



 **SEI** STOCKHOLM
ENVIRONMENT
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A European Eco-Efficient Economy

Governing climate, energy and competitiveness

In brief

This summary is based on the findings and recommendations of the report A European Eco-efficient Economy: Governing climate, energy and competitiveness (2009), prepared by Måns Nilsson, Annika Varnäs, Clarisse Kehler Siebert, Lars J Nilsson, Björn Nykvist, and Karin Ericsson for the Swedish Government Offices. The summary has been prepared by Robert Watt.

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Foreword

The Swedish Presidency has chosen to invite the informal meetings of energy, environment and competitiveness ministers to discuss how to enable an eco-efficient economy through EU and European policy making. As a common basis for discussions, the Swedish government commissioned the report *A European eco-efficient economy: governing climate, energy and competitiveness* (2009). This summary is based on the findings and recommendations of that study.

Findings

- The eco-efficient economy works: environmental improvements can go hand in hand with competitiveness. The EU has made some progress towards an eco-efficient economy, but significant untapped potential remains within production, consumption and services.
- The development of long term competitiveness relies on Europe's ability to innovate, get research to market, improve market conditions and adapt to changes. Small and medium-sized enterprises (SMEs) need special consideration – in creation of new business opportunities as well as for the administrative burden.
- Environmental policy and mainstream economic policy areas must be integrated. European governance for a eco-efficient economy must set the direction, encouraging the Member States to considering market-based instruments to be an efficient way to internalise the costs of pollution created by economic activity, resulting in prices that better reflect the total environmental and economic costs occurring during production and consumption.
- Global solutions, such as a stable carbon price, are essential if the EU, its citizens, the environment and economy are to flourish.
- New policy instruments and measures are needed to influence economic activities, such as the invention, innovation and diffusion of technological systems. The EU needs to step up the use of specific governance arrangements to bring about development and diffusion of green technologies, including innovation support, demonstration programmes, and lead market initiatives.

- Policy making, whether fiscal stimulus or environmental regulation, needs to multi-task – create jobs and economic growth at the same time as moving investments towards new technology markets.
- To meet the greenhouse gas emissions reduction target of 20%, greater efforts to decrease emissions are required. Improving energy efficiency will be decisive for reducing costs and enhancing competitiveness, for improving security of supply and for meeting the EU's commitments on climate change.

Introduction

Europe and the world are facing a series of challenges that must be tackled immediately and simultaneously: accelerating resource degradation, climate change and a global economic crisis. Talk of a 'green economy', a 'green new deal' and a 'green industrial revolution' has gathered momentum over recent months. What could this mean for the EU? How can European policy makers and businesses take best advantage?

A European Eco-efficient Economy sets out an integrated approach for energy, environment and industrial policy in Europe, outlining how we can combine climate change mitigation with a secure energy supplies and strong economic performance and competitiveness.



Setting priorities

SEI has identified three priorities for the EU:

1. Resource efficiency

From energy efficiency to sustainable city developments and infrastructure improvements, there are good examples from all corners of Europe that could be learnt from, adapted and applied or even scaled up across the EU.

2. New technology markets

The transportation and energy sectors are overwhelming contributors to climate change and resource degradation globally. Effort should be concentrated on the market growth of existing and fledgling technologies, such as carbon capture and sequestration, biofuels, electric vehicles, solar, wind and wave power. Technologies within other sectors are also important for attaining an eco-efficient economy.

3. Stable global carbon prices

This is the single strongest policy action to yield eco-efficient economic development in the long term. Without global carbon pricing in some form there will be imbalances in competitiveness, carbon leakage and political difficulties with important constituencies who will block or stall the move to an eco-efficient economy.

Resource efficiency

Energy efficiency

In brief

- Energy efficiency accounts for more than half of the reductions in energy related CO₂ emissions by 2030 in one of the World Energy Outlook stabilisation scenarios
- Complex and diverse energy users and uses requires adapted and tailor-made governance of efficiency
- Standard setting is an important complement to market signals
- Energy service companies: the emergence of a new business worth € billions annually

That governments have an important role in supporting energy efficiency through regulation, economic incentives, and procurement policies, is now getting increased support. But it goes beyond correcting market failures. Energy efficiency provides market opportunities for suppliers of building materials, windows, lighting, and ventilation equipment, and creates a variety of jobs in the construction industry. Rough estimates of the potential market for European energy efficiency services are in the order of €5-25 billion annually.

Case studies

Denmark has had ambitious energy end-use efficiency policies and programmes since 1973, and final energy use is lower today than in 1972, despite considerable economic growth. Denmark also has targets to reduce energy demand, in absolute terms, by 4% between 2006 and 2020.

A number of countries have successfully reduced industrial energy demand through voluntary agreements. In Sweden, the Programme For Industrial Energy Efficiency (PFE), exempts eligible industries from electricity taxes in exchange for committing to audits, implementing an energy management system and investing in profitable measures. The PFE typically results in 2 to 5 percent electricity savings, with additional savings in fuel use.

Higher energy prices and raised environmental awareness are strong drivers for the energy efficiency market. Energy efficiency services is a rapidly growing business, facilitated by the development and cost reduction of Information and Communication Technologies (ICT). Some of the major players are building controls and automation manufacturers such as Siemens, ABB, and Honeywell, but also power companies. However, SMEs are taking important shares of this new market, which requires niche knowledge and business organizations that do not always fit neatly into the structure of major corporations. The market is growing rapidly in both Europe and North America. For example, in January 2009, the U.S. Department of Energy awarded a contract for up to \$5 billion in energy efficiency projects at federally owned buildings and facilities.

Heating and cooling

In brief

- Heating and cooling make up 50% of final energy use in the EU
- Major waste in current systems – district heating and cooling is an untapped opportunity and could yield up to €100 billion in savings on fossil fuels
- High initial costs requires political will for infrastructure development, but potential to develop existing infrastructure too
- Once infrastructure in place, there is great fuel flexibility and simple market-based instruments such as a carbon tax can have a strong impact towards low-carbon fuel choices

EU energy use is associated with huge heat losses. The major part of the heat losses occur in thermal power plants and can be recovered in district heating systems. What's more, these systems can run on renewable energy sources (e.g. municipal waste and waste from the forestry industry), further improving efficiency, reducing carbon emissions and creating new markets. District heating is found in Nordic, Baltic and Eastern European countries, though with great variance in popularity.

Case studies

Heating: by 2007, district heating in Sweden accounted for 50% of the energy for heating buildings in the residential and service sectors, and biomass (excluding peat and waste) accounted for 44% of the fuel. Industrial waste heat is supplied by forest industries, refineries, steelworks, chemical and food-processing industries, and one sugar mill.

Cooling: the City Council of Barcelona planned carefully for district heating and cooling in the new business district of Forum. The district heating and cooling is mainly produced from waste incineration.

For countries that rely on thermal power production, the opportunity to produce electricity efficiently in Combined Heat and Power (CHP) plants is probably the most compelling reason to build district heating systems. Another argument is

that they provide an opportunity to use deep geothermal heat, for which many European countries have favourable geophysical conditions. Moreover, several European countries have untapped potential to use biomass (e.g. agricultural and forestry residues) and municipal solid waste. For example, in Poland large district heating systems connect about 52% of Polish households. The majority of the district heating is produced in CHP plants, but there is potential for increased integration with thermal power production, thereby achieving primary energy savings. Such energy efficiency improvements would reduce the use of coal, which in addition can also be reduced through substituting biomass for coal. An attractive initial strategy would be to co-fire biomass and coal – something that certain plants already do.

District cooling systems can also provide large energy savings, typically reaching an efficiency rate five or even 10 times higher than traditional local electricity-driven equipment. Switching away from the electricity-driven equipment would also cut peak electricity demand in the summer. District cooling systems are found in a number of European cities, but the systems are quite small, mainly covering business districts. In total, district cooling accounts for about 1-2% of the total cooling market in Europe. District cooling is often co-produced with district heat, and hence provide an additional business opportunity for energy service companies. Apart from potential energy savings and environmental benefits, the access to these systems may increase the attraction of a city or city district for investors. Since cooling demands are expected to continue growing in the future addressing cooling will, just as heating, be central to achieving an eco-efficient European economy.


Sustainable cities

In brief


- 75-80% of Europe's population lives in urban areas
- Energy use in buildings and transportation are the two main causes of greenhouse gas emissions from cities
- European cities are compact and thus possess the potential to enable efficient public transportation systems, and to facilitate cycling and walking
- Many co-benefits, for example improved public health from lower particulate emissions following decreased use of cars in cities
- Many European examples: decreased energy consumption in buildings, sustainable transportation, local energy production
- The global demand for sustainable urban planning holds opportunities for growth and business development for European companies. SMEs can play an essential role.

Most human and economic activities, and thus a large share of the energy consumption and the emissions of greenhouse gases, take place in urban areas, making cities key players in the move towards the eco-efficient economy. Cities can, through their associated lifestyles, be a burden on natural resources if they are not properly planned. At the same time, cities tend to be more resource efficient than nations on a per capita basis and have substantial potential to further increase this resource efficiency.

Case studies



Energy consumption in buildings accounts for the largest percentage of total energy use in cities. Over thirty years ago, Freiburg adopted a series of ambitious environmental energy policies, including a program for home insulation and energy efficiency retrofits, and a requirement that all new houses must meet low-energy efficiency standards. Such houses cost about 3% more to build, but reduce energy costs by 30%. In Berlin, energy saving partnerships between public house owners and contractors have enabled



retrofitting of old buildings, resulting in decreased emissions of greenhouse gases corresponding to about 100 000 tons between 1996 and 2002. The investments have been financed by the cost savings related to decreased energy consumption.

In Nyíregyháza, Hungary, a number of retrofitting programmes have led to an energy saving of 68%. In addition to the reduction in energy use, retrofitting of existing houses have also brought about cost savings. Transportation accounts for the second largest share of cities' greenhouse gas emissions. In many cities in Europe, improvements to the public transportation systems are being made along with other measures to decrease car use and increase use of public transportation. In London, the introduction of congestion charges reduced car use by 15 per cent. Many of those who decreased their car use switched to public transportation. In Bologna, Italy, the historic city centre has been closed for car traffic and is open for buses only. In Freiburg, planning for cycling paths and bicycle parking spaces has led to that about a third of all journeys are made by bicycle.

Cities need to deal with efficient waste water treatment, waste handling, transportation, energy supply and use and ensuring a healthy environment for the citizens. Ideally, cities should aim for a circular, rather than a linear metabolism, minimise fossil fuel use and material inputs, and maximise recycling and reuse of energy, water and materials. To address all these aspects, sustainable city planning requires an integrated approach. At the same time, the move towards sustainable cities entails many opportunities for European companies, in particular in the areas of renewable energy technologies and other environmental technologies.

New technology markets

Vehicles

In brief


- Combined governance through, for example emissions standards in combination with taxes for energy efficiency, have been successful stimuli for new technology markets
- A broad range of governance measures can turn innovation to market dominance as shown in Japan
- There is untapped potential for improvements in efficiency and the innovations to deliver these improvements

Although the automotive industry is in decline, it has until recently been the world's single largest manufacturing sector. European car manufacturing constitutes 7.5% of the manufacturing sector and employs 2 million directly while indirect employment has been estimated to another 10 million. Global competition and economies of scale have pushed car manufacturers to ever-increasing production efficiency including larger production units and firms, and smaller margins. In this sense the sector is very mature. However, new policies and consumer pressure for further improvements still induce eco-efficient technological developments. There are still energy efficiency potentials in the order of 30% to be made in further developing the standard gasoline Internal Combustion Engine and hybridisation could take the total improvement potential to around 60%.

Case study

Global cumulative sales of the Toyota Prius passed the 1 million mark in April 2008 making it the dominant model and Toyota the leading manufacturer of hybrids. How did this happen?

The policy regime in Japan included elements of standard-setting and taxation from the US and Europe, but had a greater range of support programs for battery, hybrid, and fuel cell vehicles. This involved not only persistent and strategic R&D efforts, but also infrastructure, early



market support in the form of public procurement, and a large range of supporting projects and collaborations across industry facilitated by the government. Importantly, the government created both stricter tail-pipe regulations and actively worked with visions and targets, analysing the future development of the industry.

Continued regulatory pressure for vehicular energy efficiency will benefit both climate change mitigation, security of supply, innovation, and competitiveness, making the automotive sector a centrepiece of the eco-efficient economy – not at least for small and medium-sized sub-contractors. In the more distant future, a new regime of cars including electrical drive trains offers significant higher energy efficiency; but it is very difficult, if not impossible, to conclude on optimal technological choices. Policies for an eco-efficient economy should therefore as a starting point be technology neutral and use a mix of instruments. However, forward-looking policies and visions have proven successful and as the Japanese dedication to pursue new solutions illustrates, commitment is necessary to foster initial developments.

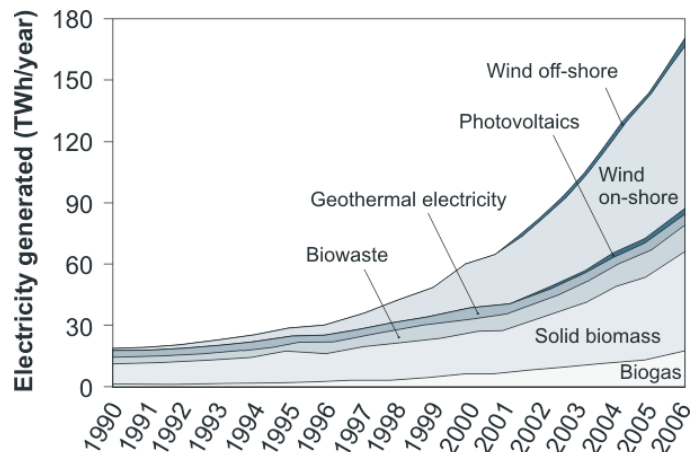
Renewable electricity

In brief

- Electricity production accounts for 29% of CO₂ emissions in the EU-15
- EU is a global leader in goals, ambitions and application of renewable energy
- Important to adapt the policy and governance portfolio to the different stages of evolution and maturity of renewable electricity technologies
- Harmonisation of European support schemes can generate further efficiency gains in the sector

Electricity production is an environmentally disruptive activity, and the sector (including heat) accounts for 29% of CO₂ emissions in the EU-15. Renewable energy does not only contribute to reduced CO₂, but has also embodied new industrial opportunities and export potentials.

The 27 Member States operate 27 different support schemes. Policy instruments range from the permitting procedure for new and enhanced installations, taxes, R&D support, investment support in the form of capital subsidies and operating support (price subsidies, certificates, tax exemption on consumption). Operating support is currently the most important support mechanism, and has led to significant advances.



Case studies

Feed in tariffs: In Spain and Germany feed in tariffs have been introduced to increase capacity. As a result more than half of the EU wind power capacity is concentrated in these countries. Moreover, in 2008 Spain accounted for 44% of the world market for the installation of solar power. These increases have also led to jobs: by 2007 the German government estimated that there were 250 000 jobs in renewable energy and in Denmark Vestas is a world leader in wind power with 20 000 employees.

Certificate trading: UK, Sweden, Italy and Belgium all have some form of certificate trading scheme, where the support is more technology neutral and the cheapest renewable source is therefore entering the market first.

The case of renewable electricity shows it is possible to stimulate innovations and create competitive advantage through policy initiatives. Both the feed-in and certificate schemes have merits, as many countries in Europe have been able to develop competitive advantages in renewable electricity technologies around which it has been possible to build export industries, enhance Europe's competitiveness and mitigate climate change globally. Such institutional change has cemented European leadership in renewable electricity.

Bioresources

In brief

- Transport makes up more than 30% of final energy use in EU
- EU policy has global implications and is leading the market with sustainability criteria
- Strong international development cooperation dimension – the chance for Africa?
- Commercial opportunity for EU agriculture and forestry sectors
- There is untapped potential in creating technology platforms linking biotechnology and chemicals industries

Options for reducing transport sector emissions include efforts to moderate growth in transport work, modal shifts, increased fuel efficiency, and switching to low-carbon biofuels and electricity. Although other options may be more important, the need for low-carbon liquid fuels in transport will remain.

Case studies

The development of technologies for ‘second generation’ biofuels presents real opportunities for Europe and the different technology platforms have important applications outside the transport fuel area. On the one hand, gasification is a key technology for facilitating pre-combustion carbon dioxide capture for storage in geological formations (CCS). On the other hand, the “carbohydrate” technology platform has a wide range of industrial biotechnology applications promising lower energy demand, fewer residues and higher productivity in the chemicals industry.

Using manure and waste for **biogas** production creates a double benefit by reducing greenhouse gas emissions through limiting the leakage of methane and substituting fossil-based transport fuels. There are several examples of cities (e.g. Lille) that are successfully using such biogas for fuelling local fleets of buses and other vehicles.

Biofuels bring globalisation straight into our daily lives. Decisions on how to fuel our cars can have effects on the livelihoods of poor people in a completely different part of the world. Clearing land for producing energy crops can increase greenhouse gas emissions relative to continued use of petroleum-derived fuels. Switching to energy crops even on existing arable land can cause displacement effects with similar but indirect effects on emissions. Without proper safeguards the expansion of biofuels may negatively affect biodiversity and water resources. Competition for feedstock, or land, can cause food prices to increase.

Nevertheless, increased biofuels production need not conflict with sustainable development. Indeed, many developing countries have strong comparative advantages for producing biofuels, and their role in the expansion of production should not be overlooked. Countries in South America and Southern Africa strongly support an expansion of biofuels to reduce their dependence on oil imports, bring economic development to rural areas and improve their trade balance. For Africa in particular, with its vast land areas, biofuels can be the entry ticket to the global trading arena. The EU is not the only market for biofuels, but it can be an important one, and it can further the development of sustainable biofuels through proper trade, energy and international development policies, including safeguards (such as sustainability criteria). European companies also have the economic capacity to invest in biofuels production around the world.


Chemicals

In brief


- The European chemical sector is the third largest manufacturing industry, providing 1.7 million jobs and indirectly employing a further three million people
- The EU is an important global player, producing 31% of the world's chemicals, including both market-leading multinationals as well as around 36,000 small and medium-sized companies
- 9% of the total production costs are due to energy use
- An innovative chemicals industry is critical for the economy and climate mitigation
- There is untapped potential in creating technology platforms linking biotechnology and chemicals industries

The chemical sector presents a particular challenge: a large sector with an inherently energy-intensive production process, a competitive global market, and comparatively weak regulation outside the EU. These environmental and governance challenges for chemical control have, however, led to a substantively and procedurally innovative European chemicals policy.

Case study



The aim of REACH is two-fold: to improve protection of human health and environment from the risks of chemicals, while enhancing the competitiveness of the EU chemicals industry. In other words, REACH tries to make the eco-efficient economy a reality. For the chemicals industry, energy savings and emission reductions are often costly. Finding ways to reduce greenhouse gas emissions and the harmful effects of chemicals demands close dialogue between different stakeholders, to find the appropriate balance between regulation and support to the sector. This type of coordination and consultation with stakeholders has arguably been achieved in the substance and process of REACH. Moreover, the outcome combines traditional regulation (e.g. the burden on the chemical sector to



produce data and the option for top-down restriction), with self-regulation (e.g. data collection and reporting by manufacturers and importers) and the devolved implementation (e.g. definition of standards, operational criteria and procedural guidance is left to national and European implementing bodies).

In regulating the chemical sector, different variables of the eco-efficiency equation have been emphasised by different actors including governments, industry and civil society. The end product is a hybrid governance structure that sets out to optimise the protection of human health and the environment while maintaining industry efficiency and taking account of economic factors. The process facilitated the engagement of stakeholders and made use of integrated impact assessment procedures.

Global carbon pricing

The eco-efficient economy agenda also has an international dimension, as Europe's own emissions of greenhouse gases only constitute about 13% of the global total, and also because European industries in most sectors must be able to compete globally. There is no doubt that the competition for jobs will continue globally, and Europe has the choice and opportunity to become the leading new market for eco-efficient products and services.

Why should Europe lead the global climate agenda? At least four strategic motives underpin this leadership aspiration. First, climate policy has developed into an important driver of European integration overall, and to take on such important challenges in a proactive way has proven to enhance the legitimacy of the European institutions in general among its Member States and populations. Second, the question of future supply security for energy is intensifying, which reinforces important parts of the climate policy agenda. Energy imports are on the rise, and oil and gas prices are unstable. Strategies for energy efficiency and renewable energy promotion will help Europe secure its energy supply. Third, the EU's strong global voice on multilateralism internationally resonates with the climate change agenda, as being particularly suited for multilateral action. Fourth, leadership on climate change and coupled issues of the eco-efficient economy could, if done right, spur innovation that enhances Europe's long-term job creation and global competitiveness.

The EU must actively expand and link international carbon markets, by working together with the US to enable future linking and further movements towards a global accord. In addition, developing countries need knowledge transfer and want to learn from experiences elsewhere in the world. They will also need assistance in creating institutions that have the capacity to govern eco-efficiently, including by monitoring and reporting emissions. Ultimately, however, the possibilities to develop a global pricing mechanism are contingent on ancillary measures of support, capacity building and incentives for emerging economies. Therefore, Europe's international policies, including environmental diplomacy, neighbourhood policies, coping with enlargement, and advancing the broader international policy agenda (including aid and trade policies) must interact more closely.

Steel


In brief

- Emissions from the steel industry represent about 6% of European CO₂ emissions.
- Over the last 50 years, the European steel industry has cut emissions by 50%.
- The industry will have to invest in long term research and development projects, for instance in carbon capture and storage (CCS) applications, where carbon dioxide is captured and stored in geological reservoirs
- Sector agreements may help to deal with concerns of carbon leakage, while policies to increase recycling will contribute to an eco-efficient economy

The EU is the second largest steel producer after China, with a production representing about 15-16% of the world output. The increase in world steel prices has led to an increase in total EU turnover, despite a decline in global market share. And demand for steel is likely to increase over the coming years, due to demand from China, India, Brazil and Russia. However, the competition from emerging economies, in particular China, represents a major challenge for EU production. In the longer perspective, there is even a risk for excess supply when emerging economy infrastructure growth slows down.

Case study

Carbon leakage: There is concern that the steel industry will relocate production to countries outside the EU without the same constraints on emissions, or cause imports of high energy intensive production from outside of the EU to increase. Free allocations of allowances were suggested as part of the climate and energy package. However, these reduce the incentive for early investments in energy efficiency and may create administrative constraints that reduce the effectiveness of carbon pricing. Border adjustments have also been suggested as a way to avoid leakage by adjusting imports and exports for the difference in carbon price. This could take the form of a tax or as an extension of the EU ETS, by requiring importers to purchase and surrender allowances on imported goods. However, while the



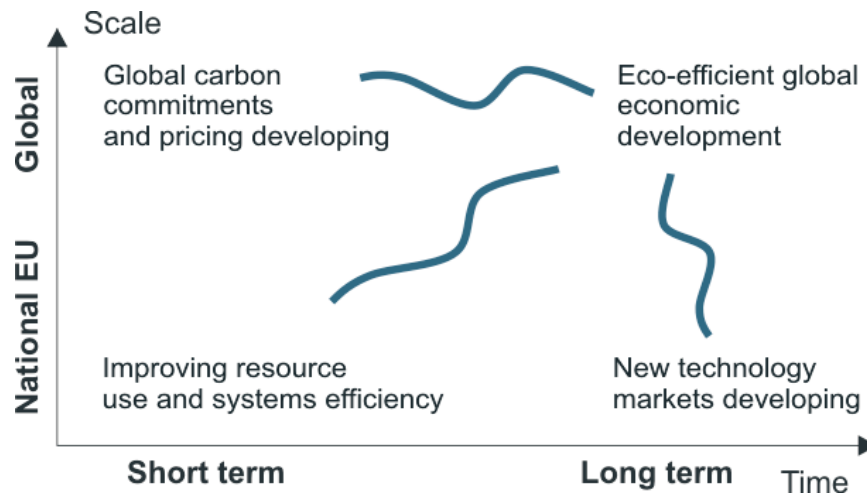
idea seems simple, the politics and the implementation are more complicated. International sectoral agreements with binding targets for entire sectors could lead to emission reductions and address leakage concerns, but would in such cases be complex to negotiate and implement. However, sectoral agreements could also take the form of sharing best practices and benchmarking across regions and countries. As such, they could potentially lead to emission reductions and at the same time accelerate international cooperation towards a global deal.

Sectoral mechanisms, emissions trading and carbon leakage are important factors to consider when resolving the steel sector's, and other energy intensive industries', contributions to the eco-efficient economy. In the long run, it is hard to escape the imperative for global carbon pricing. However, in the short term there are still important potentials to capture in current business practices, particularly through increased recycling rates.

How, when, who?

“Smart investments in tomorrow’s skills and technologies will accelerate Europe’s drive under the Lisbon Growth and Jobs Strategy to become a dynamic low-carbon economy for the 21st century”

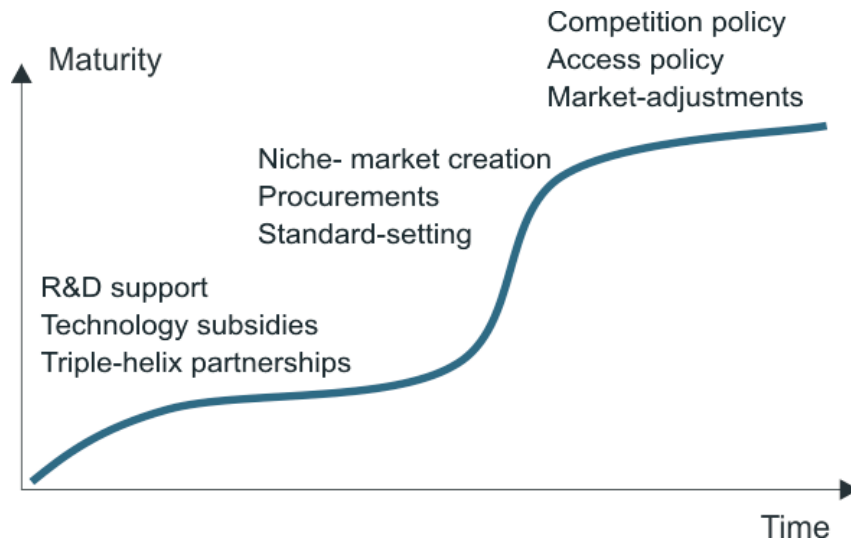
(President Barroso’s speech at the press conference to launch the Economic Recovery Plan)



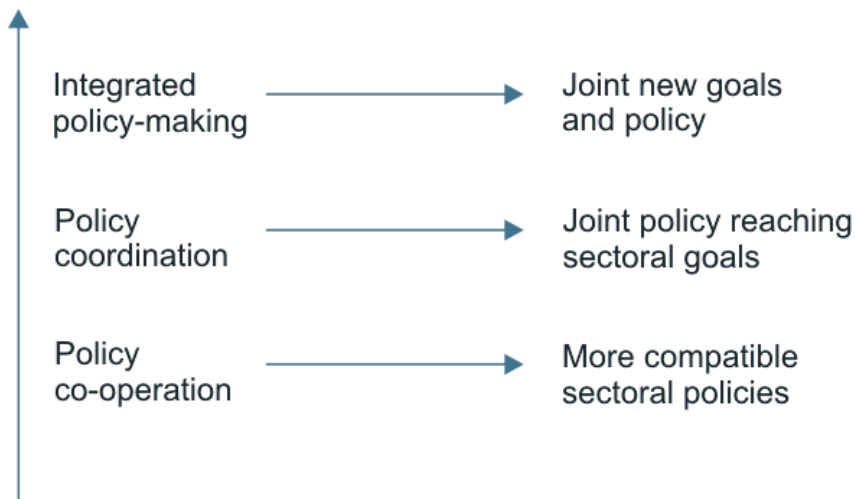
The imperative for short-term economic recovery highlights the fact that developing an eco-efficient economy has an important time dimension. In the short term, policies should facilitate harvesting “low-hanging fruits”, such as energy end-use efficiency enhancements, and use fiscal stimulus as an engine for an eco-efficient economy. In the longer term, however, more fundamental socio-technical changes are required, involving the EU’s active promotion of the development, diffusion and use of the next generation of technologies as well as promoting responsible investments in and use of environmental technologies in emerging economies. Third, a global scaling up of governance for the eco-efficient economy is needed, and in particular the development of global carbon pricing.

Recommendations

- Europe needs to enhance and adapt its innovation governance. Europe has lagged behind in terms of innovation performance, compared to for instance US and Japan, but is today catching up. One concern is the conditions and potential for SMEs to operate profitably, become stable businesses and grow organically. Alleviating administrative burden, enhancing labour market flexibility and improving access to capital are all issues that are already high on the EU policy makers' agenda. The other fundamental issue is the governance of innovation. Early-stage technologies may need to be subject to technology-specific support schemes and in the first phases of innovation and product development, R&D investments, technology partnerships and technology-specific niche-market measures can have an important role to play.
- Mature industrial sectors are integral to the eco-efficient economy agenda. The economic weight of the chemicals, cars and steel industries, and their responses to eco-efficiency challenges illustrate how their innovation and adaptation to environmental issues and global competition are critical. For the future, the potential for improving efficiency needs fully to be captured, and further governance measures should be discussed. Importantly, sectors dominated by mature technologies need different types of governance responses than new and emerging sectors.



- Governance packages are effective and politically viable. No single support measure is universally “the best”. Different cases highlight the power and potential of many different governance approaches. For example, district heating shows the power of a tax, while for chemicals, cars, and energy efficiency, regulatory standard-setting has been an important part of broader packages to drive industrial change. To induce investor confidence, these packages must be seen as stable and stay in place for a relatively long time period (at least a decade). Special packages might be considered for SMEs and service providers.
- Policies must be integrated horizontally and vertically. Effective horizontal integration across themes and sectors depends on tuning governance to the social, institutional and technological characteristics of particular economic sectors. This often means going beyond conventional boundaries of policy making. Vertical integration between different levels of governance is necessary because experience shows that many pieces of the eco-efficient economy may better be left to levels and actors below the European Union.



- Impact assessments (IA) and strategic environmental assessments (SEA) must be used systematically. The eco-efficient economy requires systems thinking. Developing governance measures means finding balancing issues such as climate change and ecosystems with economic growth, jobs and welfare. Systems thinking entails being mindful of conflicts and dilemmas while capitalising on synergies and opportunities.
- Europe's international policies must interact more closely. The eco-efficient economy is a global agenda, rather than a European one. The EU is the world's largest integrated market and can play a true leadership role best practitioner and standard setter. Still, industries, resources, and environmental impacts all diffuse across borders. Problems like carbon leakage or capital flight become real without global framework rules. Environmental diplomacy, neighbourhood policies and the broader international policy agenda (including aid and trade policies) have a significant role to play.
- The EU needs to push the development towards a global price on greenhouse gas emissions. The Emissions Trading System (ETS) could be exported as a governance approach. The EU must actively engage first with the US towards linking the carbon markets, working together to ensure compatibility that would enable future linking and further movements towards an OECD-wide carbon market. To make a global accord a reality the EU will have to support capacity building and create incentives for emerging economies.
- The EU needs to assist and induce emerging economies to make substantive commitments to reduce greenhouse gas emissions. This involves finding ways to combine a global carbon price which grows their economies and welfare. Policy discussions must be broadened from global burden sharing negotiations to questions about technology transfer, financial assistance, opportunities for developing countries to access European markets with eco-efficient materials and technologies (e.g. solar energy technologies or biofuels).

Europe and the world are facing a series of challenges that must be tackled immediately and simultaneously: accelerating resource degradation, climate change and a global economic crisis. Talk of a 'green economy', a 'green new deal' and a 'green industrial revolution' has gathered momentum over recent months. What could this mean for the EU? How can European policy makers and businesses take best advantage?

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