

CLEAN

ENERGY

WIRE

A Reporter's Guide to the Energiewende*

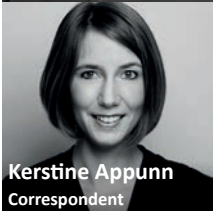
*Context.
Contacts.
Access.
2015*

**German energy transition*

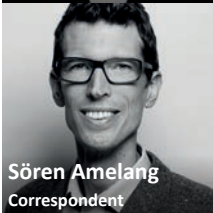
A note from CLEW



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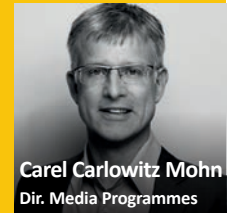
The Energiewende is turning many parts of German society upside down. Watched closely from abroad, this generational project provides a wealth of exciting and important stories. Yet researching an effort of such scale in a foreign country and language is a difficult job even for the most seasoned reporter. This is compounded by the complexity of the technology and economics behind energy policy in general.

A strong fact-based and critical journalism is essential to inform the international political debate about how to best decarbonise the global economy. The Clean Energy Wire CLEW wants to support journalists in their work. Fully funded by two non-profit foundations – Stiftung Mercator and the European Climate Foundation – we enjoy full independence from any business or political interests. We share our funders’

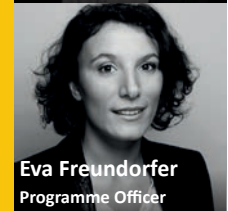
commitment to working towards reducing CO₂ emissions in order to limit man-made climate change.

The CLEW “Reporter’s Guide to the Energiewende” gives journalists a starting point for their work. It highlights the main storylines of the energy transition and provides lists of experts and links to key readings. Our website cleanenergywire.org offers more in-depth information and contacts, and our daily news digest keeps readers in the loop about the debates and events surrounding the Energiewende. We also organise journalist workshops to give a first-hand view of the transformation. But most importantly, we offer support with any questions you might have - so please don't hesitate to get in touch.

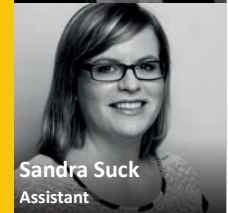
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#Energiewende – Dates 2015

13 May

Ifo Institute for Economic Research and the German Advisory Council on the Environment **Symposium – Energiewende implications for Germany as an industrial centre**. At the Bavarian state representative office in BERLIN.

17 – 19 May

6th **Petersberg Climate Dialogue** – Aims to produce a negotiating text accepted by all participants ahead of the December United Nations Climate Change Conference in Paris (COP21). At the Federal Ministry for the Environment (BMUB) in BERLIN.

28 – 29 May

Berlin Conference on Energy and Electricity Economics 2015 – Cross-border cooperation for sustainable Energy Security. At the DIW German Institute for Economic Research in BERLIN.

June 2015

The government plans to publish its concrete proposals for a **reform of the power market** and the **climate levy** (White Paper). **Nuclear power plant Grafenrheinfeld** (E.ON) in Bavaria to be shut down.

1 – 2 June

EURELECTRIC Annual Convention & Conference: **The Consumer-powered Energy Transition** – Politicians, regulators, consumer groups and industry representatives debate impact of digital technologies on the energy market BERLIN.

7 – 8 June

G7 summit – Germany hosts G7 heads of state and governments at Schloss Elmau, south of MUNICH.

23 – 25 June

BDEW Congress 2015 – Conference on energy markets and energy policy. At the InterContinental Hotel in BERLIN.

25 – 27 August

Handelsblatt **Renewable Energy Conference** in BERLIN.

Autumn 2015

Government to publish annual **Monitoring Report on Energiewende**. Legislative process for **power market reform** and **climate levy**.

15-18 September

Husum Wind trade fair in HUSUM.

21 – 24 September

10th **German Climate Conference** – At the KlimaCampus in HAMBURG.

1 October

World Energy Day 2015 – **World Energy Council Annual Forum** in BERLIN.

27 – 28 October

IEA – International Energy Agency's **Bioenergy Conference 2015** in BERLIN.

November 2015

Report on effects of **new auction process for solar parks**.

30 November – 11 December

United Nations Climate Change Conference (COP21) – 21st conference of the parties to the UNFCCC and 11th meeting of the parties to the Kyoto Protocol in PARIS.

#Energiewende – Contacts

... for official statements

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... for latest data and research

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Think tank focusing on dialogue with energy policymakers.

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German Institute for Economic Research (Deutsches Institut für Wirtschaftsforschung – DIW)

DIW's energy, transportation and environment, and climate policy departments study the economics and politics of climate change and energy.

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Fraunhofer ISE

Solar energy research institute and publisher of electricity production data. Also see their data and graphs on www.energy-charts.de.

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... for industry comment

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... for a list of over 120 experts and institutions with insights into the Energiewende, see www.cleanenergywire.org/experts

#Energiewende – Reading in English

- Federal Ministry for Economic Affairs and Energy - BMWi (2014) **The energy of the future: First “energy transition” progress report - summary** The government’s monitoring report provides an overview of the current status of reforms. It is published every three years and assesses what measures have already been implemented and what effect they are having.
- Expert commission on the “Energy of the future” monitoring process (2014) **Statement on the first progress report** by the German government for 2013 - summary. [Andreas Löschel et al. analyse the effects of measures taken so far to achieve the government’s greenhouse gas reduction targets.](#)
- BMWi (2014) **Second monitoring report “Energy of the future”** Overview of the progress and challenges of reforms in the fields of energy efficiency, renewable energies, power plants, electricity grids, greenhouse gas emissions and energy prices.
- BMWi (2014) **Overview of legislation governing Germany's energy supply system** [Key strategies, acts, directives, and regulations/ordinances.](#)
- Federal Ministry for the Environment - BMUB (2014) **Climate protection in figures** [Facts, trends and incentives for German climate policy.](#)
- Agora Energiewende (2013) **12 Insights on Germany’s Energiewende**
- Agora Energiewende (2015) **The Energiewende in the power sector: State of affairs 2014** [A review of significant developments and an outlook for 2015.](#)
- AGEB (2014) **Evaluation tables on the energy balance 1990 to 2013**
- Foreign Office (2015) **Who is Who of the Energiewende in Germany** [Brochure of contacts in politics, industry and society.](#)
- DIW (2015) **Deep Decarbonisation in Germany** [A Macro-Analysis of Economic and Political Challenges of the Energiewende.](#)
- UBA (2015) **National Trend Tables for the German Atmospheric Emission Reporting**
- UBA (2014) **Submission under the United Nations Framework Convention on Climate Change and the Kyoto Protocol 2013**
- [energytransition.de](#) - [A website/blog, funded by the Heinrich Böll Stiftung, explaining what the energy transition is, how it works, and what challenges lay ahead.](#)

#Energiewende - Targets

*The Energiewende is Germany's transition to a low-carbon and nuclear-free economy. The government has set specific **targets** for the growth of renewables and cutting carbon emissions, some of which reach decades into the future. It has also decided to take all nuclear power plants offline by 2022.*

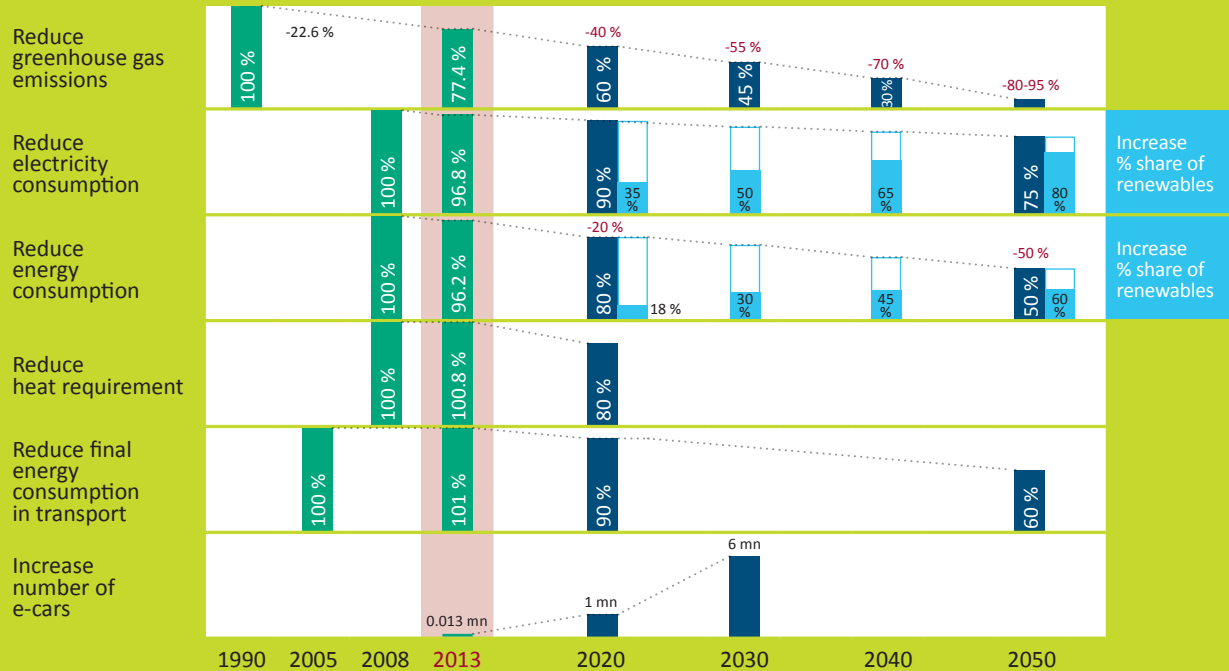
Feed-in-tariffs have been key for the rapid growth of renewables in Germany, which made investments in green electricity production profitable. This instrument, which has been introduced in many other countries around the world, spurred the construction of large-scale wind and solar parks, but also allowed ordinary citizens to participate by putting solar panels on their roofs, or by forming energy cooperatives.

The result is a radical reshaping of the energy system. The traditional model of centralised power generation that responds to consumer demand is being replaced by diverse sources of energy that fluctuate with the weather. This presents huge challenges – not least for grid infrastructure and the power market design. While so far mainly focused on electricity, the Energiewende will also have to transform other sectors like transport and construction if targets are to be met.

The energy transition is a gigantic project with countless players that will leave few aspects of Germany's economy and society untouched. Already, there are winners and losers: Big utilities' traditional business models have been hit hard while consumers and some businesses are concerned about higher electricity costs. The coal industry first benefitted from the nuclear phase-out, but its future is now uncertain as the government steps up its efforts to cut CO₂ emissions. At the same time, entirely new industries have sprung up.

Renewables already cover more than a quarter of Germany's power consumption and their rise is set to continue apace. With the world watching, it remains to be seen if and how one of the world's largest industrialised economies can lead the way to a greener future.

Quantitative targets of the energy transition



#Energiewende – Key Figures

44.4 mn

Passenger cars registered in Germany (01/2015)

18,948

Electric cars registered = 0.04% (01/2015)

46 %

Share of renewable power capacity owned by citizens (2012)

- 67 %

Share price development of the biggest utilities E.ON and RWE over past 7 years

3.6 % → **26.2 %**

Renewables share in German power generation 1990 and 2014

15 minutes

Average power outage in 2013 (Compare – France: 60 min; UK: 55 min; Poland: 254 min; Denmark: 14 min; Canada: 280 min)

912 mn tonnes

Greenhouse gas emissions in 2014

- 27 %

Fall in greenhouse gas emissions 1990-2014

11.1 %

Share of renewables in primary energy consumption (2014)

27.8 %

Share of renewables in gross power consumption (2014)

20.6 ↗ **28.8 ct/kWh**

Average household power price 2007 and 2015 – thereof 6.17 ct/kWh renewable surcharge in 2015.

56 ↘ **35 €/MWh**

Average wholesale power price (base-load) in 2007 and 2014.

371,400

Number of people employed in the renewables sector (2013)

21,089

Number of people employed in the brown coal industry (2015)

€39.5 bn

Spending on energy saving measures in residential buildings in 2013

- 11 %

Decrease in final energy consumption for heating in private households 2008-2013

92 %

of Germans believe embarking on the Energiewende was the right decision in principle (2015)

81 %

of Germans approve of the nuclear phase-out (2015)

~€20 bn
Support paid to renewables from EEG surcharge on power bills in 2014 alone

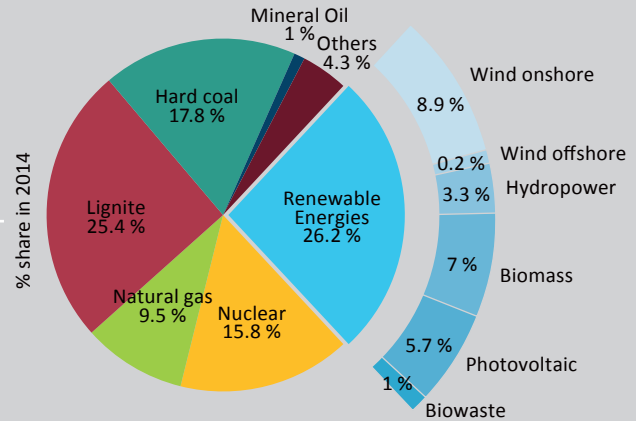
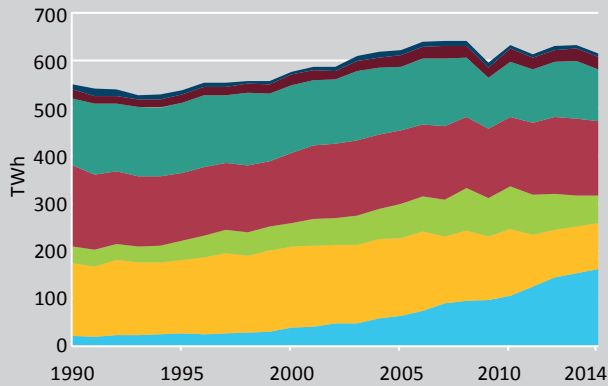
38.6 %

of all natural gas imports to Germany came from Russia (2014)

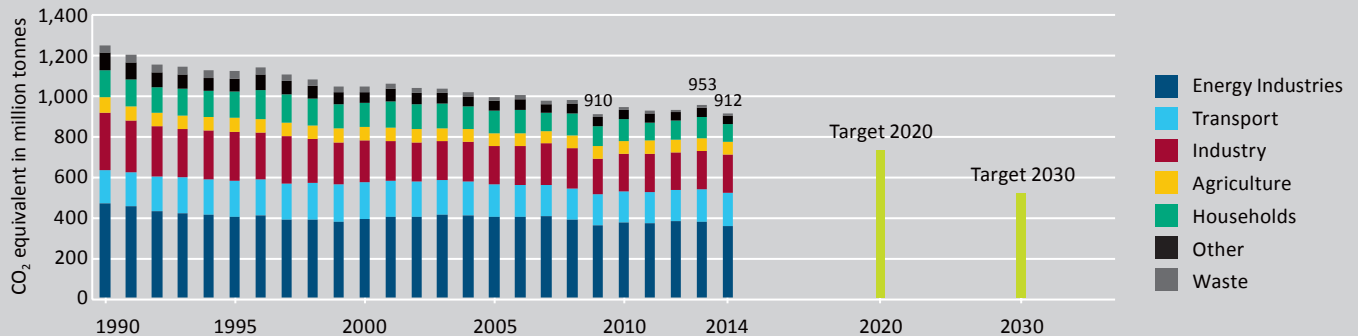
57 %

of natural gas imports to Germany came from Norway (33%) and the Netherlands (24%) (2014)

Development of gross power production 1990–2014 in TWh



Emission trends for Germany since 1990



Sources: AG Energiebilanzen 2015; UBA 2015.

#Climate and CO₂ #Fossil fuels

Climate targets force Germany to tackle coal



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Renewable energy sources have expanded rapidly since the introduction of the Renewable Energy Act in 2000, but German carbon emissions have not always fallen in step. After 2009, emissions even rose slightly as power generation from coal-fired power stations soared to levels above 1990. To keep from missing its own greenhouse gas reduction targets, the government presented its “Climate Action Programme” at the end of last year, a package of additional measures aimed at cutting emissions. Shortly after, new data showed power usage and

CO₂ emissions easing in 2014, leading some analysts to predict better years ahead and others to point out that much of the reduction was due to the warm weather. Environmentalists warn that conventional power plants, especially those fired with coal, still pose threats to Germany’s emissions targets. This year, the Ministry for Economic Affairs and Energy wants to pass legislation that could oblige the oldest brown coal plants to reduce operating times or even to shut down, as they would have to pay a “climate levy” if emitting CO₂ above a certain limit.

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Reading

Agora Energiewende (2015) Turnaround for the Energiewende

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Fraunhofer ISE (2015) Energy charts

DIW (2014) Coal power endangers climate targets: Calls for urgent action

AGEB (2015) Energy consumption in Germany, 2014 – sharp decline due to mild weather (in German)

Wuppertal Institute for Climate, Environment and Energy (2007)

Comparison among different decommissioning funds: Methodologies for nuclear installations

CLEW Factsheets - on cleanenergywire.org

Germany's greenhouse gas emissions and climate targets

Details of new Climate Action Programme

The history behind Germany's nuclear phase-out

Coal in Germany

Understanding the European Union's Emissions Trading System

#Electricity market

Designing the power market for a future dominated by renewables



© mhp/fotolia

The Energiewende has always involved tough choices. Germany is now facing the next big decision in this ambitious project: How to overhaul its power market to accommodate a predominantly renewable energy supply. With renewables contributing to falling wholesale power prices, conventional power plants are struggling to turn a profit. But there are fears that

without their readily-available power, fluctuating supply from renewables might endanger the reliability of the power supply. As with so many of the steps along the road of the energy transition, the issue is highly complex, the debates heated and the political consequences potentially huge.

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Reading

BMWi (2014) An electricity market for Germany's energy transition – Discussion paper of the Federal Ministry for Economic Affairs and Energy (Green Paper)

BDEW (2013) Position paper: Design of a decentralised capacity market

Öko-Institut/WWF (2012) Focused capacity markets

Agora Energiewende (2014) How does Germany's electricity market work?

CLEW Article / Factsheets on cleanenergywire.org

New power market design without capacity mechanism in ministry plans

Germany's power market reform: the options on the table

Capacity markets around the world

Notes

#Grid

Connecting up the Energiewende



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Germany has to update its network to cope with decentralised, fluctuating supply as the country shifts to renewables. Rapidly growing wind power capacity in the north means a bountiful supply of low-cost electricity. But too much power can be as big a problem for the stability of the grid as too

little. And not everyone is in favour of building new power lines to carry electricity to the country's industrial south. The current debate raises key challenges, not only of public acceptance but of how central government works with regional states to make the Energiewende a success.

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Reading

Bundesnetzagentur (2014) Grid expansion in Germany.
What you need to know

BMWi (2015) Grids and Grid Expansion –
Ministry website in English

DIW (2015) Electricity grids and climate targets:
New approaches to grid planning

DIW (2014) Beyond the "Grid-Lock" in electricity interconnectors:
The case of Germany and Poland

Pentalateral Energy Forum (2015) Generation adequacy
assessment

Website: Grid development plans of the four German transmission
grid operators (TSOs)

Bundesnetzagentur (2014) Monitoring report (in German)

CLEW Factsheets - on cleanenergywire.org

Set-up and challenges of Germany's power grid

Setting the power price: The merit order effect

#Citizens' Energy #Society

Germany between citizens' energy & nimbyism



© anweber/fotolia

Germany's energy revolution is having a far-reaching impact on everything from the landscape to education. Many farmers earn more from their "energy harvest" than from traditional crops and citizens are rethinking lifestyle choices to go green. Since the energy transition took off in 2000, millions of Germans have become energy producers, investing in solar panels on their houses and buying shares

in wind parks. Citizens' engagement was key for maintaining high public support for the energy transition despite rising power prices. The introduction of new regulations has stoked concerns that more complex rules will put citizens off. At the same time, important Energiewende projects – such as grid extension and wind parks – have run into resistance, requiring new ways to keep the public on board.

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Reading

Leuphana University, Lüneburg (2015) On the state of energy cooperatives in Germany (in German)

Association of German Engineers (2014) Location-related problems of acceptance of industrial and technology policy (in German)

Jeremy Rifkin (2011) The third industrial revolution: How lateral power is transforming energy, the economy, and the world

An example for an energy-friendly suburb in Freiburg:
www.vauban.de

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Citizens' participation in the Energiewende

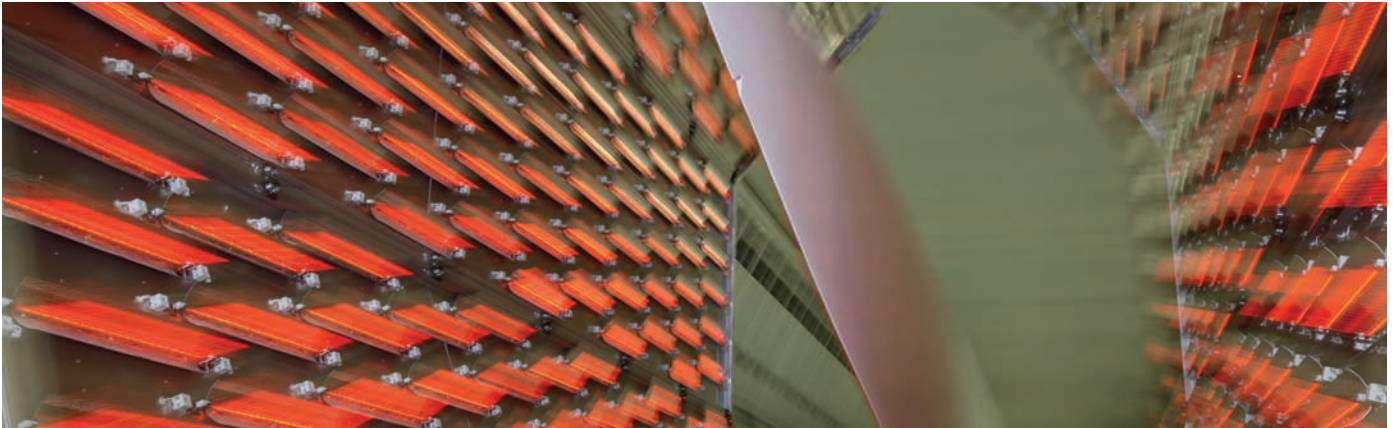
Polls reveal citizens' support for Energiewende

Facts and figures on the social impact of the Energiewende

Notes

#Business&Jobs #Cost&Prices

The Energiewende – Boon or bane for the German labour market and economy?



© VDMA/Nordex SE

Germany's energy transition is dramatically transforming the economy. From solar-panel cleaners to housing-insulation specialists and wind-turbine climbers, the move to a low-carbon economy powered by renewables is creating many business opportunities, while the conventional energy sector is bleeding jobs. Many business leaders warn the costs of the nuclear phase-out and the move into renewables could

drive some manufacturing abroad. They say this could take a toll on the car industry and other pillars of the economy. But energy-intensive industry can also benefit from the dramatic fall in wholesale electricity prices caused by green power. The government says it can uphold competitiveness without compromising green energy goals. It also hopes Energiewende technologies will secure future export success.

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Frankfurt School-UNEP (2015) Global trends in renewable energy investment 2015

GWS - Institute of Economic Structures Research (2012) Employment effects of renewable energy expansion on a regional level

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FAU University of Erlangen-Nürnberg (2014) Germany without renewables? (in German)

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What German households pay for power

Where the Energiewende creates jobs

#Utilities

Fighting for survival: Germany's big utilities look for a future in the new energy world



© Bengt Lange/Vattenfall

Germany's ambitious transition to renewable energy has left the major utilities that have dominated the market for decades out in the cold. They have started to adjust their business models, yet despite some drastic steps, their future role in Germany's greener, fast-changing energy markets is far from clear. All companies in the sector must adapt. But coping

with a new energy landscape is perhaps toughest for the four biggest German utilities, E.ON, RWE, Vattenfall and EnBW. Epitomising the "old" energy world of centralised generation and large-scale investment, they have the most to lose from political decisions taken over recent years.

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Reading

Thomson Reuters Practical Law (2014) Electricity regulation in Germany: Overview

RWE (2015) Paving the way for growth with continued focus on financial discipline

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Small, but powerful – Germany's municipal utilities

German utilities and the Energiewende

The history behind Germany's nuclear phase-out

#EEG/Law

Germany revamps renewables law as it adapts to future with green power



© Giso Bammel/fotolia

Germany's renewable energy market is coping with the most far-reaching legislative changes since green power incentives were introduced a quarter of a century ago. The controversial revamp of the renewable energy law (EEG) in 2014 aimed to cut costs related to the Energiewende, exert greater control over the expansion of renewables and maintain exemptions that help large energy users deal with the transition. Some of the measures have a short track record and strike at the very

heart of the 1990 law. Guaranteed prices for renewable energy producers (feed-in tariffs) have been partially substituted by tenders for renewables projects, and a stricter target corridor for added capacity was introduced. Energy experts stress that this was necessary to adjust the evolving sector to EU rules and subject it to more market forces. But renewables developers, particularly in the solar sector, have expressed reservations, saying the reforms make investments in renewables less secure.

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BMWi (Unofficial English translation 2015) Renewable Energy Sources Act - RES Act 2014

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Agora Energiewende (2014) Q+A on the 2014 Reform of the German Renewable Energy Act

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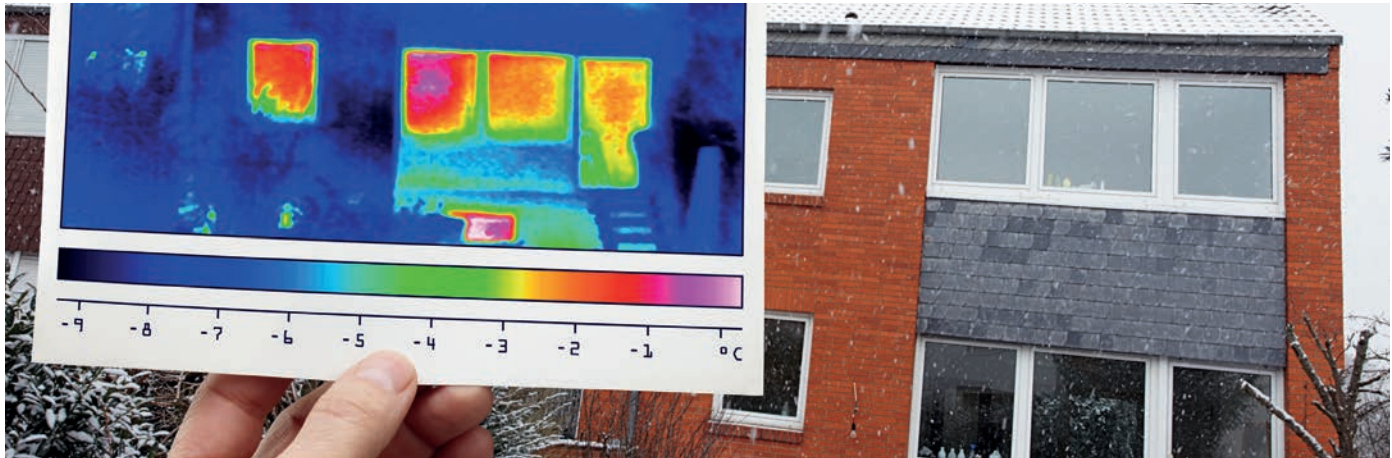
Comparing old and new: Changes to Germany's Renewable Energy Act

Position of key stakeholders on the EEG 2.0

Notes

#Efficiency

Taming the appetite for energy



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Reaching climate targets requires more than just greening the power supply. Germany must also tackle demand and consume less energy. In the past, energy use only fell significantly when the economy took a hit. Now the country wants to prove it's possible to decouple growth and emissions by dramatically increasing efficiency. The potential is huge and so far largely untapped, which is why the issue has been dubbed the “sleeping giant” of the Energiewende. The

government's Climate Action Programme, meant to get Germany back on track for its 2020 climate goals, suggests that increasing energy efficiency will reduce emissions more than any other measure – by 25 to 30 million tonnes. But saving energy on a large scale – by insulating buildings, changing behaviours and the introduction of many new and often expensive technologies – requires everyone's participation and has proven a hard sell so far.

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Notes

#International #Energy Union

From isolation to integration: The Energiewende and Germany's neighbours



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While many European countries are also investing in a greener infrastructure, few have initiated such radical reforms. Germany has started the Energiewende on its own terms. But not everyone welcomes this. Germany's energy markets are at the geographic heart of Europe. What happens here significantly affects markets in neighbouring countries. Renewable energy subsidies have in the past also been an issue with the EU, due to competition rules. Germany is adjusting its policies as it learns that energy policy can't be implemented in

isolation. Cooperation within Europe has intensified in many areas such as grid extensions, trade and research. The EU's plan for an "Energy Union" could deepen the German energy market's ties to its neighbours even more. But a new rift is emerging: While the government is keen to limit subsidies for fossil-fueled power plants, many EU countries are introducing so-called capacity markets, which can be supportive of these. The Energiewende still poses major challenges in Europe, both for Germany and its neighbours.

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Notes

#Transport

Driving change in German mobility



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The Energiewende is paving the way for a future energy system in which power, heating and transport are closely integrated. Batteries will draw electricity from the grid in order to power vehicles. But the transformation of the transport sector still lags far behind the power system, and the German affection for powerful automobiles isn't just a cliché. Car makers have lobbied hard – and with some success – against stricter

emissions limits, and they risk falling behind the global competition on battery technologies. Consumers are slow on the uptake of electric vehicles, which are still expensive and need frequent recharging. The government aims to put 1 million electric vehicles on German roads by 2020, but so far there are just around 19,000. Transport emissions have not decreased and in 2014 they again exceeded 1990 levels.

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#Security

International relations could turn on windmills



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The question of energy supply is vital to all modern economies. This is particularly true for Germany, which must import most of its fossil fuels. The Ukraine crisis has highlighted the risks of Germany's dependence on Russia, especially for imports of natural gas. But Germany's transition to a low-carbon future might shake up these relationships in the longer term,

with profound implications for foreign and security policy. If more countries sign up to cutting greenhouse gas emissions by reducing the use of fossil fuels to stop climate change, the consequences will reverberate around the world. Meanwhile, leadership in renewables technologies could become an important driver of future economic success and influence.

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A Reporter's Guide to the Energiewende (1st edition May 2015) A publication of the Clean Energy Wire, Smart Energy for Europe Platform (SEFEP) gGmbH, Rosenstr. 2, 10178 Berlin | **Responsible** Sven Egenter (Editor in Chief) | **Editing** Sören Amelang, Kerstine Appunn | **Contributor** Ruby Russell | **Design** Maren Rabe | **Pictures** Detlef Eden (Team) | **Print** Motiv Offset Druckerei, Berlin

Clean Energy Wire is a joint initiative of Stiftung Mercator and the European Climate Foundation

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