

Factsheet

30 Mar 2015 | [Paul Hockenos](#)

## Where the Energiewende creates jobs All Pages

**Tags:** [Business & Jobs](#)

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The near-term impact of the Energiewende on Germany's economy remains hotly debated. There is no systematic monitoring of business and job creation -- or losses -- as a result of the country's transition to a low-carbon economy. This factsheet provides an overview of data that are available on these issues.

Proponents argue that the Energiewende economy covers many sectors over and above the production of renewable energy hardware (solar modules, wind turbines, biogas plants, etc.) and renewable power generation itself - including, for example: [energy efficiency](#), alternative mobility, educational and training programmes, research and development, the decommissioning of nuclear reactors, climate protection technology, [smart grids](#) and [storage](#) systems, and expansion of the power grid.

Usually, the impact of the Energiewende on the German economy is discussed in terms of the number of jobs created and also, though less often, in terms of revenue. In addition, the renewable energy and climate-related industries factor into Germany's GDP and exports, keep added value in communities, drive innovation, push down wholesale power prices, increase energy security, and generate tax revenue. Still, the conventional power sector and heavy industry warn that the transition is harming Germany's competitiveness.

### **Employment in Germany's renewable energy sectors**

One of the most widely cited sources on the economic impact of the Energiewende is a study by the Institute of Economic Structures Research (GWS) for the Federal Ministry for Economic Affairs and Energy, titled "[Gross Employment for Renewable Energy in Germany in 2013](#)," which shows that in 2013 the renewables industry accounted for around 371,400 jobs (gross) in energy production and supply, the manufacturing of hardware, publically funded research and administration, and the service and maintenance of renewable energy facilities (see Figure 1). This figure is up from 160,500 in 2004. Because there is relatively little manpower involved in renewable power generation, most of these jobs are related to investments and not, for the most part, to energy production itself (See Table 1).

The biggest employer was the wind energy sector, followed by biomass (including many small-scale biomass systems. 44,300 jobs were lost between 2012 and 2013 due to the collapse of German photovoltaic manufacturing (GWS, p.7). In a presentation the author's of the GWS report estimate the number of jobs in the renewable energy sector to rise to [500,000 - 600,000 by 2020](#) (p. 17).

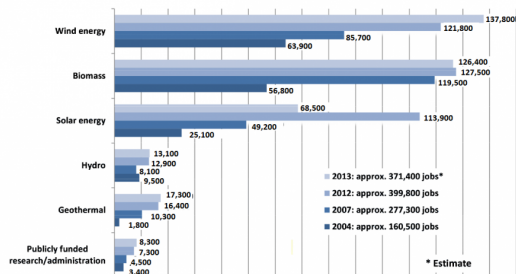


Figure 1| Development of employment in the renewables sector in Germany 2004-2013. Source: GWS et al., 2014.

	Employment generated by investment (incl. ex-ports)	Employment generated by operation and maintenance	Employment generated by the provision of biomass and biofuels	Total employment 2013	Total employment 2012
Onshore wind energy	100,800	18,200		119,000	104,000
Offshore wind energy	17,500	1,300		18,800	17,800
Photovoltaics	45,100	10,900		56,000	100,300
Solar thermal energy	10,100	1,300		11,400	12,200
Solar thermal power plants	1,100			1,100	1,400
Hydropower	8,300	4,800		13,100	12,900
Deep geothermal energy	1,300	200		1,500	1,400
Near-surface geothermal energy	13,300	2,500		15,800	15,000
Biogas	17,200	11,800	20,200	49,200	50,400
Small-scale biomass systems	10,100	3,900	14,600	28,600	28,800
Biomass-fired heating/power plants	6,000	8,600	8,400	23,000	22,900
Biofuels for transport			25,600	25,600	25,400
<b>Total</b>	<b>230,800</b>	<b>63,500</b>	<b>68,800</b>	<b>363,100</b>	<b>392,500</b>
Publicly funded research/public administration				8,300	7,300
<b>Total</b>				<b>371,400</b>	<b>399,800</b>

Table 1| Employment in the renewables sector in Germany 2013. Source: GWS et al., 2014.

A [monitoring report](#) by [energy efficiency](#) lobby group [DENEFF](#) concluded that the [energy efficiency](#) sector accounted for 848,000 jobs in 2013, many of them in construction.

A [2014 study](#) by Germany’s Federal Environment Agency ([UBA](#)) estimates that in 2010 almost two million jobs in Germany could be attributed to the environment protection sector (including waste removal, water protection, air pollution control, environmental services etc.). People working in the sector made up 4.8 percent of all people in paid work in 2010, according to a conservative estimate of the [UBA](#); of these, around half are related to the transition to a low-carbon economy ([Energiewende](#)), the study’s author told the [Clean Energy Wire](#).

The Renewable Energies Agency ([AEE](#)) estimates that [100,000 jobs \(44%\)](#) in the renewable facilities manufacturing sector can be attributed to the [export](#) of renewable energy technology.

## The energy sector and energy-intensive industry

But while hundreds of thousands of Germans have found employment in the renewable sector, critics say the [Energiewende](#) has hurt other sectors and cost jobs. 34 percent of the German companies interviewed for a [survey](#) published by the Chambers of Commerce and Industry ([DIHK](#)) said the [Energiewende](#) had an adverse impact on their firms, including on competitiveness in foreign markets. The poll says that 79 percent (p. 33) of German businesses have invested into [energy efficiency](#) measures. Of the 2,193 businesses polled for the [DIHK](#) study, four percent of industrial businesses have moved some production abroad, 8 percent said they are in the process of doing so and 12 percent are planning to do so because of “changes in the energy economy and energy policy in Germany” (p. 20). 76 percent said they do not consider moving any production capacities.

Large energy-intensive industrial businesses are exempt from paying the renewable energy surcharge and other taxes and fees, effectively benefitting from one of the lowest power prices in Europe on the wholesale market. Sectors that are **energy-intensive but do not usually qualify for exemption** from the **renewable energy surcharge** – such as some smaller chemical and metal processing companies – say they are suffering too. The **German industry** is highly competitive in export markets but say the high cost of power has made it more difficult for German industry to compete abroad. Germany is the world’s **leading chemicals exporter**.

In the conventional energy sector in Germany, employment has fallen since 1991 from 564,000 to 215,000 in 2013, a **government progress report** on the energy transition shows (p. 93) (See Figure 2).

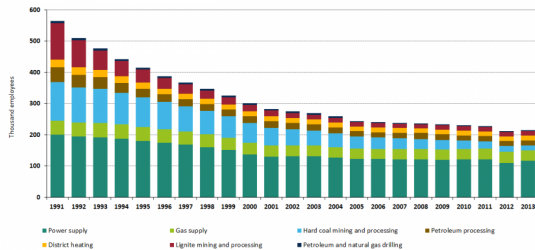


Figure 2| Jobs in the conventional energy sector 1991-2013. Source: BMWi Progress Report 2014 / Statistisches Bundesamt 2014.

## Green start-ups

Thousands of entrepreneurs have seen business opportunities in German’s energy transition, fuelling the growth of green start-ups. **A report** by the Borderstep Institute in cooperation with the University of Oldenburg found that 170,000 start-ups in the “green economy” were founded between 2006 and 2013, with young green businesses providing 1.1 million jobs. Businesses contributing to a lower-carbon economy accounted for 11 percent of all start-ups in Germany over the same period. Most new businesses were set up in the renewable energy sector (85,000), followed by the **energy efficiency** sector (73,000). A total of 135,000 young businesses are contributing with their produce or services to the target of a low-carbon economy, **the authors say** (See Figure 3).

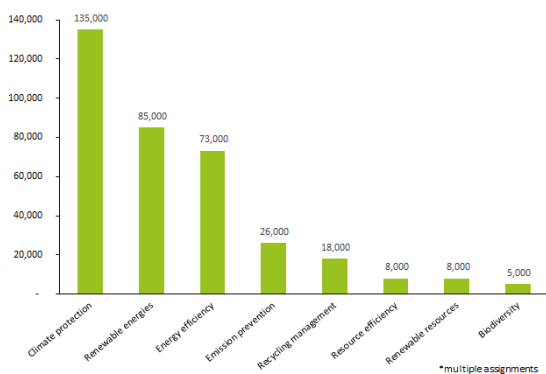


Figure 3| Businesses founded in different green economy sectors 2006-2013. Data: Universität Oldenburg/Borderstep Institut, 2014.

Across Germany, the highest total numbers of green start-ups were in the southern and western federal states (Länder) of Bavaria, North Rhine-Westphalia and Baden-Württemberg, while the states where the highest proportion of start-ups were in the green economy were Mecklenburg-Western Pomerania and Brandenburg in east Germany, as well as Rhineland-Palatinate in the west.

## Regional distribution of Energiewende-related jobs in Germany

industry varies across Germany's 16 Länder. Bavaria leads the pack with 7,693, followed by Lower Saxony (4,760) and Baden Württemberg (4,471). (See Figure 4).

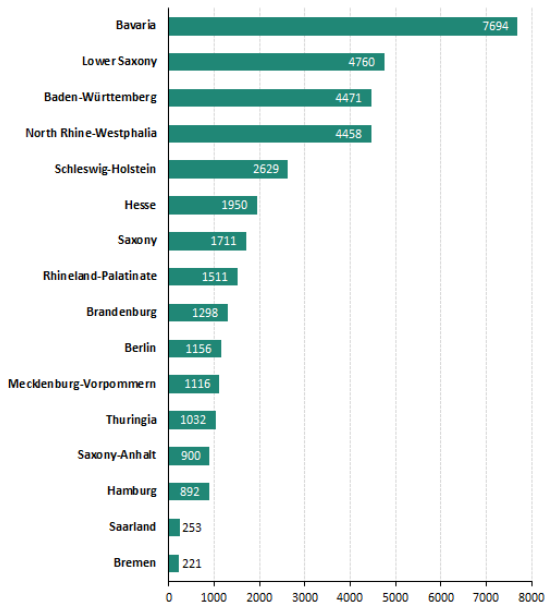


Figure 4| Number of businesses in the renewable energy sector by state in 2014. Data: Statista, 2015.

In 2013, Bavaria also had the highest number of people employed in the renewable energy sector at 60,540 (See Table 2).

	Wind	Photovoltaics	Solar <sup>1</sup>	Hydro	Geothermal <sup>2</sup>	Bio gas <sup>3</sup>	Biomass <sup>4</sup>	Biofuels	Total
Baden-Württemberg	9,410	7,520	2,300	4,930	2,400	5,200	7,800	900	40,540
Bavaria	12,350	10,480	2,620	4,580	4,370	10,960	12,880	2,300	60,540
Berlin	2,790	1,560	580	40	170	350	570	10	6,070
Brandenburg	6,120	2,460	290	70	470	2,290	2,440	3,380	17,580
Bremen	5,000	130	30	30	60	90	100	10	5,530
Hamburg	6,290	890	80	50	210	220	390	880	9,030
Hesse	5,260	5,390	840	460	1,350	1,510	4,070	1,290	20,160
Mecklenburg-Vorpommern	7,980	1,200	100	40	170	1,970	1,040	2880	14,980
Lower Saxony	32,150	1,130	1,250	340	2,220	9,890	3,940	2,280	55,200
North Rhine-Westphalia	16,520	8,910	2,540	1,330	3,700	7,030	8,190	2,210	50,330
Rhineland-Palatinate	4,710	1,590	350	430	580	1,210	2,720	1,020	12,630
Saarland	1,120	380	110	140	100	220	530	50	2,650
Saxony	4,000	4,290	680	370	620	2,000	2,370	1,970	16,400
Saxony-Anhalt	12,090	3,400	280	140	300	1,860	1,520	450	24,330
Schleswig-Holstein	9,010	950	130	70	260	3,000	1,150	1,170	15,740
Thuringia	2,390	3,730	350	180	290	1,290	1,880	1,350	11,460
West Germany	101,930	39,320	10,250	12,360	15,250	39,330	41,770	12,130	272,290
East Germany	35,870	16,630	2,250	840	2,040	9,860	9,830	13,490	90,830
GERMANY <sup>5</sup>	137,800	56,000	12,500	13,100	17,290	49,190	51,600	25,620	363,100

<sup>1</sup> including solar thermal power plants    <sup>2</sup> deep geothermal and surface geothermal energy    <sup>3</sup> including employment through supplying fuel for biomass plants  
<sup>4</sup> includes forest biomass plants, small biomass plants and biomass heating and power plants, each including employment through supplying fuel for biomass plants  
<sup>5</sup> excluding employment from publicly subsidised research/administration (8,300 persons)

Table 2| Employment in the renewable sector by state. Data: GWS et al., 2014.

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## Dossiers

This Factsheet is part of the following Dossiers:

- [The energy transition's effect on jobs and business](#)
- [New technologies for the Energiewende](#)
- [Energiewende effects on power prices, costs and industry](#)
- [Onshore wind power in Germany](#)

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