# A Reporter's Guide to the Energy Transition

#phasing out nuclear

# renewables share overtakes coal

0



### Clean Energy Wire | CLEW 2020





Correspondent





Julian Wettengel Correspondent



Freia Eriksen Correspondent



# A Note from CLEW

The global energy transition to stem harmful man-made climate change is gaining momentum. As part of this, Germany aims to be greenhouse gas neutral by 2050. The country's decades-long effort to fundamentally shift its energy supply and to run the world's fourth-largest economy without fuelling global warming provides valuable lessons on weaning a major economy off fossil fuels.

Clean Energy Wire | CLEW Anna-Louisa-Karsch-Str. Z 10178 Berlin, Germany Tel.: +49 30 700 1435 212 Email: info@cleanenergywire.org Twitter: @cleanenergywire @ClewNetwork The repercussions of the Energiewende (energy transition) are felt across society and the business sector, offering journalists a wealth of exciting and important stories. But researching this massive event from outside the country is no easy task, even for the most seasoned reporter. The huge complexity of the technology and economics behind energy policy make things harder. Yet strong fact-based and critical journalism is essential to inform the international debate on ways to decarbonise the global economy.

This is why Clean Energy Wire (CLEW) supports journalists in their work. Fully funded by two non-profit foundations - Stiftung Mercator and the European Climate Foundation - we enjoy independence from any business or political interests. Rather, we share our

funders' commitment to work towards a climate-neutral economy in order to limit the impact of man-made climate change.

CLEW's "A Reporter's Guide to the Energy Transition", now in its eighth edition, offers journalists a useful starting point by outlining the main story lines of the energy transition, providing contact details for experts, as well as links to key literature and articles.

Our website, cleanenergywire.org, offers lots more in-depth information and contacts. Our daily newsletter and our Twitter feed @cleanenergywire keep readers in the loop about Energiewende-related debates and events.

Our growing CLEW Journalism Network (@ClewNetwork) allows 200 journalists around the world to find colleagues work-









ing on energy transition and climate stories, to collaborate on cross-border stories, exchange tips and views or collect background information from other countries. We invite all reporters and editors with an interest in the energy transition and climate policy to join.

We also organise workshops for journalists, offering a first-hand account of the Energiewende. But, most importantly, we provide assistance, answer your questions, and put you in touch with experts and fellow journalists across the globe – so don't hesitate to ask CLEW.

Sven Egenter and the Clean Energy Wire team

# Our team of journalists and media professionals in Berlin is available to support journalists in their work.

	Energiewende history – the first four
	decades
	Power grid expansion20
	Transforming the transport sector 22
	The car industry and the energy
	transition24
	Renewables: Wind, solar and bio-
	energy
	$CO_2$ pricing and renewables support 28
	Nuclear phase-out
. 4	Industry and jobs 32
. 6	Start-ups and utilities34
. 7	Heating and efficiency
. 8	Finance
. 10	Society
. 11	Agriculture
. 12	Technology, storage and digitalisation 44
. 13	Natural gas as a bridging technology?46
. 14	Cities
. 16	Green Deal: A joint European project 50

## **Energiewende in Germany: Timeline**

1973-1975	1979/1980
"Nuclear power? No thanks!" Birth of Germany's anti-nuclear movement as protests force plans for a nuclear power plant in Wyhl to be aborted	Enter the Greens Germany's Green Party is founded, with an exit from nuclear energy and a renew- able future as key demands
	Activists first use the

# 🗉 Contents

# What is the Energiewende? And where did it come from?



The energy transition, known in Ger-**L** many as the Energiewende, is the country's planned transformation into a greenhouse gas-neutral, nuclear-free economy.

# The process involves:

- phasing out nuclear power by 2022 and coal by 2038; and reaching climate neutrality by 2050
- the phase-in of renewable energy and low-carbon technologies
- increased energy efficiency

Since the introduction of financial support for renewable energy in the 1990s, the Energiewende has been radically reshaping Germany's energy system as a whole. The traditional model of generating electricity in large power plants is being replaced by a system dominated by millions of renewable power installations dependent on the weather. But the project's influence now goes well beyond the electricity system, because creating a decarbonised economy also entails using renewable energy

Energiewende in Germany: Timeline	e in Germany: 1	Timeline
-----------------------------------	-----------------	----------

Energiewende in Germany: Timeline						
1986	1991	1997/2005	2000	2007	2010	2011
Chernobyl disaster solidifies Germans' resistance to nuclear energy Climate change enters the discourse – a magazine story leads parliament to establish an advisory council	Kick-starting renew- ables New legislation intro- duces feed-in tariffs for renewable power	<b>Kyoto Protocol</b> Germany, the world's sixth largest emitter at the time, has to reduce CO <sub>2</sub> emissions under the agreement	Renewable Energy Act Renewables granted feed-in tariffs and grid priority Nuclear phase-out #1 SPD-Green government and utilities agree to phase out nuclear by 2022	EU targets EU sets 2020 climate targets: 20% renew- ables share, 20% GHG reduction, 20% more efficiency	Extending nuclear The nuclear consensus is reversed by a conserva- tive government Energy concept Govt. sets out renewa- bles and climate targets for 2020 and 2050	Nuclear phase-out #2 Merkel government formulates new nuclear phase-out by 2022 with large parliamentary majority after Fukushi- ma disaster

to replace coal, oil, and gas wherever they are burned – be it in industry, heating, transport, or other sectors.

The transformation unleashed by the energy transition has already produced many winners and losers. Electricity costs have risen for most consumers, but have fallen for many energy-intensive companies, thanks to industry rebates. While traditional power companies have been hit hard and Germany's mighty car industry struggles to shift gears, many innovative businesses have turned the upheaval to their advantage. Since the energy transition turned into a truly global enterprise with the Paris Climate Agreement and the European Commission's Green Deal, new markets have opened up for low-emission technologies – and many made in Germany brands see opportunities for growth.

while traditional power companies have see opportunities for growth.						
2014	2015	2016	2017	2018	2019	2020
New EEG & climate action Govt. lowers feed-in tariffs, starts PV auctions and introduces plan to achieve 2020 climate targets	Slow progress The Energiewende monitoring report shows climate targets are "in serious danger"	Spin-off Utilities E.ON and RWE split to separate renew- ables from fossil plants Climate Action Plan Govt. adopts ambitious 2030 emission targets for individual economic sectors	Renewables Reform Auctions determine renewables payments G20 & COP23 Germany tries to main- tain climate leadership, but emis- sions stagnate	New government Wants to focus on grid expansion and sector coupling Utilities shakeup RWE and E.ON split up utility innogy, separating grids from generation	Climate action package Climate cabinet presents major policy package including national car- bon price Climate action law Germany's first climate law makes emissions reduction legally binding	exit law including timetable

# Targets of the Energiewende

Conversion and the second s

The overall objectives of the Energiewende are to phase out nuclear power and eliminate Germany's greenhouse gas emissions.

The nuclear exit is proceeding according to schedule and Germany will switch off its last nuclear power plant in 2022. Dealing with radioactive waste will, however, take many decades. As regards emissions reductions, the picture is more complex. Germany plans to cut CO<sub>2</sub> output by at least 55 percent by 2030 compared to 1990 levels. By 2050, the country aims for greenhouse gas neutrality, in line with the new EU goal. The government has translated the national targets into annual emissions budgets for individual sectors, such as transport and industry, to make progress more measurable.

The most important tools for reaching the targets are the roll-out of renewable energies, reducing energy consumption, and ending the use of fossil fuels in all sectors of the economy. Germany has already exceeded its 2020 target of covering 35 percent of power use with renewables, as their share rose to above 40 percent in 2019, and is now taking aim at 65 percent by 2030. However, renewables' share of total energy use, currently at around 17 percent, remains comparatively low.

Germany's first Climate Action Law made emissions reduction legally binding as part of a comprehensive climate action package that forms the bedrock of Germany's long-term policy. The strategy includes a coal exit by 2038 at the latest, support for electric vehicles, and a CO<sub>2</sub> price for transport and heating to complement the EU emissions trading system covering industry and the power sector.

Progress toward the climate targets was initially slow. Emissions remained stubbornly high for years, suggesting the Sector targets for greenhouse gas reductions

Sector	2019 status cut from 1990 levels	2030 target cut from 1990 levels	
Energy	45.5%	62.5%	
Buildings	41.9%	66.7%	
Transport	0.6%	42 %	-
Industry	33.8%	50.7%	
Agriculture	24.4%	35.6%	
Other	76.3%	86.5%	
Total	35.7%	"at least" 55%	

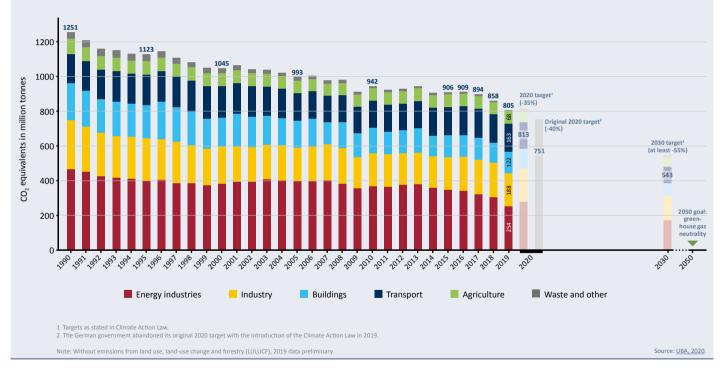
Source: UBA (2020), Climate Action Law.

country would miss its original 2020 target of cutting emissions by 40 percent by a wide margin, and threatening the entire project's credibility. But significant reductions in 2018 and 2019 pushed the country closer to the target than expected – and an economic slump caused by the coronavirus now makes it look extremely likely that Germany will meet the 2020 goal.

The country is still struggling to cut emissions in the transport and heating sectors, however, and is facing a slow-down in the roll-out of renewable energy. These trends indicate that it will require continued efforts to meet Germany's future climate targets, even in the event of a severe recession caused by the coronavirus pandemic and consequent steep drop in emissions.

35.7% greenhouse gas reduction since 1990

Emission trends for Germany by sector 1990-2019



7

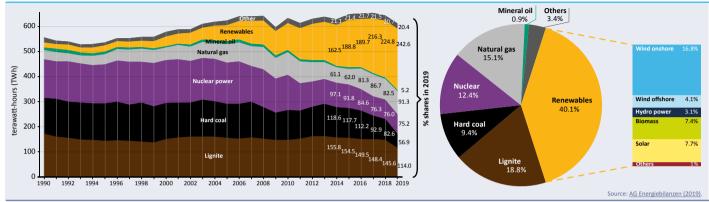


© Mwelwa Musonko.

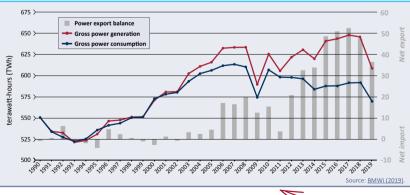
The Energiewende in Figures							
			€ 62 billion Volume of German government's climate package (2020-2023)	€25 per tonne CO <sub>2</sub> price in building and transport sector starting from 2021			
3.6% Renewables' share							
in gross German power generation in 1990 40.1% Renewables' share in gross power generation in 2019*	<b>47.7 million</b> passenger cars registered in Germany (01/2020)	<b><u>136.617</u></b> pure electric cars registered = 0.3% (01/2020)	<b>1<sup>st</sup> rank</b> for Germany in energy efficiency policy and performance score- card (ACEEE, 2018)	<b><u>17<sup>th</sup> rank</u></b> for Germany in the overall "Energy Transition Index" (WEF, 2019)			
14 minutes							
Average power outage in Germany 2018 USA: 470 mins (2017) GB: 47 mins (2016) Poland: 192 mins (2016)	89% of Germans believe increased use and expansion of renewables is very impor- tant or important (2019)	<b>€ 22.9 billion</b> Renew- able surcharge paid by power consumers in 2019	<b>316,700</b> people employed in the renewables sector (2017)	20,336 people employed in the lignite industry (12/2019)			
				- • • •			
<b>15%</b> Renewables' share in primary energy con- sumption in 2019 (up from 1.3% in 1990)	<b>42%</b> Renewables' share in gross power consump- tion in 2019 (up from 3.4% in 1990)	73.8% of homes heated with oil and gas in 2019	€ 17 billion Energy effi- ciency and renewable heat- ing investments by economy ministry (2020-2024)	<b>23.7 31.4 ct/kWh</b> Average household power price 2010 and 2020 – thereof 6.8 ct/kWh renew- able surcharge in 2020			
<b>96%</b> of natural gas used in Germany is imported (2018)	97% of crude oil is imported (2018)	54% rise in GDP since 1990 (2019)	14% fall in primary energy consumption since 1990 (2019)	5.1 > 3.7 ct/kWh Average electricity spot market price in 2010 and 2019			

# renewables share has overtaken coal 🔨

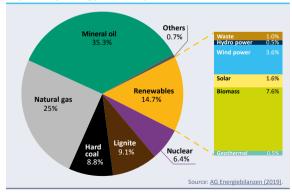
Development of gross power production in Germany 1990-2019



# Germany's power export balance 1990-2019



# Share of energy sources in primary energy consumption 2019



Germany remains net electricity exporter

# Energiewende Dates 2020/2021\*

# 2020

**20-21 April:** Global Solutions Summit, BERLIN. ONLINE

**27 – 28 April:** 11<sup>th</sup> Petersberg Climate Dialogue, BERLIN. ONLINE

**4-6 May:** Berliner Energietage 2020, BERLIN. MOVED TO SUMMER – ONLINE

17-18 June: BDEW Kongress, energy conference by German Association of Energy and Water Industries (BDEW), BERLIN.

**17 – 19 June:** Intersolar Europe, trade fair, MUNICH. CANCELLED

13 - 15 September: EU-China Summit, LEIPZIG.

**28 September:** European Sustainable Finance Summit, FRANKFURT.

\* Many events may yet be cancelled due to the coronavirus.

9 – 19 November: 2020 UN Climate Change Conference (COP26), Glasgow, UK. POSTPONED

**16 – 17 November:** dena Kongress, conference by German Energy Agency (dena), BERLIN.

# 2021

13 – 15 January: Handelsblatt Energy Conference 2021, BERLIN.

9 - 11 February: E-World energy & water trade fair, ESSEN.

**14 March:** State elections in Rhineland-Palatinate and Baden-Württemberg.

6 June: State elections in Saxony-Anhalt.



# Contacts

# ... for official statements

Federal Ministry for Economic Affairs and Energy (BMWi), +49 30 18 615 6121, pressestelle@bmwi.bund.de, www.bmwi.de/en

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), +49 30 18 305 2010, presse@bmu.bund.de, www.bmu.bund.de/en

Federal Ministry of Transport and Digital Infrastructure (BMVI), +49 30 18300-7200, www.bmvi.de/en, neuigkeitenzimmer@bmvi-bund.de

Federal Ministry of the Interior, Building and Community, +49 30 18681 11022, presse@bmi.bund.de

# ... for latest data and research

Agora Verkehrswende, Think tank focusing on the energy transition in the transport sector. +49 30 700 1435-000, info@agoraverkehrswende.de, www.agora-verkehrswende.de

AG Energiebilanzen, Energy market research group. +49 30 8913987, www.ag-energiebilanzen.de, h.g.buttermann@ag-energiebilanzen.de

# Institute for Applied Ecology (Öko-Institut),

Sustainable development consultancy and research institute. +49 30 405085-334, m.schossig@oeko.de, www.oeko.de/en

Agora Energiewende, think tank focusing on dialogue with energy policymakers in the power sector. +49 30 700 1435-110, christoph.podewils@agora-energiewende.de, www.agora-energiewende.de

German Institute for Economic Research (DIW), DIW's energy, transportation and environment, and climate policy departments study the economics and politics of climate change and energy. Petra Jasper, +49 30 89789-152, pjasper@diw.de, www.diw.de/en

Fraunhofer ISE, solar energy research institute and publisher of electricity production data. Also see their data and graphs at www.energy-charts.de, +49 761 4588-5147, www.ise.fraunhofer.de

German Renewable Energies Agency (AEE) +49 30 200 535 52, a.schwalbe@unendlichviel-energie.de, www.unendlich-viel-energie.de

# ... for industry comment

German Association of Energy and Water Industries (BDEW), Germany's largest energy industry association. +49 30 300 199-1160, presse@bdew.de, www.bdew.de

German Association of Local Utilities (VKU), representing the many local and regional utilities (Stadtwerke) in Germany. +49 30 58580-226, luig@vku.de, www.vku.de/en

Federation of German Industries (BDI) +49 30 2028-1565, j.wiskow@bdi.eu, www.bdi.eu

German Renewable Energy Federation (BEE) +49 30 275 81 70-16, presse@bee-ev.de, www.bee-ev.de



... for a list of over 250 experts and institutions with insights into the Energiewende see: WWW.cleanenergyWire.org | experts or find energy transition hotspots on the <u>CLEW Research Map</u>

# Reading in English

**cleanenergywire.org** Our website provides in-depth analyses (dossiers), factsheets, news articles, an expert database, and more.

Agora Energiewende (2020) The German Power Market: State of Affairs in 2019; (2020) The European Power Sector in 2019; (2013) 12 Insights on Germany's Energiewende.

**International Energy Agency (2020)** Germany 2020: Energy Policy Review.

**Agora Verkehrswende (2017)** Transforming Transport to Ensure Tomorrow's Mobility.

The Federal Ministry for Economic Affairs and Energy (BMWi) website offers a wide range of publications in English, including the newsletter 'Energiewende direkt'.

Federal Ministry for the Environment (BMU) (2019) Federal Climate Change Act; (2019) Climate Action in Figures. Facts, Trends and Incentives for German Climate Policy; (2016) Climate Action Plan 2050.

energytransition.org A website/blog, funded by the Green Party-affiliated Heinrich Böll Foundation, explaining what the energy transition is, how it works, and what challenges lie ahead. Federal Foreign Office (2018) The German Energiewende; (2019) Who is Who of the Energiewende in Germany. Online database of contact partners in politics, industry and society.

Federal Environment Agency (UBA) (2017) Data on the Environment.

Hager, Carol and Christoph H. Stefes (eds.) (2016) Germany's Energy Transition. A Comparative Perspective.

**Ecologic Institute** (2020) Climate laws in Europe; (2016) Understanding the Energy Transition in Germany.

**Energy Research and Social Science** (2016) Putting an energy system transformation into practice: The case of the German Energiewende.

German Institute for Economic Research (2015) Deep Decarbonisation in Germany. A Macro-Analysis of the Economic and Political Challenges of the 'Energiewende'.



AG Energiebilanzen (2019) Evaluation Tables of the Energy Balance for Germany 1990 to 2018.

Federation of German Industries (BDI) (2018) Climate Paths for Germany – Executive Summary.

**Centre on Regulation in Europe** (2015) The energy transition in Europe: initial lessons from Germany, the UK and France.

World Economic Forum (2019) Fostering Effective Energy Transition.

**#**Climate and CO<sub>2</sub> **#**Fossil Fuels

# Green pioneer Germany adds carbon price and coal exit to climate policy push





Thanks to its early embracing of renewable energy, Germany is considered a pioneer in the fight against man-made climate change. Despite a rapid rise in power generation from wind, solar, and bioenergy, the country's track record on cutting greenhouse gas emissions is, however, mixed. Germany expected to miss its original 2020 climate target and instead presented a longer-term strategy to reach the country's 2030 goals and achieve climate neutrality by 2050. Ironically, the impacts of the coronavirus mean the country is almost certain to reach the 2020 target after all. Germany has decided to cut its reliance on burning coal for power production by 2038 at the

© RWE AG

# **2** Contacts

Fraunhofer ISE, +49 761 4588-5147, karin.schneider@ise.fraunhofer.de

IKEM – Institute for Climate Protection and Mobility +49 30 408187-024, dominik.dicken@ikem.de

The Potsdam Institute for Climate Impact Research (PIK) +49 331 288 25 07, press@pik-potsdam.de

Camilla Bausch, Ecologic Institute +49 30 86880-0, berlin@ecologic.eu

Corinna Seide, WWF Germany +49 30 311777-422, corinna.seide@wwf.de

Germanwatch +49 228 60492-23, presse@germanwatch.org

very latest, is about to introduce a price on carbon to clean up transport and heating, and has started to devise a strategy to wean industry off fossil fuels. But a slow-down in the renewables roll-out and recurring squabbles over policy suggest it will be a bumpy ride to turn Germany's climate ambition into practice over the long run. Mercator Research Institute on Global Commons and Climate Change (MCC) +49 30 3385537-201, lampe@mcc-berlin.net

Climate Alliance Germany, +49 30 780 899 -514, julia.dittmann@klima-allianz.de

Stiftung 2° +49 30 204 537 34, laura.toerkel@2grad.org

Patrick Graichen, Agora Energiewende +49 30 700 1435-110, christoph.podewils@agora-energiewende.de

Claudia Kemfert, German Institute for Economic Research (DIW) +49 30 89789-663, sekretariat-evu@diw.de

# Reading

IEA (2020) Energy Policy Review Germany

Agora Energiewende (2017) The Energiewende in a nutshell

Agora Energiewende (2019) European Energy Transition 2030: The Big Picture

Agora Energiewende (2014) The German Energiewende and its Climate Paradox

Fraunhofer ISE (2020) Energy Charts

Federal Ministry for the Environment (BMU) (2019) Climate Action in Figures

**Germanwatch / Climate Action Network (2019)** The Climate Change Performance Index 2020

# • On cleanenergywire.org

### Dossiers:

Europe's largest economy aims to exit coal to reach climate goals

Germany's targets under scrutiny in year of global climate action

### Article:

Transport and heating tarnish Germany's emission cuts in 2019 – researchers

### Factsheets:

Germany's greenhouse gas emissions and climate targets

Germany's Climate Action Law

Germany's Climate Action Programme 2030

Germany's carbon pricing system for transport and buildings

Spelling out the coal exit - Germany's phase-out plan

"Now it's perfectly clear: all sectors are well advised to prepare in time for the post-fossil age."

Svenja Schulze, Environment Minister (SPD party) 15

# #Coal

# Hard-fought coal exit to set economy on course for climate neutrality



© RWE AG.

#Coal

"The planned phase-out roadmap will probably be up for debate after the next election." ts Patrick Graichen, head of energy policy nan Association of Energy and Water think tank Agora Energiewende

# Contacts

BDEW – German Association of Energy and Water Industries, +49 30 300 199 1160, presse@bdew.de

DEBRIV – Federal German Association for Brown Coal, +49 30 315 182 -22, uwe.maassen@ braunkohle.de

Institute for Applied Ecology (Öko-Institut) +49 30 405085-334, m.schossig@oeko.de

**BMWi – Federal Ministry for Economic Affairs** and Energy, +49 30 18 615 6121 and -6131, pressestelle@bmwi.bund.de

Barbara Praetorius, co-chair of coal exit commission. +49 30 5019-2532. barbara.praetorius@htw-berlin.de

# Reading

German government (2020) Draft Law for Reducing and Ending Coal-Fired Power Production (in German)

Commission on Growth. Structural Change and Employment (2019) Final report (in German)

Ecologic et al. (2019) Phasing out coal in the German energy sector

Agora Energiewende (2019) The German Coal Compromise and its Significance for the Energy Industry

Aurora Energy Research (2019) Coal exit auctions: Design options, opportunity costs and clearing prices for Germany's hard coal phase-out

out plan that includes billions of euros in support payments for coal regions and compensation for plant operators. However, it is uncertain whether the plan, which was announced in early 2020, will put the country's coal debate to a rest. Many of the former commission members are not satisfied with

the government's planning, arguing that it postpones plant closures to the latest possible date and lacks provisions for ensuring that decommissioned coal power capacity is substituted with the renewable energy sources needed as the bedrock of a climateneutral economy.

German Institute for Economic Research – DIW (2019) Whole-of-Government Strategies on Coal Transition in Major Coal Using Countries

WWF Germany (2020) Just transition to climate neutrality - doing right by the regions

International Energy Agency (2020) - Energy Policy **Review Germany 2020** 

# On cleanenergywire.org

### Dossiers:

Germany's coal phase-out

Climate cabinet to put Germany back on track for 2030 targets

### Articles:

German government adopts coal exit, fixes hard coal compensation

"Historic compromise" or "pact of unreason"? media reactions to Germany's coal exit deal

Former coal commission members say German government breached landmark exit compromise

### Factsheets:

Spelling out the coal exit - Germany's phase-out plan

German commission proposes coal exit by 2038

Germany's three lignite mining regions

#Energiewende #History

# Energiewende – the first four decades



© Bündnis 90 / Die Grünen Baden-Württemberg.

transition in Germany began with Chancellor Angela Merkel's decision to phase out nuclear power, following the accident at the Fukushima nuclear plant in Japan in 2011. But the societal project started decades before, in the 1970s. A long process, deeply rooted in German history and society, led to policies that boosted renewable energy in Germany, which are now at the heart of the move to a climate-neutral economy. The Energiewende – a full-scale transformation

# **P** Contacts

Institute for Applied Ecology (Öko-Institut) +49 30 405085-334, m.schossig@oeko.de

Heinrich Böll Foundation +49 30 285 34 217, lorenz@boell.de

Green Party +49 30 284 42 130, presse@gruene.de

Friends of the Earth Germany (BUND) +49 30 27586 425, sigrid.wolff@bund.net

Greenpeace Germany +49 40 306 18 340, presse@greenpeace.de

Nina Scheer, Social Democratic Party MP +49 30 227 73538, nina.scheer@bundestag.de

# Reading

energytransition.de Timeline Energiewende

Carbon Brief (2016) The history of the Energiewende

"The renewable energy act sparked a real grassroots citizens' movement. Germans turned the Energiewende into their own project." <sub>Nina Scheer, Social Democratic Party MP</sub>

of society and the economy – arose out of enduring grassroots movements, evidence-based discourse, concern about climate change, and key technological advances, as well as hands-on experience garnered along the way in Germany and elsewhere.

# 🗉 👦 On cleanenergywire.org

Dossier:The history of the Energiewende

Factsheets: Milestones of the German Energiewende The history behind Germany's nuclear phase-out



# #Grid

# Energiewende's success hinges on unblocking the power grid

Germany must update its electricity network to handle the fluctuating supply of power from decentralised sources, while pursuing the shift to a renewable energy system. The rapid expansion of wind power capacity in the north has supplied bountiful low-cost electricity there. But too much power can be as big a problem for the stability of the grid as too little. Bottlenecks on the network currently cause stabilisation procedures costing Germany more than a billion euros per year. Public protests against building the power lines which will carry electricity to Germany's industrial

© [Freja Eriksen] CLEW.



Federal Network Agency (Bundesnetzagentur) +49 228 14 9921, pressestelle@bnetza.de

Andreas Jahn, Regulatory Assistance Project (RAP) +49 30 700 1435 421, ajahn@raponline.org

Oliver Brückl, OTH Regensburg +49 941 943-9881, oliver.brueckl@oth-regensburg.de

# Institute of Energy Economics at the University of Cologne (EWI) +49 221 277 29-108, claudia.pichonnier@ewi.uni-koeln.de

50Hertz Transmission (grid operator) +49 30 5150-2878, volker.gustedt@50hertz.com

TenneT (grid operator) +49 921 50740 4045, ulrike.hoerchens@tennet.eu

### Amprion (grid operator)

+49 231 5849-13785, and reas. preuss@amprion.net

south mean grid expansion is lagging behind schedule. In 2019, parliament passed an 'acceleration law' to ensure that the necessary lines are completed swiftly, and agreed with states that long stretches should be placed underground to increase public acceptance. TransnetBW (grid operator) +49 711 21858-3155 r.koenig@transnetbw.de

Chambers of Commerce and Industry (DIHK) +49 30 20308-1607, renner.thomas@dihk.de

# **B** Reading

Federal Network Agency (Bundesnetzagentur) (2018) Annual Report 2018: 20 years of responsibility for networks

Federal Ministry for Economic Affairs and Energy (BMWi) (2020) An electricity grid for the energy transition

German Institute for Economic Research (DIW) (2015) Electricity grids and climate targets: New approaches to grid planning

Pentalateral Energy Forum (2018) Second regional generation adequacy assessment report

German TSOs Grid development plan – power

# On cleanenergywire.org

#### Dossier:

The energy transition and Germany's power grid

### Article:

German parliament passes law on faster grid expansion to ensure renewables growth

### Factsheets:

Set-up and challenges of Germany's power grid Interconnectors & blockages – German grid at odds with EU power market

Setting the power price: The merit order effect

Re-dispatch costs in the German power grid

Germany's electricity grid stable amid energy transition

Power grid fees - unfair and opaque?

How can Germany keep the lights on in a renewable energy future?

Volatile but predictable: Forecasting renewable power generation

Germany's renewable generation peaks remain shrouded in data fog

"Grid expansion remains the Energiewende's main challenge." Jochen Homann, head of Federal Network Agency (BNetzA)

# #Transport

# Car giant Germany struggles to spark Energiewende in transport



edging that the shift to a sustain-

able transport system will involve

a crucial step in the country's quest for a low-carbon economy, resulting in stubbornly high sector emissions. But

© [Wolfgang Klee] Deutsche Bahn AG.

"Decarbonisation isn't happening anywhere in the sector. Measures are expensive and interfere with our daily life. Thus, it just hasn't been pushed by either politicians or industry." Peter Kasten, Institute for Applied Ecology

# Contacts

Urs Maier, Agora Verkehrswende +49 30 700 1435-302, urs.maier@agora-verkehrswende.de

Andreas Knie, Berlin Social Science Center (WZB) +49 30 25491-588, andreas.knie@wzb.eu

Peter Kasten, Institute for Applied Ecology (Öko-Institut) +49 30 405085 349, p.kasten@oeko.de

Oliver Lah, Wuppertal Institute for Climate, Environment and Energy +49 30 2887458-16, oliver.lah@wupperinst.org

Werner Reh, Friends of the Earth Germany (BUND) +49 176 45719292, w.reh@bund.net

Federal Ministry of Transport and Digital Infrastructure (BMVI), +49 30 183 00-7200, neuigkeitenzimmer@bmvi.bund.de

Deutsche Umwelthilfe (DUH) +49 30 2400867-20, presse@duh.de

# **B** Reading

**Agora Verkehrswende (2019)** Implications of the Paris Agreement for the German transport sector

**Agora Verkehrswende** (2017) Transforming Transport to Ensure Tomorrow's Mobility – 12 Insights

Transport & Environment (2019) Less is more: how to go from new to sustainable mobility

Federal Ministry of Transport and Digital Infrastructure (BMVI) The future of mobility is electric

Arthur D Little (2018) The Future of Mobility

McKinsey (2016) Urban Mobility 2030: Berlin

# On cleanenergywire.org

#### Dossiers:

The energy transition and Germany's transport sector How Germany is greening its growing freight sector to meet climate targets

### Article:

Renewable fuels will not solve aviation's climate dilemma – industry experts

#### Factsheets:

Rail cargo emissions in Germany

"Dieselgate" – a timeline of Germany's car emissions fraud scandal

much more than replacing conventional cars with electric models. In a slow rethink of decades' worth of car-centred policy, there is a new emphasis on sharing concepts, public transport, cycling and walking, as tentative discussions about phasing out conventional cars are gaining ground. Policymakers have also started to make proposals on how aviation and shipping could eventually become more climate-friendly.

# #Cars

# BMW, Daimler, and VW vow to fight in green transport revolution



In Germany, the birthplace of the automobile, three iconic carmakers – BMW, Daimler, and Volkswagen – are facing the greatest challenge in their history: the mobility revolution that is turning the transport system green. Tarnished by the dieselgate scandal and facing new and powerful competitors in Google, Tesla, Apple, and Uber, the future of Germany's horsepower-proud carmakers is more uncertain than ever, especially in this age of decarbonisa-

© BMW Group

# **Q** Contacts

Kerstin Meyer, Agora Verkehrswende +49 30 700 1435-303, kerstin.meyer@agora-verkehrswende.de

Ferdinand Dudenhöffer, Center Automotive Research, University of Duisburg-Essen +49 203 379-1111, ferdinand.dudenhoeffer@uni-due.de

Stefan Bratzel, Center of Automotive Management (CAM), University of Applied Sciences Bergisch Gladbach, +49 22 02 2 85 77-0, stefan.bratzel@auto-institut.de

Peter Mock, The International Council on Clean Transportation (ICCT) +49 30 847 129-102, peter@theicct.org

Nicolai Müller, McKinsey&Company +49 211 136-4516, martin\_hattrup-silberberg@mckinsey.com

Wolfgang Bernhart, Roland Berger +49 711 3275-7421, wolfgang.bernhart@rolandberger.com

tion, self-driving vehicles, and carsharing. The carmakers have lobbied hard – and with some success – against stricter European emissions limits, and have fallen behind in the global clean mobility competition. But spearheaded by Federal Motor Transport Authority (KBA) +49 461 316-1293, pressestelle@kba.de

German Association of the Automotive Industry (VDA) +49 30 897842-124, nikolaus.doll@vda.de

Henning Kagermann, National Platform for Electric Mobility +49 30 2063096-86, huss@acatech.de

BMW Group +49 89 382-72652, wieland.bruch@bmw.de

Daimler +49 151 586 282 85, madeleine.herdlitschka@daimler.com

Volkswagen +49 5361 9-77639, tim.fronzek@volkswagen.de

# **B** Reading

Transport & Environment (2019) How carmakers can reach their 2021 CO, targets

Institute for Applied Ecology (2018) Electromobility – Fact check

VW, all three firms have now launched ambitious plans to expand their e-mobility offerings, and experts say it is far too early to write off these automotive powerhouses in the global race to the future of mobility. Alix Partners (2019) Global Automotive Outlook

McKinsey&Company (2019) Mastering new mobility

Roland Berger (2020) The car will become a computer on wheels

# • On cleanenergywire.org

#### Dossier:

BMW, Daimler and VW vow to fight in green transport revolution

#### Articles:

Anxious carmakers forced to tread 'arduous' path to e-mobility in 2020

Carmakers highlight climate ambitions at auto show in response to protest wave

#### Factsheets:

Reluctant Daimler shifts gear in race to sustainable mobility

Early e-car starter BMW has lost ground in clean mobility race

Huge EV bet could turn diesel pariah VW into "game-changing" pioneer

"Dieselgate" – a timeline of Germany's car emissions fraud scandal

#Cars

#Renewables #Wind #Solar #Bioenergy

# Renewables growth way ahead of schedule but slump in wind power spells trouble



The share of wind power, solar power and other renewable energy sources has been growing much quicker than planned in Germany and stood at over 40 percent of gross power production in 2019. Since the launch of support payments in the country's Renewable Energy Act in 2000, renewables have risen from a niche technology to become the dominant player in the power mix. On some days, they already cover about three quarters of the electricity demand of Europe's largest economy. The country's solar power industry had to cope with fierce price competition from Asia and only regained its busi-

© RWE AG.

"Policymakers need to support the energy industry to make sure that the success we've had so far is not short-lived (...) Otherwise the goal of reaching a share of 65 percent renewables in power consumption by 2030 cannot be achieved."

Kerstin Andreae, head of the German Association of Energy and Water Industries

German Renewable Energy Federation (BEE) +49 30 275 8170 16, presse@bee-ev.de

German Wind Energy Association (BWE) +49 30 212341-210, presse@wind-energie.de

Federal Association for Bioenergy +49 228 81 002 58, info@bioenergie.de

German Solar Industry Association (BSW) +49 30 29 777 88-30, francke@bsw-solar.de

Volker Quaschning, University of Applied Sciences Berlin, +49 30 5019-3656, volker.quaschning@htw-berlin.de Federal Ministry for Economic Affairs and Energy (BMWi), +49 30 18615 6133, philipp.jornitz@bmwi.bund.de

Renewable Energy Research Association +49 30 288 7565-72, fvee@helmholtz-berlin.de

Fraunhofer Institute for Systems and Innovation Research (ISI), +49 721 6809-100, anne-catherine.jung@isi.fraunhofer.de

Citizens' Energy Alliance (BBEn), +49 30 30 88 17 89, presse@buendnis-buergerenergie.de

ness confidence in the past two years. Meanwhile, Germany's most important renewable power source - onshore wind - faces a severe slump in expansion after years of remarkable growth due to licensing hurdles and quarrels over minimum distances for turbines near residential areas. The government aims to bring the share of renewables in power consumption to 65 percent by 2030, but renewable energy companies, as well as other industry actors and environmental groups in the country, fear that this goal might become hard to attain if the nosedive of wind power is not stopped soon.

# **B** Reading

Federal Ministry for Economic Affairs and Energy (BMWi) (2019) Renewable Energy Sources in Figures: National and International Development, 2018

International Renewable Energy Association (IRENA) (2019) Renewable Energy Auctions – Status and Trends Beyond Price

Fraunhofer Institute for Solar Energy Systems (ISE) (2018) Recent Facts about Photovoltaics in Germany

German Wind Energy Association (BWE) Year Book Wind Power 2018

Frankfurt School of Finance / UN Environment Programme (2019) Global Trends in Renewable Energy Investment 2019

# 🖅 On cleanenergywire.org

### Dossiers:

Bioenergy – the troubled pillar of the Energiewende Onshore wind power in Germany Offshore wind power in Germany Solar power in Germany

### Factsheets:

Solar power in Germany Bioenergy in Germany Onshore wind power in Germany Offshore wind power in Germany

© [Bergmann] Bundesregierung.

28

# #Cost&Prices #EEG/Law

# National carbon price heralds reshuffling of entire energy pricing system

# Kiimaschutzprogramm 2030





Gimaschutzprogramm 2030

C ince 1990, Germany has made visible

Oprogress in bringing down greenhouse

gas emissions in the power sector. How-

sectors of the economy have been much

ever, its achievements in other major

more modest. That's why in 2019 the

government took the momentous de-







cision to introduce a price on CO<sub>2</sub> emis-

emissions trading system (ETS), namely

transport and heating. The carbon price

will take effect from 2021, and gradually

increase the costs of using oil, gas or

sions accruing in sectors that are not

vet subject to the European Union's



















































































# **D** Contacts

Matthias Kalkuhl, Mercator Research Institute on Global Commons and Climate Change, +49 30 33 85 537-243, kalkuhl@mcc-berlin.net

Christoph M. Schmidt, RWI – Leibniz Institute for Economics, +49 201 8149-227, praesident@rwi-essen.de

Linus Herzig, Germanwatch, +49 30 28 88 356 -93, herzig@germanwatch.org

Jobst-Hinrich Wiskow, Federation of German Industries – BDI, +49 30 20 281-565, j.wiskow@bdi.eu

Clearingstelle EEG / KWKG, +49 30 206 14 16-0, post@clearingstelle-eeg-kwkg.de

# Reading

Federal Government of Germany (2019) Climate Action Programme 2030 of the German government to implement the Climate Action Plan 2050 (in German)

International Emissions Trading Association (2019) The economic potential of article 6 of the Paris Agreement and implementation challenges

Ottmar Edenhfoer et al. (2018) A framework for assessing the performance of cap-and-trade systems: Insights from the European Union emissions trading system

Potsdam Institute for Climate Impact Research – PIK (2019) Options for a carbon pricing reform

Federal Environment Agency – UBA Greenhouse-Gas-Neutrality in Germany until 2050 "We currently fund the transformation of our energy supply only with a surcharge on the power price. This cannot go on. Our target has to be to make fossil energy sources pay for it much more in all sectors." Svenja Schulze, Environment Minister (SPD party)

# On cleanenergywire.org

#### Dossiers:

Climate cabinet to put Germany back on track for 2030 targets

The reform of the Renewable Energy Act

### Factsheets:

Germany's carbon pricing system for transport and buildings

Germany ponders how to finance renewables expansion in the future

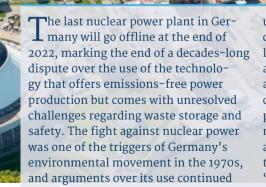
20 years on – German renewables pioneers face end of guaranteed payment

Defining features of the Renewable Energy Act (EEG)

coal for driving cars and heating homes. While critics have said the starting price of 25 euros per tonne of CO<sub>2</sub> is too low to trigger meaningful effects, the government argues a slow start helps people adapt to higher prices and, moreover, will also be followed by a deeper restructuring of energy pricing systems, whereby electricity becomes cheaper. Funding the expansion of renewables, currently done with auctioned feed-in tariffs under the German Renewable Energy Act (EEG), could ultimately be aided by the proceeds from the carbon price.

# #Nuclear phase-out

# Managing the nuclear legacy – a project into the next century



until 2011, when the Fukushima nuclear disaster in Japan led Chancellor Angela Merkel's government to implement a phase-out plan already agreed on a decade earlier by the Social Democratic-Green government and initially postponed by Merkel. While some proponents of nuclear power today endorse it as an effective tool for climate action, the broader society still widely rejects 'Atomkraft' and no former nuclear plant

© [Daniel Meier-Gerber] EnBW.

# Contacts

# Wolfgang Irrek, Ruhr West University of Applied Sciences

+49 208 88254-838, wolfgang.irrek@hs-ruhrwest.de

Energiewerke Nord GmbH (EWN) +49 38354 4-8030, marlies.philipp@ewn-gmbh.de

Federal Office for Radiation Protection (BfS) +49 30 18 333-11 30, presse@bfs.de

Becker Büttner Held energy law firm (BBH) +49 30 611 28 40-179, ines.zenke@bbh-online.de

Green Budget Germany (FÖS) +49 30 7623991-41, andrea.woerle@foes.de

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) +49 30 18 305-2010, presse@bmu.bund.de

operator in Germany has any intention to seek a resumption, not least due to the technology's high generation costs. As of 2019, nuclear plants still contributed over 12 percent to Germany's power mix, but the government says decommissioning the remaining facilities will not threaten power supply as nuclear capacity will be replaced by renewables, gas plants, and power imports from neighbour countries. Forschungszentrum Jülich +49 2461 61-2388, a.stettien@fz-juelich.de

German Institute for Economic Research (DIW) +49 30 89789-152, pjasper@diw.de

# Reading

Heinrich Böll Stiftung (2019) The world nuclear waste report 2019 – Focus Europe

German Institute for Economic Research (DIW) (2019) High-priced and dangerous: Nuclear power is not an option for the climate-friendly energy mix

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) (2020) Nuclear Safety: An information portal of the Federal government and the Länder

Federal Office for Radiation Protection (BfS) Online information on nuclear safety and nuclear waste management

Brunnengräber et. al. (2015) Nuclear Waste Governance – An International Comparison

**BBH** (2014) Financial provisions in the nuclear sector – Possible risks of the status quo and options for reform (in German) BMWi / Warth & Klein Grant Thornton (2015) Evaluation of nuclear clean-up provisions (in German)

Wuppertal Institute for Climate, Environment and Energy (2007) Comparison of Different Decommissioning Fund Methodologies for Nuclear Installations

# 🗉 👦 On cleanenergywire.org

### Dossier:

The challenges of Germany's nuclear phase-out

# Articles:

Germany's env min and plant operators dismiss call for nuclear lifetime extensions

German utilities buy out of nuclear waste liability for 23.6 bln euros

Germany's constitutional court backs speedy nuclear exit

### Factsheets:

The history behind Germany's nuclear phase-out What to do with the nuclear waste Nuclear clean-up costs Securing utility payments for the nuclear clean-up Legal disputes over the nuclear phase-out

"Nuclear energy is economically dead (...) why should I build nuclear power stations, which carry an inherent risk, if I can already harvest the sun's energy for less than half the price today?" Rolf Martin Schmitz, CEO of energy company RWE 31 #Industry #Jobs

# German industry embraces transformation challenge



© Salzgitter AG.

# Contacts

Ulrike Lehr. Institute of Economic Structures Research (GWS) +49 541 40933-280, lehr@gws-os.com

German Institute for Economic Research (DIW) +49 30 89789-152. piasper@diw.de

Sebastian Bolay. Chambers of Commerce and Industry (DIHK) +49 30 20308-2202. bolay.sebastian@dihk.de

Federation of German Industries (BDI) +49 30 2028 1565, j.wiskow@bdi.eu

Institute for the Study of Labour (IZA) +49 228 3894 223. fallak@iza.org

Institute for Employment Research (IAB) +49 911 179-1946, wolfgang.braun@iab.de

Institute for Economic Research (Ifo) +49 89 9224-1218. schultz@ifo.de

Institute for Futures Studies and Technology Assessment (IZT) +49 30 80 30 88-45, b.debus@izt.de

the Energiewende, but by harnessing its innovative momentum. This includes industries hardly involved yet, such as steelmaking, chemicals, and cement, which have all tabled proposals as to how they could become climate neutral, given the right government support.

German Industry Initiative for Energy Efficiency (DENEFF) +49 30 364 097-01, christian.noll@deneff.org

Kirsten Best-Werbunat, McKinsey & Company +49 211 136-4688, kirsten best@mckinsey.com

Frank Peter, Agora Energiewende +49 30 700 1435-123. frank.peter@agora-energiewende.de

Achim Wambach, President of the Mannheim Centre for European Economic Research (ZEW) +49 621 1235-100, achim.wambach@zew.de

# **B** Reading

Federation of German Industries BDI (2018) Climate paths for Germany

German Energy Agency (2018) Integrated Energy Transition

Energy Systems of the Future (2018) Coupling the different energy sectors – options for the next phase of the energy transition

Agora Energiewende (2019) Climate-Neutral Industry

BMWi (2019) Macroeconomic effects and distributional issues of the energy transition

# • On cleanenergywire.org

### Dossiers:

The energy transition's effect on the economy Industry bets on gas as last trump card in Energiewende

### Articles:

German industry needs policy trigger for deep emission cuts

Can Salzgitter cut Germany's CO, emissions with low-carbon steel project?

Germany must beat Asia in hydrogen technology race - government

Energy-intensive industry must jump-start low-CO<sub>2</sub> technologies to reach climate targets - study

#### Factsheets:

Industry power prices in Germany: Extremely high – and low

What business thinks of the energy transition Siemens: a case study in Energiewende industry upheaval

Where the Energiewende creates jobs How much does Germany's energy transition cost?

Studies by the BMWi (2020) on the energy tran-sition and its impact on investment, growth and jobs United Nations Environment Programme (2019) Global Trends in Renewable Energy Investment 2019 Achim Wambach, President of the Centre for European Economic Research (ZEW)

# #Start-ups #Utilities

# Energiewende start-ups – cutting emissions as a business model



Policy has a crucial role to play in the shift to a low-carbon future, but ultimately it is businesses that will make the energy transition happen. In Energiewende home country Germany, many start-ups take advantage of the transformation by bringing novel business ideas to market, and taking market shares from incumbents in sectors from renewables to heating, and industry to mobility. Some have referred to Germany's lively start-up scene as a 'Green Energy Valley'. In sectors such as storage and hydrogen, young German companies are among the world's leaders, and could be key to cleaning up polluting industries. The country's embattled utilities, who

© [renedeutscher.de] Sunfire GmbH, Dresden.

# Contacts

Klaus Fichter, Borderstep Institute +49 30 306 45 100-0, fichter@borderstep.de

Pia Dorfinger, German Energy Agency (dena) +49 30 66 777-737, dorfinger@dena.de

German Startups Association +49 30 609 8959-101, paul.wolter@deutschestartups.org

Thorsten Lenck, Agora Energiewende +49 30 700 1435-134, thorsten.lenck@agora-energiewende.de

German Association of Energy and Water Industries (BDEW) +49 30 300 199-1160, presse@bdew.de

RWE AG

+49 201 1222088, stephanie.schunck@rwe.com

were far too slow to recognise the renewables revolution, now bet on start-up innovation to cut emissions. In the innovation race against agile new players, the overhaul of the former monopolies is far from over – as evidenced by the landmark asset swap of major energy companies RWE and E.ON.

#### E.ON

+49 201 184 -42256, markus.nitschke@eon.com

Vattenfall +49 30 8182 -2320, stefan.mueller@vattenfall.de

EnBW +49 721 63 -14320, je.schreiber@enbw.com

innogy +49 201 12 -15250, alexander.stechert-mayerhoefer@innogy.com

Uniper +49 211 4579 -3570, leif.erichsen@uniper.energy

Gerard Reid, Alexa Capital +44 20 3011 5566, info@alexa-capital.com

# Reading

Borderstep Institute (2019) Green Startup Monitor 2018

**EY (2020)** How net-zero emissions present the power sector with an opportunity

EY (2019) Start-up-Barometer Germany

Cleantech Group (2020) Global Cleantech 100 List

**IEEFA (2017)** Global Electricity Utilities in Transition

**Deloitte (2018)** Power Market Study 2030 – A new outlook for the energy industry

McKinsey (2018) How utilities can keep the lights on Bain & Company (2018) Digital Strategy for Utilities

# • On cleanenergywire.org

### Dossiers:

Germany's Energiewende start-ups – cutting emissions as a business model

Battered utilities take on start-ups in innovation race Digitalisation ignites new phase in energy transition

#### Articles:

Energy transition start-ups shake up the business world

Dedicated engineers have made Germany a "Green Energy Valley" – start-up expert

### Factsheets:

'Green Energy Valley' – Germany's green start-up scene in numbers

Germany's largest utilities at a glance

#Heating #Efficiency

# The heat is on to make German buildings 'nearly' climate neutral



German homes are fossil energy guzzlers - a big hurdle on the path to climate neutrality by 2050. Nearly two thirds heat with fossil fuels, and most of them also need to be modernised to lower energy demand. The government is working to extend the energy transition to buildings with a ban on new oil-fired heating, as well as tax incentives for renovations and low-emission technologies, such as heat pumps. In many other sectors too,

#### **D** Contacts

Alexandra Langenheld, Agora Energiewende +49 30 700 1435-108, alexandra.langenheld@ agora-energiewende.de

#### Frederic Leers, Federation of German Heating Industry (BDH) +49 22 039 35 93-20, frederic.leers@bdh-koeln.de

#### Martin Ittershagen, Federal Environment Agency (UBA) +49 340 2103-2122, martin.ittershagen@uba.de

Volker Breisig, PwC Germany +49 211 981-4428, volker.breisig@de.pwc.com

#### Jan Ulland, German Association of Energy and Water Industries (BDEW) +49 30 300199 1160, presse@bdew.de

#### Thomas Bründlinger, Alliance for Building Energy Efficiency (geea) +49 30 66 777-678. bruendlinger@dena.de

saving energy on a large scale – by changing behaviour and introducing many new and often expensive technologies – requires everyone's participation, and has proven a hard sell so far. Christian Noll, German Industry Initiative for Energy Efficiency (DENEFF) +49 30 364 097 02, christian.noll@deneff.org

Federal Ministry of the Interior, Building and Community +49 30 18681-11022, presse@bmi.bund.de

Stefan Thomas, Wuppertal Institute for Climate, Environment and Energy +49 202 2492-143, stefan.thomas@wupperinst.org

#### **B** Reading

Agora Energiewende (2019) Building sector efficiency: A crucial component of the energy transition; (2017) Heat transition 2030;

#### Agora Energiewende

German Energy Agency (dena) (2018) Concise 2018 building report – energy efficiency in the building stock

German Association of Energy and Water Industries (BDEW) (2019) How is Germany heated 2019? (in German)

Ecofys / Association of the European Heating Industry (2016) EU pathways to a decarbonised building sector

Federal Ministry for Economic Affairs and Energy (BMWi) (2020) Germany makes it efficient

Federal Ministry for Economic Affairs and Energy (BMWi) (2016) Green Paper on Energy Efficiency German Industry Initiative for Energy Efficiency (DENEFF) (2016) Sector Monitor Energy Efficiency (English summary)

International Energy Agency (IEA) (2019) Energy Efficiency 2019

#### • On cleanenergywire.org

#### Dossiers:

The Wärmewende – Germany's heating transition The Energiewende and Efficiency

#### Factsheets:

Heating 40 million homes – the hurdles to phasing out fossil fuels in German basements

Combined heat and power – an Energiewende cornerstone?

"It is high time for the energy transition in the building sector to pick up speed again." Andreas Kuhlmann, head of the German Energy Agency (dena)

### #Finance

# Unlocking the financial sector's vast potential for greening the economy



Finance as a means for climate action has shifted into the focus of governments around the world in recent years. Late-starter Germany now seeks to gain ground by gearing lending, investment and insurance regulation towards lower emissions. The government appointed an advisory council in 2019 whose aim is to sketch out a plan for financing the spread of low-carbon technology and decreasing investor reliance on fossil fuel extraction, a key target of the Paris Climate Agreement. Germany is also raising the profile of climate in finance due to EU efforts to establish joint standards for the financial sector which take environmental and social consequences into account. This is meant to squeeze emission-intensive STATE OF

© [Julia Schwager] Commerzbank AG

"Basically, sustainable finance amounts to nothing less than good risk management." Joachim Faber, chairman of Deutsche Börse's advisory board

#### Contacts

German Savings Banks Association (DSGV) +49 30 20 22 55 116, presse@dsgv.de

National Association of German Cooperative Banks (BVR), +49 30 2021-1300, pressestelle@bvr.de German Insurance Association (GDV) +49 30 2020-5903, k.jarosch@gdv.de

Susan Dreyer, Carbon Disclosure Project, German Chapter +49 30 629 033 160, susan.dreyer@cdp.net

Nathalie Cahn, KfW Group +49 69 74 31-20 98, nathalie.cahn@kfw.de

Christoph Bals, Germanwatch +49 228 60 492 -34, bals@germanwatch.org

Germany Trade and Invest (GTAI) +49 30 200 099 173, office@gtai.com

Association of German Banks (BDB) +49 30 1663-1201, bdb-pressestelle@bdb.de

Frankfurt School – UNEP Collaborating Centre for Climate & Sustainable Energy Finance +49 69 154008-604, fs\_unep@fs.de Federal Ministry of Finance (BMF) +49 3018 682-4291, presse@bmf.bund.de

Deutsche Börse Group +49 69-2 11-1 29 01, martin.halusa@deutsche-boerse.com

#### Reading

German Sustainable Finance Advisory Council (2019) Theses of the German Sustainable Finance Advisory Council (in German)

German Central Bank – Bundesbank (2019) The Sustainable Finance Market – An Overview

Frankfurt School of Finance / United Nations Environment Programme (2019) Global Trends in Renewable Energy Investment 2019

Deutsche Bank Research (2019) Climate change and corporates

#### On cleanenergywire.org

#### Dossier:

Too big to just stand by – Germany's financial sector faces climate challenge

#### Factsheets:

German finance sector's push to play catch up on climate action

Germany's green finance key actors at a glance

business models out of the market. The country's finance ministry has stated that it does not want to only react to outside pressure to make its financial sector more sustainable. Instead, it strives to make the country an international leader which provides banks, investment funds, stock traders and other financial market actors with the best possible framework for marrying profit with sustainability. However, disputes with the European Central Bank over the influence climate policy may have on monetary policy, as well as the German government's initial rejection of fossil financing bans by the European Investment Bank, suggest that becoming a green finance leader will not be a straightforward exercise. #Citizens' Energy #Society

# Protests spur climate policy as government seeks to appease critics



© [Carel Mohn] CLEW.

"I very much support that school children take to the streets to fight for climate action. I think this is a very good initiative." Chancellor Angela Merkel

#### **Q**) Contacts

Association of Energy Consumers +49 2224 123 123 0, info@energieverbraucher.de

Federation of German Consumer Organisations (vzbv), Franka Kühn, +49-30-25800-525, presse@vzbv.de

Fridays for Future Germany, +49 431 5357 983, presse@fridaysforfuture.de

Nature and Biodiversity Conservation Union (NABU), Inga Römer, +49 30 284 984 -1632, inga.roemer@nabu.de

FuturZwei Foundation, Harald Welzer, +49 30 397 177 07, welzer@futurzwei.org Institute for Advanced Sustainability Studies (IASS) Johannes Staemmler, +49 331 28822 390, johannes.staemmler@iass-potsdam.de

Potsdam Institute for Climate Change Impact (PIK), Fritz A. Reusswig, +49 331 288 2576, fritz@pik-potsdam.de

Scientists for Future, +49 151 24292627, kontakt@scientists4future.org

Fachagentur Windenenergie, Bettina Bönisch, +49 30 64 494-60 64, boenisch@fa-wind.de

German Trade Union Confederation (DGB), Frederik Moch, +49 30 240 60-576, frederik.moch@dgb.de

package, protesters have helped push the government to make progress on emissions reduction, even though many still regard the steps as too unambitious. But policymakers also face a delicate balance when it comes to reassuring those voters who, for example, are against a quick rise of fuel costs or object to wind turbine construction in their neighbourhood. Economically weak coal mining regions are a case in point, but opposition to a rapid transition also exists in more affluent regions, where fears that disruption in the automotive or heavy industry could quickly turn the tide, are widespread too.

#### **B** Reading

Swedish Research Council for Sustainable Development (2020) Protest for a future II: Composition, mobilisation and motives of the participants in Fridays for Future climate protests

**IASS Potsdam / dynamics** (2019) Social Sustainability Barometer – Energy Transition 2018

**Institute for Social Movement Studies (ipb)** (2019) Fridays for Future: Profile, formation and perspectives of the protest movement in Germany (in German)

German Cooperative and Raiffeisen Confederation (2019) Annual survey of German energy cooperatives

Rhineland-Westphalia Institute for Economic Research (RWI-Essen) (2017) Societal acceptance of the energy transition (in German)

#### • On cleanenergywire.org

#### Dossiers:

Germany between citizens' energy and Nimbyism Europe's largest auto show pits climate protests against carmakers

#### Factsheets:

Citizens' participation in the Energiewende Polls reveal citizens' support for Energiewende Limits to growth: Resistance against wind power in Germany

Students demand climate action with "Fridays for Future" school strikes

### #Agriculture

## The wicked task of feeding 83 million in a climate-friendly way



© DBV.

#### (P) Contacts

**Reinhild Benning, Senior Advisor Agriculture and** Livestock, Germanwatch +49 30 28 88 356-82, benning@germanwatch.org

#### Harald Grethe, Professor for International Agricultural Trade and Development, Humboldt-Universität zu Berlin +49 30 2093 -46810, grethe@hu-berlin.de

adelphi, think tank +49 30 8900 068-920, weigel@adelphi.de

NABU – Nature and Biodiversity Conservation Union +49 30 284 984 -1627, angelika.lischka@nabu.de

DBV – German Farmers' Association +49 30 31 904 -239, presse@bauernverband.net

**BMEL – Federal Ministry for Food and Agriculture** +49 30 1 85 29-31 74, pressestelle@bmel.bund.de

but they often harbour conflicts of interest. The sector is increasingly affected by droughts during primary growing periods and must find ways to adapt. Meanwhile, calls to enforce climate action in agriculture were met with large-scale protests by farmers opposed to environmental policies in 2019.

WBAE - Scientific Advisory Board on Agricultural Policy, Food and Consumer Health Protection +49 30 2093 46822, j.c.schmid@hu-berlin.de

#### Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)

+49 30 18 305-2010, presse@bmu.bund.de

#### **Reading**

Federal Ministry for Food and Agriculture (2017) Agrarexporte 2017 – Data and Facts (in German)

adelphi/systain (2017) Atlas on Environmental Impacts Supply Chains

Thünen Institute (2019) Greenhouse gas emissions from agriculture – Facts and Figures

#### Germany's Scientific Advisory Board on Agricultural **Policy, Food and Consumer Health Protection** Publications on EU Common Agricultural Policy etc.

NABU (2017) Not fit for purpose: NGOs present Fitness Check of the Common Agricultural Policy (CAP)

#### • On cleanenergywire.org

#### Dossier:

Emissions from food and farming in Germany

#### Articles:

Must Germans give up sausage and schnitzel to cut agri-food emissions?

"Demonizing global trade" no fix for agri-food emissions

#### Factsheet:

Climate impact of farming, land use (change) and forestry in Germany

"I am convinced that our farmers can achieve a lot if they are compensated or paid for it. They are partners in environmental and climate policy." Julia Klöckner, Minister of Food and Agriculture (CDU party)

#Technology #Storage #Digitalisation

# Technology to transform the energy system - made in Germany



©[WEMAG AG] Batteriespeicher Schwerin Akkuhalle.

Germany's energy transition anticipates a vastly more efficient and interconnected energy system in the future, transforming the country into a testbed for innovation. Batteries that can help to regulate the electricity network

within seconds, smart grids, flexibility, and the integration of different power sources are key to an electricity system based on millions of wind and solar installations that will also have to power cars, provide heating, and assist in de-

## "There is no doubt that digitalisation will take the energy transition to an entirely new level."

#### Contacts

Karlsruhe Institute of Technology (KIT) +49 721 608-21150, monika.landgraf@kit.edu

Fraunhofer ISE, +49 761 4588-5147, karin.schneider@ise.fraunhofer.de

Uwe Krengel, Fraunhofer IEE, +49 561 7294 -319

Fraunhofer Institute for Systems and Innovation Research (ISI), +49 721 6809 -100, anne-catherine.jung@isi.fraunhofer.de

Federal Ministry of Education and Research (BMBF) +49 30 18 57-5050, presse@bmbf.bund.de

Robert Spanheimer, bitkom +49 30 27576-112, a.streim@bitkom.org

Stiftung Neue Verantwortung +49 30 81 45 03 78 90, srieger@stiftung-nv.de

carbonising industry. Digitalisation will be crucial for this next step of the Energiewende. The technology shift will upend many existing business models and inevitably raise concerns about data privacy and the risk of cyberattacks. , Robert Spanheimer, bitkom

Alena Müller, Association of Energy Market Innovators (bne), +49 30 400 548 18, alena.mueller@bne-online.de

Next Kraftwerke, +49 221 82 00 85-855, presse@next-kraftwerke.de

Roman Zurhold, Digital Energy World Platform (dena), +49 30 66 777-501, zurhold@dena.de

Project Enera, +49 441 480 55 118, service@projekt-enera.de

Philipp Massier, Centre for European Economic Research (ZEW), +49 621 1235 -332, philipp.massier@zew.de

Felix Hasse, pwc, +49 89 5790-5810, felix.hasse@de.pwc.com

#### Reading

**Dena (2019)** Blockchain in the integrated energy transition

Federal Ministry for Economic Affairs and Energy (BMWi) (2019) Federal Government Report on Energy Research International Energy Agency (IEA) (2019) Tracking Energy Integration

McKinsey (2018) The new rules of competition in energy storage

EFI (2019) Research and Innovation Report 2019

**EY (2019)** Barometer Digitalisation of the Energy Transition (in German)

#### • On cleanenergywire.org

#### Dossiers:

Electricity storage is next feat for Germany's energy transition

Digitalisation ignites new phase in energy transition

Battered utilities take on start-ups in innovation race

Germany's Energiewende start-ups – cutting emissions as a business model

#### Article:

New phase in transition research: Focus on an integrated energy system

#### Factsheets:

Blockchain – the next revolution in the energy sector?

How can Germany keep the lights on in a renewable energy future?

Sector coupling – shaping an integrated renewable energy system

### #Gas

# Natural gas – fossil bridge to a renewable energy future?



The long-term future of natural gas in Germany seems all but sealed, as Europe's biggest economy will have to virtually phase out all fossil fuels to reach its goal of becoming climate neutral by 2050. However, as Germany exits nuclear and coal power, the government says natural gas will continue to make a significant contribution to the energy supply for many years. The fuel emits less CO<sub>2</sub> than oil and coal when burned and the gas industry promotes flexible gas-fired electricity generation as the perfect partner for fluctuating renewables. Germany, whose gas supply is almost exclusively

© Nord Stream 2.

"Our goal is clear. We want Germany to be the global number one in hydrogen technology." Peter Altmaier, Economy Minister (CDU party)

#### **Q** Contacts

Jens Perner, Frontier Economics +49 221 337 130, hallo@frontier-economics.com

German Energy Agency (dena) +49 30 66 777-641, prein@dena.de Federal Institute for Geosciences and Natural Resources (BGR) +49 511 643 2679, info@bgr.de

Institute of Energy Economics at the University of Cologne (EWI) +49 221 277 29-103, kirsten.krumrey@ewi.uni-koeln.de

Initiative Zukunft Erdgas +49 30 460 60 15 63, presse@erdgas.info

#### **B** Reading

Agora Energiewende / Agora Verkehrswende (2018) The Future Cost of Electricity-Based Synthetic Fuels

Ecofys (2018) Gas for Climate

Energy Watch Group (2019) Natural gas makes no contribution to climate protection

**European Commission (2018)** Quo vadis EU gas market regulatory framework – Study on a Gas Market Design for Europe

covered by imports, continues to back the controversial Nord Stream 2 pipeline, which could come online in early 2021. The government also welcomes plans to build the country's first liquefied natural gas (LNG) import terminal and has offered potential state support. In the longer run, experts believe the sector will only have a future with renewables-based hydrogen, on which the government is set to present a strategy in 2020. While the gas industry pushes for extensive use in all sectors, many researchers see hydrogen as the ultimate solution to long-term renewable energy storage needs. ewi Energy Research & Scenarios (2017) The energy market in 2030 and 2050 – The contribution of gas and heat infrastructure to an efficient CO<sub>2</sub> reduction (in German)

iea (2019) Gas 2019

nature energy (2019) Economics of converting renewable power to hydrogen

World Energy Council Germany (2018) International aspects of a power-to-x roadmap

#### • On cleanenergywire.org

#### Dossiers:

Industry bets on gas as last trump card in Energiewende

The Energiewende and its implications for international security

**Bioenergy in Germany** 

#### Factsheets:

Germany's dependence on imported fossil fuels Power-to-gas: Fix for all problems or simply too expensive?

Liquefied gas – does LNG have a place in Germany's energy future?

Gas pipeline Nord Stream 2 links Germany to Russia, but splits Europe

Sector coupling – shaping an integrated renewable energy system

#Cities #Urban planning

## Energy transition to transform German cities



German cities, counties and municipalities all have their role to play in the Energiewende - and nearly 70 of them have by now declared their own 'climate emergency'. With the shift to a decentralised energy system, renewable power is increasingly generated in, and often

owned by, local communities. Urban centres are where much of the country's energy is distributed and consumed. And as the energy transition expands its focus from the power sector to heating, buildings and mobility, population centres will be where crucial changes take place.

© [Ulli Winkler] Berliner Stadtwerke.

#### Contacts

German Energy Agency (dena) +49 30 66 777-641, prein@dena.de

Anika Schwalbe, Renewable Energies Agency (AEE) +49 30 200 535-52, a.schwalbe@unendlich-viel-energie.de

Katrin Dziekan, Federal Environment Agency (UBA) +49 340 2103 65 55, katrin.dziekan@uba.de

Finn-Christopher Brüning, German Association of Towns and Municipalities (DStGB) +49 30 773 07-242, finn-christopher.bruening@dstgb.de

Weert Canzler, Research Group Science Policy Studies, Berlin Social Science Center (WZB) +49 30 25491 202, weert.canzler@wzb.eu

#### Steffen Braun, Fraunhofer Institute for Industrial Engineering (IAO) +49 711 970-2022, steffen.braun@iao.fraunhofer.de

+49 /11 970-2022, stemen.braun@iao.fraunofer.de

Germany will only meet its climate tar-

**Association of German Cities** 

+49 30 37711-130, presse@staedtetag.de

**B** Reading

Renewable Energies Agency (AEE) (2019) Bundesländer mit neuer Energie 2019/20 (in German)

**German Energy Agency dena (2019)** Urban energy transition: it's all about the cities (in German)

Report by 25 mayors of German cities and towns (sponsored by the German Council for Sustainable Development) (2013) Turning the energy transition into a success story through strong municipalities (in German)

**Cabinet of Germany (2015)** Future city – Strategic Research and Innovation Agenda (in German)

C40 Cities (2020) Berlin; Heidelberg

**Philipp Schönberger et al. (2016)** Why Subnational Actors Matter: The Role of Länder and Municipalities in the German Energy Transition

State government of Baden-Württemberg (2020) New mobility – sustainably in motion (in German)

gets if municipalities implement their own energy transitions – which can also bring economic benefits. They have opportunities to take different paths but must also overcome local challenges. Germany's municipalities, many of which are chronically underfunded, must negotiate the complex interplay between EU, federal, and state structures that set overarching goals and provide funding, in order to apply their own ideas, agency, and expertise to shape their own green future. State government of Berlin (2017) Berlin Energiewende law (in German only)

#### 🗉 🕞 On cleanenergywire.org

#### Dossiers:

Cities, municipalities and the Energiewende The energy transition in Germany's capital The energy transition and Germany's transport sector

#### Factsheets:

Energy use in the city of Berlin

Tenant electricity – feeble start for Germany's 'Energiewende at home'

Cities' & municipalities' role in the Energiewende

Efficiency gains make eastern German city Energiewende frontrunner #International #Energy Union #Security

## The Green Deal – a joint European project shapes German foreign policy



In 2019, the EU announced a new joint European project: the Green Deal aimed at making the continent climate neutral by 2050. Germany, as the bloc's largest economy and biggest emitter of CO<sub>2</sub>, is set to play a key role. But the country's ties to the ambitious climate plan go even deeper: EU Commission President Ursula von der Leyen, whose new administration presented the deal, is a former German defence minister and close ally of Chancellor Angela Merkel. Germany will also hold the EU council presidency in the second half of 2020, when an EU-China summit and the COP26 UN climate conference could present critical decision points for international climate policy. Some no longer see Germany as the international climate leader it once

© European Union

#### Contacts

Georg Zachmann, Bruegel (Brussels think tank) +32 2 227 4288, georg.zachmann@bruegel.org

Alexander Reitzenstein, E3G +49 160 80 97 748, alexander.reitzenstein@e3g.org

ENTSO-E (network of European electricity grid operators), +32 2 741 09 50, info@entsoe.eu

Hans-Josef Fell, Green Party / Energy Watch Group press@energywatchgroup.org

Kirsten Westphal, German Institute for International and Security Affairs (SWP)

+49 30 88007-0, kirsten.westphal@swp-berlin.org

was, since the country has struggled to reduce emissions in key sectors during the past years. But Europe's climate ambitions will continue to hinge on Germany's performance and the country's decisions will have a profound impact in areas such as power grids, emissions trading, green finance and energy research across the continent. Friedbert Pflüger, Department of War Studies, King's College London +44 20 7848 3202, pr@kcl.ac.uk

Wolfgang Ischinger, Ambassador / Chairman of the Munich Security Conference (MSC) +49 89 37979 4921, press@securityconference.de

Global Commission on the Geopolitics of Energy Transformation (at IEA) geopolitics@irena.org

#### **B** Reading

Global Commission on the Geopolitics of Energy Transformation (2019) A New World – The Geopolitics of the Energy Transformation

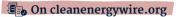
German Institute for International and Security Affairs (SWP) (2018) The Geopolitics of Energy Transformation

European Commission (2020) A European Green Deal

International Energy Agency (IEA) (2019) Global Gas Security Review 2019

**Planetary Security Initiative / adelphi** (2018) Building resilience by linking climate change adaptation, peacebuilding and conflict prevention

**Nature (2019)** How the energy transition will reshape geopolitics



#### Dossiers:

Germany's energy transition in the European context

The Energiewende and its implications for international security

Preview 2020: Germany's targets under scrutiny in year of global climate action

#### Articles:

EU and Germany hold pivotal role to drive global climate ambition 2020

Reactions to EU's Green Deal from Germany

#### Factsheets:

Gas pipeline Nord Stream 2 links Germany to Russia, but splits Europe

Germany's climate obligations under the EU Effort Sharing scheme

Germany's dependence on imported fossil fuels

Interconnectors & blockages – German grid at odds with EU power market

Liquefied gas – Does LNG have a place in Germany's energy future?

Understanding the European Union's Emissions Trading System

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

#### Ask CLEW

Our team in Berlin is available to support journalists in their work. CLEW assists with research, provides background and helps to find experts and politicians to speak with.

info@cleanenergywire.org or +49 30 700 1435 212

#### Imprint

A Reporter's Guide to the Energy Transition (8th edition, April 2020) A publication of Clean Energy Wire, Smart Energy for Europe Platform (SEFEP) gGmbH, Anna-Louisa-Karsch-Str. 2, 10178 Berlin **Responsible** Sven Egenter (Editor in Chief) Editing Freja Eriksen Layout Annika Langer Pictures Detlef Eden (Team) Print Laserline, Berlin

#### DOSSIERS

CLEW Dossiers provide you with in-depth analysis on the main topics of the energy transition.

#### Store Network

The CLEW Journalism Network brings together international reporters covering the energy transition story.

### 

**CLEW Factsheets explain** key aspects of the energy transition and provide an overview of current issues.

**OPPORTUNITIES** 

We organise tours, meet-

ings and online events to

help you with on-the-spot

reporting of the energy

transition.

#### **♦**<sup>€</sup> NEWS | NEWSLETTER

Our daily news articles and newsletter offer comprehensive coverage of the latest developments in Germany's energy transition.

#### **2** SERVICES

The CLEW team can help you find interviewees, background info, research locations and reporting opportunities.

www.cleanenergywire.org @cleanenergywire @ClewNetwork