the policy position of some environmental organisations (ii) the most likely outcome of current immigration program settings and (iii) the population growth rate preferred by Australian business interests. After the many permutations and combinations of numerous simulation experiments, all three scenarios were found to be physically feasible. All three scenarios carry with them a number of rewards and risks that merit wider public debate by proponents of each policy position. More detailed analysis of the many issues that lie outside the terms of reference of this research report, would also benefit from such debate.</p>
<p>Australia Future Fuels Forum, led by Australia's Commonwealth Scientific and Industrial Research Organization (CSIRO)</p>  <p>http://www.csiro.au/files/files/plm4.pdf</p>	<p>"Fuel for Thought – the Future of Transport Fuels: Challenges and Opportunities", Timehorizon 2050 (2008)</p> <p>The Future Fuels Forum identified a number of key risks, opportunities and challenges for the future of transport fuels in Australia. Increasing cost of oil and the need to reduce greenhouse gas emissions will drive change Our fuel mix will be more diverse The price of oil-based fuel products will increase The transport sector will make a modest contribution to reducing greenhouse gas emissions Australia is very vulnerable to changing market conditions Any increase in transport costs will adversely impact low income Australians There is likely to be only moderate preparatory responses by individuals and businesses, implying a role for government Technology alone will not be sufficient to meet the potential fuel supply gap Australian travel preferences are as important as fuel and technology preferences in reducing greenhouse gas emissions</p>
<p>Australia Collaborative Working in Construction http://www.cwic.org.au/</p>	<p>"The Building and Construction Industry Technology Roadmap", Timehorizon 2030 (2005)</p> <p>The Vision for the year 2030. While this may be idealistic, it provided a very good view as to what the nature and structure of the industry could be and some of its key characteristics. Many of the elements of the vision are actually achievable now although there are significant inhibitors to their adoption. The overall vision for the 2030 industry is very clearly client driven with a focus on delivering quality outcomes for the client and subsequent users of the buildings. The key element in this is the establishment of a strong value proposition for the client. In order to achieve this, the stakeholders in the design and construction process are required to clearly define the process together with the short and long term outcomes for the client. The outcomes are provided in a form which is clear and accessible to the client not educated in reading traditional architectural documentation. This then allows the client to evaluate the detailed outcomes of the design process.</p>
<p>Austria Energy Agency Inventory of future related anergy documents http://www.e2050.at/pdf/literaturliste_e2050_v3.pdf</p>	<p>Conference Energy Paths: Horizon 2050</p> <p>The international conference "Energy Paths - Horizon 2050" is organised within the Austrian EU Presidency in the first half of the year 2006</p>

<p>Belgium Flemish Parliament http://www.viwta.be/files/viWTA%20Annual%20Work%20Plan%202005.htm#_Toc106683009</p>	<p>“Energy Foresight Flanders 2050” “Toekomstverkenning energiesystemen – Vlaanderen 2050” (2007) – To guarantee the sustainable energy security for the entire world population: that is one of the greatest challenges of the current generation. The long-term project 'Energy Foresight Flanders 2050' (Toekomstverkenning energiesystemen - Vlaanderen 2050) investigates which energy system Flanders will need in thirty to fifty years' time, and how that energy system could be achieved. This project is the logical sequel to the project 'Energy Foresight Flanders 2050 - First Phase' (Eerste fase toekomstverkenning energiesystemen - Vlaanderen 2050, see the Annual Work Plan for 2003-2004). In the first phase, the emphasis was on gathering information and analysing it. This second phase is based on a survey of experts and stakeholders, as well as on citizen participation. Together with all parties concerned, viWTA will develop views and scenarios for a systemic approach to energy supply. In consultation with experts, stakeholders, and citizens, viWTA will select 'the preferentially desired future'. This will then be translated into choices that need to be made now ('backcasting'). The results of this project can contribute to the formation of a vision that has broad support. In addition, viWTA will formulate recommendations that will go beyond the energy policy and touch upon other important aspects, such as issues of ecological capacity, estimating the external costs of energy supply, and gaining public support.</p>
<p>China Chinese Academy of Sciences “Technological Revolution and China's Future-Innovation 2050” (2009) http://english.cas.ac.cn/eng2003/news/detailnewsb.asp?InfoNo=27765</p>	<p>According to the report, a new technological and industrial revolution featured by green energy, artificial intelligence and sustainable development is most likely to take place in the next 10 to 20 years. 8 social economic systems backed up by science and technology innovation should be developed:</p> <ul style="list-style-type: none"> - sustainable energy and resources system, - new material, - information networking system, - ecological higher value agriculture, - health insurance system, - ecology and environment preservation, - space and ocean system, - national and public security system.

China

Chinese Academy of Sciences (CAS)
 Science and Technology Roadmaps to
 China 2050 12 October 2009
<http://www.alphagalileo.org/PrintView.aspx?ItemId=61845&CultureCode=en>

Springer and the Chinese Academy of Sciences (CAS) announce the publication of strategic reports planning the next 40 years of progress in science and technology (S&T). Besides the general report, this project comprises 18 sub-group reports covering over a dozen scientific disciplines. According to the CAS report, it is necessary to conduct this strategic research for the future of China and all of mankind as well. The past 250 years of industrialization have resulted in a modernized, improved standard of living for almost one billion people. The next 40 years will bring improvements and a better life to a population of two to three billion as well as challenge the limited resources and eco-environment on earth. The project was sponsored by the Chinese Academy of Sciences with the goal of presenting a detailed scenario for China's modernization drive to 2050. It was initiated in July and August 2008 under the guidance of CAS President Dr. Yongxiang Lu. Over 300 CAS scholars from over 80 CAS institutes contributed to this research. The first volume of the book series, the general report, analyzes the evolution and laws governing the development of science and technology, describes the decisive impact of science and technology on the modernization process, and calls for China to be fully prepared for this new round of S&T advancement. Supported by illustrations and tables of data, the volumes will provide researchers, government officials and entrepreneurs with guidance concerning research directions, the planning process, and investment.

General Report - Science & Technology in China: A Roadmap to 2050 ISBN 978-3-642-04822-7 -
 Energy Science & Technology in China: A Roadmap to 2050 ISBN 978-3-642-05319-1 -
 Space Science & Technology in China: A Roadmap to 2050 ISBN 978-3-642-05341-2 -
 Marine Science & Technology in China: A Roadmap to 2050 ISBN 978-3-642-05345-0 -
 Science & Technology of Public Health in China: A Roadmap to 2050 ISBN 978-3-642-05337-5 -
 Advanced Materials Science & Technology in China: A Roadmap to 2050 ISBN 978-3-642-05317-7 -
 Science & Technology of Bio-hylic and Biomass Resources in China: A Roadmap to 2050 ISBN 978-3-642-05339-9
 Mineral Resources Science & Technology in China: A Roadmap to 2050 -
 Ecological and Environmental Science & Technology in China: A Roadmap to 2050 - Water Resources in China: A Roadmap to 2050 -
 Agricultural Science and Technology in China: A Roadmap to 2050
 Information Science and Technology in China: A Roadmap to 2050
 Hydrocarbon Resources in China: A Roadmap to 2050
 Advanced Manufacturing Science and Technology in China: A Roadmap to 2050 - Regional Development in China: A Roadmap to 2050
 Large-Scale Scientific Facilities in China: A Roadmap to 2050
 Key Interdisciplinary Cutting-Edge Science and Technology in China: A Roadmap to 2050
 Nanotechnology in China: A Roadmap to 2050
 Country and Public Safety in China: A Roadmap to 2050

Denmark

Risoe
<http://www.h2foresight.info/>

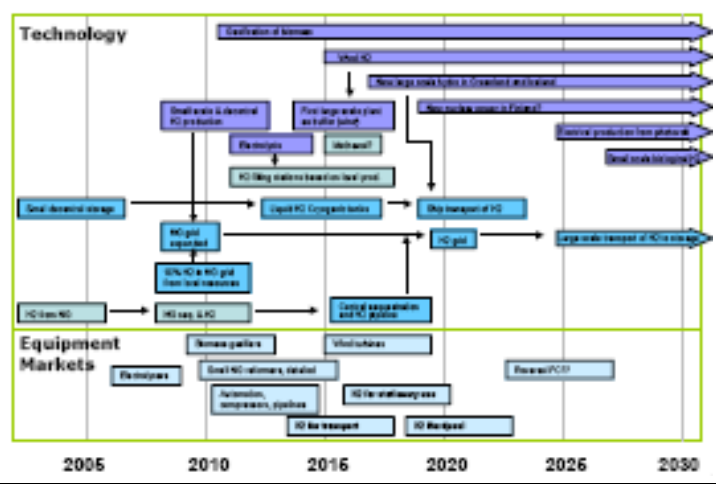


<http://www.risoe.dk/rispubl/NEI/nei-dk-4432.pdf>


Nordic Hydrogen Energy Foresight 2030

find long-term promising ways for Nordic stakeholders of exploiting hydrogen in the drive to meet the 3 Es: Energy Security, Economic Growth and Environmental protection. More specifically, the aim was to build a Nordic Research and Innovation Area in hydrogen and fuel cells, contributing with a bottom-up approach to the European Research Area.

Production and transmission



<p>Denmark Danish Research Agency, Ministry of Science, Technology and Innovation</p>  <p>http://en.fi.dk/publications/2006/the-ageing-society-2030/the-ageing-society-2030.pdf</p>	<p>“The Ageing Society 2030 – Report by the Steering Group for the Strategic foresight on the ageing society 2030” (2006) – –Healthy ageing with good functional ability and better utilisation of new technological facilities The objective is to ensure that everyone has the opportunity to age healthily. This assumes that the risk of loss of functionality is proactively limited as much as possible and that the facilities for compensating the individual for loss of functionality are used in such a way that his or her personal integrity and autonomy are guaranteed. An age-integrated labour market with better opportunities for late careers, life-long learning and flexible continuance in employment. The objective is to counteract the negative effects of ageing on the development of the workforce and to counteract exclusion from active participation in society by creating opportunities for all to achieve flexible continuance on the labour market. Promoting social cohesion across generations, genders and ethnicity The objective is to counteract the negative effects of social, gender-related and ethnically determined differences in the ageing process at the individual level and ensure that the values and norms behind the unwritten social contract between the generations are adhered to, so that the potential risk of intergenerational tension is reduced.</p>
<p>Denmark Danish Society of Engineers' (IDA)</p>  <p>http://ida.dk/sites/climate/introduction/Documents/Energyplan2030.pdf</p>	<p>“The Danish Society of Engineers' Energy Plan 2030” (2006) The visions of the Danish Society of Engineers' (IDA) Energy Plan 2030 present a picture of a Danish energy future of 2030 that is well on its way to a 100 per cent renewable energy system. The Energy Plan 2030 shows that it is technically and economically possible to restructure the Danish energy system. Greenhouse gas emissions can be reduced by 60 per cent in 2030 compared to 1990, and the consumption of fossil fuels can be markedly reduced in such a way that Denmark's net self-sufficiency can be maintained.</p>
<p>Denmark Danish Ministry of STI - Teknologisk Fremsyn - http://www.teknologiskfremsyn.dk/doc.php?id=452</p>	<p>Ageing Society 2030 Ageing populations is a challenge to all OECD countries in the coming years. The countries and companies that manage to handle the challenges to best effect can gain advantage socially, economically and on a competence level. Thus, the subject has a broad popular and political interest because it contains a series of crucial societal dilemmas, which calls for solutions and opportunities. In this regard, technology could in a broad sense play a special role. The purpose of the foresight is to provide a well-established knowledge base about an ageing society in 2030 in regards to valuing the needs for new concentrated strategic research efforts. Secondary, the foresight will have the function of a pilot project for further work with this subject in the Strategic Research Council. The foresight will be a so-called "radar-foresight" which points out and motivates the essential problem definitions and research efforts on the basis of a broad, forward-acting scan. It will work as a "funnel", which gradually reaches the essential themes in a long term and interdisciplinary perspective. The process must continually be accompanied by dialogue with all relevant actors within the field. This will ensure a broadly founded knowledge base, based on inputs from both experts and negotiation. In the foresight a storyline about an ageing society in 2030 will be completed. The storyline must draw on the latest knowledge within physiology, gerontology, psychology, biology, demography, economy, sociology and ICT ect. The Strategic Research Council establishes a steering group of people with special competences within the mentioned fields and also within culture, labour market and learning.</p>

<p>Finland VTT Technical Research Centre</p>  <p>Teknologiapolut 2050 Skennar teknologian kehittäminen kasvatuksen nykyisistä tilanteista vuoteen 2050 Suomen Tieteellisen Akatemian Suomen Akatemi</p> <p>http://www.vtt.fi/inf/pdf/tiedotteet/2008/T2433.pdf</p>	<p>Technology pathways 2050. Scenarios on deep greenhouse gas emissions reductions in Finland” (2008) The aim of the scenarios was to estimate, how Finland could respond to the recent IPCC estimate that effective mitigate climate change mitigation requires global emissions reductions in the order of 50.85% by the year 2050, and to the EU goal of reducing emissions by 60.80% by the year 2050. In Finland, GHG emissions can be reduced by 60.66% from 1990 to 2050, if emission allowance prices remain less than 80 €/t(CO₂-ekv.) Increased energy use efficiency becomes an important factor in emissions reductions by 2050. Key reduction technologies in energy production are bioenergy technologies, wind power and nuclear power. By the year 2050, also the Finnish climate will change considerably. Besides the major general harmful effects, heating requirements decrease, cooling needs increase, and wind power and hydro power potentials are estimated to increase.</p>
<p>France Centre d’analyse stratégique</p>  <p>Centre d'analyse stratégique PREMIER MINISTRE</p> <p>Avril 2007</p> <p>Perspectives énergétiques de la France à l'horizon 2020-2050 rapport d'orientation Synthèse</p> <p>Jean Synnès, président de la Commission "Énergie" Jean-Benoît Desnoyers, synthétiseur Thierry Tosti, rapporteur général Philippe Hertzman, coordinateur</p> <p>Rapports et documents</p> <p>http://www.strategie.gouv.fr/IMG/pdf/ENERGIE_Rapp_ORIENT_Synth_06_04_07.pdf</p>	<p>«Perspectives énergétiques de la France à l’horizon 2020-2050» (Vol. 1) (2008) «Rapports des groupes de travail de la commission énergie» (Vol. 2) (2008) http://www.strategie.gouv.fr/article.php3?id_article=675 «Perspectives énergétiques de la France à l’horizon 2020-2050», Rapport d’orientation (2007) http://www.strategie.gouv.fr/article.php3?id_article=523 In this paper dealing with the medium term (2020) and long term (2050) world energy mix the author has attempted to present a single most likely scenario, contrary to the usual multiple scenario approach. A second main characteristic is that the emphasis is not on the uncertainties of energy demand but on the potential limitations on the offer of fossil fuels and mainly of oil and gas. The main conclusions are that by 2050 we will need a large increase of the world nuclear industry, not only for the production of electricity but also to complement the oil industry, by providing it with necessary CO₂ emissions free heat and hydrogen. This nuclear- based hydrogen would allow to give a sustainable future to the oil industry, and to the automobile industry, by providing synthesis fuels on an economically and ecologically sound basis.</p>
<p>France, INRA, l'Institut national de recherche alimentaire. Agrimonde: Scenarios and Challenges for Feeding the World in 2050</p>  <p>Agrimonde® Scenarios and Challenges for Feeding the World in 2050 December 2009 Summary Report</p> <p>INRA cirad</p> <p>http://www.international.inra.fr/content/download/2596/49543/version/2/file/INRA-CIRAD2009-AgrimondeSummary.pdf</p>	<p>Feeding the World in 2050 This foresight study explores the possible futures of farming and food systems worldwide in 2050. The study should pinpoint the fundamental issues with which agricultural research will be faced in order to give CIRAD and INRA the means to forecast and prepare for the future in terms of public research systems and priorities as well as of their strategic position on an international level. To sum up, in Agrimonde GO, between 2000 and 2050, the cultivated land area has increased by 23%, at an average pace of 6.8 million newly cultivated hectares per year, i.e. a pace more than twice as fast as that observed between 1961 and 2000 (see Table 2 and Figure 4). The new cultivated land areas are mainly in sub-Saharan Africa and Latin America, and to a lesser extent in Asia and in OECD-1990, whereas in the other two regions the cultivated land areas have remained stable. The deforestation and increase of pasture lands observed from 1961 to 2000 have continued in the Agrimonde GO scenario, although at a slower pace. Pastures have gained 244 million hectares, largely to the detriment of “other” and of forests which have lost 38 million hectares (i.e. 1% of their current area³⁹). This phenomenon is clearly evident in sub-Saharan Africa and in Asia where the savannah has grown respectively by 288 and 170 million hectares, primarily in areas that were previously under forest cover. Trends are the opposite in former Soviet Union and the OECD-1990 countries, which have replaced respectively some 147 and 144 million hectares of pastures essentially by forests. In Latin America, deforestation has almost stopped. Finally, in Agrimonde GO irrigated</p>

French MOD (2008), Délégation aux affaires stratégiques : *Geostrategic prospectives for the next thirty years* "



<http://www.defense.gouv.fr/das/content/download/138857/1207078/file/SYN.pdf>

Conclusions have been delivered in the 5th Prospective Meeting organized by the DAS in February 13th 2008.

Prospective thinking on geopolitics and geostrategy in the next thirty years is based not only on the analysis of transverse fields of action - such as the environment, demographics or technology - but also on the study of the strategies of the world's main protagonists.

Although most conflicts in the past few years were interstate ones, it would be dangerous to minimize the risk of other interstate conflicts in the future. The gap between rich and poor countries is widening; challenging of the global regulation framework imposed by Western powers since the end of the Second World War is increasingly felt.

The relationship between economy and defence has always been a complex one. However, it remains essential: economic dynamism underpins the possibility of conducting credible military operations. Besides, economic imbalance can be a source of conflicts.

Questions about permanent access to resources and the inevitable degradation of the environment accelerated by human activity are not recent. Currently, they are well represented in the media and taken into account by political, administrative and economic role-players. In the next thirty years, the planet will have 8.6 billion inhabitants, versus 6.5 billion today. This demographic leap can be explained by a strong natural increase in the developing countries, combined with the general increase in life expectancy around the world.

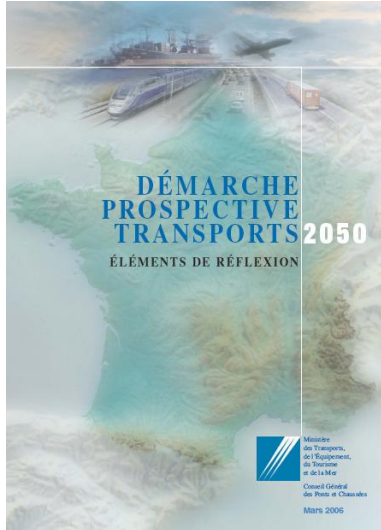
The increase in health spending is an unavoidable trend and will be mainly linked to permanent medical progress, rather than ageing. It is a delicate issue to anticipate the impact of ageing on health spending, as there are many factors involved.

This analysis looks at societies which are not European, in which cultural phenomena could have repercussions on French and European societies, and more specifically on their security.

This chapter dedicated to science and technology does not aim at providing a panorama of technologies available by the next thirty years, nor to determine technological needs for defence. It aims at shedding light on the greatest trends, uncertainty factors and potential ruptures in this domain, which could have an impact on French and EU defence.

France

Ministère de l'écologie, de l'énergie, du Développement durable et de la Mer



http://portail.documentation.developpement-durable.gouv.fr/cgedd/document.xsp?id=Cgpc-OUV00000454&qid=sdx_q0&n=2&q=&depot=notices
EFMN Brief No. 112, www.efmn.eu

« Démarche prospective Transports 2050 » (2006) –

This foresight initiative intends to initiate the elaboration of a long-term strategic plan for French Transport policy. The exercise uses a French methodological approach to carry out retrospective analysis of historical trends and build quantitative scenarios. It provides general insights on transportation flows and opens public debate on public policies designed to prepare for the “post-oil” era and create impulses for a serious effort to reduce greenhouse emissions.

The vision details four exploratory scenarios extending to 2050.

	2002	Horizon 2050 scenarios			
		Scenario 1	Scenario 2	Scenario 3	Scenario 4
Demo-graphic development (in millions)	59	67	58	67	70
GDP (annual growth)	2%	1.5%	1%	2%	1.5%
Price of a barrel oil	28\$	30\$	60\$	60\$	120\$
Carbon tax	0	60\$	0	30\$	60\$
Land-based passengers (base)	100	150	118	164	158
Airline passengers (base)	100	191	185	318	168
Freight volume (base)	100	167	94-117	146-182	150

Prices shown in US\$

- Scenario 1 - "Worldwide governance and environment-friendly industry": progress in worldwide environmental governance, coupled with effective European governance and a very open global economic system;
- Scenario 2 - "European isolationism and decline": no effective scheme of environmental governance, neither worldwide nor European, and a more protectionist stance;
- Scenario 3 - "A Tightly-integrated, enlarged Europe": lack of governance worldwide on global issues such as environment and climate shifts, with further progress on European integration and enlargement throughout the Mediterranean Basin and Russia, as well as an expanding economic and trade outlook;
- Scenario 4 - "Inward-looking European governance, regionalization and protectionism".

France

Institut d'Evaluation des Stratégies sur l'Energie et l'Environnement
<http://lesrapports.ladocumentationfrancaise.fr/BRP/984000168/0000.pdf>

La Demande d'énergie en 2050

Ce report montre 3 scénarios à l'horizon 2020, 2050 et 2100. - Un scénario de forte croissance (avec réduction significative de l'intensité énergétique); - Un scénario de croissance moyenne (avec une faible amélioration de l'intensité énergétique) - Un scénario de priorité écologique reprenant la croissance moyenne du scénario précédent et y associant une forte réduction de l'intensité énergétique et un rééquilibrage Nord-Sud.

France

Délégation interministérielle à l'aménagement et à la compétitivité des territoires (DIACT)

http://www.datar.gouv.fr/rech_resultats.php3?rech=Territoires+et+cyberespace+en+2030&lang=fr&rub=0

« Territoires et cyberspace en 2030 » (2008)



<p>France Futuribles http://www.ageing.ox.ac.uk/files/workingpaper_302.pdf</p>	<p>An exercise in scenario-building for pensions in France up to 2040</p> <p>This exercise is based on a preparatory exercise which took place in 1996. Many studies of the future of retirement pensions have already been conducted in France. All of them, however, use a similar approach: with the help of a macroeconomic model which assumes that the current social and economic system will be maintained unchanged, and using a range of different assumptions, they simulate the impact of an ageing population on pensions. While the authors here do not challenge the value of these studies, they are sceptical about the underlying assumption that the present social and economic system will still be the same in 2040. They therefore set out to examine which factors might lead to shifts and discontinuities by 2040, i.e. to explore the possible futures of French society and the issues that might arise because of an ageing population. The study, co-ordinated by the CDC, the OR and Futuribles, managed by the authors, was conducted in several phases: identification of the six sub-systems which defined the main architectural elements for the subsequent parts of the study; examination of the factors which might lead to shifts and discontinuities by 2040; elaboration of micro-scenarios; elaboration of global scenarios (six for 2020 and five for 2040). From this exercise, the authors highlight seven major outcomes and stress in particular that certain measures should be taken as quickly as possible, measures which are related not just to pensions, but rather to the general dynamics of French society, above all the labour market.</p>
<p>Germany Federal Research Ministry</p>	<p>German BMBF - Stadt 2030 / BMBF City 2030</p> <p>To forecast developments for the year 2030 on demography, quality of life, cultural identity and integration. Reason: To give an overview of possible development in the future and what their consequences may be. Audience: Policy makers and general public</p>

Germany

German Advisory Council on the Environment (SRU)



**100% erneuerbare
Stromversorgung bis 2050:
klimaverträglich,
sicher, bezahlbar**

(Vorläufige Fassung vom 5. Mai 2010)

Stellungnahme

Mai 2010

Nr. **15**

ISSN 1612-2986

http://www.umweltrat.de/cae/servlet/contentblob/1001596/publicationFile/63817/2010_05_Stellung_15_erneuerbareStromversorgung.pdf

Climate-friendly, reliable, affordable: 100% renewable electricity supply by 2050
Prof Martin Faulstich, today in the Environment Committee of the German Bundestag where the Council presented its scenarios for a renewable electricity supply in Germany. "This is the time for the German Federal Government to set the course for the transition of the energy system", Prof Faulstich added.

The energy expert of the SRU, Prof Olav Hohmeyer, emphasised: "The transition towards a renewable electricity system does not require either an extension of the operating life of nuclear power plants or the construction of new coal power plants." The "bridge" towards renewable energy is already in place.

The German Advisory Council on the Environment shows in a range of different future scenarios that a fully renewables-based electricity supply by 2050 is possible at competitive costs. Security of supply can be guaranteed at all times, every hour of the year. This provides an opportunity for sustainable innovation, enhancing the outlook for Germany's economic future.

The scenarios are based on modelling results by the German Aerospace Center (DLR). The REMix model which was used for the calculations is amongst the best and most sophisticated models in Europe. It works with an extremely high temporal resolution in modelling electricity supply and demand.

Major results of the scenarios include:

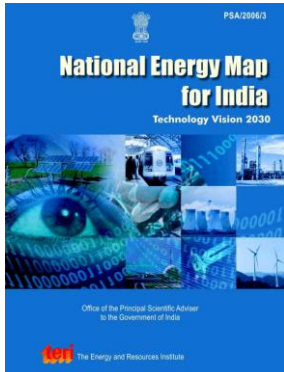
1. The sustainable potential for renewable energy in Europe exceeds the current and future electricity demand many times.
2. Because the supply of wind and solar energy fluctuates considerably, however, meeting the demand requires an extension of the grid as well as the development of electricity storage capacities. For storage, the SRU recommends in particular a close cooperation with Scandinavian countries such as Norway and Sweden. For example, a connection between Scandinavian hydro power and pump storage potentials and German supply potentials can create the required balancing mechanism and thereby lower the costs. The SRU also shows how a larger European-North African network can provide a reliable and low-cost electricity supply.
3. The electricity production costs in a fully renewables-based electricity system would according to calculations by the SRU probably be even lower than those in a system based on a mix of renewables and low-carbon conventional fuels. The costs of power generation, storage and international grid extension could in 2050 be in the range of 6 to 7 ct/kWh if policy is committed to stringent energy efficiency and saving as well as to the development of an overarching European electricity grid. Electricity production costs currently contribute about one third to the electricity prices for private consumers.
4. The necessary renewal of the power plant capital stock in Germany offers particularly favourable conditions for a transition towards renewable sources. Existing conventional power plants and those already under construction could successively be taken off the grid at the end of their regular lifetime. The SRU estimates that the gradual reduction of conventional capacity can be compensated through the addition of renewable capacity. This means: The transition towards a renewables-based electricity supply does not require either an extension of the operating life of nuclear power plants or the construction of new coal power stations with Carbon Capture and Storage (CCS). The SRU cautions that a significant extension of the operating life of nuclear power plants would lead to overcapacities in the system. In the long term, conventional power plants are not compatible with renewable electricity supply because their output cannot be adjusted sufficiently quickly to match the fluctuations of wind and solar power generation. The permanent co-existence of conventional and growing renewable electricity generation would make the system inefficient and unnecessarily expensive.
5. Grid extension and the development of electricity storage in Germany and the EU is the biggest challenge for a rapid transition towards a renewables-based electricity system. Here, quick action is urgently required. The SRU advises the Federal Government to play a very active role in planning the extension.

The scenarios presented by the SRU are part of a Special Report on the future of the electricity supply which will be published in the autumn. The Special Report will address in detail the political, legal, and economic requirements for a transformation of the electricity system towards a fully renewable-based supply. The scenarios which have been published today ahead of the full report can be downloaded at <http://www.umweltrat.de>.

For further information, please contact Dr. Christian Hey on +49 (0)30-26 36 96-0.

The Advisory Council on the Environment (SRU) was founded in 1971 to advise the German government. The Council is made up of seven university professors from a range of different environment-related disciplines. This ensures an encompassing and independent evaluation from a natural scientific and technical as well as from an economic, legal, ethical and political science perspective.

India
Office of the Principal Scientific Adviser to the Government of India



http://psa.gov.in/writereaddata/11913293531_NEM2030.pdf

“National Energy Map for India – Technology Vision 2030” (2006)

The report clearly points towards the country’s increasing import dependence of all fossil fuels. It also indicates that coal would continue to play a key role in meeting the country’s energy requirements. However, the indigenous availability of coal is expected to plateau in the next couple of decades with the current exploitation plans and technology. The need for energy efficiency in the end-use sectors and radical policy changes in the transport sector is also highlighted. The study points towards focussing efforts simultaneously on the demand and supply sides for the economy to attain the most efficient utilization of available resources.

Ireland
Teagasc Agriculture and Food Development Authority
Vision 2030 of a Sustainable Bio-Economy



[http://www.teagasc.ie/foresight/EFMN Brief No. 143](http://www.teagasc.ie/foresight/EFMN_Brief_No._143), www.efmn.eu

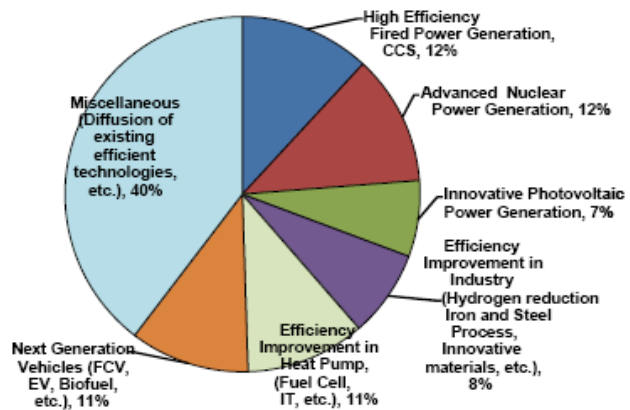
Teagasc 2030: Reinventing the Irish Agri-Food Knowledge System

Double in value : gross output value of the food and drink sector is expected to double from €20bn to €40bn by 2030.
Competitive, cost-effective and sustainable : the agrifood sector and rural economy will compete successfully on international markets, while reducing both costs and environmental impacts.
Innovative : success in all of the sectors, both traditional and emerging, will depend on exploiting new knowledge through innovation.

Japan
Ministry of Economy, Trade and Industry
National Institute for Environmental Studies –

<http://www.nies.go.jp/index.html>
http://www.iae.or.jp/research/project/Cool_Earth08_e/CoolEarth_RM.pdf
http://www.iae.or.jp/research/project/Cool_Earth08_e/CE_RoadMap.ppt
Project „2050 Japan Low-Carbon Society” – <http://2050.nies.go.jp/index.html>:
“Japan Scenarios and Actions towards Low-Carbon Societies (LCSs)” (2008)
“Aligning Climate Change and Sustainability – Scenarios, Modeling and Policy Analysis” (2007)
Energy Technology Strategy (Technology Strategy Map 2007)”, Horizon 2030 (2007) – <http://www.iae.or.jp/etm.html>
“Development Japan Scenarios Development of Japan Low Carbon Society Scenarios”, Zeithorizont 2050 (2006) – 2050.nies.go.jp/material/lcs_booklet/LCS_BOOKLET_No3.pdf

“Cool Earth-Innovative Energy Technology Program” Roadmap on Energy Horizon 2050 (2008) –
reducing carbon dioxide emission from energy sources to half in 2050



(Figure 9) Contribution of Innovative Energy Technologies for the 50 % Emission Reduction in 2050
Source: An estimation by the institute of Applied Energy

Korea

KISTEP (Korea Institute of Sci. & Tech. Evaluation and Planning)



Korea 2030
Foresight Brief No. 036

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STEP - The Science and Technology Policy Research Institute, Seoul, The Republic of Korea
Sponsors: MOST - The Ministry of Science and Technology of the Republic of Korea
Type: National Foresight Exercise covering scientific and technological fields
Organizer: MOST - Ministry of Science and Technology
Korea Institute for S&T Evaluation and Planning
www.kistep.or.kr
Duration: June 2003-Dec 2004 Budget: 50,000 Euros Time Horizon: 2005-2030

The Third Korean National Foresight Exercise

The Third Korean Foresight Exercise entitled 'Future Perspectives and Technology Foresight for Korea - Identifying Challenges and Opportunities for Korea's Economy and Society' represents the most comprehensive effort to date by the Korean government in the field of S&T foresight. Capitalizing on previous studies conducted in 1994 and 1999 to chart the future of Korea, society and technology and link people's future needs to innovations in science and in research systems in both character and methodology, the Third Korean Foresight Exercise accelerates Korea's evolution towards a knowledge society.

A Leap into the Past

Over the past four decades, Korea has gone through distinctive phases in science and technology policy-making, starting with the creation of MOST, The Ministry of Science and Technology and the Science and Technology Promotion Law in 1987.

With this basic infrastructure in place, the 1970s can be considered as the growth stage of Korean S&T when the focus shifted to capital and technology intensive industries, heavy and chemical industries and the education of qualified scientists and engineers was emphasized at national level.

The 1987 and 1992 National R&D Plans, derived under the overall theme of 'catch up and overtake', have guided Korea's S&T policies and programs. Major subthemes of the 1992 in Korea included semiconductor, steel, automobile and ship-building. By the 1990s, S&T activity on the government and private levels were greatly expanded as evidenced by the fact

that 70% of Korea's cumulative R&D investment was allocated prior 1990. Today, 70% of R&D investment originates from private sources with government contributing 27%. Total R&D investment (GERD) peaked at 2.2 trillion Korean Won in 2004 (\$22 billion or 2.10% of GDP), the highest figure the country has seen since statistics were first compiled in the early 1980s.

Korea's S&T Challenges today

Today, the Korean government is faced with the task of setting priorities in the development of a domestic technological capability and finding ways of launching new high-tech industries that can contribute to world-level competitiveness beyond Korea's traditional strengths in semi-conductors, mobile communications, petrochemicals, shipbuilding and automobiles.

Foresight is regarded as a critical tool for policy-making. While increasing the percentage of R&D funds in the govern-

The EFMD is licensed by the European Commission (EC Research) to part of a series of resources compiled to create "Foresight Europe Platform" for policy makers in the European Union. More information on the EFMD and on the Knowledge Sharing Platform is provided in WWW.EFMD.INFO

http://www.foresight-network.eu/index.php?option=com_docman&task=doc_view&gid=36

The Third Korean Foresight Exercise entitled 'Future Perspectives and Technology Foresight for Korea – Identifying Challenges and Opportunities for Korea's Economy and Society' represents the most comprehensive effort to date by the Korean government in the field of S&T foresight. Capitalizing on previous studies conducted in 1994 and 1999 its chief purpose is to chart the future of Korean society and technology and link peoples future needs to innovations in science and in research. Systemic in both character and methodology this Third Korean Foresight Exercise accelerates Korea's evolution towards a knowledge society. In the foresight exercise, the prospect of future Korean society up to Year 2030 was developed. Then, future demands and needs based on the prospects were deduced through survey on the general public. The technical panels were set-up to develop the technology subjects that may satisfy the demands and needs of future Korean society. Total 761 future technology subjects were Delphi-surveyed. In the survey, various aspects such as realization time, technical level and gap, strategic importance, obstacle to overcome were assessed. Right after the reporting, Government carried out new initiative of the future strategic technology area that can be new engine of economic growth around year 2015. Total 21 technology areas were selected based on its impact on the quality of life, economic growth and public needs. Government vow to make a master plan to execute this program in 2006. In the paper, overall priority-setting procedure will be described in details comparing existing R&D program in Korea. The proportion of people aged 65 stood at only 3.3 percent in 1966. However it increased to 9.1 percent in 2005 and is projected to increase to 24.3 percent in 2030. Most of the technology subjects in the field of 'information and knowledge' will be realized around 2010 though some from 'Space and Earth' will be realized later than 2025.

The Netherlands

Energy Research Centre of the Netherlands



The flexible future of micro combined heat and power

An analysis of the social embedding of micro CHP in Dutch households in 2030

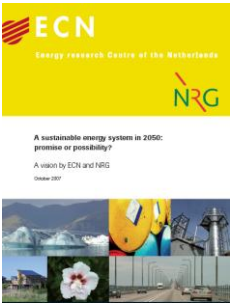
C.F.J. Feenstra

ECN-E-08-038

June 2008

<http://www.ecn.nl/publications/PdfFetch.aspx?nr=ECN-E--08-038>

"The flexible future of micro combined heat and power. An analysis of the social embedding of micro CHP in Dutch households in 2030", horizon 2030 (2008) – Within the project Flexibel, ECN has performed an analysis of the social embedding of micro CHP in Dutch households in 2030. In general it can be concluded that large differences exist in the expectations concerning the impact of mCHP on the market of heating systems in households and the size of the mCHP-market the coming years. Some stakeholders, for example the Smart Power Foundation, expect a large market penetration of mCHP as a substitute for the existing High Efficiency boiler ('HR-ketel') in households from 2010- 2015 on with four million mCHPs installed in 2030 while others expect already a decrease of the market from 2020 on.

<p>Netherlands Bureau for Economic Policy Analysis LEJOUR, A. Quantifying four scenarios for Europe / A. Lejour. - The Hague : CPB Netherlands Bureau for Economic Policy Analysis, October 2003.</p> <p style="text-align: center;">CPB Document</p> <p style="text-align: center;">No 38 October, 2003</p> <p style="text-align: center;">Quantifying Four Scenarios for Europe</p> <p style="text-align: center;">Arjan Lejour</p> <p>http://www.cpb.nl/eng/pub/cpbreesen/document/38/doc38.pdf</p>	<p>This study presents four economic scenarios for Europe until 2040. The scenarios are developed around two key uncertainties: international cooperation and institutional reforms. In the scenarios Strong Europe (SE) and Global Economy (GE), international cooperation is prominent, while the other scenarios, Regional Communities (RC) and Transatlantic Market (TM), feature limited international cooperation. Public institutions are important in Strong Europe and Regional Communities. In Global Economy and Transatlantic Market the role of the public sector is limited. There is more room for private initiatives in these scenarios.</p> <p>To illustrate the scenarios, this document presents quantitative developments described with an applied general equilibrium model developed at CPB: WorldScan. By using this model we are able to derive consistency between developments in the scenarios and to apply common economic mechanisms. The variation in the outcomes for the scenarios is derived by introducing differences in exogenous trends. This document explains and motivates these differences.</p>
<p>The Netherlands Energy Research Centre of the Netherlands</p>  <p>http://www.ecn.nl/publications/PdfFetch.aspx?nr=ECN-E--07-082</p>	<p>“A sustainable energy system in 2050: Promise or possibility?” (2007)</p> <p>This document presents an outline of a sustainable energy situation for Europe in the year 2050. In 2050 the energy system will not be completely sustainable. The authors have formulated additional sustainability conditions for the reliable use of nuclear energy, biomass, and CO2 capture & storage in a sustainable energy system. If these conditions are complied with, the overall picture will meet realistic criteria of sustainability. Despite this, continued energy conservation and further development of renewables should be pursued after 2050. In the vision for 2050 presented here, much weight is given to new technologies, new resources and new energy infrastructure. In addition to such innovation, new ways of decision-making and new patterns of behaviour are essential. With respect to technological developments that result in, for instance, affordable solar cells, the deployment of second-generation biofuels and reliable CO2 capture & storage, realistic judgements have been made as to the timing of their commercialisation. The technology policy required to bring about such technological developments is briefly outlined.</p>
<p>The Netherlands Ministry of Housing, Spatial Planning and the Environment</p> <p>http://www.vrom.nl/docs/20070326-environmental-images-for-dutch-industry-in-2030-executive-summary.pdf</p>	<p>“Environmental Images for Dutch industry in 2030 –</p> <p>A national study on environmental performance levels in 2030 and comparison of cost of available solutions” (2007) –</p> <p>Alternative technology solutions were compared for each pollutant studied, both in terms of total emission savings potential (i.e. to which extent could each technology contribute to the total national emission reduction), and in terms of cost efficiency (in Euro per ton of avoided pollutant, including learning curve effects until 2030).</p>

UK. Stern review on the economics of climate change (2006)



www.hm-treasury.gov.uk/sternreview_index.htm
http://www.hm-treasury.gov.uk/d/Executive_Summary.pdf

Vision 2050

The first half of the Review focuses on the impacts and risks arising from uncontrolled climate change, and on the costs and opportunities associated with action to tackle it. A sound understanding of the economics of risk is critical here. The Review emphasises that economic models over timescales of centuries do not offer precise forecasts – but they are an important way to illustrate the scale of effects we might see. The Review finds that all countries will be affected by climate change, but it is the poorest countries that will suffer earliest and most. Unabated climate change risks raising average temperatures by over 5°C from pre-industrial levels. Such changes would transform the physical geography of our planet, as well as the human geography – how and where we live our lives. Adding up the costs of a narrow range of the effects, based on the assessment of the science carried out by the Intergovernmental Panel on Climate Change in 2001, the Review calculates that the dangers of unabated climate change would be equivalent to at least 5% of GDP each year. The Review goes on to consider more recent scientific evidence (for example, of the risks that greenhouse gases will be released naturally as the permafrost melts), the economic effects on human life and the environment, and approaches to modelling that ensure the impacts that affect poor people are weighted appropriately. Taking these together, the Review estimates that the dangers could be equivalent to 20% of GDP or more. In contrast, the costs of action to reduce greenhouse gas emissions to avoid the worst impacts of climate change can be limited to around 1% of global GDP each year. People would pay a little more for carbon-intensive goods, but our economies could continue to grow strongly. If we take no action to control emissions, each tonne of CO2 that we emit now is causing damage worth at least \$85 – but these costs are not included when investors and consumers make decisions about how to spend their money. Emerging schemes that allow people to trade reductions in CO2 have demonstrated that there are many opportunities to cut emissions for less than \$25 a tonne. In other words, reducing emissions will make us better off. According to one measure, the benefits over time of actions to shift the world onto a low-carbon path could be in the order of \$2.5 trillion each year. The shift to a low-carbon economy will also bring huge opportunities. Markets for low-carbon technologies will be worth at least \$500bn, and perhaps much more, by 2050 if the world acts on the scale required. Tackling climate change is the pro-growth strategy; ignoring it will ultimately undermine economic growth.

UK MOD: Development, Concepts and Doctrine Centre, DCDC report "Future Character of Conflict" February 2010.



http://www.mod.uk/NR/rdonlyres/3E38C6EC-4A76-402F-9E28-C571EAB9929F/0/fcoc_final_revised_12Feb10.pdf

This paper is based on 6 broad assumptions derived from current policy:

- The UK has significant global interests and will therefore wish to remain a leading actor on the international stage as a permanent member of the United Nations Security Council (UNSC), a nuclear power, a key member of North Atlantic Treaty Organization (NATO), the European Union (EU) and other international institutions, irrespective of the potential for its power base to decline.
- Defence will be the Nation's ultimate insurance policy. We cannot rule out the re-emergence of a major state-led threat, but in the foreseeable future, there is no state with the intent and capability to threaten the UK mainland; threats are more likely to be manifested in less traditional, non-military domains. However, the sovereignty of some of our Overseas Territories will still be subject to territorial claims by other states, which will seek to exert pressure on them through some or all of diplomatic, economic or military means.
- Future planning will be conducted against a background of finite financial resources while the military purchasing power of potential competitors is increasing and their pace of adaptation is out-stripping ours.
- Our adversaries are unlikely to engage us on our terms and will not fight solely against our conventional strengths. They will seek an asymmetric advantage and some will employ a wide range of warfare techniques, sometimes simultaneously in time, space and domain. Their logic will not necessarily be our logic and thus our ability to understand adversaries – and our ability to make them understand our intent – will be challenging.
- Since final resolution of conflict will involve people and where they live, strategic success will often, but not exclusively, be achieved through the results of actions on the ground. These actions are unlikely to be purely military although it will be vital for the UK to achieve military effect both on the land and in the global commons.
- The UK will act with others where shared interests and values coincide. We will routinely operate with allies and partners, in particular as a supporting partner in a US-led coalition. It is extremely unlikely that the UK will conduct warfighting without US leadership, but in other operations the UK may be called upon to lead a non-US coalition.

UK

Office of the Deputy Prime Minister
The Department for Transport

**Regional Futures:
England's Regions
in 2030**
Final Report

January 2005

English Regions Network
RDA Planning Leads Group
Office of the Deputy
Prime Minister
Department for Transport

ARUP

Oxford
Economic
Forecasting

http://www.emra.gov.uk/news/documents/REGIONAL_FUTURES_Final_Report.pdf

England's Regions 2030

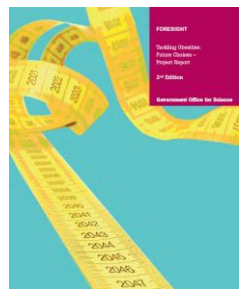
In spite of the fact that regions and regional disparities have become important political issues inter-regional aspects are rarely addressed neither scientifically nor politically. The report provides an attempt to forecast economic and demographic changes within regions in England and how these changes will affect inter-regional relations. Thus, the report can also be regarded as a basis for regional planning over the next 25 years. The main goals of the report are, hence, to identify underlying forces in regional economies, describe how the relationships between regions have been changing and will change in the future, and develop a "national perspective" on England's regions. It also explores the opportunities for policy intervention.

The vision 2030 sets out three scenarios for regional development and change. These are:

1. Constraining growth in the South: failing to plan for full potential employment growth, and restricting numbers of new dwellings, on the assumption that growth would be diverted to the islands and the North instead.
2. Planning for growth in the South: accommodating population and employment growth, delivering regeneration, and extending the London and the South East mega-city region to locations it does not currently reach.
3. City-region renaissance in the North, Midlands and peripheral parts of the South West: a tep change in rates of economic and population growth in the North and Midlands.

UK

Government Office for Science (2007) UK Government's Foresight Programme.



www.foresight.gov.uk/Obesity/Obesity_final_part1.pdf

The British foresight report 'Tackling Obesity: Future Choices' (2nd Edition) mentions obesity as one of the major challenges for the UK and predicts that by 2050 half of the UK population might be obese. The report further estimates that "[t]he NHS costs attributable to overweight and obesity are projected to double to £10 billion per year by 2050. The wider costs to society and business are estimated to reach £49.9 billion per year (at today's prices).

Depending on primary appetite control in the brain; the force of dietary habits, keeping individuals from adopting healthier alternatives; the level of physical activity and the psychological ambivalence experienced by individuals in making lifestyle choices, Britain could be a mainly obese society by 2050.




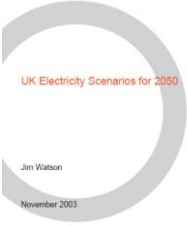
UK

Department of Energy and Climate Change
http://www.decc.gov.uk/en/content/cms/publications/lc_trans_plan/lc_trans_plan.aspx

"The UK Low Carbon Transition Plan

National strategy for climate and energy" (2009) – (Roadmap horizon 2050)

The key point is that while temperatures in 2050 may not be that different between the mitigated and the most optimistic unmitigated scenarios, by 2100 there will be a huge difference – the difference between catastrophic global warming and mere warming, which while very challenging, is something to which human society can adapt. The main beneficiaries of urgent action now, because of the long life time of greenhouse gases in the atmosphere, will be our descendants. The CCC estimated that the costs to the UK of meeting an 80% target would be in the order of 1-2% of GDP in 2050. Government has published its own estimate of the costs of meeting the 80% target in the Impact Assessment of the Climate Change Act.¹¹ This estimate drew upon a variety of modelling work including the work commissioned by the CCC and estimated costs to be of a similar order of magnitude. Overall, the costs to the UK of meeting our 2050 target are affordable – given the consequences of not acting – providing we reduce emissions cost-effectively as part of co-ordinated global action. This means bringing on the right technologies and getting the policy mix right. This is explored in the next section.

<p>UK British Cement Association http://www.cementindustry.co.uk/pdf/18%2010%2005%20-%20Carbon%20strategy%20Final.pdf</p>	<p>"A carbon strategy for the cement industry" horizon 2030 (2005) The UK cement industry recognises the importance of climate change and that it can contribute towards the government's 60% reduction target for CO₂ emissions by 2050. There are two key ways in which the cement industry can help: 1. Reduce direct emissions from cement kilns in addition to related activities such as transport, and indirect emissions from electricity use. 2. Work with the design and construction industry to promote low-carbon long-life dwellings, offices and other buildings that can adapt to a changing climate through the effective use of cement and concrete.</p>
<p>UK Tyndall Centre for Climate Change -   <small>Jim Watson, Alison Tetlow, Geoff Dalton, Angela Entwistle, Christine Kelly, and Matthew Page February 2004</small> <small>Tyndall Centre for Climate Change Research Working Paper 46</small> http://www.tyndall.ac.uk/publications/publications.shtml</p>	<p>UK Hydrogen Futures 2050 The four scenarios for 2050 that are presented in the working paper are the result of two discussion meetings by the project team held in late 2002 and early 2003. They were refined further during 2003 to reflect the needs of the hydrogen energy and transport models being developed for the project by team members within the Rutherford Appleton Laboratory and the Institute for Transport Studies. The scenarios build on those established by the UK Foresight programme, and applied widely within government over various timescales to 2050. This working paper was developed as part of Tyndall Centre project IT1.26: The Hydrogen Energy Economy: Its Role in Reducing Greenhouse Gas Emissions.</p>
<p>UK Tyndall Centre for Climate Change   <small>Jim Watson November 2003</small> <small>Tyndall Centre for Climate Change Research Working Paper 41</small> http://www.tyndall.ac.uk/index.shtml</p>	<p>- Electricity Scenarios for 2050 The purpose of this working paper is to establish a set of scenarios for the UK electricity system in 2050, principally for the Tyndall Centre project: Security of Decarbonised Electricity Systems. The scenarios will be used in this project to help investigate how the operational security of a decarbonised UK power system can be managed and maintained. The paper builds on four scenarios developed by the Royal Commission on Environmental Pollution (RCEP), all of which include a 60% reduction in UK carbon dioxide emissions.</p>
<p>UK Ministry of Defence DCDC (Development, Concepts and Doctrine Centre): http://www.mod.uk/NR/rdonlyres/94A1F45E-A830-49DB-B319-DF68C28D561D/0/strat_trends_17mar07.pdf</p>	<p>"The DCDC Global Strategic Trends Programme, Third Edition: 2007-2036", January 2007 By 2030 oil demand compared to 2004 levels is +100% in China, +164% in India, +40% in Russia/Caspian, +58% in Africa, +85% in Latin America, +25% in North America, +18% in Europe, +54% in Middle East, +73% in Asia Pacific. By 2050 230 million people living outside their country of origin, average global temperature likely 0.8-1.7 degrees Celsius above 2001 levels.</p>
<p>UK Government</p>	<p>England's regions in 2030 Description The UK Government has set the objectives of raising the rate of economic growth in all regions and, in the long term, or reducing the persistent gaps in growth rates between regions. This study attempted to provide a clearer economic and demographic context for regional planning in England for the next 25 years</p>

USA

Department of Energy (DOE)
The Hydrogen Posture Plan

Hydrogen Posture Plan

An Integrated Research, Development and Demonstration Plan

December 2006



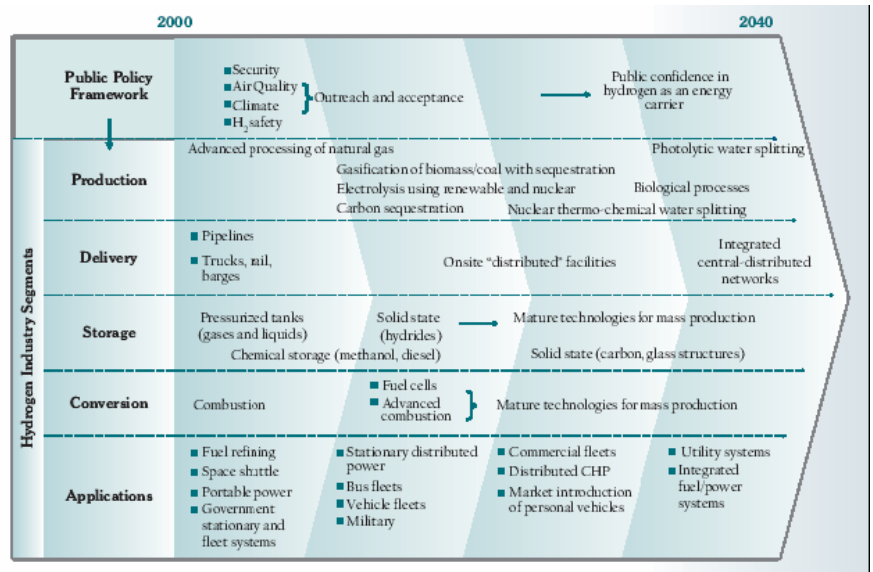
United States Department of Energy




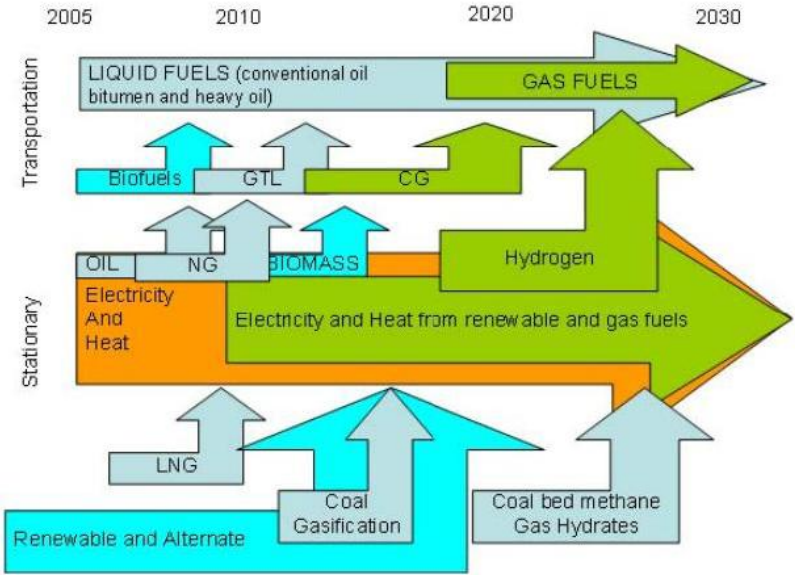
United States Department of Transportation

http://www.hydrogen.energy.gov/pdfs/hydrogen_posture_plan_dec06.pdf

The US Hydrogen Roadmap 2040



International Forward Looking Activities

Country - Organisation –Reference	Background + Vision
<p data-bbox="151 338 574 365">Asia-Pacific Economic Cooperation (APEC)</p>  <p data-bbox="167 806 574 952">THE 2050 SCENARIOS: LOW CARBON – HIGH QUALITY LIFESTYLES for THE ASIA –PACIFIC</p> <p data-bbox="151 974 654 1086"> http://www.lcs2050.com/file/doc_scenario/report_scenario.pdf http://www.apecforesight.org/apec_wide/docs/APEC2030IntegratedRoadmap.pdf </p>	<p data-bbox="683 338 1093 365">Future Fuel Technology for APEC Regions</p> <p data-bbox="683 369 1524 571">The main aspiration was to gain strategic intelligence on future fuel technologies going beyond the current status and trends of present day energy technology and to draw roadmaps of selected future fuel technologies leading to robust plans for the future of technologies in the APEC region up to 2030. Moreover, the co-organizers of the project also anticipated continuous activities referred to as “post foresight” within APEC economies and among fuel technologies experts both during and after the project.</p> <p data-bbox="683 575 782 602">Fuel 2030</p>  <p data-bbox="782 1187 1348 1220">Possible Integration of Future Fuel Technologies</p>
<p data-bbox="151 1256 502 1283">FAO - World agriculture 2030/2050</p> <p data-bbox="231 1321 414 1355">Prospects for food, nutrition, agriculture and major commodity groups</p> <p data-bbox="215 1433 414 1489">World agriculture: towards 2030/2050</p> <p data-bbox="327 1523 414 1545">Interim report</p> <p data-bbox="199 1612 414 1646">Global Perspective Studies Unit Food and Agriculture Organization of the United Nations Rome, June 2006</p> <p data-bbox="151 1657 590 1686"> http://www.fao.org/es/esd/AT2050web.pdf </p>	<p data-bbox="683 1256 1524 1489">The slowdown in the growth of world agriculture may be mitigated if the use of crop biomass for biofuels were to be further increased and consolidated. Several countries in Latin America, South-East Asia and sub-Saharan Africa, including some of the most needy and food-insecure ones, could benefit. Of particular interest are (a) possible adverse effects on the food security of the poor and the food-insecure if food prices were to rise because of resource diversion towards the production of feedstock crops for biofuels; and (b) the environmental implications of cultivated land expansion into pasturelands and forested areas.</p>

FAO- High Level Expert Forum - How to Feed the World in 2050



How to Feed the World in 2050

Executive Summary

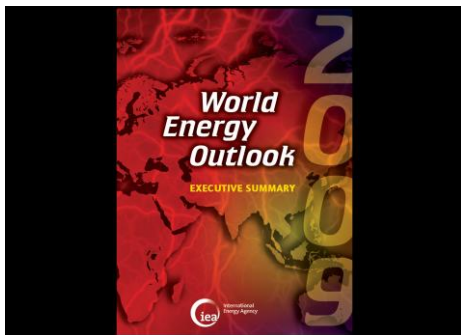
1. Introduction
2. Outlook for food security towards 2050
 - (1) The changing socio-economic environment
 - (2) The natural resource base to 2050 – will there be enough land, water and genetic diversity to meet demand?
 - (3) Potential for food security
3. Prerequisites for global food security
 - (1) Enhancing investment in sustainable agricultural production capacity and rural development
 - (2) Promoting technology change and productivity growth
 - (3) Trade, markets and support to farmers
4. The risks and challenges:
 - (1) Hunger amidst adequate overall supplies
 - (2) Climate Change
 - (3) Biofuels
5. Mobilising political will and building institutions

<http://www.fao.org/wsfs/forum2050/wsfs-forum/en/>

How to Feed the World in 2050

- On horizon 2050 - billions needed for agriculture
- Net investments of US\$83 billion a year must be made in agriculture in developing countries if there is to be enough food for 9.1 billion people in 2050
- Climate change will worsen the plight of the poor
- Future of agriculture and food security closely linked to climate change
- Africa's food challenge
- Prospects good, resources abundant, policy must improve
- Increased investment in agricultural research essential
- Producing more food will largely depend on increasing crop yields, not farming more land
- A third more mouths to feed
- Food production will have to increase by 70 percent

**IEA International Energy Agency
World Energy Outlook**



<http://www.worldenergyoutlook.org/>

The financial crisis has halted the rise in global fossil-energy use, but its long-term upward path will resume soon *on current policies*

- Tackling climate change & enhancing energy security require a massive decarbonisation of the energy system
- > We are now on course for a 6°C temperature rise & rising energy costs
- > Limiting temperature rise to 2°C will require big emission reductions in all regions
- A 450 path towards 'Green Growth' would bring substantial benefits
- > Avoiding the worst effects & costs of climate change
- > Energy-security benefits, lower oil & gas imports & reduced energy bills
- > Much less air pollution & huge health benefits
- Natural gas can play a key role as a bridge to a cleaner energy future
- The challenge is enormous – but it can and must be met
- > Improved energy efficiency & technology deployment are critical
- > Each year of delay adds \$500 bn to mitigation costs between today & 2030

INFORSE - International Network for Sustainable Energy

Global Vision2050 INFORSE

A Global Shift
INFORSE's Vision2050 for the world foresees a future where energy services are more widely available than they are today, but the energy use is lower and 100% powered by renewable sources.

In Vision2050, only a fraction of the globe's potential renewable energy is used, with most renewable energy coming from the sources nearest to human population. In this way the Vision avoids coping the very constrained fossil supply that we have today.

This is realised with high reliance on energy efficiency that has a good economy when used in large scale.

Energy Services per Capita

Energy Sources

Here's How
The adoption of many new energy-saving technologies worldwide will make Vision2050 achievable. Pictured here are a number of these technologies: (Clockwise from left) energy-efficient light bulbs, solar-powered electricity and solar panels, hydrogen-powered public transportation, wind power, energy-saving components like energy-saving light bulbs, and solutions like bicycles that require no fuel at all.

<http://www.inforse.org/europe/Vision2050.htm>
http://www.inforse.org/projects_pro.php3?id=46

Sustainable Energy Vision 2050,

- A proposal to achieve a sustainable energy system, following environmental and social imperatives.

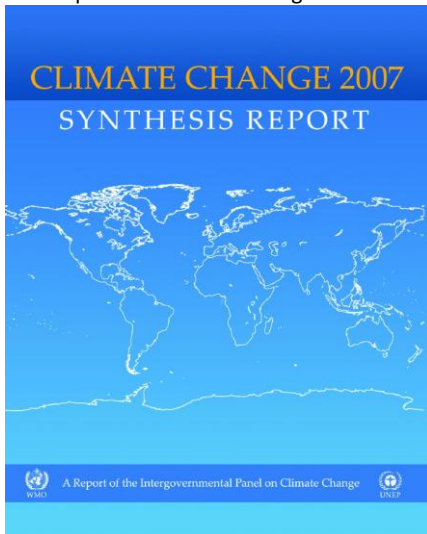
One of the best descriptions of a worldwide energy system without fossil fuel and nuclear energy is given in "A Global Renewable Energy Scenario" (GRES) (Soerensen & Meibom, 1998)¹. In that study is described, a detailed study on how to supply the world's energy needs with renewable energy in 2050. This scenario is based on the key assumptions:

- That the world population will be 9.4 billion people in 2050
- That all basic energy and food needs are met
- That 60% of the "full goal satisfaction" is fulfilled for all energy demands including leisure time activities etc. This is an increase from 33% today. This gives an increase of a representation of energy services² of 4.8 times compared to today's level.
- That the best available energy efficiency technology today is the average technology in 2050.
- There are two scenarios for meeting this demand: a decentralised scenario, relying only on renewable energy produced near its use except for hydropower, and a more centralised scenario, with 20% of the energy coming from windparks and solar centrals. Estimations of consumption and renewable energy potentials are based on a worldwide geographical information system (GIS).
- In the following part of this article, the centralised scenario is used as basis, and referred to as "GRES".

¹ Prof. Bent Sørensen and Peter Meibom, "A Global Renewable Energy Scenario", Roskilde University Center, Institute 2, Energy & Environment Group, Denmark 1998. (IMFUFU tekst no. 354, see also: mmf.ruc.dk/energy/abstracts/ipcc.zip)

² "Energy services" is referring to the benefit in non-energy terms (heated area, light, prepared food, etc.) that end-user have of his/her energy consumption. In the report of Bent Sørensen et.al., the concept is quantified as end-use energy use with the efficiency in 2050.

Intergovernmental Panel on Climate Change
IPCC reports on Climate Change



http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf
http://www.ipcc.ch/publications_and_data/ar4/syr/en/spms5.html

Vision 2050

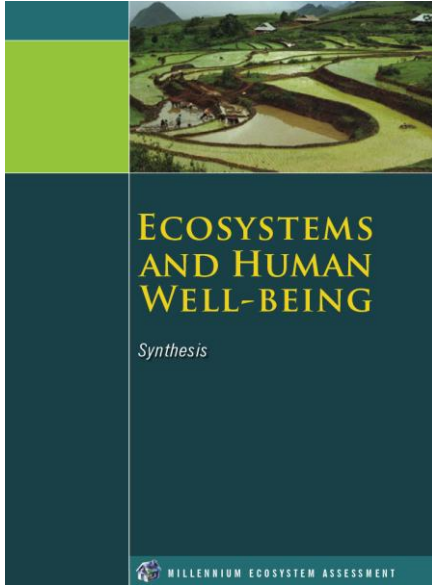
The macro-economic costs of mitigation generally rise with the stringency of the stabilisation target (Table SPM.7). For specific countries and sectors, costs vary considerably from the global average. [22] {5.6}

In 2050, global average macro-economic costs for mitigation towards stabilisation between 710 and 445ppm CO₂-eq are between a 1% gain and 5.5% decrease of global GDP (Table SPM.7). This corresponds to slowing average annual global GDP growth by less than 0.12 percentage points. {5.6}

Responding to climate change involves an iterative risk management process that includes both adaptation and mitigation and takes into account climate change damages, co-benefits, sustainability, equity and attitudes to risk. {5.1}

Impacts of climate change are very likely to impose net annual costs, which will increase over time as global temperatures increase. Peer-reviewed estimates of the social cost of carbon [23] in 2005 average US\$12 per tonne of CO₂, but the range from 100 estimates is large (-\$3 to \$95/tCO₂). This is due in large part to differences in assumptions regarding climate sensitivity, response lags, the treatment of risk and equity, economic and non-economic impacts, the inclusion of potentially catastrophic losses and discount rates. Aggregate estimates of costs mask significant differences in impacts across sectors, regions and populations and very likely underestimate damage costs because they cannot include many non-quantifiable impacts. {5.7}

Millennium Ecosystem Assessment



<http://www.millenniumassessment.org/en/Synthesis.aspx>

<http://www.millenniumassessment.org/documents/document.356.aspx.pdf>

Vision 2050

The consumption of ecosystem services, which is unsustainable in many cases, will continue to grow as a consequence of a likely three- to sixfold increase in global GDP by 2050 even while global population growth is expected to slow and level off in mid-century. *Habitat transformation, particularly from conversion to agriculture:* Under the MA scenarios, a further 10–20% of grassland and forestland is projected to be converted between 2000 and 2050 (primarily to agriculture). *Pollution, particularly nutrient loading:* Humans have already doubled the flow of reactive nitrogen on the continents, and some projections suggest that this may increase by roughly a further two thirds by 2050. Food security is not achieved under the MA scenarios by 2050, and child malnutrition is not eradicated (and is projected to increase in some regions in some MA scenarios) despite increasing food supply and more diversified diets (*medium certainty*). Habitat loss and other ecosystem changes are projected to lead to a decline in local diversity of native species in all four MA scenarios by 2050 (*high certainty*). Globally, the equilibrium number of plant species is projected to be reduced by roughly 10–15% as the result of habitat loss alone over the period of 1970 to 2050 in the MA scenarios (*low certainty*), and other factors such as overharvesting, invasive species, pollution, and climate change will further increase the rate of extinction.

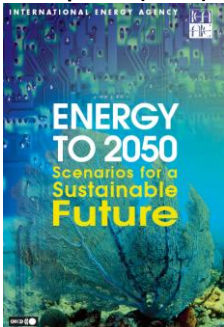
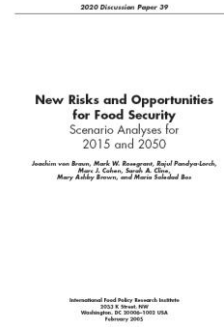
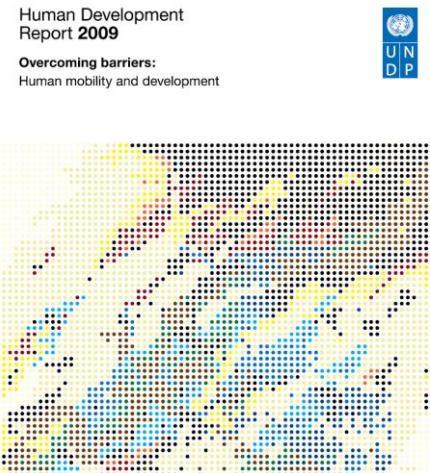
Demand for food crops (measured in tons) is projected to grow by 70–85% by 2050. Undernutrition is the underlying cause of a substantial proportion of all child deaths. Three of the MA scenarios project reductions in child undernourishment by 2050 of between 10% and 60% but undernourishment increases by 10% in *Order from Strength (low certainty)*.

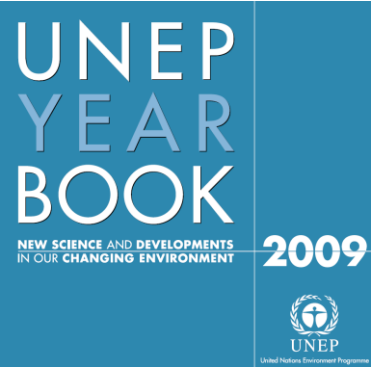
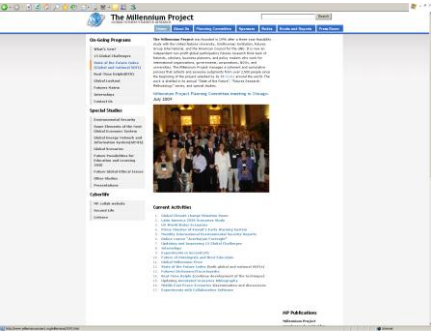
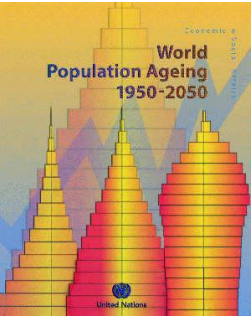
Child mortality is also strongly influenced by diseases associated with water quality. Diarrhea is one of the predominant causes of infant deaths worldwide. In sub-Saharan Africa, malaria additionally plays an important part in child mortality in many countries of the region. All provisioning, regulating, and cultural ecosystem services are projected to be in worse condition in 2050 than they are today in only one of the four MA scenarios.

Population is projected to grow to 8.1–9.6 billion in 2050 (medium to high certainty) and to 6.8–10.5 billion in 2100, depending on the scenario Under the four MA scenarios, global temperature is expected to increase significantly—1.5– 2.0o Celsius above preindustrial level in 2050 and 2.0–3.5o Celsius above it in 2100, depending on the scenario and using a median estimate for climate sensitivity (2.5oC for a doubling of the CO₂ concentration) (*medium certainty*).

Roughly 10–20% (*low to medium certainty*) of current grassland and forestland is projected to be converted to other uses between now and 2050, mainly due to the expansion of agriculture and, secondarily, because of the expansion of cities and infrastructure. Habitat loss in terrestrial environments is projected to accelerate decline in local diversity of native species in all four scenarios by 2050 (*high certainty*). Across all the MA scenarios, global water withdrawals increase between 20% and 85% between 2000 and 2050. By 2050, global water availability increases by 5–7% (depending on the scenario), with Latin America having the smallest increase (around 2%, depending on the scenario), and the Former Soviet Union the largest (16–22%)

<p>Organisation for Economic Co-operation and Development (OECD)</p> <p>OECD WORK ON THE INTERNATIONAL FUTURES PROGRAM</p>  <p>http://www.oecd.org/department/0,2688,en_2649_33707_1_1_1_1_1,00.html http://www.oecd.org/dataoecd/37/54/42332642.pdf</p>	<p>International Futures Programme</p> <p>The OECD International Futures Programme provides the Organisation with an early warning of emerging issues, pinpoints major developments, and analyses key long-term concerns to help governments map strategy. The Programme uses a variety of tools including multiyear projects, high-level conferences, expert workshops, and consultations; a futures-oriented online information system, and a network of contacts from government, industry, academia and civil society OECD "Futures project: Future global shocks The purpose of the Future Global Shocks project is to bring together experts from the public and private sector in order to review the changing risks landscape; analyse the increasing complexity of systems and the lessons learned from past and recent small- and large-scale disasters; identify gaps in knowledge and requirements for co-operation between actors; and finally, propose a set of policy options to OECD governments that aim to anticipate future global shocks and enhance the shock-resilience of the global economy and society in the years to come.</p> <p>Infrastructures to 2030 (The number of telephone service users worldwide is expected to grow from 800 000 in 2004 to over 5 billion in 2020) Risk Management Reviews The Space Economy The Bioeconomy to 2030 (Contrary to popular belief, the major socioeconomic effects of biotech in the mid-term will likely be in agriculture, not health) The Future of International Migration to OECD Countries The Family in 2030 The OECD Review of Italy's National Civil Protection System Future Global Shocks (When the financial crisis broke, it was called a 10-sigma or one-in-10,000-years event, and it was claimed that no modelling would have been capable of preparing for such an extreme risk.) Transcontinental Infrastructure Needs (The Chinese government is planning to build 97 new regional airports by 2020 at an estimated cost of USD 62.5 billion.)</p>
<p>Organisation for Economic Co-operation and Development (OECD)</p> <p>http://www.oecd.org/document/45/0,3343,en_2649_34269_44213357_1_1_1_1,00.html</p>	<p>TIP 2009 Workshop on Future Orientations for Science, Technology and Innovation Policy</p> <p>Since the early 1990s the TIP has been a reference 'think tank' for innovation policy development based on a system approach. The 'National Innovation System' gave a methodological and policy framework to help countries develop a broad-based innovation strategy that takes advantage of the multi-stakeholder character and interactive dynamics of innovation systems, linking both supply and demand. The OECD Country studies have been also a reference for national reform programmes thanks to the application of this framework.</p>

<p>Organisation for Economic Co-operation and Development (OECD)</p>  <p>http://www.iea.org/textbase/nppdf/free/2000/2050_2003.pdf</p>	<p>OECD - Energy Scenarios to 2050</p> <p>Policy responses to the threats of climate change manifest effects on emissions that can be appreciated after an often considerable delay. An analysis that seeks to tackle energy and environmental issues needs to look ahead at least to the next thirty to fifty years. Such a long-term perspective must come to terms with the concept of uncertainty and with the limitations of our knowledge. Over time horizons of five to ten years the inertia of the energy/economy system is so strong as to leave little room for change, but over longer periods the future will almost certainly look different. The three scenarios outlined in this chapter represent three rather extreme views of the future. This approach was taken on purpose, to cover a wide range of cases concerning the chosen variables and as a way to clarify logical chains of events and possible consequences. To some extent, all three scenarios have elements of plausibility. Thus, talking about the "likelihood" of any particular scenario is not appropriate. In fact, it seems likely that the future world will be some combination of the three cases - and perhaps other stronger drivers will emerge over time that will pull the future in entirely different directions.</p>
<p>The International Food Policy Research Institute's (IFPRI's)</p>  <p>http://www.ifpri.org/2020/dp/dp39/2020dp39.pdf</p>	<p>New Risks and Opportunities for Food Security - Scenarios for 2015 and 2050</p> <p>Given the number of undernourished people in the developing world and the increasingly complex risks to food security, policymakers are faced with an enormous agenda. Freeing people from hunger will require more and better-targeted investments, innovations, and policy actions, driven by a keen understanding of the dynamic risks and forces that shape the factors affecting people's access to food and the links with nutrition. The International Food Policy Research Institute's (IFPRI's) International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT) provides insight into the management of these risks through appropriate policy actions. By projecting future global food scenarios to 2050, IMPACT explores the potential implications of policy action and inaction in several main risk areas as well as the effects on child malnutrition in the developing world, commodity prices, demand, cereal yields, production, and net trade.</p>
<p>UN World Population Prospects</p> <p>http://esa.un.org/unpp/</p>	<p>Population Forecasts: world population at 8.2 billion in 2030, 8,7 in 2040, 9,1 in 2050. The Spanish population will decrease by 9.4 million in the next 50 years, according to a report released last month by the United Nations' population division. This represents a 24% net loss in its current population. The reason is the low birth rate of the country, which at 1.2 children per woman is one of the lowest in the world.</p>
<p>UNEP "Human development Report"</p> <p>Human Development Report 2009</p> <p>Overcoming barriers: Human mobility and development</p>  <p>http://hdr.undp.org/en/reports/global/hdr2009/</p>	<p>National and local policies play a critical role in enabling better human development outcomes for both those who choose to move in order to improve their circumstances, and those forced to relocate due to conflict, environmental degradation, or other reasons. Host country restrictions can raise both the costs and the risks of migration. Similarly, negative outcomes can arise at the country levels where basic civic rights, like voting, schooling and health care are denied to those who have moved across provincial lines to work and live. HDR09 shows how a human development approach can be a means to redress some of the underlying issues that erode the potential benefits of mobility and/or force migration.</p>

<p>UNEP Year Book 2009</p>  <p>http://www.unep.org/yearbook/2009/</p>	<p>The UNEP Year Book 2009 presents work in progress on scientific understanding of global environmental change, as well as foresight about possible issues on the horizon. The aim is to raise awareness of the interlinkages among environmental issues that can accelerate the rates of change and threaten human wellbeing. Vision 2030:</p> <p>In 2004 China surpassed America as the largest producer of rubbish: By 2030 it will be churning out nearly 500 million tonnes a year. By 2030, 3.9 billion people will live in areas under severe water stress, mostly in South Asia and China.</p> <p>Rapid expansion of the construction sector in developing countries, projected to double existing floor space by 2030, makes it critically important to adopt sustainable products, systems, and materials</p> <p>Estimates indicate that there were 650 million vehicles on the road in 2005, a number that is predicted to more than double by 2030</p> <p>The number of commercial aircraft is expected to rise from 18 000 in 2006 to 44 000 by 2030. The increase in volume of traffic could potentially offset any efficiency gains</p>
<p>United Nations Industrial Development Organization (UNIDO)</p> <p>http://www.unido.org/index.php?id=o5216</p>	<p>Unido Technology Foresight</p> <p>Technology Foresight in Europe (CEE/NIS)</p> <p>This regional initiative responds to the Central and Eastern Europe and the Newly Independent States need for a mid- and long-term development vision of the region as well as for bringing a more technology-oriented focus into the relevant national and regional knowledge-based institutions. The regional initiative has been instrumental to provide extensive capacity-building and networking of different actors applying foresight in policy making. One important component of the regional initiative is the establishment of a focused capacity in treating, storing and disseminating information through modern electronic facilities and internet.</p>
<p>UN-MILLENNIUM PROJECT SCENARIOS</p> <p>http://www.millennium-project.org/millennium/normscen.html</p> <p>http://www.millennium-project.org/millennium/m3000-scenarios.html</p> 	<p>The Millennium Project was founded in 1996 after a three-year feasibility study with the United Nations University, Smithsonian Institution, Futures Group International, and the American Council for the UNU. It is now an independent non-profit global participatory futures research think tank of futurists, scholars, business planners, and policy makers who work for international organizations, governments, corporations, NGOs, and universities. The Millennium Project manages a coherent and cumulative process that collects and assesses judgments from over 2,500 people since the beginning of the project selected by its 33 Nodes around the world. The work is distilled in its annual "State of the Future", "Futures Research Methodology" series, and special studies.</p> <p>The Millennium Project organizes futures research to improve thinking about the future and make that thinking available through a variety of media for consideration by policy-makers and for use in advanced training and public education. The goal is to accumulate wisdom about possible futures. High profile results of the project include the elaboration of Millennium Development Goals</p> <p>Global Normative Scenarios 2050 Excerpt from "1999 State of the Future: Challenges We Face at the Millennium"</p> <p>Millennium 3000 Scenarios - Excerpt from the State of the Future at the Millennium</p>
<p>UN-Population Division</p>  <p>http://www.un.org/esa/population/publications/worldageing19502050/</p> <p>http://www.un.org/esa/population/publications/worldageing19502050/pdf/62executivesummary_english.pdf</p>	<p>Vision 2050</p> <p>Population ageing is unprecedented, without parallel in human history—and the twenty-first century will witness even more rapid ageing than did the century just past.</p> <p>Population ageing is pervasive, a global phenomenon affecting every man, woman and child—but countries are at very different stages of the process, and the pace of change differs greatly. Countries that started the process later will have less time to adjust.</p> <p>Population ageing is enduring: we will not return to the young populations that our ancestors knew.</p> <p>Population ageing has profound implications for many facets of human life.</p>

World Business Council for Sustainable Development

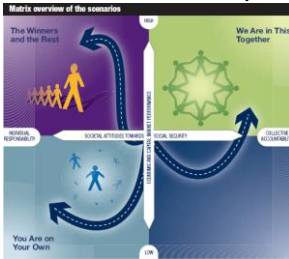


<http://www.wbcsd.org/DocRoot/BPIWgkksZJUWEulZJmIk/biotech-scenarios.pdf>

Biotechnology Scenarios 2000 - 2050.

In fields that change as rapidly as biotechnology, predicting the long-term future - or even short-term developments - is a dangerous game. Predicting technology breakthroughs or likely market share is not enough to guide decision-making into the future. Such decision-making, to be effective, must take into account possible future developments without falling into the trap of placing bets, implicitly or explicitly, based on only one vision of the future. Scenarios are intended not as predictions of the future but as stories about possible futures and the factors that might lead to one future rather than another. These biotechnology scenarios form one of a number of WBCSD projects, including "Energy and Climate Change," "Eco-Efficiency," "Corporate Social Responsibility," "Sustainability through the Market," and "Innovation, Technology, Society, and Sustainability." These projects all reflect the ongoing commitment of member companies to sustainable development

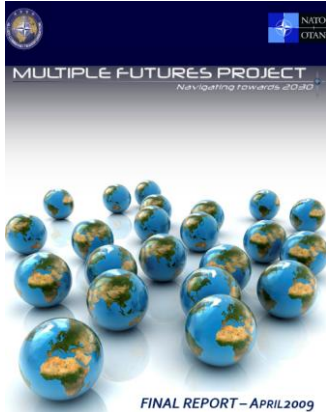
World Economic Forum (2008)



www.weforum.org/pdf/scenarios/Pensions.pdf

The Future of Pensions and Healthcare in a Rapidly Ageing World Scenarios 2030
 The report 'Financing Demographic Shifts: Pension and Healthcare Scenarios to 2030' by the World Economic Forum has drafted four scenarios for future healthcare and pension costs and financing options with an in-depth analysis for Italy and China as contrasting examples. These scenario comparisons show the complexity of the issue as well as the interplay of different factors like economic growth, demography, technological progress and general health conditions that can lead to different outcomes.

NATO "Multiple Futures Project: Navigating Towards 2030" Allied Command Transformation, April 2009.



http://www.iris-france.org/docs/pdf/up_docs_bdd/20090511-112315.pdf

In the world of 2030, the inability to react with expediency and purpose to events both expected and unexpected will be costly. In the security context, where such costs are measured against interests, values and public security, every effort must be made to align functions and simplify decision making processes. The Multiple Futures Project (MFP) is designed to support strategic decision makers. It focuses on future challenges, on their relative nature and gravity, and on what the Alliance can do today to prepare for tomorrow. It offers insights into the difficult choices associated with managing risk, in order to protect the most vital element of the Alliance, its population. It is crucial that we build a mutual understanding of the new and uncertain challenges for which NATO must be prepared to respond.

To be open, transparent, inclusive and able to process the widest spectrum of inputs objectively and comprehensively, the MFP was built on the work of national and international organisations and developed through extensive consultation across the Alliance. Twenty-one workshops and strategic engagements were conducted, including combined North Atlantic Council and Military Committee (NAC/MC) sessions. This exhaustive process included representatives from 45 nations and more than 60 institutions bringing more than 500 political, military, civil and economic experts to the table from the public and private sectors and from both international and non-governmental organisations. These engagements were used to capture the values, ideas, and perspectives that, blended and distilled, make up the core of the report. The Security Implications point to four broad insights and associated consequences.


The *first* of these touches upon the cornerstone of Alliance defence structures by discussing why and how the evolving nature of threats will challenge efforts to reach a consensus on what constitutes an Article 5 response.

The *second* insight reflects on the need for the Alliance to examine its responsibility to act outside NATO's traditional areas of engagement, in order to preclude or minimise conflict with pro-active, integrated, and comprehensive approaches.

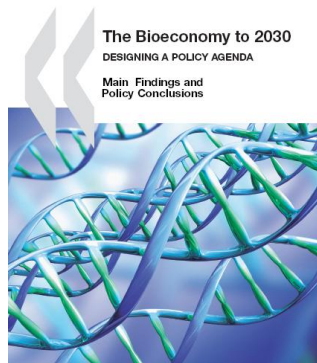
The *third* insight centers on the understanding that readily available advanced technology will enable determined adversaries to attack Alliance vulnerabilities in new and unexpected ways, thus requiring NATO to consider changes in its operating concepts, capabilities, and future force structure.

The *fourth* insight suggests that enhanced communications and increased interaction with international partners will be required to positively shape and influence values, ideas, and events in an increasingly globalised world. Military Implications point to seven broad focus areas.

Five of the focus areas identify potential roles within the military realm that NATO could consider emphasizing for 2030: *Adapting to the Demands of Hybrid Threats, Operating with Others and Building Institutions, Conflict Management (prevention and resolution) including Consequence Management, Counter Proliferation, and Expeditionary and Combat Capability in Austere Environments*. The remaining two focus areas, *Strategic Communications and Winning the Battle of the Narrative*, and *Organisational and Force Development Issues*, represent the essential enablers associated with the roles its member nations envision for the Alliance. Overall, the implications derived from the multiple futures reveal that the security environment will continue to evolve and be subject to a variety of unforeseeable and dynamic political, social, technological and military developments. Accordingly, the Alliance must strive to achieve a common understanding of perceived risks and threats in order to anticipate and sense important trends, developments and events. By doing so, the Alliance will be better positioned to positively shape and react to the security environment of the future.

<p>OECD Higher Education to 2030: What Futures for Quality Access in the Era of Globalisation? http://www.oecd.org/document/33/0,3343,en_21571361_41508887_41511201_1_1_1_1,00.html Higher Education to 2030: What Futures for Quality Access in the Era of Globalisation?</p>	<p>Higher Education to 2030</p> <p>The OECD/France conference <i>Higher Education to 2030</i> was held in 2008 in Paris with a view to present and discuss possible and desirable futures for higher education. The event drew on analytical findings and stakeholder consultations carried out in the framework of the OECD Centre for Educational Research and Innovation (CERI) <u>project on the Future of Higher Education</u>, with a particular focus on globalisation as well as on higher education participation, access and expansion. Future challenges and opportunities related to demographic change and use of new technologies were also explored. The first volume <i>Demography</i> of the new OECD book series entitled <i>Higher Education to 2030</i> was launched on this occasion. The following specific questions were addressed:</p> <p>What kind of policy options and opportunities could be used to respond to the main challenges for future higher education access, attainment and achievement? How does higher education expansion influence the reduction of social inequalities? How could the future challenges of higher education financing be met? In what different ways may globalisation influence the role and the governance of future higher education?</p> <p>What plays out in the future often depends upon decisions taken today, particularly as the passage of time narrows the room for manoeuvre of different players. Hence the importance of factoring the long term into decision-making in higher education. Four scenarios for higher education systems have been developed by the OECD Secretariat as part of its ongoing project on the future of higher education.</p>
<p>OECD Space 2030: Tackling Society's Challenges</p>  <p>http://www.oecd.org/document/13/0,3343,en_2649_34815_35059341_1_1_1_1,00.html</p>	<p>Space technology has huge potential to provide practical responses to society's major challenges. Over the coming decades, governments will increasingly be confronted with long-term problems such as threats to the environment or the management of decreasing natural resources, as well as social and society-wide trends such as growing mobility and its consequences, or the need to cope with mounting security concerns and a shift to the information society.</p> <p>Space technology is well-placed to deal with these issues. With its help, it is possible to observe the Earth from its upper atmosphere to the depths of the ocean, to locate a fixed or moving object anywhere on the surface of the globe, and to communicate information across the world with speed and accuracy.</p> <p>This book discusses the challenges for developing space applications. It assesses the strengths and weaknesses of the institutional, legal and regulatory frameworks that currently govern space activities in the OECD area and beyond. Finally, it formulates an overall policy framework that OECD governments might use in drafting policies to ensure that space can realise its potential.</p>

OECD (2009) The Bioeconomy to 2030: Designing a Policy Agenda, Paris. "Agricultural and health biotechnologies: Building blocks of the bioeconomy", OECD Journal: General Papers, Volume 2009/3, OECD, Paris.



The Bioeconomy to 2030
DESIGNING A POLICY AGENDA

Main Findings and
Policy Conclusions



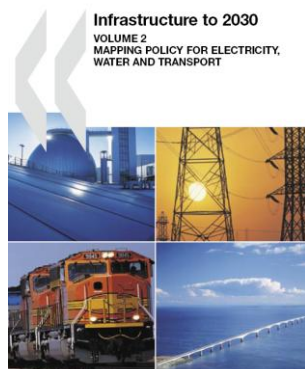
<http://www.oecd.org/dataoecd/5/24/42837897.pdf>, www.oecd.org/futures/bioeconomy

The International Futures Programme (IFP) of the OECD undertook The Bioeconomy to 2030 project with the support of other interested OECD directorates, OECD Government Ministries, and outside partners. A number of documents prepared within the context of "The Bioeconomy to 2030" project, including scenarios and analytical reports covering business models, ethics, intellectual property, and regulation are available at http://www.oecd.org/document/56/0,3343,en_2649_36831301_36960312_1_1_1_1,00.html

The concept of a bioeconomy covers a broad range of economic activities, each benefiting from new discoveries, and the related products and services arising out of the biosciences. The futures project, assessed how pervasive biotechnological applications are likely to become, the prospects for further development over the next two to three decades, the potential impact on the economy and society, and the policy agenda needed to promote and diffuse this new wave of innovations in a way that is consistent with broader socioeconomic goals.

The Bioeconomy to 2030: Designing a Policy Agenda begins with an evidence-based technology approach, focusing on biotechnology applications in primary production, health, and industry. It describes the current status of biotechnologies and, using quantitative analyses of data on development pipelines and R&D expenditures from private and public databases, it estimates biotechnological developments to 2015. Moving to a broader institutional view, it also looks at the roles of R&D funding, human resources, intellectual property, and regulation in the bioeconomy, as well as at possible developments that could influence emerging business models. Fictional scenarios to 2030 are included to encourage readers to reflect on the interplay between policy choices and technological advances in shaping the bioeconomy. Finally, the book explores policy options to support the social, environmental and economic benefits of a bioeconomy.

OECD INFRASTRUCTURE TO 2030: MAPPING POLICY FOR ELECTRICITY, WATER AND TRANSPORT –OECD 2007





Infrastructure to 2030
VOLUME 2
MAPPING POLICY FOR ELECTRICITY,
WATER AND TRANSPORT



Infrastructure to 2030 – Vol. 2
Mapping Policy for Electricity, Water and Transport,
http://www.oecd.org/document/49/0,3343,en_2649_36240452_38429809_1_1_1_1,00.html

Infrastructures are not an end in themselves. Rather, they are a means for ensuring the delivery of goods and services that promote prosperity and growth and contribute to quality of life, including the social well-being, health and safety of citizens, and the quality of their environments. The longer-term future performance of OECD economies, and indeed of the global economy, will depend to an important extent on the availability of adequate infrastructures to sustain growth and social development. Through to 2030, annual infrastructure investment requirements for electricity, road and rail transport, telecommunications and water are likely to average around 3.5% of world gross domestic product (GDP). A large share of investments will be undertaken in the developing world, where countries such as China, India and Brazil will be spending billions of dollars on infrastructures to underpin their booming economies and satisfy the growing aspirations of their populations. However, despite their significantly lower economic growth rates over the next few decades, OECD countries too will be required to invest heavily to maintain, upgrade or replace existing (and often ageing) infrastructures, and to preserve their international competitiveness. For OECD countries as a whole, investment requirements in electricity transmission and distribution are expected to more than double through to 2025/30, in road construction almost to double, and to increase by almost 50% in the water supply and treatment sector. The purpose of the OECD International Futures Programme project on "Global Infrastructure Needs: Prospects and Implications for Public and Private Actors" was to take stock of the long-term opportunities and challenges facing infrastructures world wide and to propose a set of policy recommendations to OECD governments that aim to enhance infrastructures' contribution to economic and social development in the years to come. The project had a time horizon to 2020-30 and covered electricity, surface transport (road, rail and urban public transport), water and telecommunications.

<p>OECD International Futures Programme</p>  <p>ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT ADVISORY UNIT ON MULTI-DISCIPLINARY ISSUES INTERNATIONAL FUTURES PROGRAMME</p> <p>OECD Futures Project: Transcontinental Infrastructure Needs to 2030/2050</p> <p>PROJECT DESCRIPTION 15 June 2009</p> <p>Advisory Unit to the Secretary General 2, rue André Pascal 75775 Paris Cedex 16</p> <p>For further information please contact: Bianca Sereanu bianca.sereanu@oecd.org or Pierre-Alain Schuch pierre-alain.schuch@oecd.org</p> <p>© OECD 2009</p> <p>http://www.oecd.org/department/0,3355,en_2649_36240452_1_1_1_1_1,00.html</p>	<p>The purpose of this Project is to bring together experts from the public and private sector to take stock of the long-term opportunities and challenges facing transcontinental infrastructure worldwide (ports, airports, rail corridors, pipelines etc.) and to propose a set of policy options to OECD governments which aim to enhance infrastructures' contribution to economic and social development in the years to come. Particular attention will be paid to assessing the global infrastructure investment requirements for these sectors to 2030, and to examining the long-term challenges facing the world's major transit hubs. This Project follows on from work recently completed by the Futures Project on Infrastructure Needs to 2030 which covered telecoms, water, electricity and surface transport, but did not include ports, airports and other major infrastructures crossing or connecting continents. The two-year OECD Futures Project "Global Infrastructure Needs: Prospects and Implications for Public and Private Actors" (2005-2007) brought together experts from the public and private sector to take stock of the long-term opportunities and challenges facing infrastructures worldwide, and to propose a set of policy recommendations for OECD Governments which aim to enhance infrastructures' contribution to economic and social development in the years to come.</p>
<p>OECD: SPACE 2030: EXPLORING THE FUTURE OF SPACE APPLICATIONS –2004</p>  <p>Space 2030 EXPLORING THE FUTURE OF SPACE APPLICATIONS</p> <p>OECD</p> <p>http://www.oecd.org/document/18/0,3343,en_2649_34815_34726866_1_1_1_1,00.html</p>	<p>Even since the launching of Sputnik in 1957, media attention has focused almost exclusively on spectacular space missions such as the landing of Apollo on the Moon in 1969 or, more recently, the stunning pictures transmitted from Mars by Mars Pathfinder in 1997 and Spirit in 2004. However, space actors have also faced their fair share of setbacks, including dramatic failures such as the Columbia tragedy, extravagant cost overruns, grossly unfulfilled promises and painful reductions in public support to space ventures.</p> <p>But space is more than a showroom where nations can display their technological proficiency. Over the years, advances in space technologies have led to the development of increasingly sophisticated military and civil space assets offering a growing number of space-based services, ranging from communication, remote sensing and earth observation services to navigation and location-based services. While military space assets have gained strategic prominence in the arsenals of space-faring nations, the services provided by civil space assets are having an increasing impact on our daily life, even if we are not always aware of it.</p> <p>Where is the space sector heading up now? What are the obstacles to its further development? What are its future prospects? What are the applications that are likely to be successful in the future?</p> <p>To answer these questions, this report adopted a scenario-based approach to explore the future evolution of major components of the space sector (military space, civil space, commercial space) over the next thirty years, taking into account four major factors of change: geopolitical developments, socio-economic developments, energy and the environment and technology. This provides the basis for assessing the prospects of a number of space applications, taking into account expected progress in technologies such as microelectronics, nanotechnology or robotics as well as space technologies.</p>
<p>World bank group Global economic prospects 2007: overview and global outlook - managing the next wave of globalization http://www-wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2008/09/12/000333037_20080912025354/Rendered/PDF/381380CHINESE01Dec011020060gep071cn.pdf http://econ.worldbank.org/external/default/main?pagePK=64165259&theSitePK=469372&piPK=64165421&menuPK=64166093&entityID=000333037_20080912025354</p>	<p>Summary: This overview of the Global Economic Prospects 2007 (GEP 2007) contains also the first chapter covering the general economic situation, and the regional appendices. The GEP 2007 explores the next wave of globalization using a set of growth scenarios covering 2006 to 2030. While the medium-term outlook for the world economy remains bright, demographic trends will be a major driver of future events and the benefits of globalization are likely to be uneven across regions and countries. The next wave of globalization will feature: the growing economic weight of developing countries, the potential for increased productivity by global production chains, and the accelerated diffusion of technology. Possible consequences of this globalization include: growing inequality, pressures in labor markets, and threats to the global commons. All of these developments, along with deepening economic interdependence, place a burden on the collective actions of the international community: to manage globalization or risk being run over by it. This report is available in Chinese only!</p>

**World Economic Forum, Mining & Metals
Scenarios to 2030**



<http://www.weforum.org/pdf/scenarios/MetalsMiningScenarios.pdf>

Mining & Metals Scenarios to 2030

In collaboration with its constituents in the mining and metals sector, the World Economic Forum engaged in a year-long process which brought together over 250 leaders from the private sector, government, academia and international and non-governmental organizations in a strategic dialogue structured by scenario planning methodology to consider the following central question: “How will the environment for the global mining and metals sector look in 2030?”

The project objectives were to:

- Stimulate dialogue and mutual understanding between the public and private sectors and civil society regarding the future of the mining and metals sector in a non-threatening context
- Deepen insight into the complex context in which the sector operates by bringing together multidisciplinary and multistakeholder perspectives
- Provide useful tools to improve strategic decision-making, and identify strategies for collaborative action

Out of this process came 3 scenarios presented through a publication and a video. They have been developed and selected by the participants of the project through numerous discussions and face-to-face and virtual workshops. They represent for those involved stories about their future context that are relevant, plausible, challenging and divergent.

Green Trade Alliance

In 2030, the world is divided and countries are defined economically by whether or not they belong to the Green Trade Alliance (GTA), formed in 2016 to promote “environmental sustainability without compromising competitiveness.” GTA countries, including some industrialised, resource-rich and developing countries, have experienced a period of accelerating innovation and lifestyle changes. While there is strong alignment among GTA countries, non-GTA countries operate independently.

Rebased Globalism

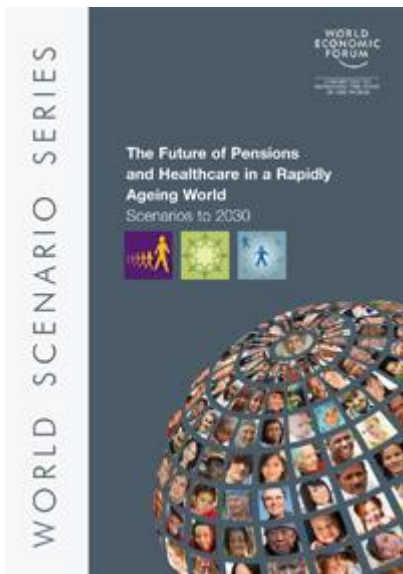
In 2030, the world is committed to realising the benefits of global interconnection but has become far more complex and multipolar. Power comes from control of resources as well as possession of capital, with resource-rich countries playing by their own rules. Civil society has gained power, resulting in various local laws that affect global corporations.

Resource Security

In 2030, the era of globalisation is a distant memory as nations prioritise narrow self-interest. They hoard domestic resources, enter cartels based on regional and ideological alliances and resource blocs, and engage in neo-colonialism and import substitution strategies.

Moving forward in a multistakeholder setting, these scenarios are a basis for collaborative work that will develop strategic options to contribute to the sustainability of the global mining and metals sector in economic, social and environmental terms.

World Economic Forum, Scenarios for the future of pensions and healthcare in a rapidly ageing world



<http://www.weforum.org/pdf/scenarios/Pensions.pdf>

The World Economic Forum's report *The Future of Pensions and Healthcare in a Rapidly Ageing World – Scenarios to 2030*, indicates that new forms of collaboration between key stakeholders – individuals, financial institutions, healthcare providers, employers, and governments - will be critical to finance the ongoing well-being of current and future generations in a sustainable manner.

World Economic Forum, Strategies to address the challenge of financing retirement and healthcare in a rapidly ageing world



<http://www.weforum.org/pdf/scenarios/Transforming-Pensions-Healthcare.pdf>

The ageing of society is a current challenge in developed countries and an imminent challenge in others. By 2030, it will be a major issue in most of today's emerging economies, and by 2050, few countries will be unaffected. With an ageing population, a declining labour force, and alarming healthcare and pension benefit costs, concerted effort from government, private sectors and civil societies is essential to address these concerns.

European Forward Looking Activities

Directorate/Organisation - Reference	Background + Vision
<p>EC, DG Environment</p>  <p>EU Transport GHG: Routes to 2050?</p> <p>EU transport demand: Trends and drivers</p> <p>Carlo Sessa and Riccardo Enei (ISIS) 23 September 2009 <small>(amended version of paper presented at meeting of 27 March 2009)</small></p> <p>Partners: </p> <p>The project is funded by the European Commission's Directorate-General Environment</p>  <p>http://www.eutransportghg2050.eu/cms/assets/EU-Transport-GHG-2050-Task-3-Paper-ISIS-EU-Transport-Trends-and-Drivers-September-2009.pdf</p>	<p>EU Transport GHG: Routes to 2050? project</p> <p>The project is funded by the European Commission's DG Environment and is organised around the following themes:</p> <ol style="list-style-type: none"> 1) Transport trends and drivers: How is transport demand influenced by the wider economy and wider trends? 2) What level of GHG emissions from the transport sector would be likely to be compatible with the EU's long term GHG reduction goals? What is the optimal timing for actions to achieve these? 3) How much GHG emission reduction is technology likely to be able to deliver and what other actions will be needed? What will the overall costs to society be for these actions? 4) How can likely changes in transport type and structure affect the sector's GHG emissions? 5) What policy framework is needed over the short, medium and longer term to ensure the compatibility of EU transport sector emissions with long term climate goals?
<p>EC, DG ECFIN and the Economic Policy Committee (AWG) The 2009 Ageing Report</p>  <p>The 2009 Ageing Report: Underlying Assumptions and Projection Methodologies EUROPEAN ECONOMY 7 2008</p>  <p>http://ec.europa.eu/economy_finance/publications/publication13782_en.pdf http://ec.europa.eu/economy_finance/publications/publication_summary13784_en.htm</p>	<p>Underlying Assumptions and Projection Methodologies for the EU-27 Member States (2007-2060)</p> <p>This report provides a description of underlying macroeconomic assumptions and projection methodologies of the age-related expenditure projections for all Member States over the period 2009-2060. On the basis of these underlying assumptions and methodologies, age-related expenditures covering pensions, health care, long-term care, education and unemployment transfers are envisaged to be presented to the ECOFIN Council in May 2009. The long-term projections provide an indication of the timing and scale of changes in economic developments that could result from an ageing population in a 'no-policy change' scenario. The projections show where (in which countries), when, and to what extent ageing pressures will accelerate as the baby-boom generation retires and average life span in the EU continues to increase. Hence, the projections are helpful in highlighting the immediate and future policy challenges for governments posed by demographic trends. It should be recalled that the long-term projections are not forecasts, they are subject to increasing uncertainty over time, and the results are strongly influenced by the underlying assumptions. Moreover, given the current juncture characterized by the financial and economic crisis, there is also considerable additional uncertainty concerning the medium-term economic developments.</p>

EC, DG ECFIN, 2006

The impact of ageing on public expenditure: projections for the EU-25 Member States on pensions, healthcare, long-term care, education and unemployment transfers (2004-2050)



http://ec.europa.eu/economy_finance/publications/publication6502_en.pdf

The impact of ageing on public expenditure: projections for the EU-25 Member States on pensions, healthcare, long-term care, education and unemployment transfers (2004-2050)

In 2003, the ECOFIN Council gave the Economic Policy Committee (EPC) a mandate to produce a new set of long-run budgetary projections for all twenty-five Member States covering pensions, health care, long-term care, education, unemployment transfers and, if possible, contributions to pensions/social security systems. This follows the projection exercises of 2001 and 2003. The age-related expenditure projections feed into a variety of policy debates at EU level. In particular, they are used in the annual assessment of the sustainability of public finances carried out as part of the Stability and Growth Pact; in the context of the Open-Method of Coordination on pensions; and the analysis on the impact of ageing populations on the labour market and potential growth which will be relevant for the Lisbon strategy and Broad Economic Policy Guidelines.

This report provides a description of underlying assumptions, projection methodologies and background analysis of the age-related expenditure projections. Final results will be calculated on the basis the described methodology and will be presented to the Ecofin Council in February 2006.

The 2005 projections of age-related expenditure (2004–50) for the EU-25 Member States: underlying assumptions and projection methodologies

The assessment by the Ageing Working Group of the social and financial sustainability of the main social protection functions in the 27 EU countries is structured in two parts. The first describes the assumptions underlying the population projection, the labour force projection and the other macroeconomic assumptions. The second part presents the projection of expenditure on pensions, health care, long-term care, education and unemployment transfers. A statistical annex gives a country-by-country overview of the main assumptions and results.

The process which has been applied for a decade from now is made up of 2 phases:

- first, the Member States and the Commission participate in the AWG which produces the “Ageing Report with 2 outputs:
 - the long term projections and the so called cost of aging which is simply the increase from 2008 to 2060 in percentage of GDP of the public expenditures;
 - an assessment methodology of the risk of unsustainability of the present legislation;
- the Commission alone applies this methodology to each country and draws conclusions on the Member State’s respective risk of unsustainability (“The Sustainability Report”).

EC, DG AGRI

Standing Committee on Agricultural Research (SCAR)

Foresight in EU Agricultural research



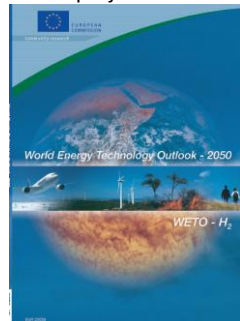
http://ec.europa.eu/research/agriculture/scar/index_en.cfm?p=3_foresight
http://ec.europa.eu/research/agriculture/scar/pdf/scar_2nd_foresight_exercise_en.pdf
http://ec.europa.eu/research/agriculture/scar/index_en.cfm?p=3_foresight

Trends and development scenarios in the food and farming for the period after 2032

Global warming continues Realisation of new Global Earth policy “KYOTO III” - a holistic security and climate neutral concept More sustainable consumption styles Civil society has regained confidence in the agriculture and food systems Open-source knowledge systems
Long term sustainable technologies (smart, appropriate and careful)
Nanotechnology will be only used in a controlled and limited way and are labelled
Broad application of solar and wind energy Broad application of automation and robotics Broad interdisciplinary system research on Further developed non GM and traditional breeding techniques with Genom knowledge STILL CLIMATE CHANGE AND RESOURCES GLOBAL EARTH POLICIES
Strong reorientation of agriculture has taken place towards more resilient systems (LEISA and organic farming) Sustainable and ethical entrepreneurship in food and farming sector Re-introduction of more sustainable rotation systems with locally adapted varieties Completely changed food cost structure New multi- and intercropping systems Agro/Biofuel 3rd generation Herbicide use has almost disappeared More added value trough ecosystem services Big and central operations will remain but have to follow strict more risk-oriented restrictions More special intercropping and Agroforestry systems Regional territory approaches = life laboratories for social and technical innovation
The SCAR launched a wide foresight process aiming at identifying possible scenarios for European agriculture in a 20-year perspective, to be used in the identification of priority research needs for the medium and long term. This foresight process was strongly encouraged by the by the informal meeting of EU Council in Krems on 28-30 May 2006.
The CEG group finished its work in December 2008. They made a report that is based on a scanning of foresight studies and reviews of challenges to European agriculture in a global context as well as an analysis of priority areas

EC, DG RTD

WETO project



http://ec.europa.eu/research/energy/pdf/weto-h2_en.pdf

The WETO-H2 report (World Energy Technology Outlook-2050) places the European energy system in a global context. Europe represents today 10% of the world population, 25% of the world GDP and 20% of world energy consumption. Considering the demographic changes and the techno-economic progress made by developing countries, by 2050 these figures will be less than 7%, 15% and 12% respectively. WETO-H2 is structured around a business-as-usual case, and features two specific scenarios that reflect the political will of Europe to be at the forefront of the struggle against climate change and to promote new clean energy technologies:

EC, DG JRC
IPTS
Foresight web site

<http://forera.jrc.ec.europa.eu/index.html>

Current and recent projects of the JRC-IPTS European Foresight activity include:

Facing the future - time for the EU to meet global challenges: The aim of this project is to provide a comprehensive picture of the main trends ahead and possible future disruptive global challenges, and to examine how the EU could take an active role in shaping a response to them. The work described in the final report contributes a fresh perspective on the future, linking widely accepted quantified trends towards 2025 and beyond with the opinions of experts and policy makers on the likely consequences of these trends and wild cards. This work has been undertaken in cooperation with the Bureau of European Policy Advisors of the European Commission. <http://forera.jrc.ec.europa.eu/bepa.html>.

Future Oriented Technology Analyses International Conferences: The JRC-IPTS regularly organises the Future Oriented Technology Analyses (FTA) International Conferences with the aim of consolidating and developing further the Foresight knowledge base on an international level. The Third International FTA Seville Conference took place on the 16-17 of October 2008, with a special emphasis on the impact and implications of FTA for policy and decision-making processes. The next FTA Conference will take place in 2011. <http://forera.jrc.ec.europa.eu/fta.html>.

FOR-LEARN aims to consolidate European expertise on Foresight through actively promoting mutual learning among Foresight practitioners and users in Member States and at the Regional level in Europe. FOR-LEARN aims at the codifying and increasing of the quality of Foresight practice by the exchange of knowledge between Foresight practitioners, sponsors and other stakeholders. <http://forlearn.jrc.ec.europa.eu/>

Foresight in New Member States and Candidate Countries: JRC-IPTS organises a series of workshops to raise awareness of the potential of Foresight as a policy support tool, as well as to provide the practical knowledge needed within a number of countries to enable them to conduct their own Foresight activities.

EC, DG RTD-IPTS
JOINT RESEARCH CENTRE
Institute for Prospective Technological Studies (Seville)
Knowledge for Growth (KfG) Unit
Facing the future: global challenges in 2025 and EU policy implications
Analysis of the issues shaping the future of the EU and the world in 6 areas
in print:
<http://foresight.jrc.ec.europa.eu/bepa.html>

Within the world demographics, the following megatrends can be identified:

The number of people living in the world is expected to grow substantially by 2025. The population will be increasingly urbanized.

The populations of developed nations, in particular Europe, Japan and Russia will be ageing over the next two decades.

Migration to the EU will continue to accelerate.

All of these trends appear to be evidence-based.

World population will continue to grow by 2025

Global population will be increasingly urban

Populations in industrialized countries will continue to age in the future evoking an increased (and expensive) health prevention and care system

Immigration to the EU will continue to increase

Stabilization of EU population due to increased longevity and immigration?

EC, DG RTD
ERAB
A Strategic View of the European Research Area -

http://ec.europa.eu/research/erab/pdf/erab-first-annual-report-06102009_en.pdf

Preparing Europe for a New Renaissance 2030

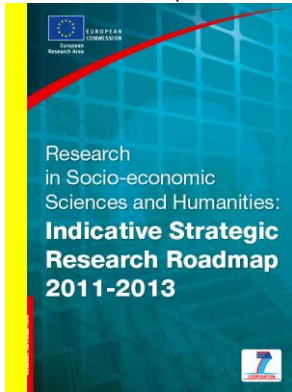
In this 'vision' paper, ERAB paints a picture, in broad strokes, of where they think the European Research Area needs to go by 2030 – for the sake of the EU, and of the world at large. ERAB identifies six broad areas in which action must be taken:

- the creation of a united ERA
- the solution of our Grand Challenges
- the interaction of science and society
- the collaboration of public and private sectors in open innovation
- the encouragement of excellence, and,
- the promotion of cohesion.

http://www.oecd.org/document/45/0,3343,en_2649_34269_44213357_1_1_1_1,00.html

EC, DG RTD

L.2: Research in the economic, social sciences and humanities - Prospective



http://ec.europa.eu/research/social-sciences/about-us12_en.html

Research in the Economic, Social Sciences and Humanities - Prospective Unit
This unit is responsible for defining and implementing the research strategy on economic, social, and human sciences based on current research needs in Europe and requirements emanating from EU policies. It identifies and manages research projects most suitable to this strategy, disseminates research results to users, policy-makers and stakeholders, and promotes the use of these results.
Research is focused on:
growth, employment and competitiveness in a knowledge society;
consolidating the basis for sustainable development at European level;
major societal trends and their implications;
the interactions between world regions and governance of these;
foresight activities and scientific indicators for socio-economic sciences.
The unit also launches initiatives designed to strengthen the EU scientific community in economic, social, and human sciences, with a view to reinforcing the European Research Area.

EC, DG RTD

L.2: Research in the economic, social sciences and humanities - Prospective
European Foresight-(Monitoring)-Network / EFMN



Global Foresight Outlook

GFO 2007






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<http://www.foresight-network.eu/>
<http://www.efmn.eu>
www.foresight-network.eu/files/reports/efmn_mapping_2007.pdf

European Foresight Platform

The European Commission under its Framework Programme 7 is providing the means to continue the important networking activities of foresight initiatives. Setting out on the previous work of the European Foresight Monitoring Network and ForLearn the new European Foresight Platform resumes its work. We are grateful to the community of correspondents and their valuable contributions that have filled EFMN activities with live so far and we hope to continue the fruitful work.

<p>EC, DG RTD L1 METRIS</p>  <p>http://ec.europa.eu/research/social-sciences/pdf/metris-report_en.pdf</p>	<p>Emerging Trends 2030 in Socio-economic Sciences and Humanities in Europe</p> <p>A slower population growth at the global level The city as the standard human habitat Global Democracy, Global Crisis of Democracy Everyday life and the Acceleration of change New Developments in Biotechnology Ageing Migration flows New Intersections Between the Political and the Religious The rise of new forms of governance The political mobilisation of religious groups</p>
<p>EC, DG RTD ERA Vision 2020</p>  <p>http://ec.europa.eu/research/era/pdf/2020-vision-for-era_en.pdf</p>	<p>“ 2020 vision for the European Research Area”</p> <p>By 2020, all players will fully benefit from the “fifth freedom” across the ERA: free circulation of researchers, knowledge and technology. The ERA provides attractive conditions and effective and efficient governance for carrying out research and investing in R&D intensive sectors in Europe. It creates significant added value by fostering healthy Europe-wide scientific competition whilst ensuring the appropriate level of cooperation and coordination. It is responsive to the needs and ambitions of citizens and contributes effectively to the sustainable development and competitiveness of Europe.</p>
<p>EC, DG RTD L.2 – Research in the economic, social sciences and humanities – Prospective</p>  <p>24044 EN</p>	<p>Meta.Analysis of foresight studies on the future of Public health Systems</p> <p>This paper exploits how the topic of ‘healthy ageing and the future of public healthcare systems’ features in most recent exercises and prospective studies around the world focusing on the most important emerging challenges for the future. It consolidates the global perspective on healthy ageing and the future of the public healthcare systems and how the issue is displayed by various communities/ nations/regions.</p>

EC, DG RTD

L2 – Research in the economic, social sciences and humanities – Prospective



http://ec.europa.eu/research/social-sciences/pdf/the-world-in-2025-report_en.pdf

http://ec.europa.eu/research/social-sciences/pdf/report-the-world-in-2025_en.pdf

2025 Trends

Geopolitical Transformations

Population growth in 2025 up to 8 billion worldwide
61% of world population in Asia, EU: 6.5%
35% of the European population will be older than 60

Geopolitical economic power

30% of GDP produced by Asia, EU: 20%
Asia will be the first world exporter: 35%, EU: 32%
Asia on par with US & Europe in the field of R&D

Wild Cards

Among the unforeseeable turbulences which could shape the next two decades, the report identifies 7 “wild cards”:

1. Persistence of the financial and economic crisis beyond 2010;
 2. A major war (for the years 2010-2020 of strong turbulence);
 3. A technological disaster which could influence the choices of priorities of governments (e.g. a nuclear accident like Chernobyl blocking the nuclear option for many years);
 4. Pandemics with devastating effects;
 5. The collapse of a major urban area in a developing country;
 6. The blocking of the European Union as a result of the difficulties to initiate new economic governance and political decision mechanisms;
 7. A breakthrough in the field of renewable energy production;
 8. A new wave of technological innovations and a new rapid growth cycle drawn by emerging countries;
 9. Sudden or even brutal acceleration of the (nonlinear) impacts of climate change;
- Progress in the adoption of a world governance system, due to the extent of the problems to be dealt with and to the pressure of public opinion.

EC-DG RTD

L2 – Research in the economic, social sciences and humanities – Prospective

Security and defence (SANDERA)



www.sandera.net

The objective of SANDERA is to examine the future relationship between two critical European policy domains: the EU strategy since Lisbon to move towards the European Research Area (ERA) and those EU policies focused on the security of the European citizen in the world.

As a foresight project SANDERA will in particular

- identify drivers of change in the relationship between EU security and defence policies and the ERA;
- develop exploratory scenarios of alternative futures for this relationship;
- analyse the policy implications and develop indicators of change.

The SANDERA team will engage stakeholders throughout the project. Key activities include workshops, a conference, regular newsletters, and the creation of a website to reach out to the public.

EC, DG RTD

L2 – Research in the economic, social sciences and humanities – Prospective

Science, technology and innovation (SESTI)



www.sesti.info

SESTI - Scanning for Emerging Science & Technology issues - aims at proactively scanning for hard-to-detect weak signals of issues that could over time develop into mainstream or disruptive issues. Such issues, having an uncertain development, distinguish themselves well from trends and megatrends, which are normally quite visible.

In order to discover such “weak signals”, an initial “collective intelligence” approach has started wherein participants may input what they consider to be potential weak signals into a wiki-database at www.sesti.info. A wide array of stakeholders, experts, policy makers, and the general public will eventually evaluate the potential weak signals in the database, with regard to novelty, weakness, plausibility, and potential impact to reduce complexity. The results are expected to have a number of impacts. First, the Project will come up with a wealth of information about what people consider as “outside the ordinary” observations they made. Second, it is likely that some findings could be an “eye opener” where different weak signals can sum up into a bigger picture. Third, it is useful for anticipatory planning and scenario building to have a systematic list about potential weak signals that will be collectively evaluated. And finally, the data can also serve as an information pool for research in foresight social and technological change analysis.

SESTI is conducted within an international consortium that includes the Dutch Ministry of Education, Culture and Science (Min OCW), the Austrian Institute of Technology (AIT, formerly Austrian Research Centres), Manchester Institute for Innovation Research (MIOIR), The Malta Council for Science and Technology (MCST) and is coordinated by the Dutch TNO Innovation Policy group. The JRC - Institute for Prospected Technology Studies (JRC-IPTS) will organize in-depth workshops with national and international policy-makers on the selected topics.

EC, DG RTD

L2 – Research in the economic, social sciences and humanities – Prospective

CIVISTI



www.civisti.org


The CIVISTI project is based upon the idea that the process of defining relevant and proactive research agendas could, in many respects, gain from consultation with citizens. Our societies are changing rapidly as a consequence of globalisation, and various developments, will involve an interface between science, technology and society. Citizens are the carriers of the concerns and expectations of the future; such concerns and expectations can be collected, captured and transformed into relevant research agendas.



In short, CIVISTI will:

- ☑ Produce a list of new and emerging issues for European Science & Technology;
- ☑ Produce a set of policy options of relevance to future European framework programmes;
- ☑ Base these products upon a novel process of citizen participation.

First, the project will take a long-term view into citizens’ visions for the future. Citizens in seven European member states will make these visions which, in themselves, will be a result, since they will represent trends of relevance to S&T in the future.

Secondly, a process involving experts and stakeholders will use an analytical model to extract the new S&T agendas from the visions of the citizens in order to have an overview of potential new areas for S&T, including an overview of policy options. Thirdly, the citizens will be consulted again to validate and prioritise the new S&T agendas and policy options; thus providing a set of S&T issues and recommendations, which can directly be fed into the processes of defining FP8. The CIVISTI project started in September 2008, and since then 70 visions were developed which are now being clustered before they are presented to the group of experts and stakeholders, in order to extract new S&T agendas therefrom.

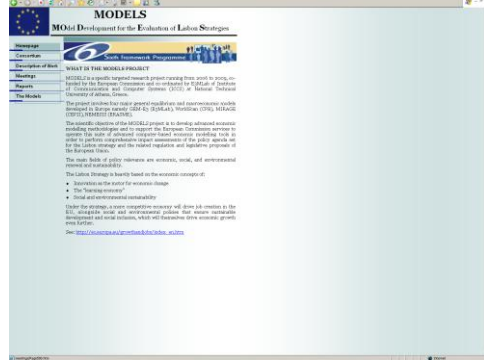
<p>EC, DG RTD L2 – Research in the economic, social sciences and humanities – Prospective INFU</p> <p>innovation-futures.org A Foresight Exercise on Emerging Patterns of Innovation http://www.innovation-futures.org/</p>	<p>The emergence of new innovation patterns implies re-configurations in European innovation systems with diverse implications for European S&T in the long run. While a few radical visions have been taking up these signals, there is little systematic exploration of possible future innovation landscapes and their implications for economy and society.</p> <p>Typical issues that will be addressed include:</p> <ul style="list-style-type: none"> ☑ The role of current innovation agents within new innovation patterns; ☑ The importance peoples' attitudes towards innovation activities and their dependence on cultural context for the emergence of new innovation patterns; ☑ What business models enable new innovation schemes; ☑ The type of products for which different innovation patterns will likely gain popularity; ☑ The relation of new innovation patterns to well-known global mega-trends; ☑ The implications of new innovation schemes for production patterns (distribution and location of production); ☑ The environmental impact of new innovation patterns and in particular of user innovations; ☑ The implications of new innovation forms for regulatory framework conditions (both enabling and controlling these innovations). <p>With the foregoing in mind, the INFU Foresight project will develop plausible and relevant long-term scenarios of future innovation landscapes in order to orient long-term strategy building for policy and other innovation actors.</p>
<p>EC, DG RTD L2 – Research in the economic, social sciences and humanities – Prospective Wild cards (iKNOW)</p> <div data-bbox="188 1070 651 1406" style="border: 1px solid black; padding: 10px; text-align: center;">  </div> <p>www.iknowfutures.eu</p>	<p>iKNOW aims to advance knowledge and tools related to events and trends potentially shaping the future of science, technology and innovation (STI). As part of the DG Research's Blue Sky initiatives, it is designed to create more proactive European research policy that will be capable of anticipating emerging issues, wild cards and weak signals (WI-WE).</p> <p>With a consortium of eight partners having high level expertise in foresight, and significant IT and WEB experience, iKNOW intends to become a cornerstone for foresight and futures studies in Europe.</p> <p>iKNOW will compile and analyse the existing world-wide literature WI-WE. It is developing dynamic and interactive Web 2.0 platforms (WI-WE Bank and WI-WE Scan) capable of capturing WI-WE intelligence, and connecting expert knowledge through structured discussions on the potential implications of WI-WE analyses for Europe and other world regions.</p> <p>These platforms will be supported by an interactive virtual space (iKNOW Community) to facilitate dialogue among researchers and policy-makers on a range of science-related themes.</p> <p>iKNOW will use three major mechanisms to generate these outputs: structured and continuous scanning of WI-WE, organisation of surveys, interviews, and a cross-national Delphi to gather EU and international views on WI-WE, and validation and dissemination of findings through WI-WE bulletins, policy toolkits and practical guides.</p>

<p>EC, DG RTD L2 – Research in the economic, social sciences and humanities – Prospective Societal drivers and policy needs (FARHORIZON)</p> <h1 style="text-align: center;">FARHORIZON</h1> <p>http://ec.europa.eu/research/era/pdf/event01/e01-2-luke-georghiou-farhorizon_en.pdf</p>	<p>The FarHorizon project stems from the need to better align research at European level with the range of policy and regulatory competences that Members of the European Union have agreed should be at European level. This alignment through consultations on the Framework Programme, and through actions such as ERANets and Open Method of Coordination could be complemented by strategic targeting of priority sectors.</p> <p>The aim of FarHorizon is to pilot the use of foresight to align research with longer-term policy needs in Europe. It seeks to advance knowledge on differences across policy domains using the conceptual frame of the “European Research and Innovation Ecosystem” (also further articulating this concept) in terms of the role and the integration of research agendas in long-term policies. In tandem with this conceptual switch is the notion that the type of integration, coordination and resources envisaged in the ERA concept is only likely to be achieved if actors and policymakers are motivated by engagement in a series of Grand Challenges and other mission-oriented projects.</p> <p>Four areas with different sectoral characteristics have been selected:</p> <ul style="list-style-type: none"> Climate Change and Agriculture Ageing and Policy Coordination Policy for Creative Industries Innovation Policy <p>The major dissemination vehicle is the Policy Conference which is designed to assess and learn from the experience in the four areas and to spread the approach to the policy and research domains.</p>
<p>EC, DG RTD L2 – Research in the economic, social sciences and humanities – Prospective</p> 	<p>Indirect Forward looking dimension on:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Post carbon society (PACT, GILDED) <input type="checkbox"/> Evaluation of EU policies (DEMETER) <p>Near future Forward looking activities in the Socio-economic Sciences and Humanities Programme</p> <ul style="list-style-type: none"> • Challenges for Europe in the world in 2025 (AUGUR) • Prospective analysis for the Mediterranean region (MEDPRO) • Paradigm shift and on energy, environment, transport nexus and land use (PASHMINA, SUSTAINCITY) • Social platform on Family (FAMILYPLATFORM) • Impacts of global changes (WP 2010)
<p>EC, DG RTD L2 – Research in the economic, social sciences and humanities – Prospective EU 'Science in Society' (SiS) research programme</p>  <p>http://ec.europa.eu/research/science-society/document_library/pdf_06/sis-project-synopses-2007-2008_en.pdf</p>	<p>Lifeworld and Imaginaries in Foresight and Ethics</p> <p>Dominant imaginaries, ethical concerns and broad technological developments will be described, deploying insights from a number of disciplines.</p>

EC, DG RTD

I.2 - Environment-Sustainable Development

MODELS project



<http://www.ecmodels.eu/>

MODELS is a specific targeted research project running from 2006 to 2009, co-funded by the European Commission and co-ordinated by E3MLab of Institute of Communication and Computer Systems (ICCS) at National Technical University of Athens, Greece.

The project involves four major general equilibrium and macroeconomic models developed in Europe namely GEM-E3 (E3MLab), WorldScan (CPB), MIRAGE (CEPII), NEMESIS (ERASME).

The scientific objective of the MODELS project is to develop advanced economic modelling methodologies and to support the European Commission services to operate this suite of advanced computer-based economic modelling tools in order to perform comprehensive impact assessments of the policy agenda set for the Lisbon strategy and the related regulation and legislative proposals of the European Union.

The main fields of policy relevance are economic, social, and environmental renewal and sustainability.

The Lisbon Strategy is heavily based on the economic concepts of:

- Innovation as the motor for economic change
- The “learning economy”
- Social and environmental sustainability

Under the strategy, a more competitive economy will drive job creation in the EU, alongside social and environmental policies that ensure sustainable development and social inclusion, which will themselves drive economic growth even further.

EC, DG RTD

Climate Change and Environmental Risks Unit,

ADAM project



<http://adamproject.info/index.php/Download-document/456-Adam-Final-Report-revised-June-2009.html>

<http://www.adamproject.eu>

ADAM supports the EU in the development of post-2012 global climate policies, the definition of European mitigation policies to reach its 2020 goals, and the emergence of new adaptation policies for Europe with special attention to the role of extreme weather events. ADAM’s core objectives: Assessment and appraisal of existing and development of new and innovative EU climate policies
Global climate policy beyond 2012 requires a strong, integrated governance architecture that involves both public and private actors and that provides a regulatory framework on both mitigation and adaptation. Highly fragmented global climate governance is likely to be more costly, less effective in terms of environmental goals, and less equitable regarding smaller countries, particularly in the global South.

Policy recommendations include the following:


- to strengthen dialogues between environment, trade and development ministries;
- to open the EU emissions trading scheme and to link it with other schemes;
- to initiate formal co-operation between the UN climate regime, the Asia-Pacific Partnership and other multilateral partnerships;
- to agree on science-based sustainability criteria for removing trade barriers for climate-friendly goods and services;
- to consider climate-related issue links and package deals in the World Trade Organization Doha Round.

EC, DG RTD
Energy Programme
HYWAYS

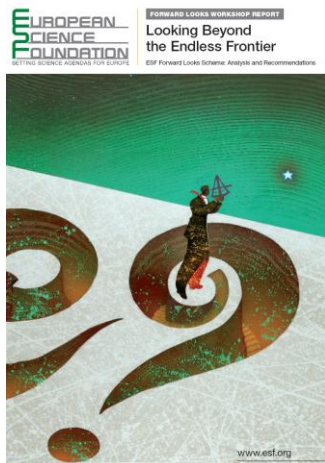


<http://www.hyways.de/>

The HyWays Project estimates that introducing hydrogen into the energy system would reduce the total oil consumption by the road transport sector by 40% between now and 2050. By taking a leading position in the worldwide market for hydrogen technologies, Europe can open new economic opportunities and strengthen its competitiveness. But the analysis also states that transition won't happen automatically. Substantial barriers have first to be overcome, ranging from economic and technological to institutional barriers, and actions must be taken as soon as possible. The HyWays project brings together industry, research institutes and government agencies from ten European countries. Following a series of more than 50 workshops the project has produced a Roadmap to analyse the potential impacts on the EU economy, society and environment of the large-scale introduction of hydrogen in the short- and long- term, as well as an action plan detailing what needs to be done for this to take place. The report is published as the Member States are due to give their approval of a new €940m public/private research partnership for the development of hydrogen and fuel cells. The HyWays project has created a roadmap based on country-specific analysis of the situation in Finland, France, Germany, Greece, Italy, Netherlands, Norway, Poland, Spain and the United Kingdom, together with an action plan detailing the steps necessary to move towards greater use of hydrogen. Hydrogen is one of the most realistic options for environmental and economic sustainability in the transport sector, in particular passenger transport, light duty vehicles and city buses. However, its introduction requires gradual changes throughout the entire energy system and thus careful planning at this early stage. The transitional period offers Europe the opportunity to take the lead in developing hydrogen and fuel cell technology and its applications in transport and energy supply. The challenges are high and the right steps have to be taken quickly if Europe is not to count the cost of late market entry. The costs of hydrogen end-use applications, especially for road transport, need to be reduced considerably to become competitive. At the same time deployment support schemes for hydrogen end-use technologies and infrastructure build-up are required. Comparing the spending for hydrogen production, supply and vehicles with the savings to be gained from replacing conventional fuel and conventional vehicles over time, the extensive and high-quality simulations of the project predict that the break-even point would be most likely reached between 2025 and 2035. The HyWays Roadmap estimates that in 2030 there will be 16 million hydrogen cars and the total cumulative investment for infrastructure build-up will amount to €60 billion.

<p>EC, DG RTD</p> <p>NoE ENDURE, the European Network for the Durable Exploitation of Crop Protection Strategies</p>  <p>ENDURE Foresight study</p> <p>European Crop Protection in 2030</p> <p>> The European Parliament has approved new European Union pesticides legislation introducing new regulations on the production and handling of plant production products and introducing new rules on their use.</p> <p>> ENDURE, the European Network for the Durable Exploitation of Crop Protection Strategies, has conducted a foresight study that seeks to provide crop protection stakeholders with the tools they need to tackle proactively future challenges. The process has enabled ENDURE to draw up five very different scenarios for European crop protection heading towards the year 2030.</p> <p>> From these scenarios we intend to discuss what scientific knowledge already exists to satisfy their varied demands, which research areas will need to be strengthened further and which additional measures will be needed to accompany ongoing changes.</p> <p>This foresight exercise was carried out by researchers from:</p> <p>AU, University of Aarhus > Denmark INRA, Institut National de la Recherche Agronomique > France WUR, Wageningen University > The Netherlands RIIS, Rothamsted Research > United Kingdom with the contribution of all other ENDURE partners.</p> <p>http://www.endure-network.eu/content/download/5050/41091/file/Foresight%20Study%20-%20English.pdfEU Endure Network of Excellence - (European Network for the Durable Exploitation of Crop Protection Strategies)</p>	<p>La Protection des Cultures en Europe en 2030</p> <p>ENDURE brings together more than 300 researchers in the fields of agronomy, biology, ecology, economics and the social sciences from 18 organisations in 10 European countries. They are committed to the ENDURE NoE (Network of Excellence) for four years (2007-2010), with the financial support of the European Commission's Sixth Framework Programme, priority 5: 'Food Quality and Security'. The ENDURE network's objectives are to:</p> <ul style="list-style-type: none"> • Build a lasting crop protection community of research. • Provide end-users with a broader range of short-term solutions to specific problems. • Develop a holistic approach to sustainable pest management. • Take stock of and inform plant protection policy changes. <p>The aim of this network is to develop crop protection strategies which are environmentally friendly, more closely tuned to consumer expectations and compatible with economically-viable farming systems. ENDURE, coordinated by INRA and managed by its subsidiary INRA Transfert, has received European €11.2 million in funding, and will involve more than 130 researchers working in 18 European organisations over the next four years.</p> <p>An integrative approach</p> <p>ENDURE (European Network for the Durable Exploitation of Crop Protection Strategies) aims to bring together basic and applied research resources across Europe to promote the development of a wide diversity of crop protection strategies compatible with sustainable development.</p> <p>The network will foster investment in the biology of pathogens, insect pests and weeds and the creation of varieties with sustainable resistance, the use of biological control, the spatial diversification of agricultural ecosystems, the management of invasive species and the integrated management of weeds. It will mobilise methods, tools and experience which will enable the implementation of integrated crop protection systems less reliant on or requiring lower inputs of plant health products. Particular emphasis shall be laid on the design of innovative plant protection systems, evaluated not only in terms of their agronomic efficacy, environmental impacts and economic consequences but also consumer perceptions, marketing strategies, barriers to and drivers of adoption of innovation and regulatory policies regarding plant health.</p> <p>Through the pooling of knowledge, equipment and human resources from leading teams throughout Europe, this network also aims to create a multi-disciplinary and trans-national joint research culture. It will cover a wide variety of disciplines (agronomy, genetics, ecology, economics, sociology) in order to generate new knowledge, aid in the development of novel technologies and propose innovative cropping strategies which are essential to the development of alternatives that are environmentally and agronomically sustainable as well as economically-viable. The work by ENDURE aims to foster solutions applicable to a diversity of crops and production systems across Europe, and to provide support to the stakeholders that are key to their implementation.</p> <p>In conjunction with stakeholders</p> <p>The network wishes to create and sustain working relationships with the scientific, industrial, extension and political worlds. It will supply them with information, identify their expectations and respond to their needs for knowledge and expertise so as to enable the emergence of dialogue between these groups concerning economically, culturally and socially acceptable solutions.</p>
<p>EC, DG Industry</p> <p>FORESEC Synthesis Report</p> <p>http://www.foresec.eu/wp3_docs/FORESEC_Deliverable_D_4_5.pdf</p>	<p>Maintaining European security requires a comprehensive approach both at national and European level. National security research and foresight activities are not adequately coordinated with the European level research programmes resulting in gaps and overlap between activities. There is an increased focus on the citizen as the object of security. There is increasing debate about whose responsibility the provision of security is.</p>

European Science Foundation (ESF) in particular
ESF Forward Looks



<http://www.esf.org/activities/forward-looks.html>

The flagship activity of ESF's strategic arm, Forward Looks enable Europe's scientific community, in interaction with policy makers, to develop medium to long-term views and analyses of future research developments with the aim of defining research agendas at national and European level. Forward Looks are driven by ESF's Member Organisations and, by extension, the European research community. Quality assurance mechanisms, based on peer review where appropriate, are applied at every stage of the development and delivery of a Forward Look to ensure its quality and impact.

European Policy Center EPC Well-being 2030



<http://www.epc.eu/en/p.asp?TYP=TEWN&LV=187&see=y&PG=TEWN/EN/wb1&I=14>

Well-being 2030' is a new two-year research project which will investigate the major trends and developments that will determine Europe's policy options for improving its citizens' quality of life by the year 2030.

This forward-looking project will provide analysis and stimulate debate on the future of Europe's economic and social models. It will assess and debate the following key questions:

- ▶ What kind of 'Social Europe' do citizens want in future?
- ▶ How can Europe's public sectors and services manage the sustainability challenges arising from demographic change, globalisation, climate change, the current economic crisis, inequalities and social exclusion?
- ▶ How can 'well-being' be measured?
- ▶ How can European policies contribute to improving social conditions?
- ▶ What choices are open to Europeans in shaping their future communities?

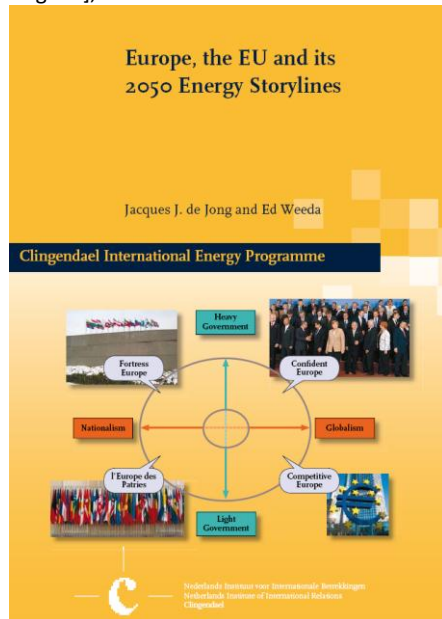
Clingendael European Studies Programme



http://www.clingendael.nl/cesp/events/20091007/20091007_cesp_final_report.pdf

EU Policy Seminar: The European Union in 2030: Geopolitical realities and considerations for EU policy strategies

Clingendael International Energy Programme
[CIEP JONG, J.J. DE, Europe, the EU and its 2050 energy storylines / J.J. de Jong; E. Weeda. - The Hague :], December 2007.



http://www.nbiz.nl/publications/2007/20071200_ciep_energy_jong.pdf

This paper seeks to explore some of the conditions under which energy policy will be formulated in and by the EU over the next 40 years or so. The development of energy policy at the EU level is addressed from a wider historical perspective, taking into account a number of factors that influence both the EU project and its energy supply security. Furthermore **four** storylines that are conceivable and inherently consistent are developed in this paper. They are labelled with names that refer not only to their content, but also to the type of global political and societal climate prevailing in the region.

Energy policy is rich in emotion and diverse political and economic interests. Thus the journey towards establishing and implementing an integrated European energy policy has been and still is a cumbersome one, full of stories of failures and successes. This paper seeks to explore some of the conditions under which energy policy could be formulated in and by the EU over the next 40 years or so. The development of energy policy at the EU level is addressed from a wider historical perspective, taking into account a number of factors that influence both the EU project and its energy supply security. These factors include the EU's international orientation and cooperation; the EU 'economic community of law' paradigm; the EU's (failing?) external leadership role; the impact of the fall of the Berlin Wall; and Europe's talents for creativity and improvisation. These factors are discussed in somewhat greater depth in the context of the formulation of an all-EU energy policy. The global energy policy environment is briefly discussed, indicating that energy resources for the world are less at stake than access to them. On this basis, a closer look is taken at the theoretical and practical aspects of using scenarios as a tool for energy policy-making. A few examples are presented, and it is argued that scenarios should basically be addressed on the basis of storylines. Storylines do require a set of specific parameters, and in this case the choice was made to use the various roles played by stakeholders for intervening in markets and in the world order. This choice is argued on the basis of the global interrelations that are currently influencing resource policies in general and energy in particular. Market efficiency, climate change, poverty issues, geopolitics and global coordination mechanisms are considered, leading to the two policy dimensions of 'nationalism' versus 'globalism' and 'heavy' versus 'light' government as the axes for the scenarios and storylines. This paper develops four storylines that are conceivable and inherently consistent. They are labelled with names that refer not only to their content, but also to the political and societal climate prevailing in the region. The first, '*l'Europe des Patries*', applies to a region where nation states are still the determinant factors. The second, 'Fortress Europe', is primarily inward-looking, with a strong drive towards inter-European cooperation and relations. 'Confident Europe' is an active participant in the global international system and practices what it preaches. And lastly, in 'Competitive Europe', market forces effectively deliver and are globally accepted. The main conclusions to be drawn are that the issue for the EU is not energy resources per se, but rather access to them, and that current ambitions at the EU level on climate change adaptation and related energy issues are not likely to be matched by long-term performance in the region. More specifically, in the futures depicted by the four scenarios, the historical downward trend in energy intensity continues in all four storylines; the share of oil in the TPES decreases in all the storylines as well, and even ends up at roughly the same level in all four; coal remains important in the energy mix, largely for electricity generation; gas seems to be the most stable energy source in 2050, no matter what is happening in the world at large; and no physical supply constraints are anticipated. Nuclear energy seems to experience a revival in all the storylines, but with regard to renewable energy sources, there are some notable variations among them. Finally, the new Energy Policy for Europe (EPE) presented in early 2007 is assessed from a historical perspective, in the light of the EU's 50-year energy policy quest, and is further analysed in relation to the four 2050 storylines. It is concluded that elements of all four scenarios are found in the EPE, but that the general tendency seems to be moving in the direction of more government intervention in markets instead of less. Meanwhile, for global climate issues the EU seems to be building its policy more on multilateralism and globalism, whereas when seeking energy supply security, nationalism and bilateral or regional approaches seem to prevail. The development of such policies however touches on the core competences of the national state. Developing such policies at EU level represents a huge challenge. The new energy policy is judged to be an intelligent first step towards balancing the triangle of energy policy objectives – the environment, competitiveness and supply security – that is usually framed as the Kyoto-Lisbon-Moscow triangle.

EU Reflection Group on the Future of the EU 2030
 May 2010

PROJECT EUROPE 2030
 Challenges and Opportunities

A report to the European Council by the Reflection Group on the Future of the EU 2030

May 2010

PROJECT

EUROPE 2030

Challenges and Opportunities

A report to the European Council by the EU Reflection Group on the Future of the EU 2030
<http://www.reflectiongroup.eu/2010/05/08/project-europe-2030-challenges-and-opportunities/>
http://www.reflectiongroup.eu/wp-content/uploads/2010/05/reflection_en_web.pdf

Looking to the 2030 horizon, Europeans will need a highly competitive and sustainable social market economy in order to maintain social cohesion and fight against climate change.

This will require an ambitious reform programme with clear priorities and much more effective enforcement mechanisms than the Open Method of Coordination can provide. In this context, we assume that the Commission's new Europe2020 strategy will form part of this major endeavour.

The EU must therefore implement without further delay the structural reforms that are still pending from the Lisbon Agenda. This will require reforming the new strategy's implementation mechanisms, by means of a more effective system of incentives, to ensure that the objectives decided by the European Council and other European institutions are actually met.

Human capital is the key strategic instrument for ensuring success in the global economy. And yet, Europe has lost considerable ground in the race to a knowledge economy. Catching up will require a coordinated effort. Member States must mobilise the resources they agreed to invest in R&D, with the help of the private sector, and reform all aspects of education, including professional training. The Union must also act through its own revised budgetary instruments, while making better use of the European Investment Bank and the European Investment Fund. Finally, we need to consider the possibility of opening up new sources of revenue, for instance through the imposition of a carbon tax.

The EU needs to implement a common energy policy with both internal and external dimensions that will allow us to achieve greater energy efficiency and savings of the kind advocated in the Europe2020 strategy, and diversify our energy supplies from third countries. Europeans also need to embark on a serious discussion about the need for safe nuclear energy in Europe, and to define the contours of a permanent system of incentives for the development of alternative energy sources.

European Parliament, Committee on Industry, Research and Energy (ITRE) Future Energy Systems for the EU25 for 2030



Security of Energy Supply: A Quantitative Scenario Study on Future Energy Systems for the EU25 for 2030
 Foresight Brief No. 110

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Purpose

The quantitative scenario study on the EU energy system focuses on the security of energy supply and address strategies for the EU energy system that address the security of energy supply in 2030. The study is part of the project 'Energy Security in the EU' funded by the European Parliament. The project aims to provide a quantitative assessment of the security of energy supply in the EU energy system in 2030. The project is part of the 'Energy Security in the EU' project funded by the European Parliament.

The Dual Challenge of Climate Protection and Security of Energy Supply

The dual challenge of climate protection and security of energy supply is a central challenge for energy policy. Climate protection and security of energy supply are two sides of the same coin. Climate protection requires a reduction of greenhouse gas emissions, which can be achieved by a shift to a low-carbon energy system. Security of energy supply requires a reliable and affordable energy supply, which can be achieved by a diversified energy system. The dual challenge of climate protection and security of energy supply is a central challenge for energy policy.

The study is part of the 'Energy Security in the EU' project funded by the European Parliament. The project aims to provide a quantitative assessment of the security of energy supply in the EU energy system in 2030. The project is part of the 'Energy Security in the EU' project funded by the European Parliament.

http://www.foresight-network.eu/index.php?option=com_docman&task=doc_download&gid=345

Security of Energy Supply: A Quantitative Scenario Study on Future Energy Systems for the EU25 for 2030

The quantitative scenario study on the EU energy system focuses on the security of energy supply and different alternatives for the EU energy system. Five different scenarios for the EU25 energy system by 2030 were developed. The scenarios were then grouped into two main families called "advanced conventional" and "domestic action" and their respective pros and cons analysed with regard to all relevant EU-policy fields for providing policy recommendations.

Communication From The Commission
"Preparing for our future: Developing a common strategy for key enabling technologies in the EU"



{SEC(2009) 1257} Brussels, 30.09.2009
 COM(2009) 512 final
http://ec.europa.eu/enterprise/sectors/ict/files/communication_key_enabling_technologies_en.pdf

European high-level expert group on key enabling technologies

Context and objective – According to the Commission, key enabling technologies are of “systemic relevance” for the European economy and provide the basis for process, goods and service innovation (Clause 1). Therefore, a process is to be launched whose purpose is to identify and promote the key enabling technologies in the EU. – The aim is to develop a strategy for the improved commercialisation and deployment of research results gained by publicly and privately funded R&D (research and development) activities in the EU. – The research base for the development of key enabling technologies in the EU should be strengthened through “the right framework conditions and support instruments“ (Clause 1). Synergy effects created by a better coordination of research promotion and joint action by Member States are assumed to be beneficial to European companies and very competitive high-tech markets. – The Commission announces that it wishes first to exhaust the current policy framework for fostering key enabling technologies. In particular, it refers to the legal framework of state aid rules, trade policy and the access to financial means. Moreover, it intends to reinforce existing initiatives for direct action in the field of specific key enabling technologies (Clause 5).

EC - President
Europe 2020



<http://ec.europa.eu/eu2020/pdf/annex1.pdf>

Strategy Europe 2020 will focus on a trio of interlinked priorities: growth from knowledge, creating an inclusive society, and building a greener economy that is competitive at international level.


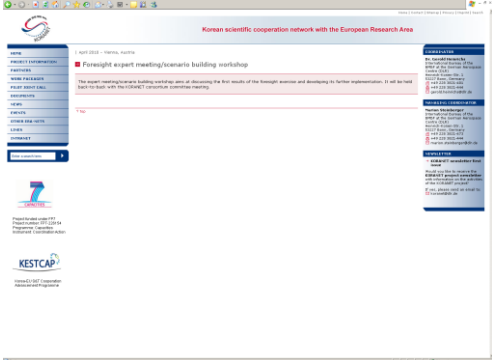
The strategy will be discussed and approved by the EU’s heads of state and government at the end of March and rolling out will begin after they meet again in June to agree on a few remaining points.

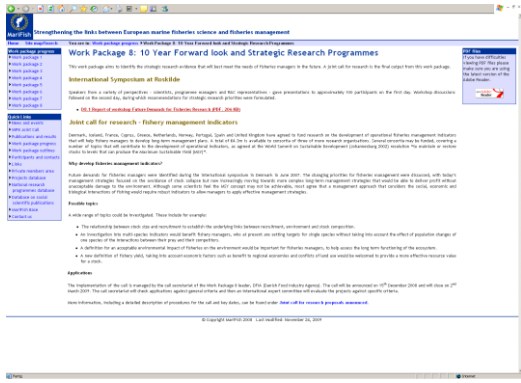
The Commission’s proposal on a new strategy follows a public consultation that attracted some 1 500 comments. The strategy builds on what has been achieved and the lessons learned. The first priority must be to hasten the exit from the crisis, but the strategy must also provide the building blocks for growth that will be sustainable in the future. Europe is recognised the world over for its high quality of life, underpinned by a unique social model. The strategy should ensure that these benefits are sustained and even further enhanced, while employment, productivity and social cohesion are optimised.


Forward Looking Activities within ERA-NETS

Name	Net type Framework funding Fp thematic priority Countries Coordinator Start date End date	Description +Vision
<p>AMPERA European Concerted Action to foster prevention and best response to Accidental Marine Pollution http://www.cid.csic.es/ampera/</p>	<p>ERA-NET FP6 Sustainable Development, Global Change and Ecosystems 9 MEC: Ministry of Education and Science 2005/04/01 2009/03/31</p>	<p>AMPERA aims at:</p> <ul style="list-style-type: none"> • Setting priorities in trans-disciplinary accidental marine pollution research. • Improved linking of accidental marine contamination research with prevention and mitigation activities, to underpin and emphasise the role of sound knowledge in decision making . • Improving co-ordination of national/regional research programmes on accidental marine pollution. • Design strategies to overcome barriers that hinder trans-national co-operation aimed at opening up of national/regional programmes. • Launching long-term RTD strategies, by identifying synergies and complementarities that will act as nuclei for sustainable co-operations between partners and improve the use of R & D outputs . • Dissemination of knowledge at different levels, underscoring the science-public interface and the importance of adopting this approach for society generally.
<p>CORE Organic Coordination of European Transnational Research in Organic Food and Farming http://www.coreorganic.org/</p>	<p>ERA-NET FP6 Food Quality and Safety 11 AU-KFT: Coordination Unit for Research in Climate Change Adaptation, Aarhus University 2005/05/01 2010/04/30</p>	<p>CORE Organic is a transnational partnership where resources within research in organic food and farming are joined. The aim is to enhance the quality, relevance and utilisation of resources in European research in organic food and farming through coordination and collaboration.</p>
<p>CORE Organic II Coordination of European Transnational Research in Organic Food and Farming Systems</p>	<p>ERA-NET FP7 Food, agriculture and fisheries 22 ICROFS: International Centre for Research in Organic Food Systems</p>	
<p>ERA-PG European Research area plant genomics http://www.erapg.org/evryone</p>	<p>ERA-NET FP6 Life sciences, Genomics and Biotechnology for Health 15 NWO/NGI: Netherlands Organisation for scientific research genomics initiative 2006/06/01 2010/05/31</p>	<p>ERA-NET Plant Genomics (ERA-PG) is a collaborative network of ministries, funding agencies and national research councils with programmes in plant genomics. ERA-PG aims to stimulate excellent research, drive innovation and create a fruitful environment for commercial exploitation in Europe. Supported by the European Commission 6th Framework Programme for research ERA-PG contributes to building the European Research Area (ERA).</p>


<p>ERASysBio Towards a European Research Area for Systems Biology - A Transnational Funding Initiative to Support the Convergence of Life Sciences with Information Technology & Systems Sciences http://www.erasysbio.net/lw_resource/datapool/_pages/pdp_2/ERASysBio_Systems_Biology_Strategy_Paper_25-Mar-2008.pdf http://www.erasysbio.net</p> 	<p>ERA-NET FP6 Life sciences, Genomics and Biotechnology for Health 15 PTJ: Project Management Juelich 2006/02/01 2010/01/31</p>	<p>A transnational funding initiative to support the convergence of life sciences with information technology & systems science. The first step will be to collect information about the projects and programmes under way in the 12 partner countries and their plans for the future. Next, the partners will draft a research agenda in systems biology for the period 2006-2008 outlining topics of common interest and potential for future collaboration. Once an agreed agenda is in place, the partners will start to pave the way for new transnational funding initiatives by setting up the appropriate contractual arrangements and a joint funding scheme. A web-based service to help students and researchers set up exchanges will be provided through the existing European Researchers Mobility Portal.</p> <p>Vision2015-2020 What can we expect from systems biology in 5 to 10 years? Great advances in biomedicine, agricultural, food and environmental sciences are expected through the setup of realistic goals. A 'man on the moon' success story will put systems biology in the spotlight and demonstrate its full potential. For this to become a reality, systems biology needs firm action towards structuring, training of excellent scientists and adoption of data standards and management. The view of the ERASysBio partners is that in addition to funding research projects, the areas where funding organisations can make significant contribution in the next 5-10 years are the training of a new generation of researchers, the adoption of policies on data standards, data management, data sharing and best practice, and the fostering of productive and long-lasting scientific networks.</p>
<p>FORSOCIETY Foresight and Society ERA - NET</p> <p>outdated</p>  <p>Progress & Achievements of the ForSociety</p> 	<p>ERA-NET FP6 Citizens and Governance in a knowledge-based society 15 GSRT: General Secretariat for Research and Technology 2005/03/01 2009/02/28</p>	<p>ForSociety ERA-Net enables coordination among the national foresight programmes of 15 countries, with a view to increase their national and European impact and to implement joint programmes. For this purpose the consortium will carry out a set of coordination activities that will also provide effective support to European scientific and technological integration along with the spirit of the ERA, especially in view of the enlarged EU and operational implementation of Article 169.</p> <p>ForSociety ERA-Net addresses the following strategic objectives: 1- Realise a sustained coordination between the national foresight programmes, through which their quality and impact is improved, their European content is enhanced, and trans-national programmes emerge. 2- Avoid compartmental approaches in emerging fields of research in Europe and thus deliver strategic guidance for the realisation of ERA. 3- Develop a system of national foresights in Europe, which contributes to the realisation of ERA by shaping the future of research towards societal needs and concerns. 4- Develop a European foresight culture, which strengthens future oriented thinking among policy makers and enhances the participation of all relevant stakeholder groups in the decision-making processes.</p>
<p>INNER Innovative Energy Research www.inner-era.net</p>	<p>ERA-NET FP6 Sustainable Development, Global Change and Ecosystems 11 PTJ: Project Management Juelich 2005/06/01 2010/12/31</p>	<p>The objective of the INNER project is to establish cooperation between European research programmes, or parts within such programmes, that aim to identify and stimulate innovative energy technologies and unexpected breakthroughs in conventional energy technology fields. This means research into new energy technologies in the very first stages of their development. The INNER project contributes to strengthen European efforts to define a policy and suitable approaches to find new ways (energy technologies) to meet the challenges of our energy economy: establish a secure supply, environmentally sound, while decreasing our import dependence.</p>

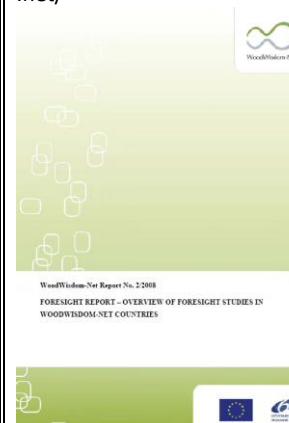
<p>IWRM.Net-CA Towards a European-wide exchange Network for improving dissemination of Integrated Water Resources Management research outcomes http://www.iwrn-net.eu http://www.iwrn-net.eu/IMG/pdf/D31.pdf</p>	<p>ERA-NET FP6 Sustainable Development, Global Change and Ecosystems 14 OIEau: International Office for Water 2010/12/31</p>	<p>IWRM-NET aims to implement new research activities at the national and regional levels related to Integrated Water Resource Management (IWRM) with a focus on the Water Framework Directive. Mapping of Research related Water Foresights</p>  <p>The slide shows the IWRM-NET logo and project details. It is an ERA-CT-0306060 FP6-NET project titled 'Towards a Europe-wide exchange Network for integrating research efforts on Integrated Water Resources Management'. The project is jointly supported by several organizations. The main deliverable is 'Mapping of Research-related Water Foresights', which is a synthesis of information from 15 European research areas. The project is part of the 7th Framework Programme for Research and Technological Development, starting in 2007 and ending in 2013. A table lists the participating research areas and their lead researchers.</p>
<p>KORANET Korean Scientific cooperation Network with the European Research Area (ERA) http://www.koranet.eu/ http://www.koranet.eu/en/205.php</p>	<p>ERA-NET FP7 None/Horizontal Network 12 DLR: German Aerospace Center 2009/01/01 2012/12/31</p>	<p>An Initiative to Intensify and Strengthen the Regional S&T Cooperation between Korea and the ERA. KORANET will contribute to increasing the quality, quantity, profile and impact of S&T cooperation activities between Korea and the European Research Area (ERA). With the help of several analytical exercises (mappings, foresight studies and other reports), the establishment of a pilot joint funding scheme and a joint funding programme as well as several joint activities (conferences, workshops and brokerage events) the project aims at building a sustainable and coordinated implementation of a common research area and the increase of Korean participation in the 7th Research Framework Programme.</p>  <p>The screenshot shows the KORANET website interface. The main heading is 'Korean scientific cooperation network with the European Research Area'. There is a section for 'Foresight expert meeting/scenarios building workshop' with a sub-heading 'The expert meeting/scenarios building workshop aims at discussing the first results of the foresight exercise and developing its further implementation. It will be held together with the ICRANET-2009/2010 workshop'. The website includes a navigation menu on the left and a list of events on the right. Logos for KESTAP and the European Commission are visible at the bottom.</p>


<p>MariFish Cordination of European Marine Fisheries Research</p> <p>http://www.marifish.net/</p>	<p>ERA-NET FP6 Food, agriculture and fisheries 15 DEFRA: Department for Environment Food and Rural Affairs 2006/01/15 2011/01/15</p>	<p>Research topics of the future</p> <ul style="list-style-type: none"> •The two burning topics of today are likely to continue in the future: <ul style="list-style-type: none"> –Climate change –Bottom trawling •Both are likely to attract funding so perhaps not the most important topics for MariFish to cover. •Ecosystems and trophic levels (food webs and predator-prey interactions) are important new areas and could influence policies on MSY •Interdisciplinary research (socio-economic and institutional analysis) to understand the drivers behind fishers' behaviour •Consumer to ocean/ocean to plate •Ecolabelling and certification •Spatial planning and carbon footprints  <p>http://www.marifish.net/News/2007-08-07.htm</p>
<p>MARINERA Co-ordination of National and Regional Marine RTD Activities in Europe</p> <p>http://www.marinera.net/</p>	<p>ERA-NET FP6 Sustainable Development, Global Change and Ecosystems 14 IFREMER: French Research Institute for Exploitation of the Sea 2006/06/01 2009/05/31</p>	<p>The MarinERA project main objectives are to: * Map European marine RTD programmes and specialised infrastructures, facilitating the creation of an internal market and quantifying the existing European marine research capacity.</p> <p>Facilitate the networking of Marine RTD funding agencies in the European Union, leading to a more cost effective and efficient use of Member State resources including scientific personnel, specialist infrastructures and planned investments.</p> <p>Contribute to the development of a European marine research policy, by identifying future scientific challenges.</p> <p>Provide a basis for the sharing of available resources to address priority issues which are beyond the capacities of individual Member States.</p> <p>Progress the reciprocal opening of Member State Marine RTD Programmes.</p>

<p>NEURON Network of European Funding for Neuroscience Research</p> <p>http://www.neuron-eranet.org/ http://www.neuron-eranet.org/en/114.php#Strategic_activities</p>	<p>ERA-NET FP6 Life sciences, Genomics and Biotechnology for Health 12 DLR: German Aerospace Center 2007/01/01 2010/12/31</p>	<p>In NEURON as well as in other ERA-Nets, funding organisations exchange information about their work, their review procedures and funding philosophies. This already is an achievement and will eventually lead to improvement of standards throughout partner countries. The ultimate goal of the ERA-Net scheme, however, is to initiate joint funding from national research budgets. These budgets are more or less strictly limited to national borders, and funding across borders is usually not possible. Concepts regarding how to overcome legal and administrative barriers need to be developed. Eventually, it will depend on the political will in each country whether the ambitious aims of NEURON and other ERA-Nets will materialize. There is no doubt that this would be beneficial to both the scientific community and the patients suffering from brain diseases. So called Foresight activities: A report about the workshop "Mental illness and neural dysfunction" that was held in May 2009 in Paris. Editor Delphine Prou with a foreword by Alexis Brice (INSERM, France). Articles by Guy Goodwin, Eduard Vieta, Andreas Meyer-Lindenberg, Thomas Bourgeron, Celso Arango Lopez, Paul Bebbington, Veronique Deroche-Gamonet, Elizabeth Kuipers. A report about the workshop "New technologies in Neurosciences" that was held in September 2008 in Warsaw. Editor Bérangère Ballion with a foreword by Alexis Brice (INSERM, France). Articles by Arthur Konnerth, John Rothwell, Jean Livet, Mohamed Jaber, Jacques Mallet and Bertram Müller-Myhsok. A report about the FENS Satellite Symposium "Prospects for Funding Neuroscience in Europe" that was held in July 2008 in Geneva, organisers INSERM and CNRS. Editor André Garenne with a foreword by Alexis Brice. Articles by Paola Bovolenta, Daniel Choquet, Mart Saarma, Laurent Cohen, Niels Birbaumer, Marlies Dorlöchter, Patrizia Tosetti, Joel Hasse Ferreira, Richard Nakamura. A report about the workshop "Future perspectives, benefits and bottlenecks of Neuro-biobanks" that was held in Vienna in April 2008. Editor Hella Lichtenberg (PT-DLR, Germany). Articles by Jürgen Goebel, Andrea Cook, James Ironside, Thomas Pickardt, Kurt Zatloukal and Martin Yuille. A report about the workshop "Neurodegeneration" that was held in October 2007 in Paris. Editors Jean-Antoine Girault and François Fresnois (INSERM, France). Articles by Ignacio Torres, Shlomo Rotshenker, Charles Duyckaerts, Giovanni Frisoni, Thomas Gasser, Jörg Schulz, Wolfgang Oertel and Jens Volkmann.</p>
<p>NEW OSH ERA New and Emerging Risks in Occupational Safety and Health (OSH) - Anticipating and Dealing With Change in the Workplace through Coordination of OSH Risk Research</p> <p>http://www.newoshera.eu http://www.newoshera.eu/en/pdf/Foresight.pdf</p>	<p>ERA-NET FP6 Life sciences, Genomics and Biotechnology for Health 11 FIOH: Finnish Institute of Occupational Health 2006/04/01 2010/03/31</p>	<p>The NEW OSH ERA project will help to combine the strengths of the different EU Member States in occupational safety and health (OSH) research</p> <p>Foresight study on future challenges of OSH research</p> <p>The aim of the foresight study was to examine the change factors in the society that have impact on the world of work, to reflect on the consequences of the changes for the workplaces and identify future challenges for OSH research. Non-OSH experts, who are innovative and creative in their way of thinking were interviewed using scenario-technique and the results were analysed using qualitative content analysis (Mayring).</p> 

<p>SEE-ERA.NET Plus South East European ERA-NET Plus; joint call for European Research projects in September 2009 in order to enhance the integration of the Western Balkan Countries into the European Research Area http://plus.see-era.net/start.html</p>	<p>ERA-NET plus FP7 Food, agriculture and fisheries 14 ZSI: Center for Social Innovation 2009/04/01 2013/01/31</p>	<p>In essence, SEE-ERA.NET PLUS is the next step in further integrating the Western Balkan Countries (WBC) and its key research communities into the European Research Area (ERA). It will further enhance the coordination of bilateral R&D cooperation with WBC and lift it up to an activity at European level. By joining forces and by pooling financial resources, the SEE-ERA.NET PLUS consortium will bring critical mass to bear.</p>
<p>SKEP Scientific Knowledge for Environmental Protection - Network of Funding Agencies http://www.skep-era.net http://www.skep-era.net/site/files/D6%20WP6_report_final.pdf</p>	<p>ERA-NET FP6 Sustainable Development, Global Change and Ecosystems 13 EA: Environment Agency (England and Wales) 2005/06/01 2009/05/31</p>	<p>The SKEP ERA-NET (Scientific Knowledge for Environmental Protection) is a partnership of 17 government ministries and agencies, from 13 European countries, responsible for funding environmental research. The SKEP network aims to facilitate the improvement of science into policy processes, and to support evidence-led modern regulation. The objectives include: delivering better value for money for our research; encouraging innovation through more efficient use of research funding; and the improvement of environmental protection capability by setting down foundations for co-ordinating research programmes.</p>  <p>SKEP ERA-net Scientific Knowledge for Environmental Protection Work Package 6 - Investigate emerging issues for future research planning Deliverable 6.4 Nanotechnology, Biotechnology, Information Technology and Cognitive Sciences: Environmental Opportunities and Risks of Converging Technologies Skepp ERA-net, Area PRILE (Environment and energy management agency) Ministry of Knowledge, Energy, Sustainable Development and Environmental Policy www.skep-era.net</p>
<p>URBAN-NET Urban ERA-NET - coordination of the funding of urban research in Europe http://www.urban-net.org/ http://www.urban-net.org/urban/live/binaries/urban-net/bulk/text/del-3_2_final_strategies_urban_research_needs.pdf</p>  <p>URBAN-NET Deliverable 3.2 "Strategies for identifying and addressing urban research needs in Europe (including stakeholder engagement plan)" Prepared by TÜV Rheinland Consulting GmbH (Lead of work package 3) January 2008 Project Title: Urban ERA-NET - Coordination of the funding of Urban Research in Europe Instrument: ERA-NET (Coordination Action) Contract no: 011342 Start date of project: 01 August 2008 Duration: 4 years</p>	<p>ERA-NET FP6 Sustainable Development, Global Change and Ecosystems 13 SNIFFER: Scottish and Northern Ireland Forum For Environmental Research 2006/08/01 2010/07/31</p>	<p>The URBAN-NET project addresses issues of urban sustainability in Europe. Its overall aim is to increase the cooperation and coordination between European Member and Associated States through networking and the collaboration on joint research activities. Work Package 3: identification and analysis of common strategic issues Work Package 3 (WP3) represents the main preparatory building block for the implementation of URBAN-NET cooperation and coordination activities. It aims to develop joint understanding of the future agenda for urban research, incorporating links with policy. From this base, a transparent and consolidated process of selecting thematic priorities for cooperation and coordination is derived. This selection of thematic priorities will be achieved by combining an overview of regional, national and European urban research activities with a foresight or "horizon scanning" type process to define the future strategic priorities for urban research in Europe. It is intended that URBAN-NET will employ both top-down, strategic approaches to identify research topics and bottom-up, problem-driven methods. WP3 will also contribute to the longer-term project objectives by highlighting opportunities for future initiatives.</p>

<p>VISION Shared knowledge base for sustainable innovation policies</p> <p>http://www.visioneranet.org/ http://www.visioneranet.org/files/451/program_knowledgestrategies_VISIONEra-Net_Conference2009_final.pdf</p> 	<p>ERA-NET FP6 Nanotechnologies and nano-sciences, multifunctional materials, new production processes and devices 10 TEM: Ministry of Employment and the Economy 2005/05/01 2008/04/30</p>	<p>VISION ERA-NET is a collaborative network of nationally leading innovation policy agencies who seek to:</p> <ul style="list-style-type: none"> * Coordinate European research on innovation and technology * Improve the utilization of research and evaluation intelligence in policy making * Expand and advance European knowledge base on innovation environment * Identify common knowledge and development needs <p>Part of efforts to create the European Research Area (ERA), VISION ERA-NET bridges nationally leading funding agencies for research on innovation policy. The project benchmarks policy related research in different countries, as well as utilization of strategic research in policy planning and design. Based on exploration of shared knowledge needs, partners design cross-national research mechanisms on selected strategic issues. Such joint activities may include cross-national research calls, policy outlines, expert networks, and learning for policy makers. Due to the policy relevance of innovation, VISION ERA-NET pays particular attention to the use of strategic research. The network will allow members to augment existing national research capabilities, access specialized complementary research communities, and to strengthen evaluation exercises.</p>
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<p>WOODWISDOM-NET Networking and Integration of National Programmes in the Area of Wood Material Science and Engineering http://www.woodwisdom.net/</p>	<p>ERA-NET FP6 Nanotechnologies and nano-sciences, multifunctional materials, new production processes and devices 8 TEKES: Finnish Funding Agency for Technology and Innovation 2004/01/01 2007/12/31</p>	<p>The strategic objectives of the ERA-NET WoodWisdom-Net are to deepen the collaboration between the European funding organisations (ministries and funding agencies) in the field of wood material science in order to coordinate the use of research funds, and to integrate research resources from different countries in order to promote the competitiveness and sustainability of the European forest and wood cluster.</p>
<p>WoodWisdom-Net 2 Networking and Integration of National Programmes in the Area of Wood Material Science and Engineering in the Forest-Based Value Chains http://www.woodwisdom.net/</p>  <p>WoodWisdom-Net Report No. 2 2008 FORESIGHT REPORT - OVERVIEW OF FORESIGHT STUDIES IN WOODWISDOM-NET COUNTRIES</p>	<p>ERA-NET FP7 Nanosciences, nanotechnologies, materials and new production technologies 12 TEKES: Finnish Funding Agency for Technology and Innovation 2009/03/01 2012/02/28</p>	<p>Inventory of OVERVIEW OF FORESIGHT STUDIES IN WOODWISDOM-NET COUNTRIES <u>Strategic Objectives of the European forest-based sector's Vision 2030 adapted from TP Forest Technology Platform</u></p> <ul style="list-style-type: none"> - Strategic Objective 1: Development of innovative products for changing markets and customer needs - Strategic Objective 2: Development of intelligent and efficient manufacturing processes, including reduced energy consumption - Strategic Objective 3: Enhancing availability and use of forest biomass for products and energy - Strategic Objective 4: Meeting the multifunctional demands on forest resources and their sustainable management - Strategic Objective 5: The sector in a societal perspective. <p>http://www.woodwisdom.net/mm_files/do_804/WWNet_Report2_2008_Foresight.pdf</p>

<p>WORK-IN-NET Labour and innovation: Work-oriented innovations - a key to better employment, cohesion and competitiveness in a knowledge-intensive society</p> <p>http://www.workinnet.org/</p> 	<p>ERA-NET FP6 Citizens and Governance in a knowledge-based society 9 DLR: German Aerospace Center 2007/05/10 2008/09/30</p>	<p>The aim of WORK-IN-NET is to set up sustainable communication and cooperation channels in Europe between the still fragmented national and regional research activities in the area of work-related innovation issues. The WORK-IN-NET Coordination Action (CA) exchanges and collects, analyses and spreads information on existing national and regional activities on work-related innovations, thus paving the way for joint, transnational initiatives as benchmark exercises, transfer seminars and a joint programme.</p> <p>September 2008 WORK-IN-NET Foresight seminar in Stockholm During two days in September 2008, FAS organised a WORK-IN-NET seminar in Stockholm on the theme “future challenges of work life development and work-oriented innovation activities in Europe”. All WORK-IN-NET partner organisations had been invited to participate in the workshop. They were encouraged to contribute with short foresight reports about future challenges of work life development and work-oriented innovation activities, for example around the following themes:</p> <p>Newsletter WORK-IN-NET Nr. 02/08 of December 2008 - 3 -</p> <ul style="list-style-type: none"> ☐ Who will instigate and carry out work-oriented innovation activities in your country 2020? How will new technology affect the division of labour in the future? ☐ How will globalisation and the integrating European labour market affect working conditions and health promotion at work in 2020? ☐ What has happened to corporate social responsibility in 2020? ☐ Describe industrial relations, job security and employment contracts in your country in 2020. ☐ Elaborate on equity, gender, ethnic inclusion & diversity as well as generation gaps at work in 2020. <p>Country specific reports were given by Tuomo Alasoini (Finland), Kenneth Abrahamsson (Sweden), and Jürgen Howaldt (Germany). In addition the following experts had been invited to make presentations and provide background papers: Raija Koivisto, VTT Technical Research Centre of Finland; Peter Docherty, Chalmers University of Technology and ATK Arbetsliv Sweden; Peter Totterdill, UK Work Organisation Network; and Jari Kaivo-oja, Finland Futures Research Centre, Turku School of Economics. The following two participants contributed with insights about the European context: Elisabeth Lagerlöf, previously at European Foundation for the improvement of Living and Working Conditions and Werner Wobbe, DG Research, European Commission.</p> <p>The two days contained a broad range of thought provoking presentations and lively discussions among the 25 participants. A report from the seminar captures the essence of those presentations and discussions, as well as the submitted background papers. It will be available on www.workinnet.org/ soon.</p>
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Forward Looking Activities beyond 2030 within Technology Platforms

Technology Platform + Reference	Background + Vision
<p>European Biofuels Technology Platform (EBTP) "Biofuels in the European Union, a vision for 2030 and beyond"</p>  <p>http://www.biofuelstp.eu/downloads/biofuels_vision_2030_en.pdf</p>	<p>Background + Vision</p> <p>By 2030, the European Union covers as much as one quarter of its road transport fuel needs by clean and CO2-efficient biofuels.</p> <p>A substantial part is provided by a competitive European industry. This significantly decreases the EU fossil fuel import dependence. Biofuels are produced using sustainable and innovative technologies; these create opportunities for biomass providers, biofuel producers and the automotive industry.</p>
<p>European Construction Technology Platform (ECTP) „Challenging and Changing Europe’s Built Environment. A vision for a sustainable and competitive construction sector by 2030”</p>  <p>http://www.ectp.org/documentation/ECTP-Vision2030-25Feb2005.pdf</p>	<p>"In the year 2030, Europe’s built environment is designed, built and maintained by a successful knowledge- and demand- driven sector, well known for its ability to satisfy all the needs of its clients and society, providing a high quality of life and demonstrating its long-term responsibility to the mankind’s environment.</p> <p>Diversity in age, ability and culture is embraced. Equalization of opportunities for all is an overarching principle; construction has a good reputation as an attractive sector to work in, is deeply involved in research and development, and whose companies are well known for their competitiveness on the local and regional as well as global levels".</p>

<p>European Steel Technology Platform (ESTEP) From a Strategic Research Agenda to implementation</p>  <p>ftp://ftp.cordis.europa.eu/pub/estep/docs/sra_en.pdf</p>	<p>Vision 2030 The ambition of the European steel industry is to maintain and reinforce a global leadership, which is both sustainable and competitive, given the strong development in other parts of the world, notably Asia.</p>
<p>Forest-based sector Technology Platform (FTP) INNOVATIVE AND SUSTAINABLE USE OF FOREST RESOURCES</p>  <p>http://www.forestplatform.org/easydata/customers/ftp/files/pdf/FTP_Vision_Document_2030.pdf</p>	<p>Vision 2030 The European forest-based sector plays a key role in a sustainable society. It comprises a competitive, knowledge-based industry that fosters the extended use of renewable forest resources. It strives to ensure its societal contribution in the context of a bio-based, customer-driven and globally competitive European economy.</p>
<p>European Photovoltaic Technology Platform A vision for photovoltaic technology</p>  <p>http://www.eupvplatform.org/fileadmin/Documents/vision-report-final.pdf</p>	<p>It is envisaged that by 2030, PV will be established as a viable electricity supplier, and that the market will continue to grow thereafter at full speed.</p>

European Platform on Sustainable Mineral Resources (ETP SMR)

17 March 2005

Vision Paper for a European Technology Platform on Sustainable Mineral Resources (SMR)¹

VISION FOR 2030

The European Technology Platform on Sustainable Mineral Resources (SMR) will modernise and reshape one of the fundamental pillars of the European economy and society: the European extracting and processing sector of energy and non-energy minerals. It will achieve this by:

- > Securing the future supply of /access to European raw materials;
- > Supporting the revival of exploration of Europe's mineral potential;
- > Developing innovative and sustainable production technologies;
- > Implementing best practices;
- > Reuse, recovery and recycling as well as new product applications;
- > Creating European added value through R&D-based technology leadership, education and training which could also benefit to developing countries if the Commission agrees to recognise the mineral resources sector in its development policy.

KEY BENEFITS OF THE TECHNOLOGY PLATFORM

- > will stimulate growth and employment
- > will have a positive impact on a wider range of Community policies, and contribute to the forthcoming Thematic Strategy on the Sustainable Use of Natural Resources;
- > will boost research and technology and support Europe's position as technology leader
- > will contribute to the EU's 2020 development objectives;
- > will provide mineral products responding to societal needs in the 21st century based on economically, environmentally and socially sustainable production of raw materials in Europe;
- > will bring together small, medium and large enterprises (European and international), associations, scientific community, governmental authorities and financial institutions in order to leverage best-practice technologies and to promote innovations.

¹ This vision document is a living document and will evolve over time. It is meant for and contains it is supported by the following industry sector organisations and their consortia, of whom several submit comments and proposals to this document: European Nuclear Group/European Nuclear Energy, ENR, ENR, the Society of Mining Engineers. Some organisations and their members are not in the position to contribute at this stage and might be able. More extensive consultation is necessary for the development of the Strategy Research Network. It is acknowledged for having provided the vision draft, to all listed companies to further update comments.

<http://www.etpsmr.org/contents/downloadable-documents/Public%20Download%20Area/ETP%20SMR%20Vision%20document.pdf>

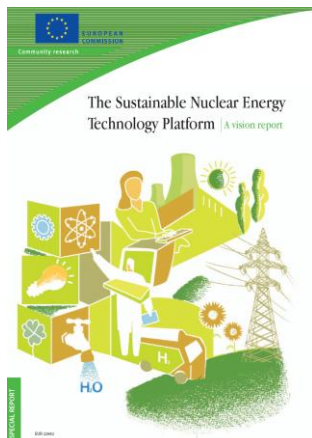
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Sustainable Nuclear Energy Technology Platform (SNETP)



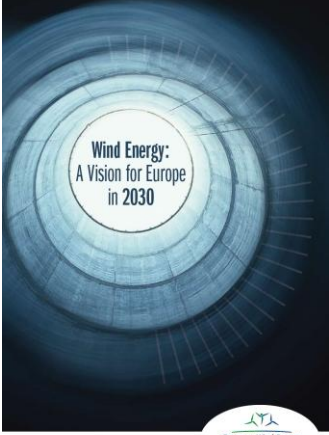
http://www.snetp.eu/www/snetp/images/stories/Docs-VisionReport/snetp_vision_report_eur22842_en.pdf

Vision 2030

To maintain its role as a worldwide player in the context of an increase in energy demand at global level, Europe needs an energy mix which deals with the following challenges: increase of security of supply, cost competitiveness, and reduction of greenhouse-gas emissions to combat climate change. Since its launch in 2007, SNETP's aims to:

- Preserve and strengthen the European technological leadership and nuclear industry through a strong and long-term Research and Development programme, involving fuel cycles and reactor systems of Generation II, III and IV types;
- Enhance Europe's technological leadership in nuclear science and engineering by the production of scientific and technical skills to keep pace with corresponding industrial and R&D demand; and
- Contribute to the production of synthetic fuels and hydrogen needs on the basis of non greenhouse gas emitting production sources in an environmentally benign and sustainable economy.

This document proposes a vision for the short-, medium and long-term development of nuclear energy technologies, with the aim of achieving a sustainable production of nuclear energy, significant progress in economic performance, technological breakthroughs, and a high safety level. Roadmaps are proposed for the development and deployment of several potentially sustainable nuclear technologies as well as for actions to harmonise Europe's training and education and renew its research infrastructures.

<p>European Wind Energy Technology Platform (TPWind) Windenergy: A vision for Europe in 2030</p>  <p>http://www.windplatform.eu/fileadmin/ewetp_docs/Structure/061003Vision_final.pdf</p>	<p>2030 TPWind will endeavour to spread wind energy experience across the EU region through direct interaction among Member State Governments. To expand research budgets, it will investigate new opportunities for funding at national and EU levels and draw in increased funding from private industry, encouraging more attention on long term R&D</p>
<p>Water Supply and Sanitation European Technology Platform (WSSTP) Water – safe, strong, sustainable European vision for water supply and sanitation I 2030</p> <p>http://www.wsstp.eu/content/default.asp?PageId=738&LanguageId=0</p>	<p>A long-term vision 2030 document has been created, that includes:</p> <ul style="list-style-type: none"> • Integrated management of water resources and water infrastructure • Balanced water uses preserving aquatic and terrestrial ecosystem. • Uses of alternative resources, recovery and re-use of water. • Reduced detrimental health effect of water-based emissions. • Water quality monitoring. • Risk management in the water-cycle.

Forward Looking Activities within Corporations

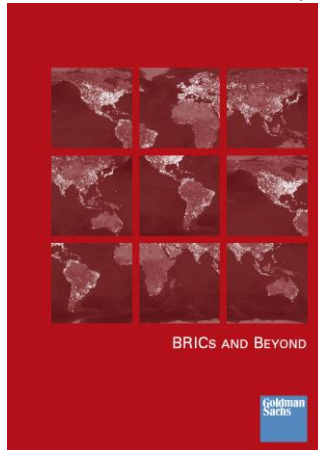
Deutsche Bank
Alfred Herrhausen Society
The International Forum of Deutsche Bank



<http://www.foresightproject.net/about/idea.asp>

Foresight is a new international programme of investigation and debate structured around the challenge of forging common futures in a multi-polar world. The last decade has seen a major shift in the distribution of power away from the OECD towards other regions of the world. Foresight aims to ensure a smooth transition by encouraging better multilateral understanding and promoting a fairer and more functional international order. The Foresight working method includes a series of high-level roundtable symposia, at which different "insider" and "outsider" perspectives on a number of key global challenges are compared. The aim of these events is to identify areas where common positions between the Foresight countries/regions can be developed and thus progress made towards forging common futures. By bringing together participants from different parts of the world, these events will help build and sustain a Foresight network. The first event was held in Moscow on the 19 and 20 June. Further symposia are scheduled in Santiago de Chile, Washington DC, Berlin, New Delhi and Beijing, with further events in other regions being planned.

Goldman Sachs, BRICs and Beyond



<http://www2.goldmansachs.com/ideas/brics/book/BRIC-Full.pdf>

Vision 2030

Goldman Sachs coined the term BRIC in 2001 to refer to the group made up of Brazil, Russia, India and China, countries that were growing at a pace that suggested they would become economic giants in the future. According to the investment bank's study, in ten years their weight in world GDP would increase by 50% and, by the middle of the century, this group would match the group of developed economies. Their level of per capita income would still be considerably below that corresponding to rich economies but it would go on rising, and we mustn't forget that the BRICs go to make up 40% of the world's population.

The term became famous and today's reality more than confirms these predictions. Since the study was published, China has become the third economy on the planet, ahead of Germany and behind the United States and Japan, and has recently achieved the distinction of leading world exporter. Brazil and India have also come up to expectations and only Russia has a more uncertain situation. If we look at China, India and Brazil, in 2009 their contribution to the world GDP reached 20% in terms of purchasing power parity, equalling the weight of the United States and that of the European Union. Specifically, 12% of the world GDP originated in China, while India and Brazil produced the remaining 8%. Moreover, the outlook is good: the latest forecasts by the International Monetary Fund predict that China will return to the 10% annual growth rates we'd got used to in the past. For their part, in the coming years India and Brazil are likely to exceed growth averages of 7.2% and 3.5%, respectively, achieved in the decade prior to the crisis. In 2010-11, Brazil, India and China will contribute 1.7 annual percentage points to global growth, contributing 40% of the total (measured in purchasing power parity). China alone will add 1.2 percentage points or 30% to global progress, more than double the United States' contribution.

The BRIC acronym was right to direct attention towards what are known today as the emerging economies. Their increasing economic weight, together with their maintenance of high growth rates, explains their rising contribution to the progress of the world economy. But this phenomenon isn't limited to the four big guns: it extends to a diverse group of countries located in Asia, Eastern Europe, Latin America and Africa. Economies with medium or low incomes according to the World Bank classification, but that have more or less successfully opened themselves up to globalisation in their economic and commercial relations, have adopted a free market economy and have made an effort to provide themselves with the mechanisms required to guarantee institutional stability.

The emerging economies are already the stars of the global economic stage. They are a relevant engine for growth, are large consumers of energy, hold three quarters of the foreign exchange reserves and provide 80% of the world's population. Acknowledgement of this phenomenon has also become evident in the area of international cooperation. The G-7 meetings between the richest countries in the world that, until very recently, called all the shots for the planet, have given way to G-20 meetings that include a large number of emerging countries, since action could not be taken without their approval. The emerging countries are increasingly the future, something those of us in the old west must bear very much in mind.

McKinsey: Charting our water future



http://www.mckinsey.com/client-service/Water/Charting_our_water_future.aspx

Water frameworks to 2030

Growing competition for scarce water resources is a growing business risk, a major economic threat, and a challenge for the sustainability of communities and the ecosystems upon which they rely. It is an issue that has serious implications for the stability of countries in which businesses operate, and for industries whose value chains are exposed to water scarcity.

Charting our water future: Economic frameworks to inform decision-making shows that while meeting competing demands for water will be a considerable challenge, it is entirely possible to close the growing gap between water supply and demand. This report provides greater clarity on the scale of the water challenge and how it can be met in an affordable and sustainable manner.

The report offers case studies from four countries with drastically different water issues, which will collectively account for 40 percent of the world's population, 30 percent of global GDP and 42 percent of projected water demand in 2030: China, India, South Africa and Brazil. The report's methodology identifies supply- and demand-side measures that could constitute a more cost effective approach to closing the water gap and achieve savings in each country.

PricewaterhouseCoopers

(John Hawksworth): Corporation



[http://www.pwc.com/extweb/pwcpublications.nsf/docid/56DD37D0C399661D852571410060FF8B/\\$file/world2050emergingeconomies.pdf](http://www.pwc.com/extweb/pwcpublications.nsf/docid/56DD37D0C399661D852571410060FF8B/$file/world2050emergingeconomies.pdf)
http://www.pwc.ch/de/dyn_output.html?content.void=16295&collectionpageid=222&containervoid=201&comefromcontainer=true
http://www.pwc.ch/user_content/editor/files/publ_tls/pwc_the_world_in_2050_e.pdf

"The World in 2050: How big will the major emerging market economies get and how can the OECD compete?", March 2006

By 2050 the economy of Brazil same size as Japan (at market exchange rates), which is 20-25% of US; economy of Indonesia & Mexico are both larger than Germany or UK; economy of Russia same size as France; economy of Italy same size as Turkey; economy of India is 58%(market) of US; economy of China is 94%(market) of US; economy of Korea & Spain are both 8% of US market; economy of E7 (Brazil, Russia, India, China, Turkey, Mexico, Indonesia) is 125%(market) of G7 (US, Japan, France, UK, Germany, Italy, Canada); GDP-per-capita in Brazil, Turkey and China broadly on par with 2004 levels of G7; about 50% of 2050-G7 levels.

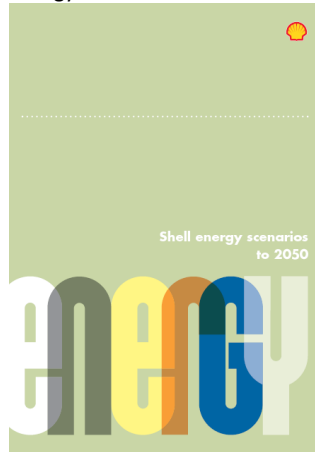
In March 2008 PWC has updated their economic growth projections in "The World in 2050: Beyond the BRICs", taking into account the latest available data and extend the analysis to include 13 other emerging economies. Some of the key findings of our survey:

- The E7 emerging economies will by 2050 be around 50% larger than the current G7 (US, Japan, Germany, UK, France, Italy and Canada).
- China is expected to overtake the US as the largest economy in around 2025.
- India is now assessed as having the potential nearly to catch up with the US by 2050.
- The Brazilian economy could be larger than the Japanese economy by 2050.
- The Russian, Mexican and Indonesian economies could be larger than the German, French or UK economies by 2050.
- The Turkish economy could be of similar size to the Italian economy by 2050.

The general message is that investors with long time horizons should look beyond the BRICs – there are many other alternatives worth considering (such as Vietnam or Nigeria) depending on the nature of the investment and the risk tolerance of the investor.

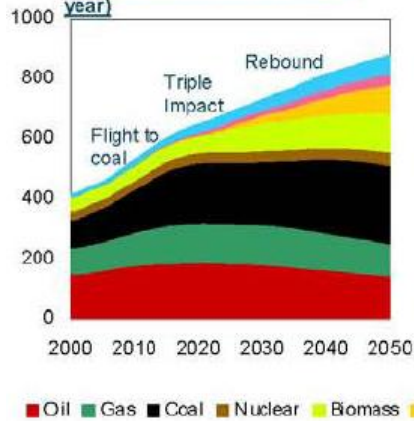
Shell

Energy Scenarios 2050



http://www-static.shell.com/static/public/downloads/brochures/corporate_pkg/scenarios/shell_energy_scenarios_2050.pdf
http://www.shell.com/home/content/aboutshell/our_strategy/shell_global_scenarios/dir_global_scenarios_07112006.html

Total primary energy (EJ per year)



- Focus on existing infrastructure
- Sequential responses to hard truths
- Volatile energy prices
- Knee-jerk reactions to climate events
 - No effective carbon pricing
 - Adaptation
- Flight to coal, then biofuels
- Renewables forced in by mandates
- Patchwork of national standards

Siemens

Future Dialogue 2009



Towards a sustainable future:
The changing role of science, business and politics in the 21st century

A summary paper written by the Economist Intelligence Unit for the Future Dialogue, Berlin, October 2009



<http://www.future-dialogue.org/de/home>

The aim of Future Dialogue was threefold:

to heighten awareness of the cutting-edge scientific solutions that are being developed in response to the challenges we currently face to explore ways of overcoming the constraints to co-operation between science and business, ensuring that innovative research is both financed and translated into marketable solutions to debate how best to engage the support of the general public and policy-makers

Siemens

Pictures of the Future

<http://www.siemens.com/innovation/en/publications/index.htm>

Tomorrow's Power Grids | Scenario 2030

Which Technologies will shape our lives in ten to twenty years? The magazine "Pictures of the Future" reports twice a year on major technology trends and looks at work in progress in the Siemens laboratories. It includes future scenarios, features and reports on corresponding R&D activities at Siemens and interviews with international experts. Harvesting electricity in 2030. A solar thermal power plant in the Moroccan desert covers 100 km², which makes it the world's largest installation of its kind. Using HVDC lines, the electricity is transmitted as direct current at 1000 kV to the coast, where it transforms salt water into pure drinking water. From there, it is transmitted across the sea to Europe, where it provides clean power to many countries

The Challenge Network

<http://www.chforum.org/>

Scenarios for 2040: Final http://www.chforum.org/scenarios2009/scenarios_final...



Scenarios for 2040

This text concludes the scenario exercise, although you are invited to comment and we may develop a series of "implications" papers, depending on public interest. We offer courses in how to generate and apply scenarios, or how to build the tool into a wider set of mechanisms for generating insight. Please make contact if this would be useful to your organisation. There is a direct relation available, and you can see the overall workings [here](#), or via the menu which is given on the left.

Index:

- Introduction
- The issues which these scenarios address
- Summary and précis
- The main areas of analysis
 - Patterns of political evolution
 - Government and the nation state in 2040
 - Rival political narratives in 2040
 - Institutions and integrable infrastructure
 - Networks and collective intelligence
 - The outlook for economic growth
- Systems issues: managing the commons
 - Two wedges, three populations and three paths
 - The wedges and the paths
 - The populations
- Three scenarios for 2040
 - Neglect and Fracture
 - Yesterday's Future
 - Waking Up
- Afterword: a review
- Discussion

The discussion section is where we post interesting comments and observations. Please feel free to make contact if you have something which you wish to add. You can do this by using the link given on the left. All comments are edited, and it is our decision whether to post them or not.

Introduction [Back to index](#)

These scenarios have been extremely difficult to develop. There are several reasons why this is so. The next thirty years seem likely to overturn so many established patterns of power. It will roughly triple the level of economic activity. Scientific insight will be multiplied by much more, and generate tools and capabilities of enormous power. The period will, however, offer unprecedented challenges. It will begin to overturn three centuries of political dominance by the current established powers, and of ways of thinking about politics. These and other factors make the period akin to us in a way that, as seen from the perspective of 1980, 2010 was not. Consequently, it is hard to prioritise the issues which the scenarios should highlight.

The team's ideas have evolved very considerably during the year that it took us to generate these scenarios. We have published position papers as the process went forward, and the

The Challenge Network released three global scenarios for 2040: "Neglect and Fracture", "Yesterday's Future" und "Waking Up". The scenarios were developed by a team of around 20 experts and tested in various workshops and on 4 continents. Scenarios 2040 by The Challenge Network: three fundamental questions have been addressed:

Will the international community address what we have called "systems issues", and if so how will they do this? By this, we mean all of those concerns that arise when hitherto isolated populations and commercial systems come into intimate contact with each other: issues connected with security, law and policing, with environmental and resource balances, with public health and related issues.

What does a development path look like for the poor nations as we move towards 2040? Is there a viable pathway, given the many obstacles that the systems issues present?

The overused word "sustainability" has rather passive connotations: essentially, that we meet our future by doing more with less, existing on a declining pathway as our marginal improvements contribute less and less. We ask, therefore, **how can we transcend this pathway,** and so blossom into something new? What will the most capable communities be doing when they undertake commerce, government or individual daily life in 2040?

The Munich Personal RePEc Archive (MPRA)
Munich University Library



Strategic Foresight in multinational enterprises – a case study on the Deutsche Telekom Laboratories

Rohrbach, René, Arnold, Benoit M. and Hees, Joq UNSPECIFIED

12 January 2007

Online at <http://mpra.ub.uni-muenchen.de/5700/>
MPRA Paper No. 250, posted 10 November 2007 / 16:51

http://mpra.ub.uni-muenchen.de/5700/1/MPRA_paper_5700.pdf

MPRA Foresight TeleKom

Strategic Foresight activities enable companies to use weak signals to identify opportunities and threats. Research on Strategic Foresight proposes different methods, discusses their implementation and gives recommendations on how to link Strategic Foresight with other functions in an organization. Based on a literature review, we define a generic framework for the management of Strategic Foresight activities on the strategic, tactical and operational level and identify and discuss actors, methods and systems of Strategic Foresight

Building on an in-depth case study of the Deutsche Telekom Laboratories we shed light on the implementation of Strategic Foresight activities. In the discussion we focus on the interaction of methods from Consumer Foresight and Technology Intelligence. Taking an example project, we explore how Strategic Foresight is used on the operational level of innovation management. We conclude that Strategic Foresight can successfully contribute to coping with uncertainty and complexity and can feed the front-end of innovation from the market (customer needs) and technology (realization opportunities) perspective.

World Business Council for Sustainable Development



(WBCSD)

<http://www.wbcd.org/web/vision2050.htm>

Vision 2050 – The new agenda for business

The World Business Council for Sustainable Development (WBCSD) launched "Vision 2050: The new agenda for business," a study that lays out a pathway leading to a global population of some 9 billion people living well, within the resource limits of the planet by 2050. The report, compiled by 29 leading global companies representing 14 industries, including Syngenta, was released at the World CEO Forum in New Delhi, India.

The publication outlines a future in which 9 billion people live well, enjoying health, food, shelter, energy, mobility, education and other basics of life. Syngenta CEO, Michael Mack added that "humanity has largely had an exploitative relationship with our planet; we can, and should, aim to make this a symbiotic one." In the *Vision 2050* scenario, global society attains this standard of living at a sustainable rate, without further harm to biodiversity, climate and ecosystem services.

As part of this transformation, *Vision 2050* calls for a new agenda for business: to work with government and society worldwide to transform markets and competition.

PWC study “100% renewable electricity”
03.2010

100% renewable electricity

A roadmap to 2050 for Europe and North Africa



http://uk.sitestat.com/pwc/uk/s?ukws.eng_iss_ues.pdf.sustainability.100_percent_renewable_electricity&ns_type=pdf

The study, by international energy and climate experts from PricewaterhouseCoopers LLP in collaboration with researchers of the Potsdam Institute for Climate Impact Research (PIK), the International Institute for Applied Systems Analysis (IIASA) and the European Climate Forum (ECF) has formulated the first policy roadmap towards a 2050 goal of achieving a 100% renewable power sector in Europe and North Africa.

A transformation of the power sector based on 100% renewables would address energy security and supply concerns while decarbonising electricity generation and at the same time contribute to a substantial reduction in energy poverty.

Taking into account existing infrastructure and electricity generation capacities, and recognising the need for a cross-national power system, the proposed SuperSmart Grid would allow load and demand management for power, independent of when and where the power is generated. Making the most of natural resources and established weather patterns it would incorporate:

- The vast concentrating solar potential of southern Europe and the arid deserts of North Africa
- The hydro capability of Scandinavia and the European alps
- Onshore and offshore wind farms in the Baltic and North Sea
- The continent’s ocean tidal and wave power
- Biomass generation across Europe

The researchers studied the policy, markets, investments and infrastructure leadership needed to achieve the 100% renewables goal in terms of financial, infrastructure and government policy milestones for policy makers and business.