

# Green industrial policies: economic recovery and emissions reduction in Europe

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## 1. Introduction

The 2008–2009 economic crisis led to the loss of more than 9 million jobs in both the United States and Europe, resulting in unemployment totals of 15 million in the United States and 23 million in the European Union. In both cases, unemployment rose to over 9 per cent.<sup>1</sup> In recent months, however, the financial markets have started to grow again, the major financial institutions (bailed out by taxpayers) are making profits and in various countries GDP is increasing. The ‘jobless recovery’ predicted by a number of observers and governments is under way.

The current weak economic recovery in Europe will not guarantee employment growth unless there is an extraordinary effort by governments. European governments reacted differently during the crisis. Some, such as France, implemented anti-cyclical measures, while others, such as a number of south-European countries and some new member states, were forced to act under the threat of financial default, without being able to support their economies. Meanwhile, the world is facing another global emergency in the form of climate change. Governments need to focus on both employment objectives and environmental protection.

In order to address both employment and environmental issues industrial policy intervention is crucial. Industry currently employs 25 per cent of the European workforce<sup>2</sup> and generates 23 per cent of EU greenhouse gases<sup>3</sup> and thus is a major source of pollution (for example, heavy

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1. OECD Statistics.
2. Eurostat, author’s calculation.
3. Excluding energy sector and transport, Öko-Institut (2011).

metals, volatile organic compounds, nutrients and so on). A green industrial policy needs to take care of two parallel approaches: limiting the environmental externalities of polluters and supporting those industries able to reduce emissions and provide useful innovations. Within the industrial sector special attention should therefore be given to eco-industries because of their high growth expectations, low pollution and ability to provide green technologies. Eco-industries represent a broad aggregate of activities to which industrial policy should constantly refer. According to the OECD and Eurostat (1999), eco-industries are 'activities which produce goods and services to measure, prevent, limit, minimize or correct environmental damage to water, air and soil, as well as problems related to waste, noise and eco-systems. This includes technologies, products and services that reduce environmental risk and minimize pollution and resources'.

The eco-industry is one of Europe's biggest sectors with an annual turnover of over 300 billion euros. It has been growing by around 8 per cent per annum (Ecorys 2009). According to a recent study by the Wuppertal Institute, the share of eco-industries (a sector that goes well beyond industry and includes services and agriculture) in EU member states' GDP is 31 per cent for Germany, 21 per cent for France and 15 per cent on average (Schepelmann et al. 2009). Simultaneously, industrial greenhouse gas emissions in Europe have been declining constantly over the past two decades. They were reduced by 26 per cent between 1990 and 2008. Nevertheless, the industrial sector remains the major energy consumer, with more than 40 per cent of total electricity consumed in the final energy sector. It is also the major consumer of solid fuels and natural gas (Öko-Institut 2011, on Eurostat data).

Tackling the objectives of employment and environment means facing two different emergencies: a short-term one, the former, and a long-term one, the latter. This entails structural change in the economy. For many European countries, still locked in traditional specialisations, this challenge may represent an important diversification of production which must be supported adequately by a mix of industrial policies.

The shift towards a green industrial system appears to be perfectly complementary with the need to face the employment emergency. In fact, eco-industries comprise high labour intensity activities which require different skill levels. Not only high qualifications to be used in eco-innovation, but also medium and low ones, for example in materials recycling

or in building refurbishment in order to make houses and industrial plants more energy efficient. For this kind of job, new skills are needed that will not substitute but will be added to the existing ones. Therefore workers who might have lost their jobs in traditional manufacturing and construction during the downturn, can be re-qualified in a relatively short period and at relatively low cost. This represents an opportunity also for older workers who, still far from retirement, may be at risk of falling into long-term unemployment.

The environmental approach to innovation and industrial policy has plenty of possible sectors of application. Under the general objective of CO<sub>2</sub> reduction necessary to mitigate climate change the possible fields of intervention range from renewable energies (wind, solar, bioenergy and so on) to more sustainable mobility (car fuel efficiency, hybrid vehicles, urban and national transports, rail) to enhancing the energy efficiency of buildings and housing appliances, heating and lighting. To these, soil protection, biodiversity and water management should also be added.

The general principles underlying sustainable green industrial policies are simple enough (Pianta 2010). They should favour the evolution of knowledge, technologies and economic activities in directions that improve economic performance, social conditions – addressing needs and increasing equity – and environmental sustainability. They should favour activities and industries related to improving environmental conditions and energy efficiency, characterised by learning processes, rapid technological change, scale and scope economies and strong growth in demand and productivity. Within this approach, innovation plays a central role. Innovation in eco-industries may lead to new products and services that expand output and ‘good’ jobs; new processes may increase efficiency by reducing materials and energy use more than labour. The result would be a wave of technological and industrial change that is ‘environmental-friendly’ and capable of reducing current unemployment.

Fostering the green economy is a threefold task: increasing employment, protecting the climate and overcoming the crisis. The sum of these three elements is crucial and to achieve it a broad approach is necessary, not a one-off intervention. Only in this way may an overall rearrangement of industrial production be reached.

This chapter starts by analysing EU policies currently affecting the green economy, starting from the emergency measures following the outbreak

of the subprime crisis and then focusing on different tools in the hands of the European Commission, such as structural funds, the Research Framework Programme, Life+, the Environmental Technology Action Plan and the Emissions Trading System. The second part of the chapter is dedicated to policy proposals for fostering the green economy in Europe by supporting eco-industries, the development of smart grids and the decarbonisation of transport. In Section 3, the cases for an energy tax and a financial transaction tax are considered for the renewal of the EU's own resources and financing a so-called 'green New Deal'.

## **2. European green policies**

The green stimulus

The 2008–2009 global economic crisis overlapped with a new momentum with regard to climate issues due to widespread optimism after Obama's election, as well as the negotiations for the COP Summit held in Copenhagen by December 2009. This led to a broad convergence towards a so-called 'green New Deal', the idea of overcoming the crisis through major public investments in the green economy. Most governments put in place measures to tackle the most urgent economic and financial effects and, according to an HSBC Global Research analysis (2009), out of over 3 trillion US dollars worth of global stimulus packages worldwide, 478 billion US dollars (15.5 per cent) were directed to climate policy objectives. Europe (EU and non-EU) accounted for 54 billion US dollars of this, or about 10 per cent of the global total (Table 1).

National stimulus packages differed considerably, both in absolute terms and in terms of the share of green funds, both overall and at European level. France represented the highest share and Germany and the United Kingdom put relatively more emphasis on green measures than Italy and Spain.

At community level, the European Commission's Economic Recovery Plan included promising initiatives on green cars, energy-efficient buildings and 'factories of the future' (1.2 billion euros for R&D), with a substantial portion of the funds – over 60 per cent – dedicated to green initiatives. It must be noted that the European stimulus package boosted carbon capture and storage (CCS) research, with over 12 billion euros invested in this technology.

Table 1 National economic stimulus and green share for 2009–2010 (US\$ billion)

Country	Stimulus	Green Fund	% Green Fund	Renewable	CCS	Building EE**	Low C vehicles	Rail	Grids	Water/waste
European Union	38.8	24.7	63.7%	0.65	12.49	2.85	1.94	–	4.85	–
Germany	104.8	13.8	13.2%	–	–	10.39	0.69	2.75	–	–
France	33.7	7.1	21.2%	0.87	–	0.83	–	1.31	4.13	–
Italy*	103.5	1.3	1.3%	–	–	–	–	1.32	–	–
Spain	14.2	0.8	5.8%	–	–	–	–	–	–	0.83
United Kingdom	34.9	3.7	10.6%	0.10	0.64	0.79	1.72	0.41	–	0.05
Europe	539.9	54.3	10.1%	2.5	13.1	15.7	6.6	6.1	9.0	1.2
China	586.1	200.8	34.3%	–	–	–	1.50	98.65	70.00	30.69
US*	967.9	116.2	11.9%	32.78	6.55	30.74	4.76	10.92	11.92	20.00
Total	3090	478	15.5%	39.7	35.5	74.6	18.4	132.1	91.7	86.3

Note: \* 2009 onward; \*\* Energy efficiency.

Source: HSBC (2009), author's calculations.

However 'green' the Commission's contribution might have been, overall the response of European actors is short-sighted. A 10 per cent share for environmental measures is not enough when such significant shares are dedicated to traditional carbon-intensive policies. For example, some 210 billion euros were allocated worldwide to road building (Harvey 2009).

### Other EU policies

Apart from exceptional measures due to the global crisis, the European Union presents a number of budgetary chapters related to green industrial policies.

The *Structural Funds* play a substantial role in helping regional development, corresponding to situation and priorities. The European Commis-

sion announced 105 billion euros from the Structural Funds (30 per cent of the total) to be spent in 2007–2013 to create ‘green jobs and growth’, a substantial portion of which will go to Eastern Europe. (Bulgaria and Romania are the countries with the largest share of cohesion funds earmarked for environmental projects, at 45 and 42 per cent, respectively.) While these are not new funds but rather the disbursing of previously committed sums, they are triple the amount allocated for similar purposes during 2000–2006. Specifically, some 48 billion euros are aimed at climate objectives: 23 billion for railways, 6 billion for public transport, 4.8 billion for renewable energy and 4.2 billion for energy efficiency (Philips 2009).

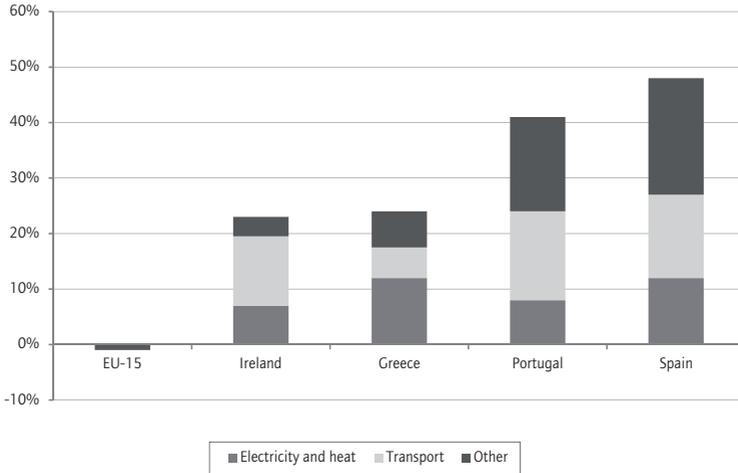
At the same time, for the period 2007–2013, 53 per cent of transport funds are being allocated for roads and motorways, with only 30 per cent for railways and 10 per cent for urban public transport (CEE-Bankwatch 2007). The differences between individual countries prove that things can be done better in most cases.

The environmental impact of the Structural Funds has had fairly controversial outcomes in the recent past. Worryingly, as Figure 1 shows, EU policies may be at odds with each other. EU funding seems so far to have undermined rather than supported EU climate objectives (Stefanova 2008). The four ‘cohesion countries’ (Greece, Ireland, Portugal and Spain), which have so far received by far the most EU money per capita, have also witnessed by far the greatest increases in greenhouse gas emissions in the EU. Spanish emissions have soared by almost 50 per cent in only 15 years. In all four countries, most of the increases can be attributed to growing transport and the production of electricity and heat.

While the blame cannot be wholly pinned on EU funding, EU money has undoubtedly strongly contributed to the trend of rising emissions by financing road infrastructure, generating more traffic, and by supporting an energy-intensive economic growth model. The huge financial amounts from the EU and the development strategies linked to them crucially shape the long-term development of the beneficiary countries.

Structural and Cohesion Funds – the EU’s main financial means of promoting its goals – have a central role to play in realising the EU climate strategy. They should help the beneficiary countries move onto the low-carbon development path. For this purpose, EU cohesion policy itself needs to be ‘decarbonised’ and to include robust, systematic and well-

Figure 1 Greenhouse gas emissions of countries receiving the most EU funding in comparison with the total for the EU15 (percentage change, 1990–2004)



Source: Annual European Community greenhouse gas inventory 1990–2004 and inventory report 2006. Submission to UNFCCC Secretariat, European Environment Agency Technical report No. 6/2006 (CEE-Bankwatch, op. cit.)

targeted support for energy efficiency and renewable energies. Symbolic support here and there will not suffice.

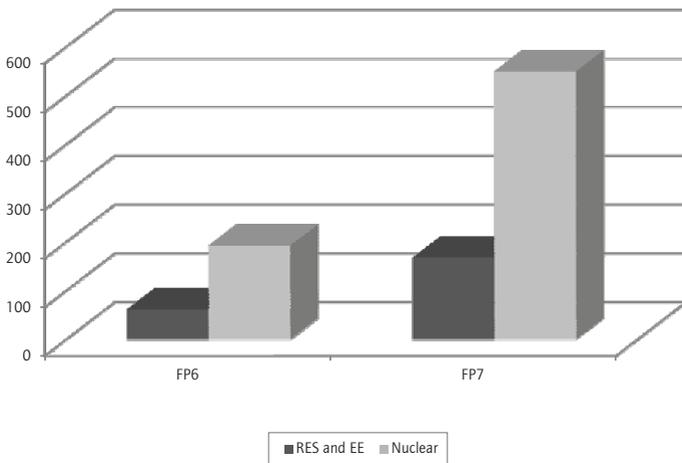
The most important novelty in the EU funding framework for 2007–2013 is the so-called ‘Lisbonisation’ of cohesion policy: 60 per cent of the funds under the ‘Convergence’ objective and 75 per cent under the ‘Regional Competitiveness and Employment’ objective are earmarked for new Lisbon (Growth and Jobs) Agenda investments. To make EU funding climate-friendly, a comparable effort would have to be made to earmark high minimum funding allocations for the main low-carbon investments, such as energy efficiency and renewable and clean urban transport. Although these investments are included in the list of the promoted ‘Lisbon-friendly’ investments, so are major motorways and airports that contribute heavily to increasing greenhouse gas emissions.

The *Research Framework Programmes (FP)* are the EU’s main instrument for funding research in Europe and have been operating successfully since 1984. They have played a particularly important role in

bringing European researchers (in academia and industry) together in collaborative research projects, in facilitating the mobility of researchers across Europe and in supporting the creation of the European Research Area and carrying it further towards the development of the knowledge economy and society in Europe. The current Seventh Framework Programme (FP7) has a budget of over 50 billion euros, covering the seven-year period 2007 to 2013 and has shown an important increase (250 per cent) in funding for renewable energy, as compared to the previous research framework. At the same time, funding for nuclear technologies has been boosted (Raquette 2006). Recent events in Fukushima show that much of the resources dedicated to nuclear energy might be better shifted towards renewable sources and energy efficiency.

*LIFE+* is a financial scheme uniting several existing funds (the Urban programme, the NGO programme and Forest Focus) to help implement community environmental policies. It covers three thematic components: Nature and biodiversity, Environmental policy and governance and Information and communication and may provide funding of more than 2 billion euros during the 2007–2013 period.

Figure 2 Budget committed to renewable sources and energy efficiency vs. nuclear energy by the FP6 and FP7 programmes



Source: Raquet (2006).

The *Environmental Technology Action Plan (ETAP)* is an overall plan to stimulate the development and uptake of environmental technologies on a large scale, directly addressing the three dimensions of the Lisbon and Sustainable Development Strategies: growth, jobs and the environment. ETAP consists of actions covering various issues: R&D, technology platforms and public–private partnerships, environmental performance and mobilisation of financing and instruments through other funds, such as CIP, LIFE or the cohesion policy. Through the plan, the Commission also provides tools for improving the image and visibility of eco-industries, such as the Ecolabel, the Community Eco-management and Audit Scheme or the European Business Awards for the Environment.

Finally, the *European Emission Trading System (EU ETS)* has a major role in green policies. Following the adoption of the Kyoto Protocol, the EU started a process of emissions reduction based on two major instruments: the definition of standards for industrial emissions and the distribution of tradable emission allowances and the creation of a related market (ETS). EU ETS came into force in 2005, leading to a reduction of emissions, at least with respect to other OECD countries. The effects appear to be modest because of limited coverage, however – about 11,000 industrial plants, representing 40 per cent of EU emissions – and because of the excessive number of distributed allowances, leading to a low and volatile average price of emissions (Le Cacheux 2010). Galgóczi (2010) stresses the uncertainty surrounding the next phase of the ETS and the difficulty of calculating future cost increases arising from the ETS due to an increase in the price of allowances. However, cost predictability is a major driver of investments and ETS uncertainty may limit green innovation. All industrial policies must be stable and well defined so that companies can take action and plan accordingly (MET 2011).

The weakness of the ETS and the lack of a European carbon tax show that the core elements for an effective green policy framework are still missing at community level (ibid.).

### **3. Proposals for policy action**

Supporting eco-industries: involve the whole supply chain

Industrial policy should foster projects to involve all actors in the supply chains of eco-industries (partners, suppliers, competitors, clients, pub-

lic administration and so on) and in the knowledge sector (universities, public and private research centres and so on).

The approach based on supporting the whole value chain of eco-industries appears particularly challenging because of the difficulty involved in setting boundaries between green and traditional industries. According to Ecorys (2009) interdependence is expected to increase because of the growing incorporation of green technologies and adoption of energy efficiency and carbon reduction strategies by traditional industries.

The potential for contributing to these green business strategies will thus also increase for eco-industries, as they can increasingly generate value, and even reduce costs through the integration of, for instance, onsite water purification, energy production and/or heat capture. Further supply chain integration and 'convergence' between eco-industries and conventional industries thus seems to be taking place. (Ecorys, op. cit.)

It is also difficult to identify supply chains because of the generalised absence, for eco-industries, of lead firms that organise the whole value chain, as in the car industry. The leading role may be therefore taken by public policies aimed at integrating eco-supply chains and developing clusters to increase efficiency, specialisation and technology transfer.

Policies must build closer relations among all actors in national systems – firms, financial institutions, universities and policymakers – helping to coordinate the decisions of public and private actors. Different tools should be used to support the different actors in the chains: state-owned enterprises and public services may have an important role in promoting research and development and fostering public–private partnerships and public and private institutions could support business start-ups in key fields with loans and venture capital to foster innovative firms.

Start-ups of innovative firms should also be guaranteed with less punitive bankruptcy laws, while avoiding any moral hazard effect.

### Supporting eco-industries: the polluter pays principle

Support for eco-industries can also come from imposing limits on polluting industries. Cap and trade is one of the adopted tools. In the case of the European Union, the Emissions Trading System (ETS) sets a low-

ering of the cap by 1.7 per cent a year from 2013, and 60 per cent of allowances will be auctioned compared with just 3 per cent in the current phase (although major exemptions from auctioning were agreed for key industry sectors and power generation in Eastern Europe). The number of allowances should be limited in the next phase of ETS, thus forcing lower emissions and a relatively higher price for carbon trading. Energy taxes, discussed in the next paragraph, play a symmetrical role and appear particularly relevant in industrial decarbonisation for those sectors not included in the ETS.

According to the ECOFYS project (2009), only around half the emissions reductions that have occurred in the EU to date have been the result of environmental policies (with no real impact from the emissions trading scheme). The rest have been the result of the collapse of former Soviet industries and the economic recession. Most of the other emissions reductions achieved by the EU are expected to be the result of offset projects in developing countries through the Clean Development Mechanism. There is the risk (WWF 2010) that no more than 4 or 5 per cent of emissions reductions will happen within European borders. The EU's emissions trading scheme risks being an ineffective instrument of climate policy unless the EU adopts more ambitious emissions reduction targets. With a 20 per cent carbon emissions reduction target, the ETS will not stimulate the shift to a greener economy.

### Supporting eco-industries' innovation policies

Since most of the low carbon technologies are too costly to compete with carbon-related ones, innovative technologies will make renewable sources more convenient and increase energy efficiency. Innovation is a key factor in the path towards sustainability and a green economy and an indispensable strategic element for eco-industries.

In general, the crisis seems to have hit the green technologies sector less heavily than others. Even if venture capital investments decreased by one-third in 2009 – the most affected sectors being solar, wind, biofuels and agriculture – some green technologies have experienced significant increases, including electric and hybrid cars, battery technologies, energy efficiency and smart grids (Cleantech Group 2010). Moreover, the OECD (2010) calculates, based on Cleantech data, that mergers and acquisitions in the green sector declined only marginally between 2008

and 2009, while the overall volume halved. A survey of global trends in venture capital carried out by Deloitte (2009) estimates that 63 per cent of surveyed venture capitalists anticipate an increase in their investments in green technologies over the next three years. Eco-innovation has spread even during the crisis, with 45 per cent of enterprises introducing at least one eco-innovation during the past two years, with more than half of them registering important reductions in material use thanks to them (Eurobarometer 2011).

Fostering innovation still requires the creation of a favourable environment which is determined, among other things, by the presence of clear policy signals, such as carbon pricing. Policy signals induce firms to invest in innovative green technologies and in energy efficiency measures, thus enlarging the related markets. But these signals need to be supported by sharp increases in research and development (R&D) expenditure, which to date have been totally inadequate to meet the urgency of the climate issue and to the economic benefits in the medium and long terms. Environmental R&D typically represents less than 4 per cent of public R&D (OECD 2010). However, it is supposed to cover a wide range of areas in which investments by firms are too risky, providing up-front subsidies to attract private investments. As shown in Table 2, green in-

Table 2 Degree to which green patenting draws on specific areas of scientific research, 2000–2007

Scientific research area	Share
Material science	17.4%
Chemistry	14.2%
Engineering	10.6%
Physics	10.5%
Chemical engineering	9.5%
Environmental science	7.5%
Biochemistry, genetics and molecular biology	6.6%
Earth and planetary science	5.7%
Energy	4.9%
Immunology and microbiology	4.8%
Agricultural and biological science	3.7%

Source: OECD (2010).

novations come from a number of sectors. For example, within the electricity consumption sector, the ÖKO Institute (2011) considers particularly important the improved standards for electrical motors, pumps and pressured air installations, accompanied by new specific energy-efficient materials, provided especially through micro-technology and nanotechnology, ceramics and organochemical-based materials, the use of catalytic and biological processes or optoelectronics (Öko-Institut 2011).

### Fostering green infrastructure: smart grids

Looking at the Heinrich Böll Stiftung-based project European Community for Renewable Energy (ERENE) it appears clear that coordinated action at EU level may (almost) completely cover European energy demand with renewable sources, exploiting all forms of renewable energy: geological, climatic and hydrological. However, the sources are not homogeneously distributed throughout the Union and an important coordinating effort is therefore needed. Five elements appear crucial for such an approach:

- (i) development of a Europe-wide electricity grid;
- (ii) establishment of an internal European market for renewable energy;
- (iii) promotion of transnational research;
- (iv) construction of pilot plants for producing and distributing energy for renewable sources;
- (v) cooperation with Mediterranean countries due to their enormous solar energy potential. (Source: [www.boell.org/erene](http://www.boell.org/erene).)

Grids – and, in particular, smart grids – represent an essential starting point for the development of renewable energy and energy efficiency in Europe. Smart grids is the term used to define a broad set of innovative technologies for lowering the environmental impact of energy distribution, providing, among other things, efficient energy metering, storage and communication and, in general, efficient energy management at local, national and international level. They represent one of the key elements for a low-carbon or even a zero-emission society. The integration of both centralised and decentralised generation is the only model that is able to guarantee sufficient energy from renewable sources. A so-called SuperSmart Grid (Battaglini and Lilliestam 2010) would be able to integrate North Sea offshore wind farms with Sahara solar production, as

well as millions of small producers in the same network by distributing energy in the most efficient way according to demand, thus limiting the costs of storage and backup. With the prospect of progressive shifting from fossil fuels towards renewables, Europe will need to efficiently include all green sources, regardless of size, location or owner.

Smart grids are a key element of energy efficiency at all levels and for electric mobility. European governments should promote them for energy management at local level but should also speed up the building of a continental SuperSmart Grid for joint exploitation of renewable sources in Europe.

Grids are a fundamental pillar in promoting the spread of participatory mechanisms and widespread control over energetic choices. Not all interventions composing the green economy have this characteristic: for example, offshore wind farms will necessarily be set up by big corporations. However, the overall profile of the green economy should support millions of households and enterprises in self-producing the energy they consume. By the way, within such a framework it will be much easier to spread behavioural changes, such as giving up individual car ownership in favour of car-sharing and the use of bicycles, or rigorous waste separation, the choice of living in zero-emission suburbs or adopting a diet that includes high quality food but takes care of the environment (Cianciullo and Silvestrini 2010).

## The demand side: green public procurement

According to a recent Eurobarometer survey (Eurobarometer 2011), uncertain market demand is the major barrier to the accelerated uptake of eco-innovation. An important contribution to the green economy and to eco-industries in particular is expected from public sector demand. Green public procurement represents an essential principle for a demand-driven contribution to green growth. The extension of green practices to public administration, apart from being a principle of political consistency, is a forward-looking measure with regard to future benefits for the public budget – for example, reducing energy expenditure – and a powerful tool for guaranteeing a home market for eco-industries. The use of photovoltaic energy, energy efficient buildings, recycling, computerisation of services and innovative mobility are policies which all public institutions should put in place. The purchase of greener goods and

services would make eco-industries grow and stimulate further research and innovation, thereby sustaining their global competitiveness.

## Greening the transport industry

TEN-T, the EU framework programme for building and integrated transport infrastructure throughout Europe, is one of the pillars of the Structural Funds. They have an important role in providing incentives in the choice of different mobility strategies. The European Commission should therefore require that EU funds for transport in each member state be focused on public and environment-friendly transport.

If Europe is willing to 'green' the TEN-T, within the framework of the next EU Financial Perspectives, at least 75 per cent of all transport funding in each member state should be allocated to environmentally more friendly transport investment (Stefanova 2008): public urban transport systems; integrated regional and suburban public transport systems; railways; inter-modal infrastructure for shifting freight from road to rail; bicycle lanes; and traffic management systems. Investments in public transport should cover improvements in both infrastructure and rolling stock and be part of integrated transport strategies, including enhanced accessibility, frequency, quality, safety and environmental performance of public transport services.

The necessary funding for roads should be focused primarily on the rehabilitation of the existing road infrastructure and safety improvements rather than the building of new roads and motorways.

In general, the environmental and climate impact of infrastructure projects must be monitored. Each member state should demonstrate how it will finance the necessary modernisation of its public transport from EU, national or other sources, using appropriate indicators. Strategic Environmental Assessments (SEA) must be carried out properly, including their climate change impact.

More than half of the energy use in road transport stems from private cars. A number of measures may help to reduce private transport emissions. They range from reducing emissions standards for cars and lorries to lowering of speed limits, as recently experimented with in Spain, which in the medium term would lead also to lighter and less powerful

cars, and to promoting fuel-efficient driving and increasing fuel taxation or road tolls (Öko-Institut 2011).

Among a number of measures in the transport sector, in most countries governments have introduced 'car scrappage' schemes in order to support the car industry, presenting them as promoting more energy efficient vehicles. A number of studies have called such schemes into question (Haugh et al. 2010; Schweinfurth 2009). While incentivising the substitution of older vehicles by more efficient ones, these measures encourage greater material consumption and an anti-ecological culture of private transport, thus increasing emissions. Even their economic impact may be questioned since, on the one hand, the incentives bring forward car purchases, while on the other hand the impact on economic activities overall is likely to be reduced by the crowding out of other household consumption products. Even if a final net – economic and environmental – benefit were achieved by car scrappage it would be very weak and even insufficient to defray the costs.

Support for renewable energies should also involve the *removal of all fuel subsidies* at international level. An OECD (2010) analysis shows how removing subsidies in all countries would generate real income gains apart from reducing the financial burden on government. It would reduce the demand for fuel and traded volumes globally, with positive effects on CO<sub>2</sub> emissions, as well as prices. The OECD estimates net benefits for oil importing countries and marginal losses for oil exporters (with the exception of Russia). Further analysis is still needed in order to better assess who will benefit and who will not from subsidy removals. Since 2010, the G20 has been calling for the gradual elimination of all fuel subsidies in order to reduce pressure on oil prices, promoting energy market transparency and stability and tackling climate change.

#### **4. Possible revenues**

The stimulus involved in an active industrial policy towards green growth will definitely be costly. However, fiscal policies may represent a win–win option in which raising resources will simultaneously contribute to a greening of the economy.

Part of the resources can be provided by a national tax system that should be adjusted to reflect the new policy priorities, shifting the tax

burden from labour towards activities with high use of non-renewable resources (land, energy, materials and so on). These include a carbon tax and higher VAT rates on selected goods to provide clear incentives to shift to sustainable technologies and products. Part of the funds for industrial and innovation policies could also be raised through targeted public debt. At the EU level, proposals have been made for financing EU projects through the issuing of EU bonds, guaranteed by member states and managed by a central agency.

At the national level, governments could set up agencies funded by government bonds – that may pay interest above Treasury bills – with the aim of providing venture capital, minority stakes, investment loans and R&D support to new activities fostering a green economy. More funds may also come from the banking sector, which could be invited to participate in new financing programmes. Once these new economic activities start growing in European countries, private equity and lending may flow rapidly, and the public role could then be reduced.

## New resources for the EU budget

The current structure of the EU's 'own resources' system still presents a few drawbacks, mainly due to the fact that only a small proportion of them are effectively 'owned' by the EU. The largest part comprises direct transfers from member states, requiring estimations of countries' net contributions and triggering negotiations based on member states' bargaining power (Rondinella 2010). Many proposals have been put forward in order to provide the Union with a revenue mechanism able to:

- generate 'own resources' to make it possible to abandon negotiations based on net contributions;
- confer stability and resources sufficient to cover EU expenditure in the long run, in other words, at least 1 per cent of European GNI;
- be transparent to citizens, who must have a clear and direct perception of how European policies are financed and how much they are paying for them;
- guarantee vertical and horizontal equity: the former satisfies the principle according to which the richer pays a higher proportion of its income because of its greater ability to pay, this being true of both countries and citizens; the latter refers to the principle of equal treatment.

A straightforward system to provide the EU with its own resources should be either based on a harmonised tax levied at European level, or be derived from existing national taxation. It is of paramount importance tax systems are fair, provide vertical equity and have side effects promoting public goods. The chance to implement taxes at community level appears to be a first step towards a system able to control social and environmental issues that cross national borders and defend global public goods (ibid.).

The best option for a European levy seems to be an overall *energy tax*. This may be linked to an existing directive entailing the harmonisation of the tax base on mineral oils, natural gas, electricity and coal, and the approximation of tax levels through Community-wide minimum rates of taxation (Cattoir 2004). Apart from being a source of revenues for the EU, an energy tax would represent an important incentive towards the development of renewable energies. Such a measure would limit the demand for fossil fuels and simultaneously allow a reduction in incentives aimed at boosting renewable sources.

Revenues from environmental taxes currently come mainly from taxes on fuel and motor vehicles. However, although the number of these taxes has been increasing in recent years, total revenues have fallen as a percentage of GDP because of increases in oil prices and the consequent fall in demand (OECD 2010). Environmental revenues in EU countries are usually higher than in other countries, although with some differences. They comprise between 1.5 and 2.5 per cent of GDP, with the exceptions of Denmark and the Netherlands, where they represent more than 4 per cent of GDP.<sup>4</sup>

An EU energy tax, even if limited to the minimum rates defined by the directive, would probably bring sufficient revenue to cover a significant part of the EU budget. This is in line with previous Commission conclusions. For instance, the European Commission (1993) estimated that a 10 US dollar tax per barrel of oil equivalent would yield about 1.1 per cent of EU GNI in the context of a carbon/energy tax. Such a levy could also guarantee stability of revenues in the long run, since energy consumption is usually strictly linked to GDP growth (Cattoir 2004). The case for

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4. OECD/EEA database on instruments used for environmental policy and natural resource management.

a reduction because of massive use of renewable energy does not seem likely in the short term, but it would be desirable for sustainability reasons. The main limitation on taxation of this kind concerns its progressivity, its ability to guarantee vertical equity: while taxation on gasoline for transport falls proportionately more on well-off people, taxation on heating products affects poorer households much more. A fee structure should be worked out that puts a heavier burden on richer taxpayers. This may result in a reduction of the tax yield, but an energy tax does not have to cover the whole budget, since it is not the only source of revenues for the EU (Rondinella 2010).

Besides an energy tax, a *financial transactions tax (FTT)* would be a major boon.<sup>5</sup> Support for such a levy is gathering momentum within European institutions. A very small levy (0.05 per cent) on all financial transactions is expected to raise significant revenue, estimated at around 200 billion euros or 1.63 per cent of GDP (Schulmeister 2010). Governance of the tax would depend on member states, but if applied in the Eurozone, a significant part of it might be dedicated to the Community budget. Its only limitation is its dependence on financial market fluctuation, but it is expected that it would limit financial volatility, thus stabilising related revenues. FTT as proposed is a very small fee which would not affect international trade or savings. The only actors who would be affected by this tax are financial institutions buying and selling assets continuously in order to realise miniscule advantages on random market fluctuations. These activities are not based on the real economy. Decisions are taken according to risk analysis and on behavioural and compulsive imitation of other actors, thus producing herd behaviour and increasing the volatility of financial markets. Affecting only speculators, an FTT would promote financial stability, which would be good for the stability of EU revenues, but above all for savers. Financial stability may be considered a public good to be protected. Compliance and administration costs would be limited, since the tax would be paid automatically to the stock market authorities. From an equity point of view an FTT would be very effective. It would be paid mainly by the few people, banks and investment funds (European and non-European) able to invest vast amounts of money in the financial markets. In the current situation, such a tax would also be just. After the world economic crisis, mostly attributable to financial reasons, governments were asked to bail out irresponsible banks. Two years

5. See: <http://financialtransactionstax.eu>

later, many governments are under constant attack from the financial markets on the basis of their debts. It is high time the financial sector paid its fair share towards economic and social recovery and that politics resumed its central role, no longer blackmailed by international finance. A financial transaction tax would represent an important step in this direction.

These two resources alone may easily substitute Community resources based on VAT and GNI and increase the EU budget, shaping it in accordance with a proper system of own resources and allowing European institutions to concentrate on EU goals instead of responding to member state pressure.

When it comes to reforming the Community budget,<sup>6</sup> reform of the revenue side must be the starting point. The new European budget should be based first of all on genuine own resources able to guarantee independence for the European institutions so they can use the budget according to what is best for the EU as a whole. In order to achieve this objective an overhaul of the current system based on country contributions seems necessary.

A combination of energy taxation and a financial transactions tax added to the current own resources would achieve a flow of resources sufficient to substitute GNI and VAT, thereby overcoming the drawbacks of net contributors approach. Moreover, a proper own resources system will make it possible to eliminate all the adjustments and rebates currently characterising the revenue side, thereby enhancing budget transparency for the sake of European citizens.

## 5. Conclusions

The path towards the green economy needs to be underpinned by a dedicated industrial policy that would help to turn the European production system into a decarbonised one.

European policies already cover a large number of sectors involved in the green economy and offer plenty of different tools. However, their

6. See: [http://ec.europa.eu/budget/reform/index\\_en.htm](http://ec.europa.eu/budget/reform/index_en.htm)

contribution sometimes appears inconsistent, since a number of 'carbon promoting' policies are being implemented at the same time, for example roads and motorways financed by the Structural Funds, fuel subsidies or member states' car scrappage schemes. On the other hand, the resources dedicated to the green economy are still not sufficient to effectively promote a so-called '*green New Deal*' in order to boost green growth able to rescue the European economy from the crisis and turn production and consumption towards sustainability.

Supporting eco-industries is a challenging issue in which difficulties start with the very identification of the firms to be targeted because of the blurring boundaries between green and traditional industries. As a general principle of industrial policy, the whole supply chain must be targeted, which in the case of eco-industries is seldom organised around a lead firm, as in the case of automobiles.

Industrial and innovation policies can generally rely on a range of policy tools. On the supply side, public funds could support selected R&D, innovation and investment efforts. State-owned enterprises and public services may have an important role in promoting research and development and in fostering public–private partnerships. Public and private institutions could support business start-ups in key fields with loans and venture capital. The private sector can also be targeted via incentives and the taxation of polluters, as well as through market regulation, imposing higher standards on all economic actors.

On the demand side, far-sighted public procurement, the organisation and regulation of markets with high growth potential, and support and incentives for early users of new technologies could help to 'pull' innovation and investments, shifting production and consumption towards more sustainable patterns. The purchase of greener goods and services would make eco-industries grow and stimulate further research and innovation. Green procurement can help to sustain the global competitiveness of the EU eco-industry by contributing to the formation of a home market.

Finally, in order to implement such ambitious, as well as necessary, conversion to green economy, significant resources are needed. A number of sources have been identified as optimal options, for example, an EU-wide energy tax and a financial transaction tax to be implemented at least in the Eurozone. Apart from finding resources for financing the

green economy they would all have positive side effects. The first would limit emissions and increase the competitiveness of eco-industries, the second would enhance market stability – with positive effects on the real economy – and raise resources through a fair mechanism, while the third will lower pressure on Eurozone sovereign debt.

The implementation of a green New Deal for Europe therefore appears to depend mainly on the political will to trigger change.

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