European Employment Observatory

EEO Review: Promoting green jobs throughout the crisis: a handbook of best practices in Europe

Germany

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1. Introduction: employment in the green economy

Current estimates indicate that there are approximately 2 million green jobs in Germany.[1] Federal Environment Agency data for 2008 show that 1.93 million persons were working in the environment protection sector in Germany in 2008 (representing 4.8% of working population, as compared to 4.5% in 2006). About 1,205,700 persons worked in environmental services in 2008, a rise of +73,300 people compared to 2006. Within environmental services, especially environmental services for companies (282,200 persons working in this sector in 2008, +24,900 compared to 2006) and trade, maintenance, repair (216,900 in 2008, +21,800 compared to 2006) could expand (Eckermann 2012[2]).

According to data of the Federal Statistical office, the number of green jobs increased by 37% between 1998 and 2008, representing an additional 521,000 employees (Federal Statistical Office 2012b). After 2002 the number of green jobs grew by 6% per year, six times more than total employment growth. About two-thirds of employees were working directly in the area of environment protection or delivered services for the environment protection (see Table 1).

Table 1 Persons employed in the environmental sector 2008

	in thousand	**%**
Environment protection, environment protection services	1206	62.4
Renewable energies	322	16.6
Environment protection investments	168	8.7
Administrative environment protection expenditures	165	8.5
Export of environmentally protective goods	73	3.8
Total	**1934**	**100.0**

Source: Edler, Blazejczak (2010)

According to a study carried out by the consulting company Roland Berger, the number of environmental technology jobs could rise from 1.4 million in 2011 to 2.4 million in 2025, which would mean an average annual growth of 3.2% (Federal Employment Ministry 2012a).

Employment in related branches of the construction industry (e.g. energy efficiency and eco-requalification of buildings)

In 2009, about 40,000 persons were working in the environment protection-related construction sector (Federal Statistical Office 2012c). The restoration programme maintained, according to the ILO, about 300,000 jobs in the building industry (ILO 2012).

Employment in the renewable energy sector

Germany is among the 5 worldwide leading countries in terms of total renewable energy production capacity and is the leading country in this area in Europe (ILO 2012). Around 381,600 persons were working directly or indirectly in the renewable energy production in 2011 (2004: 160,000 persons), the Federal Environment Ministry ascribes 276,500 of these jobs to the Renewable Energy Law (Federal Employment Ministry 2012b). The

[1] For an overview of measurement of green jobs in Germany see OECD 2012

[2] Data refer to the definition used by Eurostat / OECD, see above.

largest industries in terms of employment were photovoltaics (110,900), on-shore wind power (92,500) and biogas production (50,600) (O'Sullivan et al. 2012). Employment more than doubled between 2004 and 2011 (Lehr et al. 2011). The Federal Environment Ministry estimates that the net employment effect of renewable energies will amount to 250,000 people by 2030 (Lehr et al. 2011).

The *Land* with the highest number of jobs in the renewable energy sector is Bavaria followed by North Rhine Westphalia and Lower Saxony. However, measured in terms of share in regional employment, renewable energy plays a more important role in East Germany, in particular in Saxony-Anhalt, Brandenburg and Mecklenburg-Vorpommern (see Table 2 in annex).

2. Selection of green employment promotion strategies and programmes with low-carbon / environmental objectives or activities

Promoting the development of a green economy

Environment protection policies have been on the political agenda in Germany for many years. The decision in 2000 to abandon nuclear energy by 2021 and to reduce the use of coal power stations has already pushed the development of renewable energy, a growing sector in terms of employment, as has been shown above. This policy orientation was reinforced in the context of the nuclear accidents in Fukushima.

The federal government set out the following objectives in its latest energy policy concept of 2011 (Federal Ministry of Economics and Technology 2012):

- Reduce green house gas emission by 40% until 2020 and by 80% until 2050.
- Increase the share of renewable energies in the energy consumption from 10% in 2010 to 60% in 2050. Its share in electricity supply shall reach 80%.
- Reduce the consumption of primary energy by 50%, electricity consumption by 25% and the energy consumption in traffic by 40% as compared with 2008.
- Increase the rate of energy-saving building restoration to 2% per year. In 2011 this rate amounted to 0.8%.

Furthermore, in August 2012, the Federal Ministry for Environment published "ten points for the environmental policy" as reaction to the neglection of environment policies during the financial and debt crisis (German Bundestag 2012a). The issues are mostly characterised by already voiced targets and influenced by aims to improve energy-efficiency and by the nuclear power phase-out plans of Germany. From a labour market perspective, the necessity for safeguarding jobs during the energy turnaround ("*Energiewende*") is emphasised (Federal Employment Ministry 2012c).

To reach these objectives renewable energy production needs to be increased and energy productivity to be raised more strongly than in the past:

- It will involve major restructuring of the electricity production and promotion of renewable energy production.
- Developing electromobility is a key element of the strategy.
- A further pillar will consist in high investments in building restoration and in the implementation of smart metering solutions.

- The promotion of resource efficiency in firms and in relation to private energy consumption is a further key area.

However, the current strategy of the government is discussed controversely: e.g. the institute RWI criticises the adoption of renewable energies in Germany for not being cost effective, not being environmentally effective, not being able to set the right market incentives, and therefore, to conclude, as not being suitable as a role model of renewable energy implementation for other countries (Frondel/Ritter/Schmidt/Vance 2009).

It needs to be recalled that during the economic crisis, the government included also green projects in initiatives in its business cycle package (see for an overview Eurofound 2011). Since then, the German economy has recovered and the pursuing of a strategy of greening the economy is consequently not related to the economic crisis.

There are various European, federal and regional programmes for the promotion of environmental and climate protection, the development of the renewable energy sector and increasing of energy effiency. The Länder generally formulate their own energy policy and environmental protection objectives. Many of these projects are small-scaled and implemented at a decentralized level.

European Union Funds and mobilising public and public-private investments

In early 2012, the Federal Government submitted a new programme regarding resource efficiency. It aims at safeguarding the supply of sustainable resources, increasing resource efficiency in the industrial production, at raising awareness of the buying public for resource-efficiency, at expanding the recycling sector, and at using inter-sectoral instruments to foster resource efficiency (Federal Environment Ministry 2012f).
A central project to increase resource-efficiency and which has direct positive employment effects is the building restoration programme of the Federal Government (Federal Government 2011). Further information is given in part 3 of this review.

In the climate protection initiative (*Klimaschutzinitative*) of the Ministry for the Environment, projects are funded that aim at climate protection measures and target consumers, municipalities, companies, and educational institutions. From 2008, 24 projects were promoted or are still ongoing[3], further information is given in section 3 (Ziesing 2012).

Indirect employment impacts can be expected from a number of projects supporting greening SMEs, e.g. those companies can take out a loan or get benefits from the German development bank KfW for investments in energy efficiency, in environment protection, in low-emission vehicles or in environmental innovations (KFW 2013). Also, many projects aiming at small and medium-sized companies regarding the green economy or green innovations, e.g. the innovation programme for medium-sized companies (*Zentrales Innovationsprogramm für den Mittelstand*, see ZIM 2013), have indirect positive green employment effects.

[3] For an overview of those projects, see Ziesing 2012 pp. 59-62 and http://www.bmu.de/fileadmin/Daten_BMU/Download_PDF/Forschung_Foerderung/Projektliste_2013_Internet_bf.pdf.

There are some examples for the use of EFRE for environment and climate protection. Thus, the Land of Bavaria is promoting the development of renewable energies in economically weaker and remote regions. The environment discharge programme Berlin is another example (Umweltentlastungsprogramm Berlin, see also section 3.10).

In the area of environment protection in particular LIFE funds are used. Furthermore, funding of projects under the programme Intelligent Energy Europe have played an important role.[4] Furthermore, a large number of environmental projects are carried out in the context of territorial programmes (e.g. Alpin Space Programme) and INTERREG. It is not possible to give a short overview of the multitude of these projects.

Examples of ESF-funded which promote environmental projects include:

- Corporate Social Responsibility in SMEs (*CSR – Gesellschaftliche Verantwortung im Mittelstand*)[5]
- Voluntary ecological year (*Freiwilliges ökologisches Jahr,* see section 3)
- Electricity-saving check (*Stromspar-Check,* see section 3)[6]

Activation of targeted training programmes / active labour market policies

Projects for integrating long-term unemployed often have a social and/or ecological utility.
One example of training long-term unemployed in the recycling industry is given in section 3.

Developing skills

With regard to skills development, there are two answers to the increasing greening economy: mainly new competences are introduced in existing education and training programmes and in a few new occupations in the area of the dual vocational training system have been designed (Vogler-Ludwig, Stock, 2010). In the area of tertiary education, about 380 university courses on renewable energies could be recorded in 2012 (Bühler 2012).

Promotion of green job quality (agreements with social partners)

Working conditions
It seems that renewable jobs are overwhelmingly permanent (96%) full-time positions, with a relatively small share of temporary employment (ILO 2012). About 82% of employees have completed vocational training, and almost 40 per cent of these have a university degree and thus the educational level is higher than in the rest of the economy. However, not all subsectors are covered by an industry-level collective agreement. Therefore, the trade unions pursue the objective to conclude branch-level collective agreements and has initiated an industry-level dialogue (*Branchendialog Solar*) with works councils, representatives of the solar industry and politicians, including the

[4] To give an example at the local level, the City of Munich is participating in the IEE funded cooperation project POLIS that focuses on implementing strategic town planning and local policy measures to promote solar energy in the built environment.
[5] See http://www.esf.de/portal/generator/15836/programm__csr.html.
[6] See http://www.esf.de/portal/generator/1410/programmuebersicht.html.

Minister for the Economy of Thuringia (IG Metall 2012a). As the industry has to face increasing competitive pressure from Asia, there is also concern about maintaining jobs in Germany.

Support of the social partners to new energy policy and greening the economy
The trade-unions are generally supportive of "greening the economy" initiatives. The powerful industry union IG-Metall stresses the job potential, e.g. in the area of renewable energy.[7] To give a more concrete example, the expansion of the wind energy, in particular offshore wind parks, is perceived as a strength for promoting economic development in the weaker regions such as the Northern German coast region.
The programme of renovation of buildings for energy efficiency was originally proposed to the government by the social partners as part of a 'pact for the environment and employment' (ILO 2012). The industry union construction (IG-BAU) is still pushing the government to effectively implement energy efficient restoration (IG BAU 2012).

In the chemical industry sector the social partners have signed a declaration in August 2011 with the aim to promote the contribution of the sector to sustainable development. A 'forum for a sustainable plastics industry in the future' has been set up. The industry will hereby position itself in the context of a strategy towards sustainable development and seeks to show the potentials and contribution of the plastics industry in this respect (IG BCE 2011).

The social partners are represented in various projects and networks, such as in the Network resource efficiency[8] initiated by German union IG Metall and the Ministry in 2007 which was already examined by Eurofound (Eurofound 2011). The social partners are also represented in the Council on Sustainable Development set up in 2001. [9]

3. Detailed description of practices

3.1. Electromobilty in public transport

As part of its climate protection initiative, the Federal Government promotes electromobility in public transport, e.g. by subsidising hybrid buses (Federal Employment Ministry 2012e), furthermore, there are and were other transport or research-related initiatives to promote public transport electromobility. According to the Federal Government, hybrid buses need to be cheaper and more reliable to be an alternative to regular buses in the long-term. Also, the Government is taking measures to fight impending skilled worker shortage in the sustainable mobility sector (German Bundestag 2012b). Adaptations in the vocational education and training system seem to be necessary because of a shift of qualification requirements from traditional mechanic automotive engineering to a more electronics-based required knowledge (Spath et al. 2012). Tertiary education in Germany already reacted to these requirements with electromobility-specialised courses of studies, e.g. at the University of Applied Science in Munich (HM

[7] For examples, see http://www.igmetall.de/cps/rde/xchg/internet/style.xsl/pressemitteilungen-2011-8750.htm; http://www.igmetall.de/cps/rde/xchg/internet/style.xsl/gruene-technologien-3051.htm; and http://www.igmetall-kurswechselkongress.de/.
[8] Homepage: http://neress.de/startseite.html
[9] Homepage: http://www.nachhaltigkeitsrat.de/

Munich 2013) or at the University of Applied Science Ingolstadt. (HAW Ingolstadt 2013). A projection investigating manpower requirements of electromobility came to the conclusion that, in 2030 and depending on the projection scenario, 6,200 to 7,800 skilled workers will be needed per 1 million produced electric car engines (Spath et al. 2012). A study funded by the Ministry for the Environment with the aim to examine the potential of electromobility concludes that in 2030 about 6 million electro-powered cars could be in use (with a market share of 14%) (Institute for Applied Ecology 2012). To conclude, electromobility is seen as an expanding sector in Germany, not only in public transport, but also as a replacement of gas-operated cars – positive (green) employment effects can be expected for the future, the more so because research in this area is promoted by the public authorities quite strongly.

3.2 Climate protection projects of the Federal government

In 2012, the Federal Government promoted 1,414 projects within the climate protection initiative (*Klimschutzinitiative*) introduced in 2008 (German Bundestag 2013). The initiative aims at encouraging energy-efficiency and CO2-emission reduction by promoting projects, e.g. for local authorities and companies and is financed by the federal budget and by fund assets of the energy and climate funds. Until August 2012, the projects promoted by the initiative had a total volume of 400 million Euros (Federal Employment Ministry 2012g). It is estimated that the projects of the climate projection initiative directly had a gross employment effect of 19,400 full-time equivalents. Taking into account indirect employment effects, the initiative created 35,500 green jobs during the period 2008-2011 in total (Ziesing 2012).

3.3 Building restoration and energy efficiency

Germany‘s building restoration programme, which was pushed by the unions and employers’ organisations, is the biggest programme of its kind worldwide, mobilising about 100 billion Euros in the past decade and (besides enhancing energy efficiency) creating around 300,000 direct jobs per year (ILO 2012). The programme is supported by loans of the German development bank KfW, thus, there can be examined “the key role that can be played by unions and employers, as well as a development bank, supporting local authorities and primarily benefiting SMEs“(ILO 2012). Though, there are some issues between *Bund* and *Länder* regarding a further subvention of building restorations at a (financial) level similar to the past, negotiations failed recently (Focus Online 2012). Nevertheless, the Government promised further subventions and loans by KfW in December 2012 (Federal Ministry of Transport, Building and Urban Development 2012), although these conditions are still trailing behind the former funding, e.g. of 2 billion Euros in the year 2009 (Süddeutsche Zeitung Online 2012). This stagnation was criticized repeatedly by trade-unions like the construction union IG BAU (IG Bau 2012).

3.4 Windparks in Bremerhaven in Northern Germany

The region of Bremerhaven suffered from the crisis of the shipyard sector and a closure of an US military basis with severe implications for the local economy (Distelkamp et al. 2011). Furthermore, research and development is relatively weak in the area in which the city is located. One area of regional development has been the promotion of renewable energies. In 2001, the Windenergieagentur Bremerhaven/Bremen e.V. (WAB), a wind energy sector network, was founded, furthermore, the town of Bremerhaven concentrated on attracting wind energy companies – in 2003, an ‘on- and offshore strategy’ was decided by the senate in Bremen. In the following years, infrastructure investments were

made, wind energy research was promoted, and the vocational and training system was adjusted to consider skill needs of the wind energy industry. To conclude, a network of wind energy-related research, services and production came into existence in Bremerhaven. In 2006, about 100 persons were working in the onshore-wind sector in the town of Bremerhaven and in 2009, the number rose to 800 and was predicted to reach 1,000 in 2011 (Distelkamp et al. 2011). It is worth mentioning that even in the crisis year 2009, total employment in Bremerhaven rose. The authors of the study concluded that the green jobs of the (onshore) wind energy industry can compensate negative employment effects in maritime areas affected by job losses in traditional sectors. Thus, promotion of 'green' research, vocational education and training, infrastructure investments and 'network-building' is reasonable in these areas. In an optimistic scenario with good export conditions, the study also estimates a net employment of around 165,300 persons in the onshore wind energy sector in Germany in 2030 (Distelkamp et al. 2011).

3.5 Alliance for Sustainability in Lower Saxony

There are various initiatives in the *Länder* that promote environmental innovations in companies. One example is the Alliance for Sustainability between public authorities and administration, companies, interest groups and unions in Lower Saxony that focuses e.g. on projects promoting energy efficiency in 70 companies is *Transferzentren Energieeffizienz*[10] (Allianz für Nachhaltigkeit 2013).

3.6 Promotion of research in Bavaria

Research is promoted at federal and *Länder* levels in all areas including in the area of energy efficiency and the development of renewable energy. One example is the Green Factory Bavaria, a research project for energy-saving production technologies which also pursues the target to raise awareness for the need to concentrate on renewable energy production and to provide energy-efficient training based in the Bavarian cities of Augsburg, Bayreuth, Nuremberg and Munich. Another programme carried out by the Bavarian research foundation, Programm ForEnergy[11], is a cooperation of five research institutes and 28 industrial actors, started in September 2012 with a project volume of 4.2 million Euros for the duration of three years, to promote a energy-flexible factory to increase energy efficiency. In Germany, almost 10,000 jobs in the area of renewable energy research and development were promoted by subsidies in 2011 (Ulrich et al. 2012).

3.7 ESF-funded voluntary ecological year

The ESF-co-financed voluntary ecological year (*Freiwilliges Ökologisches Jahr*) was designed for younger persons (16-27 year olds) to dip in the environmental (protection) sector. Posts are always ecology-oriented and are provided by charitable (youth) institutions which pay the participants pocket money and compensate their expenditures of board and lodging. It starts in August and ends in July of the following year. Participants gain practical experience in an environmental-related occupation and also take part at workshops for theoretical education (Federal Ministry for Family, Older People and Younger People 2013). Thus, the voluntary ecological year can be seen as a

[10] See http://www.dnw-online.de/index.php?id=1077.
[11] Homepage http://forenergy.de

training programme for persons interested in green jobs.

3.8 EFRE fund used for the environment discharge programme Berlin

An example for an EFRE-funded measure is the environment discharge programme Berlin (Umweltentlastungsprogramm Berlin), introduced in 2001. It aims on ecologically compatible growth of the Berlin economy and on sustainable employment, e.g. by subsidising research for technical, ecofriendly innovations, by promoting renewable energies or introducing environmental/energy management policies. Target groups are charitable institutions, public institutions, public and private research institutes and small and medium-sized enterprises (Umweltentlastungsprogramm Berlin 2013). According to a public report from 2011, 320 projects were promoted, employment effects could be observed especially for the regional construction sector. From 2007 till 2013, the environment discharge programme will be allocated 80.4 million Euros which is 9% of Berlin's total ERDF fund income from 2007 to 2013 (Senate for health, environment and consumer protection Berlin 2011).

3.9 Example of environmental networks at the local level: Ökoprofit

Ökoprofit (ecological project for integrated environmental technology) is a project originally established in the Austrian city Graz in 1991. The programme promotes cooperation between local authorities, companies and (environmental) experts to strengthen ecological efficiency and to exploit cost-saving potentials of companies through establishing local networks and providing consulting services. Institutes are reviewed and labeled as Ökoprofit-enterprise. The programme was adopted in many German regions, e.g. in the most populated German federal state, Northrhine-Westphalia. Between 2000 and 2012, about 6,200 environmental protection measures were carried out by 1.370 companies in 116 projects with investments amounting to 172 million Euros, savings of around 57 million Euros per year and a conservation of 200,000 tons of CO2 emissions per year. Ökoprofit also aims to ensure green job quality, e.g. when labeling, it considers occupational safety and motivation of employees (Ökoprofit NRW 2013).

3.10 Tackling long-term unemployment

A further example is the project Energy-Saving check (Stromspar-Check) which was, since 2008, amongst others funded by the Federal Ministry for Environment (funding until the end of 2012: 21 million Euros). This project employs more than 700 long-term unemployed persons. The programme provides long-term unemployed persons training for their task to consult low-income households on the subject of energy saving and water consumption. Originally, the project is the result of cooperation between the local energy department, the local youth and social matters department, the local caritas organisation and the local energy supplier in Frankfurt/Main (Stieß et al. 2012). This project is also funded by the ESF.[12]

3.11 Social partners initiatives: Bargaining environmental protection issues and training of works councils

Increasing energy efficiency is certainly perceived by the social partners as one way to reduce costs (and thus indirectly save jobs). In order to better prepare works councils, the trade-

[12] See e.g. an article of Caritas Stuttgart about the problems of expiring ESF-benefits for the energy-saving check (http://www.caritas-stuttgart.de/65542.asp?id=35160)

unions are running training courses and issue guidelines for works councils. The industry union IG Metall has elaborated a guideline for works councils and employees on increasing energy efficiency (IG Metall 2012b).
In the chemical industry a society for the information of works councils has been set up by the social partners in 2001. Seminars and training courses are offered in various fields such as environmental protection and energy efficiency, eco-auditing, safety, emission certificates and other energy policy instruments (GIBUCI – *Gesellschaft zur Information von Betriebsräten über Umweltschutz in der chemischen Industry*).[13]

4. Conclusion

In Germany environmental and climate protection is a shared objective by various societal groups and there is a consensus among all political parties about the energy turnaround strategy. The nuclear accident in Fukushima has strengthened the national consensus to abandon nuclear energy. The Federal government and some of the *Länder* governments have set very ambitious objectives with regard to the production and consumption of renewable energy. It can be doubted whether it will be possible to reach the set aims within the next decade. However, up to now the new energy policy objectives have further pushed investments and research in renewable energies and it can be expected that this sector will still expand in Germany, despite the competition from the Asian markets.

Direct gross employment effects are visible. Indirect effects are more difficult to grasp, as are net employment effects. Overall, it seems that Germany has gained up to now from the energy policy shift in terms of job creation. This may hold true for both dynamic regions and regions with structural problems. There is a potential for further job creation in this area (for both the domestic market and exports), but gains will depend on innovations in energy storage, energy transportation, energy efficiency and increased cost-effectiveness in the use of new technologies. Furthermore, increasing energy efficiency may engender positive indirect employment effects as it helps to control for energy costs. It needs to be added, that negative employment effects which could have resulted from increasing energy prices, have been prevented by exempting energy-intense companies from the renewable energy law provisions (*EEG-Umlage*). If these exemptions were given up, negative employment effects could become a reality. There is indeed a controversy about the exemption as this leads to higher energy costs for private consumers and more energy intense companies.

A wide variety of projects are implemented at all territorial levels, with the use of EU-funds, national funds, regional and local funds. In particular at the local level and the company level a large number of innovative projects and new forms of cooperation for increasing energy efficiency and promoting the development of a low-carbon economy can be recorded.

The success factors of the German way towards a low-carbon economy are manyfold:

- High commitment of all political parties towards reaching the ambitious aim of the energy policy change and environmental protection policy
- Public investments in renewable energy

[13] Homepage http://www.chemie-sozialpartner.de/institutionen/gibuci/wir-ueber-uns/

- Promotion of finding and implementing energy-saving solutions at all levels
- Network and partnership approaches at the *Länder* and local levels bringing key stakeholders such as governments, companies, consumers and chambers in charge of vocational training together
- Support of the social partners
- Social dialogue on environmental protection and increasing energy efficiency at company level

Risk factors include:

- The consensus may be questioned, as the costs of the energy policy change are distributed unevenly, due to the exemption of energy-intensive companies. Energy prices have grown considerably for private households and questions about social equity are raised.
- One way for controlling energy price development could be to reduce incentives for producing renewable energy, but this would hamper future development in the renewable energy sector.
- It is not sure in what time frame the shortcomings in the transportation and storage of energy can be overcome.
- There will be fierce global competition at the environmental protection and equipment for renewable energy markets. It is not sure that Germany can maintain or even expand its world market shares in this area.

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Annex

Table 3 Total employment in the renewable energy sector

Land	**Total employment**	**Share of all employment in the *Land*, in %**
Bavaria	68,850	1.18
North Rhine Westphalia	53,710	0.68
Lower Saxony	48,050	1.45
Baden-Württemberg	43,270	0.86
Saxony-Anhalt	24,400	2.65
Hesse	21,050	0.75
Brandenburg	20,800	2.22
Saxony	19,450	1.12
Schleswig-Holstein	14,340	1.27
Thuringia	14,020	1.54
Rhineland-Palatinate	12,380	0.68
Mecklenburg – Vorpommern	12,080	1.85
Hamburg	6,760	0.66
Berlin	6,490	0.45
Bremen	4,050	1.12
Saarland	2,250	0.48
West-Germany	**274,710**	**0.93**
East-Germany	**92,240**	**1.47**
Germany	**371,950**	**1.03**

Source: Ulrich et al. (2012)