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# LOW CARBON JOBS FOR EUROPE

## Current Opportunities and Future Prospects

Executive Summary

Published June 2009 by WWF-World Wide Fund for Nature (formerly World Wildlife Fund)


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Design: www.okidokidesign.net
Printed on recycled paper by Imprimerie Les Editions Européennes
Cover picture: © Gettyimages

# EXECUTIVE SUMMARY

Like other major economies, Europe finds itself facing a critical convergence of economic and climate crises. Both are similar in that they must be tackled with urgency combined with strong political leadership. Both are critically interconnected sharing the same roots, namely a narrow pre-occupation with short-term gain at the expense of long-term security. And solving both is likely to provide new opportunities to transition towards low carbon futures with new types of jobs.

2009 is the year in which the nations of the world must come together at the UN 0Climate Change Conference in Copenhagen to agree a new 'Global Climate Deal' to succeed the Kyoto Protocol.

Since the global financial crisis erupted in 2008, leading to the global economic downturn, the EU and several Member States have passed large-scale economic stimulus packages aimed at revitalizing their economies. However, economists and politicians are increasingly seeing the opportunity of using economic stimulus packages to "green" the economy. Through use of investment and public spending decisions to incentivise the development of "green" sectors, it is hoped that such packages could deliver the co-benefits of regenerating the economy, while at the same time establishing long-term structural changes which move economies towards a low-carbon, sustainable growth future.

In this context, a recent analysis suggests something of a missed opportunity - only a relatively small portion, €42 billion or less than 9 percent, of the combined stimulus funds allocated by EU members states and the European Commission are likely to help advance climate protection goals.

With its December 2008 climate and energy package, as well as an array of Directives and regulations, the European Union has been regarded as a leader in climate policy - and has created a considerable number of good quality "green jobs" in the process. Evidence to date suggests that green jobs span a wide array of occupations, skill-levels, and salaries, potentially offering opportunities for a broad sections of the workforce. The current economic crisis presents an opportunity to ensure that measures aimed at stimulating economic recovery also serve to set Europe on course towards a low-carbon, sustainable economy.

Although fears are sometimes expressed that climate policy will be a job killer, the job losses that have occurred in extractive and energy-intensive industries to date are largely due to the growing automation of these industries as well as market liberalization and outsourcing, rather than climate protection policies. Furthermore, in some cases, flexibility given to EU industries actually encourages them to invest their money outside the EU, which is more detrimental to the overall health of the EU economy and workforce. An example of this is the excessive amounts of international offsetting credits that are allowed into the EU Emissions Trading System and Effort Sharing Directives agreed in 2008. This is not to say that measures to reduce carbon emissions will not have an impact on these industries.

But in general, climate-friendly and energy-efficient industries and the products associated with those industries tend to be more labour-intensive than products associated with conventional and fossil fuel-based industries or less efficient products. In addition, saved fuels through energy efficiency do not only contribute to energy security but also increase the purchasing power of consumers.

*Low carbon jobs for Europe* gathers evidence of already-existing green jobs and assessments of potential job growth. The report provides emploment numbers, estimates, and projections in three core areas: the renewable energy sector, transport, and energy efficiency.

## RENEWABLE ENERGIES

A few European countries have been leaders in renewable energy technologies. **An "Advanced Renewable Strategy" modelling exercise supported by the EU found that there could be 1.7 million net jobs by 2010 in the EU and 2.5 million by 2020.**

- ### Wind Power:

  In 2007, there were an estimated 154,000 direct and indirect jobs in Europe—most of them in Germany, Spain, and Denmark. By 2008, this had likely grown to at least 160,000. France expects its wind jobs to grow from 7,000 to 16,000 jobs by 2012, and Italy may have 66,000 by 2020. The UK has some 4,000 jobs, a level that Portugal will likely reach this year as well. **European wind industry employment has the potential to reach 329,000 jobs in 2020, and 377,000 in 2030**.

- ### Solar Photo-Voltaic (PV):

  Germany commands close to half the global installations market and is also a leading producer of solar cells, along with Japan and China. At 57,000 jobs, Germany accounts for the bulk of European PV-related employment which now runs to at least 90,000. Spain has 26,800 jobs. **Under fairly conservative assumptions, Europe's PV workforce is expected to expand strongly, to 727,000 and 1.4 million, respectively**.

- ### Concentrating Solar Power (CSP):

  CSP plants will be built in Europe's Mediterranean areas including Spain and Greece as well as desert areas. This is still a very young industry, but European companies—principally from Spain, Germany, Belgium, and the UK—are likely to play an important role in producing collectors, mirrors/reflectors, and other components.

- ### Solar Thermal Heat Energy:

  While China is the global leader in terms of market size, European companies are the technological leaders in solar thermal energy, and the European market has doubled in less than three years. A rough formula (1 full-time job per 70 kW / 100 square meters of installed capacity) suggests more than 27,000 jobs already exist in this industry in Europe. National statistics suggest that Germany alone has some 17,400 jobs, Spain has 9,000 (direct only), and Italy about 3,000. **Altogether, it appears likely that Europe already has some 30,000 jobs in this emerging industry and there is potential for more growth in the future**.

- ### Bioenergy:

  Biomass can be used for a variety of purposes—biofuels, biogas, and heat and power. European countries account for only a small share of bioethanol production, but are prominent players in biodiesel. Most biogas facilities are currently in Germany and Austria, but are now also booming in Eastern Europe. Germany had 95,800 direct and indirect jobs in bioenergy in 2008; in Spain more than 10,000 people are directly employed in the industry. **Studies suggest considerable future job potential over the next decade or so, possibly 580,000 jobs in biomass heating, 424,000 jobs in biofuels, and as many as 2.7 million jobs in biogas**. Second and third generation biofuels also offer a significant new market for jobs and sustainable economic growth as well as providing significant coverage against the burdensome cost of oil imports.

## TRANSPORT

The auto industry is in deep crisis. Even as the industry copes with plunging sales - new passenger car registrations in Europe fell almost 8 percent in 2008 - it is facing growing consumer and political pressure to reduce its carbon footprint. Beyond that, a climate-friendly transport system needs to have a better balance among different transport modes.

**While there are few detailed studies, there is reason to believe that job gains would outweigh losses in a modal shift away from automobiles and trucks toward urban public transit and inter-urban rail.**

- ### Fuel Efficient Automobiles:

  Using a 120 grams of $CO_2$ per kilometre limit as a benchmark, just 7.5 percent of 2004 new-car sales by European manufacturers were efficient, low-carbon vehicles. **Applying that percentage to the industry's workforce, an initial provisional estimate suggests that some 150,000 out of 2 million auto industry jobs could be considered a 'shade of green'.** French and Italian companies produce smaller cars and fare better than German ones in terms of $CO_2$ emissions.

- ### Hybrid–Electric Vehicles (HEVs) and Plug-in Hybrid Electric Vehicles (PHEVs):

  Japanese firms are leading HEV development, and it remains to be seen how European firms fare with regard to PHEVs. The EU has called for the production of 1 million such vehicles by 2020. Employment will occur in producing such cars, the nickel metal hydride and lithium ion batteries needed, charging stations, as well in creating an expanded 'smart grid' that can handle a growing PHEV fleet. The possibility of capturing the global hybrid and electric car market is of key strategic importance for the EU especially given its long heritage and legacy in this sector.

- ### Urban Public Transport:

  An estimated 900,000 people are employed in urban public transport in the EU-25. The sector accounts for 1–2 percent of total employment, and for every direct job, an average of another 2 to 2.5 indirect jobs are typically created. **Expanding and modernizing transit systems holds considerable employment potential; this includes not just operating local transport systems, but manufacturing buses, light rail, and subways, and maintaining rolling stock and infrastructure (tracks, signals, and stations).**

- ### Car Sharing:

  Such programmes are still relatively limited, but a German study suggests that a systematic expansion could create some 14,000 jobs (net gain: 8,000) over a 7-year period. **A simple extrapolation yields a Europe-wide figure of about 50,000, though specific country-studies are needed to substantiate the employment potential.**

- ### Bicycles:

  There are no good employment statistics for this industry. China and other Asian countries produce the bulk of bicycles worldwide. European employment is limited, but greater opportunities exist in sales and rentals, as well as in constructing bike paths and other infrastructure - jobs that are, of necessity, local in nature.

- ### Rail:

  Railways employ about 900,000 people, out of 8.2 million people employed in all transport services combined.[1] Rail employment has fallen by 14 percent in just the short span of time between 2000 and 2004. But rail transport is far less fuel-intensive and polluting than road transport. Modernizing and expanding the rail network would entail a reversal of the employment loss of recent decades. **It would also benefit employment in manufacturing locomotives and rolling stock, which stands at about 140,000 people in the EU-25**.

[1] These figures represent EU-25 data.

## ENERGY EFFICIENCY

Energy efficiency creates jobs not just in producing more efficient equipment and appliances, but also through the so-called "re-spending" effect: avoided energy costs can be invested in other sectors of the economy, which are typically more labour-intensive than the energy sector. A number of studies have ascertained the job potential. **A 2005 European Commission study concluded that efficiency investments to save 20 percent of EU energy consumption can create up to 1 million direct and indirect jobs.** Energy end-use efficiency investments create three to four times the number of jobs created by comparable energy supply investments, i.e., coal-fired and nuclear power plants.

- Buildings:

  The building sector is responsible for 40 percent of EU final energy consumption. A revised EU Energy Performance of Buildings Directive could generate between 280,000 and 450,000 new jobs by 2020 through auditors and inspectors, construction workers, and employees of industries that produce insulation materials components and other inputs. **Eurima, an insulation industry umbrella group, projects job gains of 274,000 to 856,000 by 2020. And a study by the European Trade Union Congress estimated that up to 2.59 million jobs could be created by 2030**.

- Lighting:

  The planned phase-out of inefficient incandescent lamps in the EU by 2012 will likely cost an estimated 2,000 to 3,000 jobs, mostly at factories in Hungary and Poland. In total some 50,000 people work in the EU lighting industry, but efficient compact fluorescent lights are mostly produced in China. Meanwhile, a number of European companies are involved in product design, marketing and selling of highly-efficient LED lamps, but they mostly outsource the manufacturing to Asian firms. But of course much of the design, marketing and selling potential lies within the EU.

- Combined Heat and Power (CHP):

  A number of European countries use CHP fairly extensively, including Denmark, Finland, the Netherlands, Germany, Poland, and Romania. **A rough estimate suggests that an average of 25 workers are required to operate and maintain every 10 MW of existing CHP capacity. Europe currently has a capacity of 104 GW. Applying this formula yields an estimate of 260,000 jobs. This figure needs to be regarded with caution as additional jobs are typically found at supplier firms.** There is also growing employment opportunity in export sales. European companies are well placed to benefit - in terms of capturing contracts for designing, developing, and building facilities - capital goods from an expansion of CHP in countries outside of Europe. The United Kingdom, for instance, has a share of more than 20 percent of global exports of CHP systems. Given that just 8 percent of global electricity demand is currently met by CHP systems, the market potential is very substantial.

It is difficult to come up with a comprehensive figure for green employment, especially in the area of energy efficiency. However, available figures – as reviewed above - suggest that in Europe, there are close to 400,000 jobs in renewable energy (direct and indirect), some 2.1 million in efficient transportation (direct only), and a highly conservative 900,000-plus (again, direct only) in energy efficiency goods and services. These add up to some 3.4 million direct jobs altogether. Indirect jobs not accounted for above may be in the order of at least an additional 5 million. Other energy efficiency areas such as efficient appliances, lighting, and other equipment would add more jobs to the total.

Some 130 million people are employed in the EU altogether. The number of green jobs is still a relatively small share of that total, but compares favourably with the 2.8 million jobs in polluting industries (mining, electricity, gas, cement, and iron and steel sectors). And indications are that jobs in the renewable energy sector and other green economic activities will continue to expand in the future, whereas employment in extractive and polluting industries continues to decline.

WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by:

- conserving the world's biological diversity
- ensuring that the use of renewable natural resources is sustainable
- promoting the reduction of pollution and wasteful consumption

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