

Webinar

Germany: Latest Developments of Energy and Climate Policy and Legislation
Before and After the Government Change



自然エネルギー財団

RENEWABLE ENERGY INSTITUTE

Germany's Decarbonization Strategy:

**Policies and Legislation under the Merkel Government
and Prospects of the Scholz Government**

Emi Ichiyanagi, Researcher, Renewable Energy Institute

January 25, 2022

Table of Contents



The Merkel Government

1. Introduction
2. Overview of Decarbonization Policy and Legislation
3. Renewables
4. Coal
5. Nuclear
6. Conclusion



<https://www.renewable-ei.org/activities/reports/20211201.php>

The Scholz Government

- Energy- and Climate Policy in the Coalition Agreement
- Comparison with the Merkel Government's Policy



<https://www.renewable-ei.org/activities/column/REupdate/20211206.php>



自然エネルギー財団

RENEWABLE ENERGY INSTITUTE

The Merkel Government

1. Introduction

Comparison of Medium- and Long-term Goals in Japan and Germany



Medium- to Long-term GHG Emissions Reduction Targets

	Japan	Germany (Merkel Government)
Long-term	Carbon neutrality by 2050	Climate neutrality by 2045
Medium-term	46 % reduction in FY 2030 (compared to FY 2013)	65% reduction by 2030 (compared to 1990)
Source	<ul style="list-style-type: none"> Act on Promotion of Global Warming Countermeasures Plan for Global Warming Countermeasures 	Federal Climate Change Act (KSG)

Energy Mix in 2030

	Japan (FY 2030)	Germany (Merkel Government)
Renewables	36 - 38%	65% (of total power consumption)
Nuclear	20 - 22%	0 % (Completion of nuclear phase-out in 2022)
LNG	20 %	-
Coal	19 %	0% - (Completion of coal phase-out between 2030 and 2038)
Oil, etc.	2 %	-
Hydrogen / Ammonia	1 %	-
Source	Sixth Strategic Energy Plan	<ul style="list-style-type: none"> Renewable Energy Sources Act (EEG 2021) Atomic Energy Act (AtG) Act to Reduce and End Coal-Fired Power Generation (KVBG)



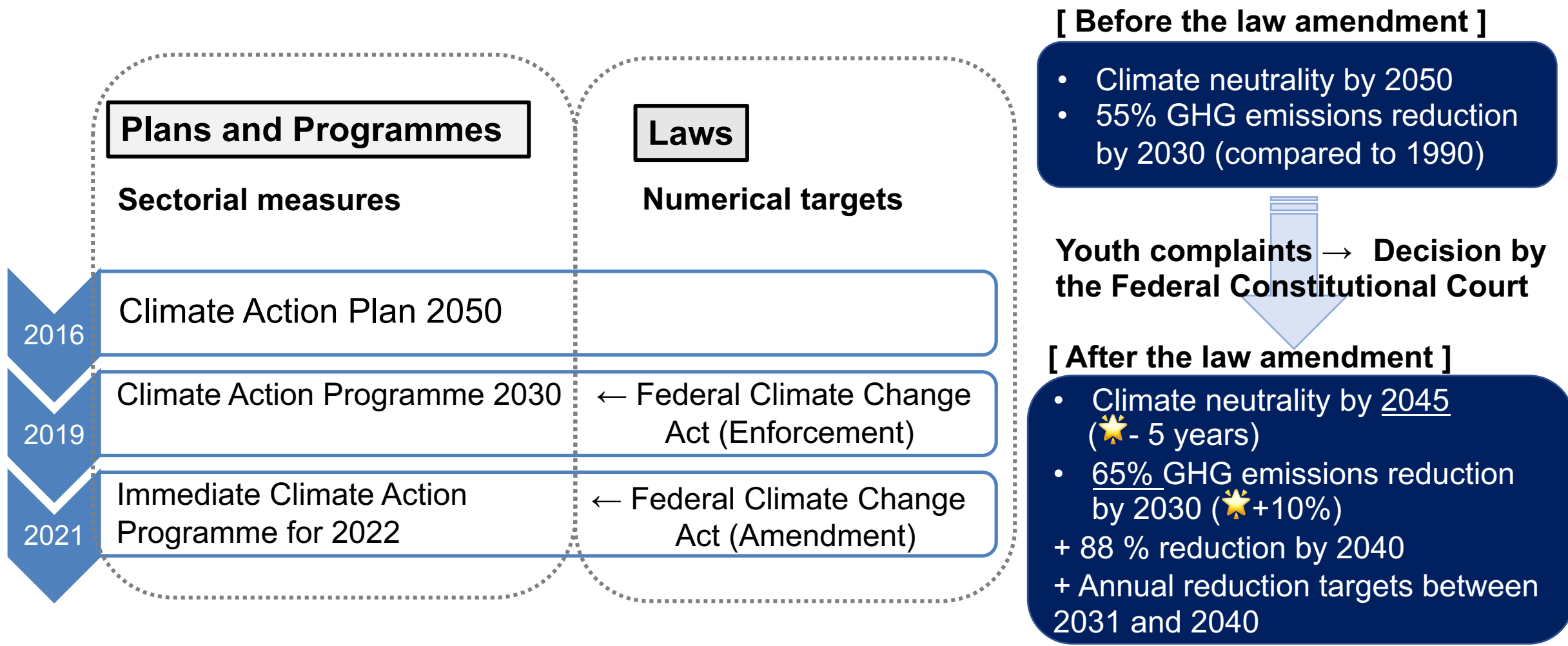
The Merkel Government

2. Overview of Decarbonization Policy and Legislation

2.1 Federal Climate Change Act (KSG) and Medium- and Long-term Plan

2.2 Legislative Framework for Sectoral Targets

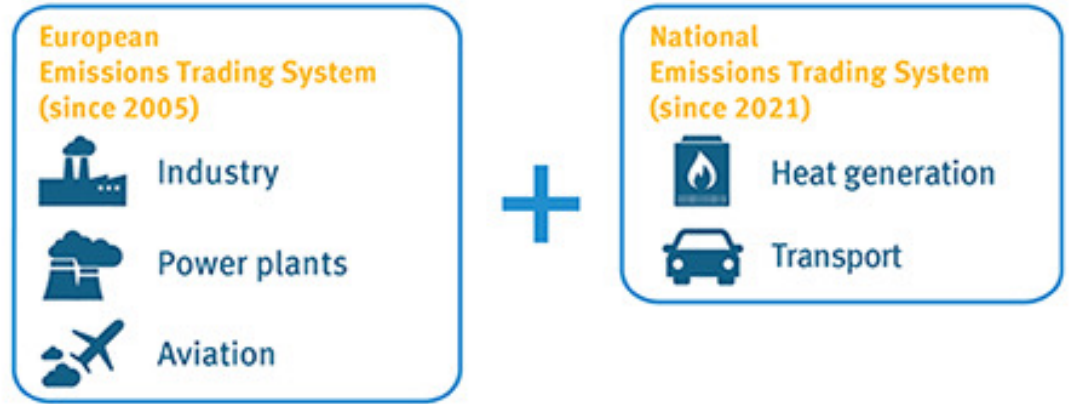
2.1. Federal Climate Change Act (KSG) and Medium- and Long-term Plan



Amendment of the Federal Climate Change Act (KSG) in 2021 enhanced medium- and long-term GHG emissions reduction targets.

2.1. Federal Climate Change Act (KSG) and Medium- and Long-term Plan

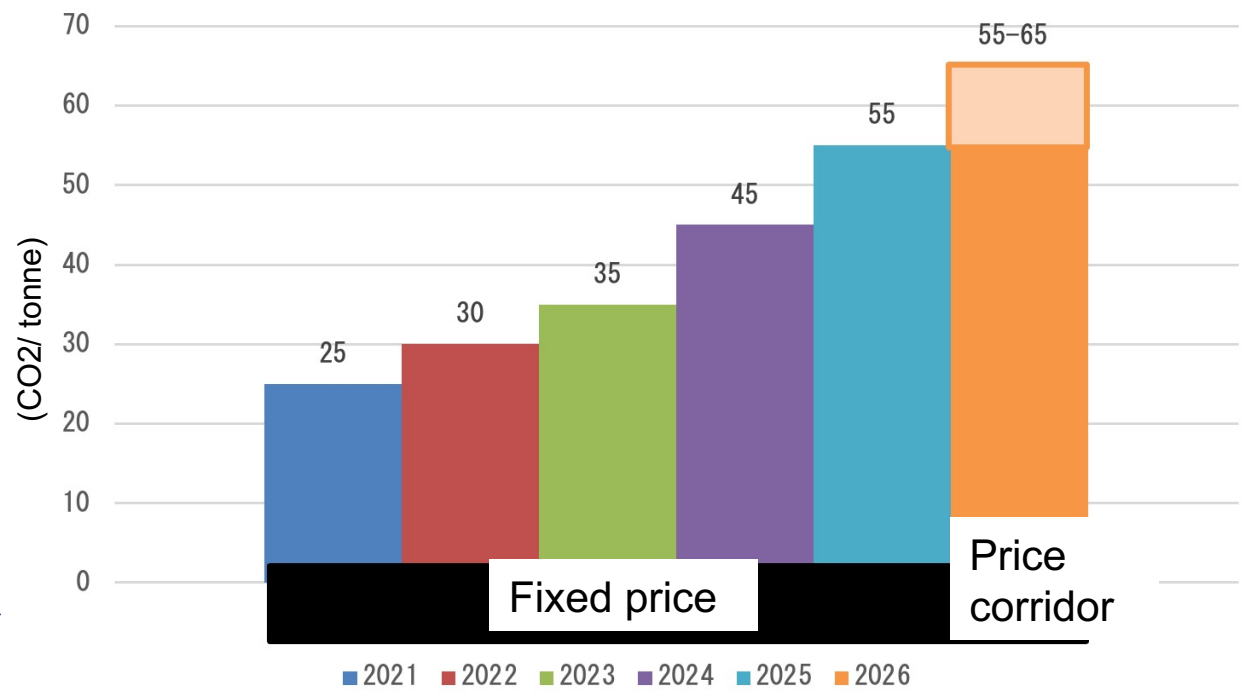
The EU and Germany's Emissions Trading System: Scope of application



Source: DEHSt of the Federal Agency for the Environment (UBA)

Fuel Emission Allowance Trading Act (BEHG) →

Germany's National Emissions Trading System: Development of emission rights prices



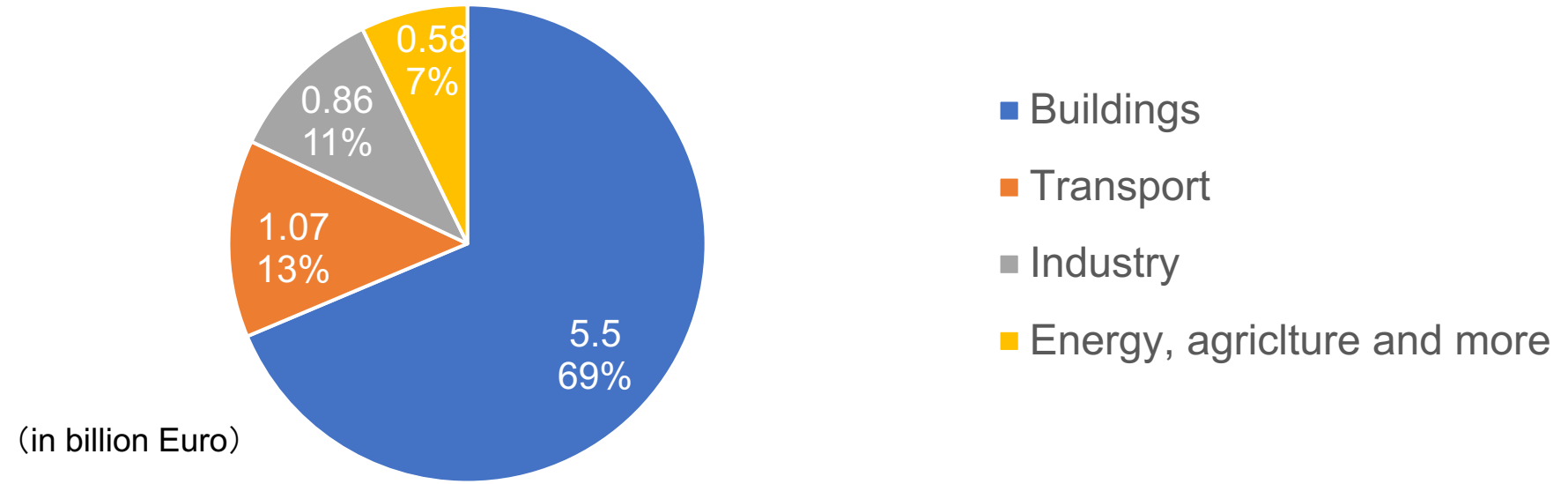
Source: BEHG, Art. 10

Introduction of carbon pricing in the transport and heat sectors as a core part of the Climate Action Programme 2030: National Emissions Trading System (nEHS) launched in 2021

2.1. Federal Climate Change Act (KSG) and Medium- and Long-term Plan



Allocation of funds by sector for the Immediate Climate Action Programme for 2022



Source: Immediate Climate Action Programme for 2022

Amendment of the Federal Climate Change Act (KSG)
→ About 70% of the additional 8 billion euros (about 1 trillion yen) in funding for the Immediate Climate Action Programme 2022 will go to the building sector.

2.2. Legislative Framework for Sectoral Targets

Field	Laws	Year	Targets	Legislation
Climate protection targets				
GHG emissions reduction	Federal Climate Change Act (KSG) Art.3	2030	65% GHG emissions reduction (compared to 1990)	2019: Introduction 2021: Amendment
		2040	88% GHG emissions reduction (compared to 1990)	
		2045	Achieve climate neutrality	
		2050	Negative GHG emissions	
Energy-related targets				
Nuclear	Atomic Energy Law (AtG), Art. 7	2022	Shut down all nuclear power plants	← 2011: Amendment
Coal	Act to Reduce and End Coal-Fired Power Generation (KVBG), Art. 2	2038	Shut down all hard coal and lignite power plants	← 2020: Introduction
Renewables	Renewable Energy Sources Act (EEG 2021), Art. 1	2030	65% of total electricity consumption generated by renewables	as of 2021
		2050	Domestic electricity generation and consumption covered completely by climate-neutral generation	

Clearly define what is to be done and by when in the areas of GHG emissions reduction, nuclear- and coal phase-out and renewables expansion



自然エネルギー財団

RENEWABLE ENERGY INSTITUTE

The Merkel Government

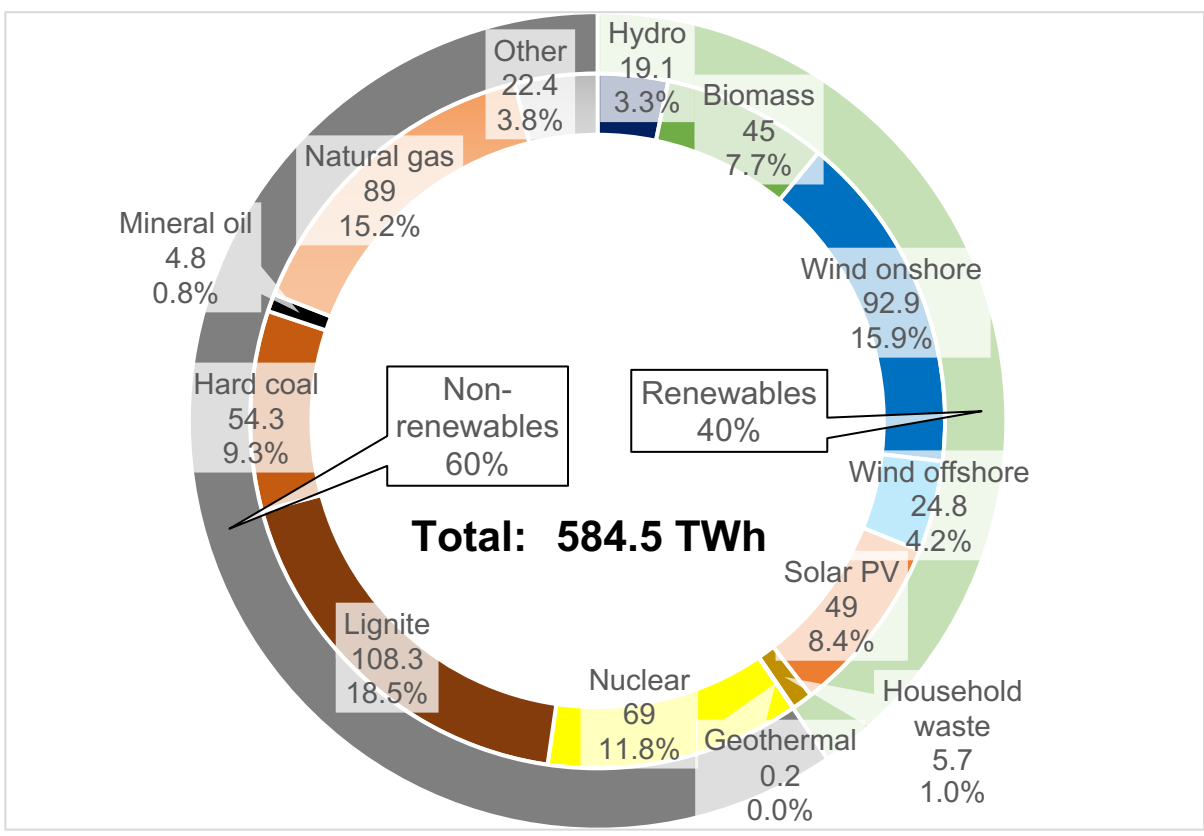
3. Renewables

3.1 Bidding System

3.2 Hydrogen Strategy

Renewable Energy Expansion in Germany

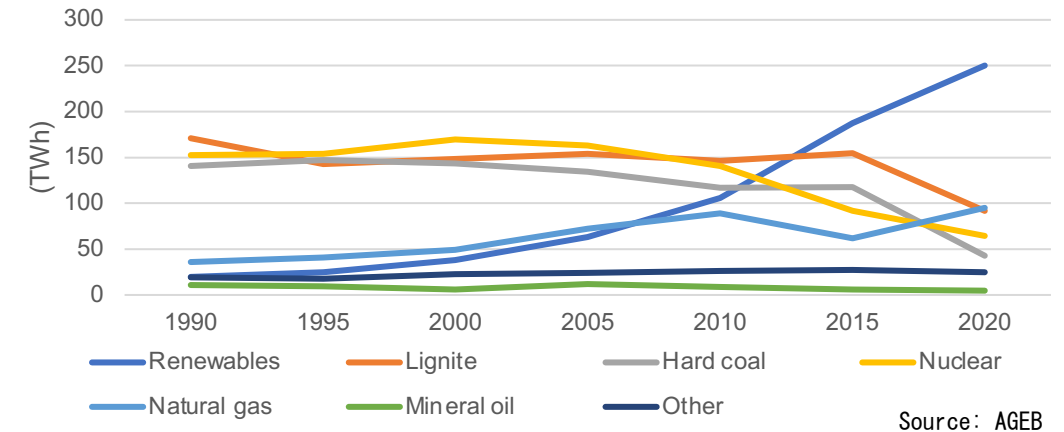
Germany's gross power generation mix in 2021



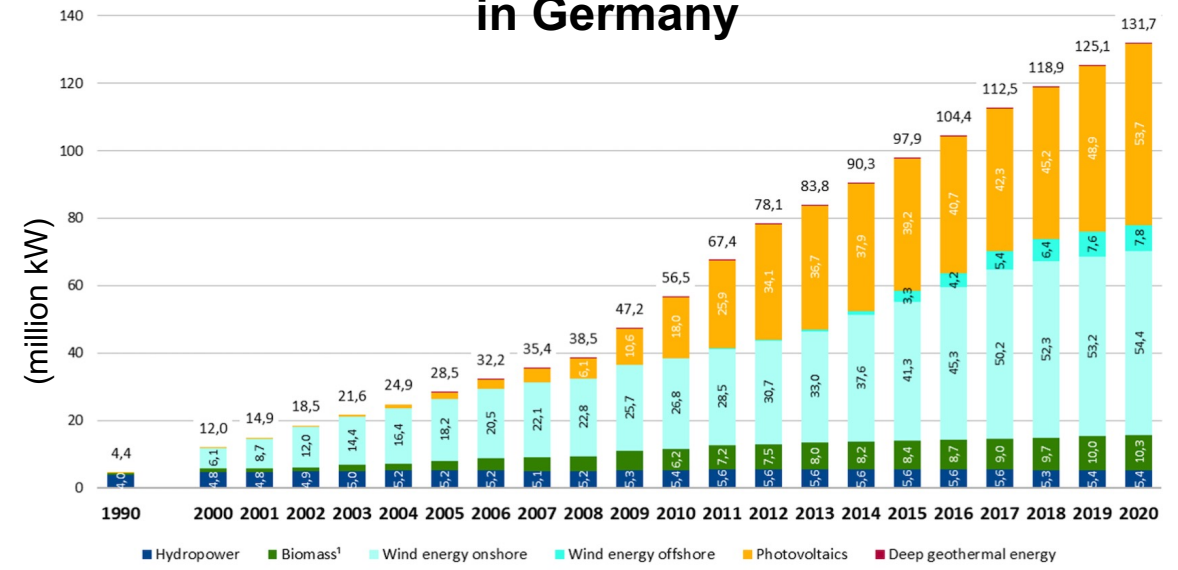
Source: AGEB

Renewable power generation exceeds the total of coal- and nuclear power generation

Development of gross power generation in Germany



Installed capacity of renewable energy generation in Germany

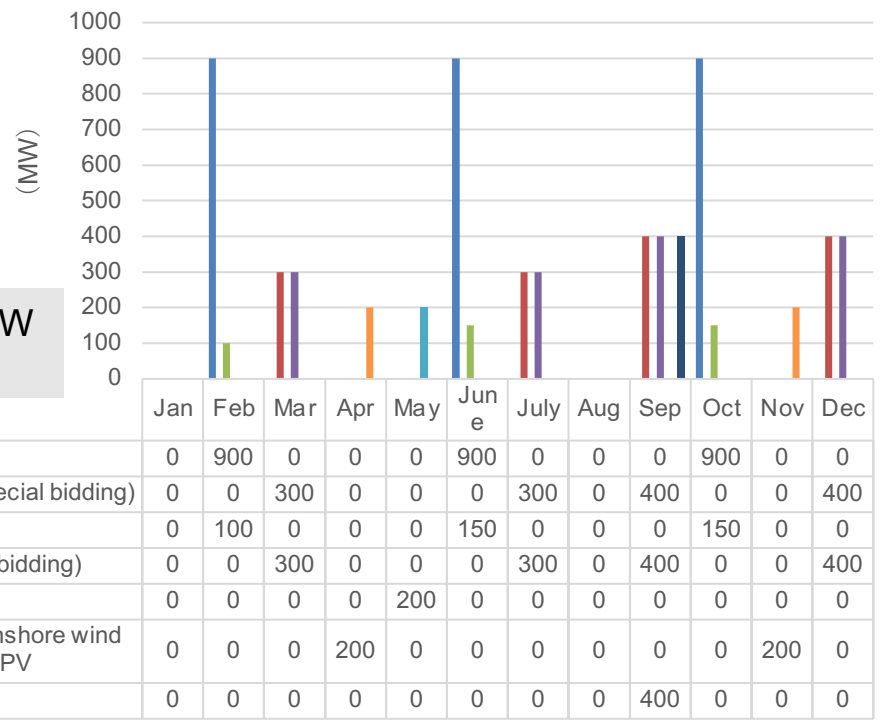


Source: BMWi / AGEE-Stat

3.1. Bidding system: Bid capacity

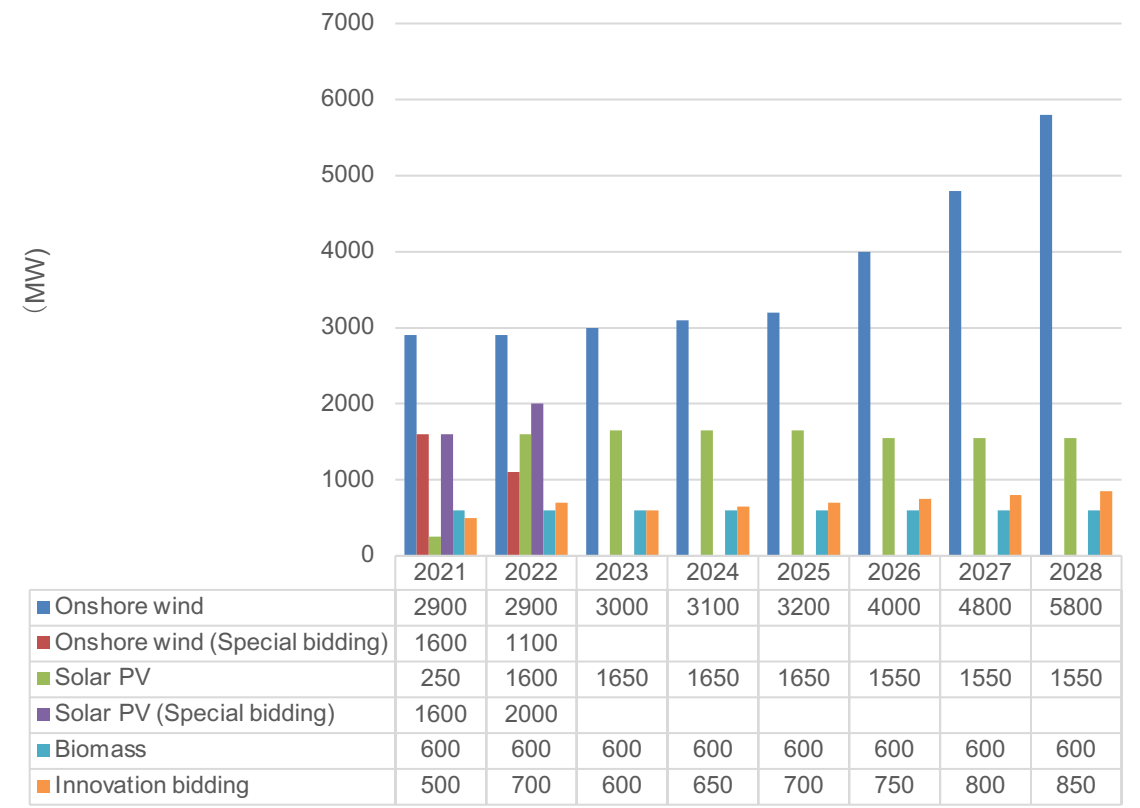
Bid implementation status in 2020

Onshore wind: 4100 MW
Solar PV: 1800 MW



Source: BMWi

Allocation of tendered capacity in Germany between 2021 and 2028



Source: EEG 2021, Art.28

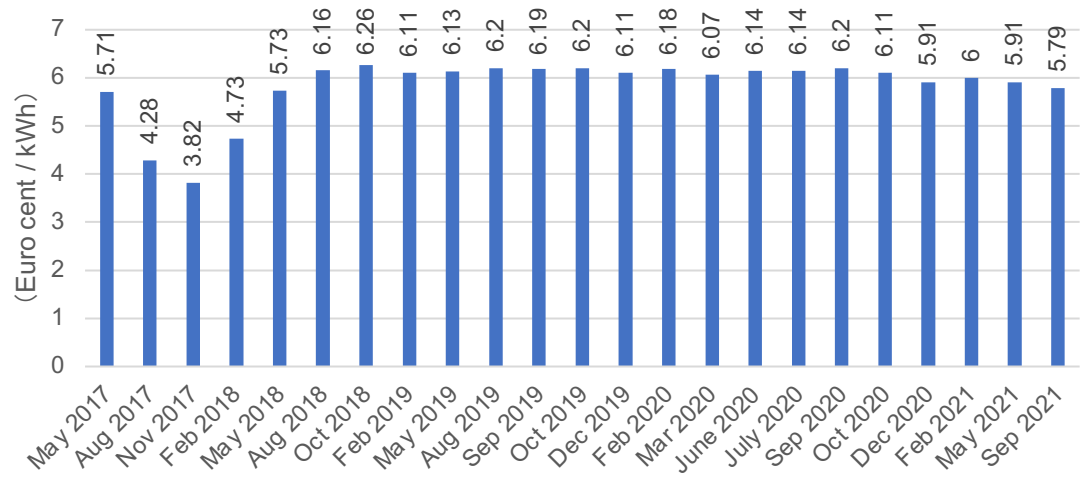
Legislation for the bidding system

- Renewable Energy Sources Act (EEG) for onshore wind, solar, biomass
- Offshore Wind Energy Act (WindSeeG) for offshore wind

Bidding capacity for onshore wind: Much higher than bidding capacity for solar, biomass, etc.

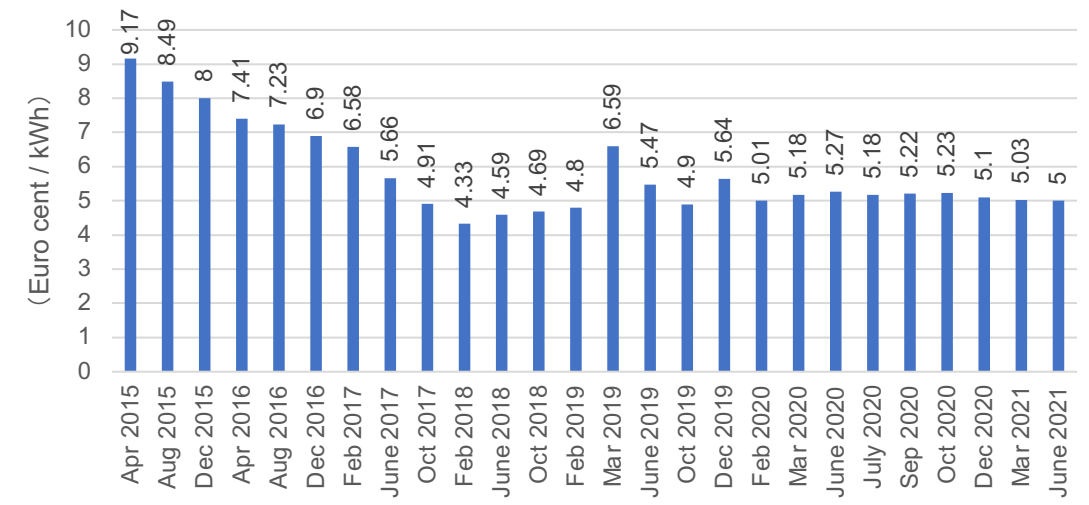
3.1. Bidding system: Bid price

Average bid price for onshore wind (2017- 2021)



Source: BNetzA

Average bid price for solar PV (2015 - 2021)



Source: BNetzA

The average bid price for onshore wind remains around 6-euro cents (approx. 7.8 yen) /kWh. The average bid price for solar PV continues to fall, reaching 5-euro cents (approx. 6.5 yen) /kWh in 2021.

3.2. Hydrogen Strategy

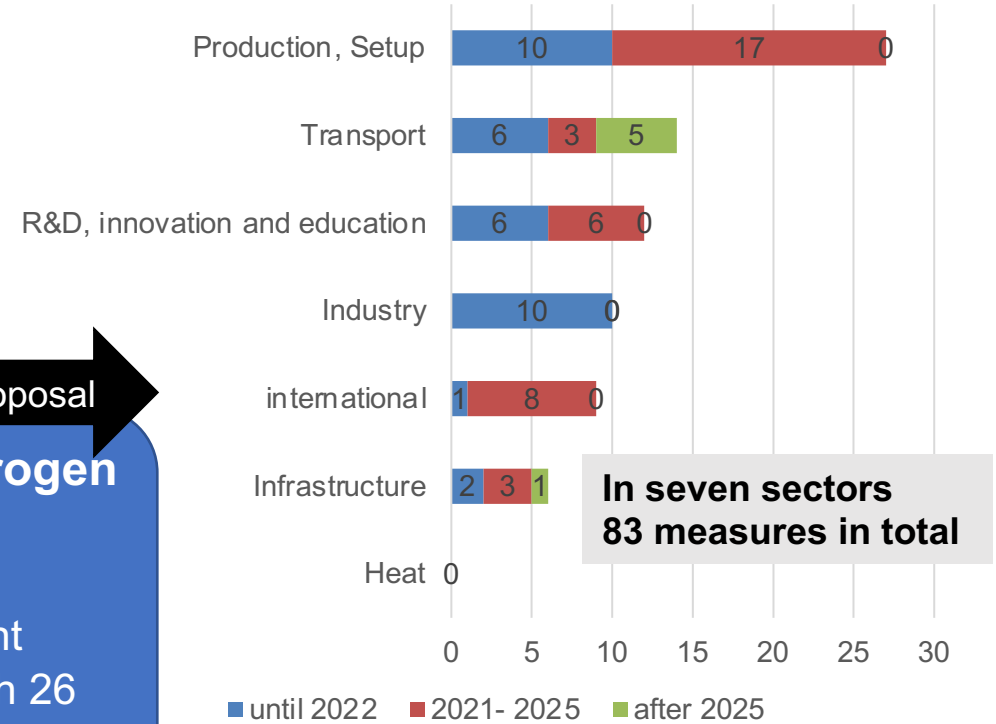
National Hydrogen Strategy in 2020 (Action Plan: 2 Steps, 38 Measures)

38 measures	Amount
Hydrogen production (4 measures)	Germany: 7 billion euros (Approx. 900 billion yen)
Transport sector (9 measures)	
Industrial sector (4 measures)	
Heat sector (2 measures)	
Infrastructure development (3 measures)	
R&D, education, and Innovation (7 measures)	International Cooperation: 2 billion euros (Approx. 260 billion yen)
Actions within Europe (4 measures)	
International hydrogen market (5 measures)	

Green hydrogen from renewables, mainly wind and solar in Germany

Proposal
National Hydrogen Council:
Independent committee with 26 experts

Hydrogen Action Plan Germany 2021-2025 Measures in sectors and timing of implementation



Source: Hydrogen Action Plan Germany 2021-2025

Green hydrogen is a key pillar for decarbonization in Germany.
Hydrogen use in transport (heavy vehicles, etc.) & industrial sectors (steel industry and chemical industries).



The Merkel Government

4. Coal

4.1 Plan to Complete Coal Phase-Out

4.2 Compensation and Structural Transformation

Laws on coal phase-out: in two groups

(1) Coal Phase-Out Act:

Act to Reduce and End Coal-Fired Power Generation (KVBG) + amendments of existing laws

→ Procedure for coal phase-out

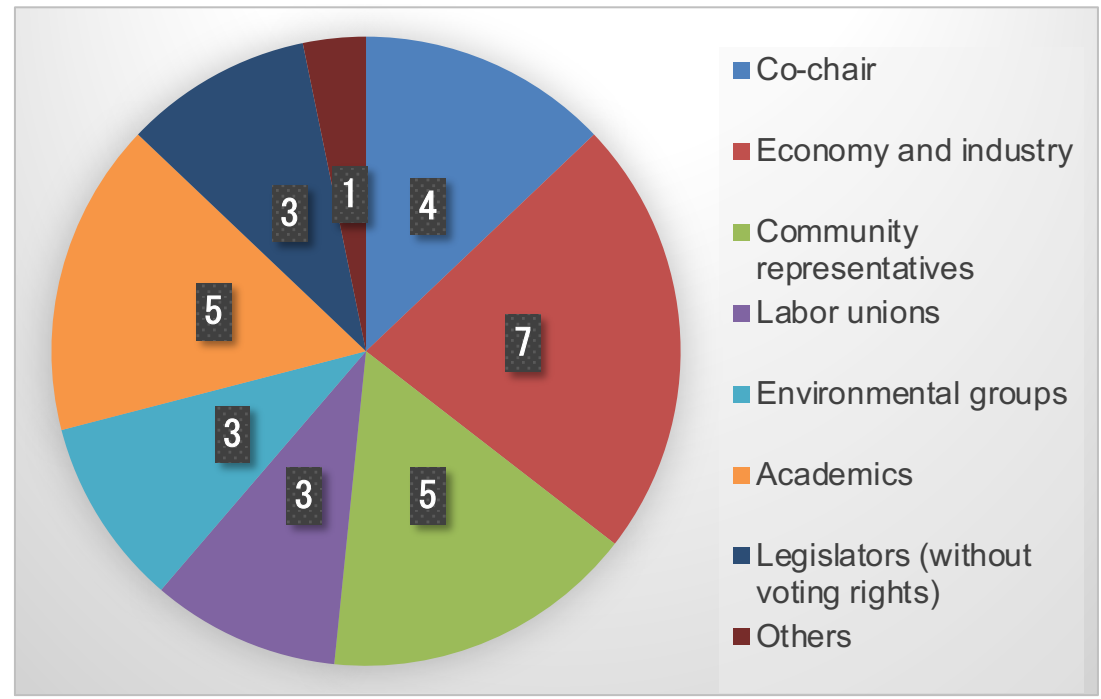
(2) Structural Development Act for Coal-mining Regions (StStG):

A set of laws including the Coal Region Investment Act (InvKG)

→ Financial assistance to coal regions

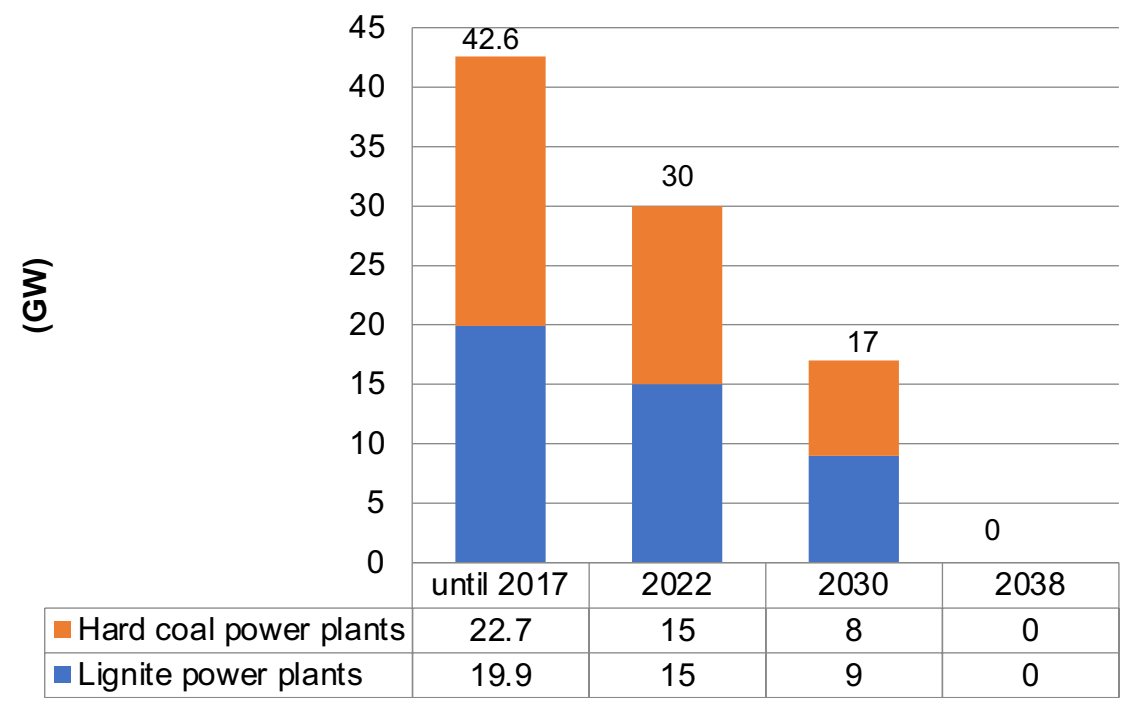
4.1. Plan to Complete Coal Phase-Out

Allocation of 31 members of the coal commission (Commission on Growth, Structural Change and Employment)



Source: klimareporter

Capacity reduction plan for hard coal and lignite power plants until 2038

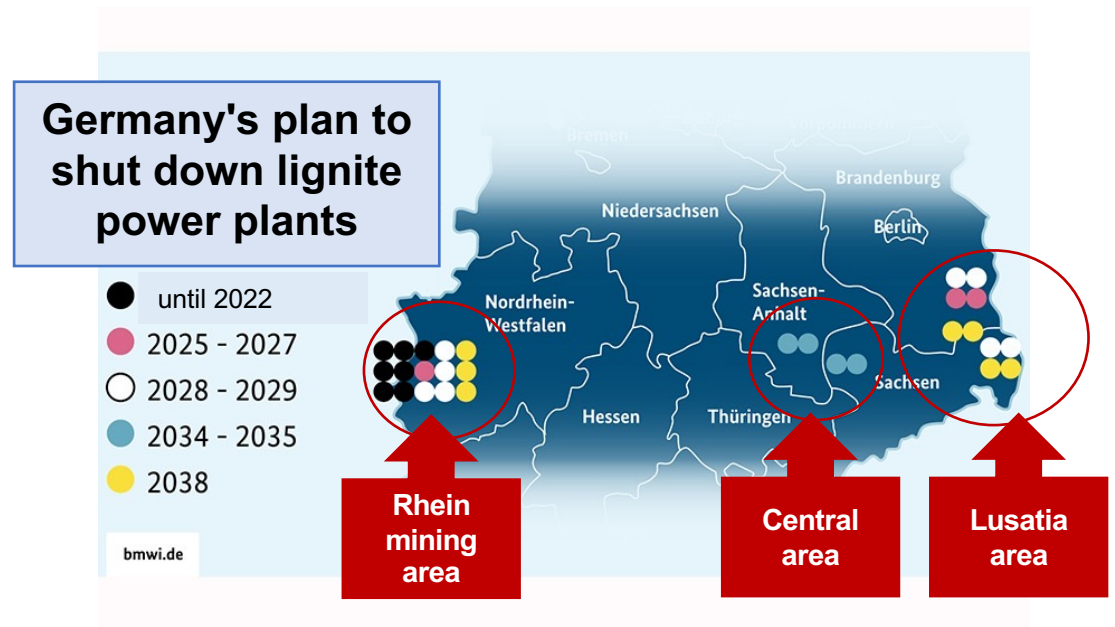


Source: KVBG Art.2 & the Coal Commission's Final Report

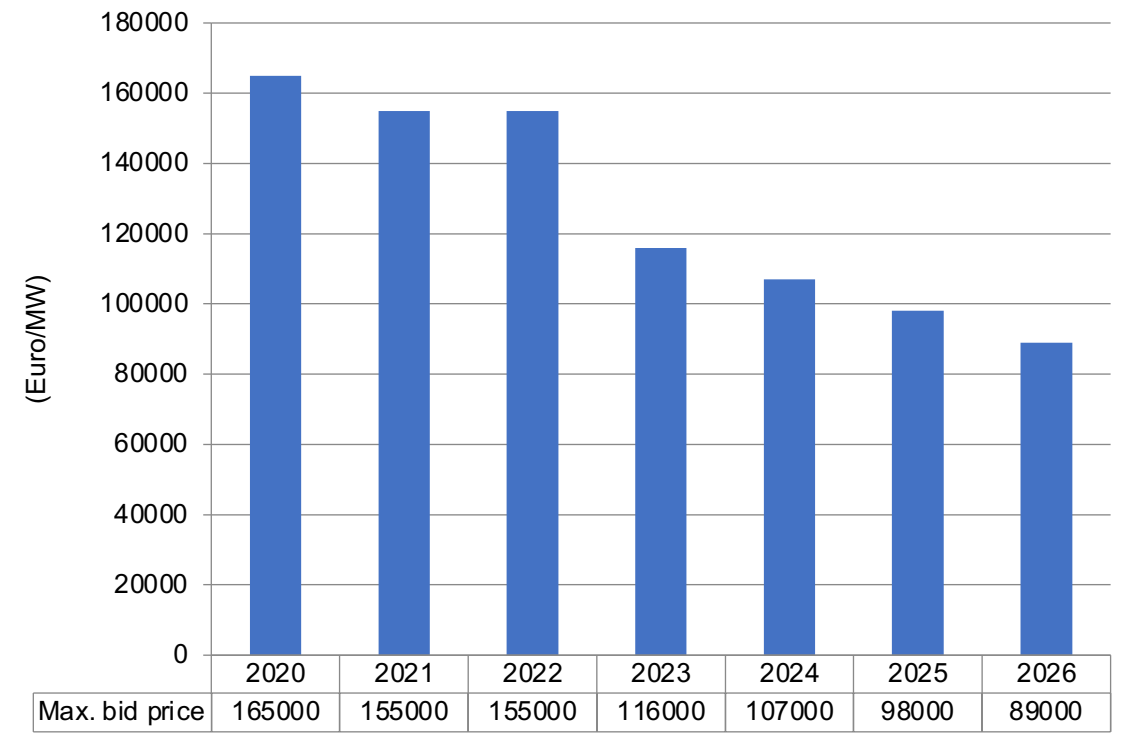
The Act to Reduce and End Coal-Fired Power Generation (KVBG):
 Objective: To reduce and end coal power generation in Germany in a socially acceptable manner, gradually and as steadily as possible, thereby reducing emissions and ensuring a secure, affordable, efficient and climate-friendly electricity supply for the general public (Art.2)

4.1. Plan to Complete Coal Phase-Out

Map of plan to end lignite power generation in Germany



Maximum bid prices for hard coal power plants (2020 – 2026)



Source: KVBG, Art. 19

To end lignite power generation: specify date, operator and block name in KVBG: from West to East
 In the bidding system for hard coal power plants, the maximum price decreases every year.

4.2. Compensation and Structural Transformation

Payment of compensation related to coal phase-out

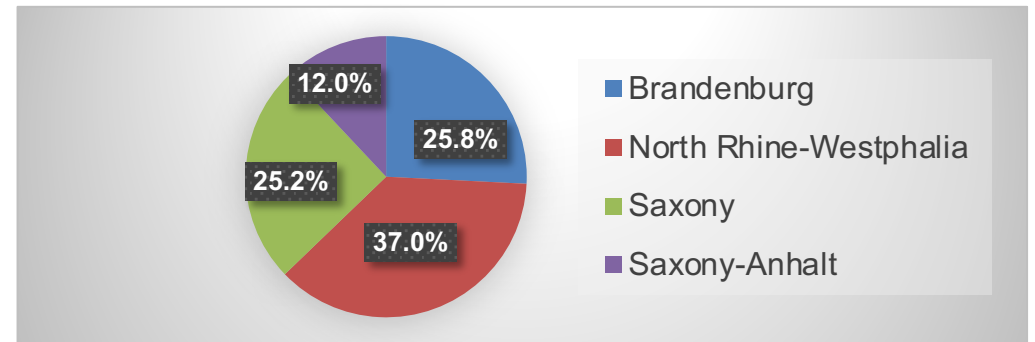
	(A) Regions	(B) Plant operators		(C) Workers
Contents	Up to 14 billion euros for 3 areas spread across four federal states until 2038 (about 1.8 trillion yen)	Hard coal power plants Maximum price for the bidding system between 2020 and 2026 to be 89,000 -165,000 euro/MW (about 12-21 million yen)	Lignite Power Plants 4.35 billion euros in 15-year installments to the operators in two areas of lignite power plants to be decommissioned by 2029 (about 562 billion yen)	Adjustment allowance for up to five years for workers aged 58 and above
Laws	InvKG Art.1	KVBG Art.19	KVBG Art.44-45	KVBG Art.57

Source: KVBG & InvKG

The Coal Region Investment Act (InvKG) :

- Objective: To determine the content of financial assistance that will help to reduce the gap in economic power and promote economic growth in lignite regions.
- The financial assistance shall contribute to addressing structural transformation and protecting jobs associated with the phase-out of lignite mining and lignite power generation (Art. 1)

Breakdown of financial assistance to lignite regions



Source: InvKG, Art. 3

A Case Study of Structural Transformation

LEAG in the Lusatia area



Before: Lignite Industry

- It has four lignite power plants and four open-pit mines. Nearly 8,000 employees will be affected by the structural transformation.
- **Jänschwalde open-pit lignite mine (2,800 ha):** lignite production of 7.4 million tons in 2020; lignite reserves expected to be depleted by 2023.
- **Jänschwalde lignite power plan:** LEAG's largest installed capacity of 3,000 MW, to be completely closed by the end of 2028.

Funding from
Structural
Development
Act for Coal-
mining
Regions
(StStG)

After: Renewable Energy Industry

- Re-cultivation of the Jänschwalde open-pit mine: Plan to construct 17 **wind turbines** (102 MW)
- Cultivated land close to the Jänschwalde open-pit mine: Plan to construct a **land-based solar power generation systems** (400 MW)
- The company's flagship project: **Floating solar power generation facility** (21 MW, up to 18 ha) in an **artificial lake** on the site of an open-pit lignite mine north of Cottbus.



自然エネルギー財団

RENEWABLE ENERGY INSTITUTE

The Merkel Government

5. Nuclear

5.1 Plan to Complete Nuclear Phase-out

5.2 Compensation and Final Disposal Site Selection

5.1. Plan to Complete Nuclear Phase-out

- Amendment of the Atomic Energy Act (Article 7)

Shut down in

- 2021: Three nuclear power plants
- 2022: Three nuclear power plants

- Keyword search: Nuclear Energy (Atom) in

- Federal Climate Change Act (KSG)
- Climate Action Programme 2030
- Immediate Climate Action Programme for 2022

Major climate protection laws and plans do not discuss nuclear power

12 Plans for Completing a Nuclear Phase-Out: Statement by the German Federal Ministry for the Environment (March 11, 2021)

3 fields	12 plans	
A) Germany	[Plan1]	Shut down nuclear fuel supply facilities in Lingen and Gronau.
	[Plan2]	Accelerate the expansion of renewables, rapidly replacing nuclear and coal with wind and solar.
	[Plan3]	Make firm progress on final disposal of high-level radioactive waste with maximum safety.
	[Plan4]	Provide more information and allow for further public participation
Completing nuclear phase-out:		
	• Closure of nuclear fuel supply facilities	
	• Progress in final disposal of radioactive Waste	
	• Accelerating the expansion of renewable energy	
B) Europe	[Plan5]	Call for solidarity among nations critical of nuclear power.
	[Plan6]	Safety risks of aging nuclear power plants: Opposition to extended operation periods and demand for opportunities to participate
	[Plan7]	No public funding of nuclear power plants in or outside the EU.
	[Plan8]	Nuclear power plants near borders: strengthening bilateral committees
	[Plan9]	Continue high level of radiation emergency protection after Germany's nuclear phase-out and enhance international networks.
C) World	[Plan10]	Global commitment to high safety standards
	[Plan11]	Improving liability for damages related to nuclear power plants: Preventing damage and protecting victims should be top priorities.
	[Plan12]	Maintain expertise and provide solid information on new reactor concepts in the international nuclear debate.
• Strengthening nuclear safety worldwide		
• Maintaining expertise		
• Provide appropriate information		

5.2. Compensation and Final Disposal Site Selection

Breakdown of financial compensation to nuclear power plant operators in connection with nuclear phase-out

A total of about **2.428 billion euros**
(about 314 billion yen)

(1) In return for the investment

1. EnBW Energie Baden-Württemberg AG	80 million euros
2. Preussen Elektra GmbH	42.5 million euros
3. RWE Nuclear GmbH	20 million euros

(2) As compensation for electricity volumes from the electricity volume quotas of the nuclear power plants

1. RWE Nuclear GmbH	860.398 million euros
2. Vattenfall Europe Nuclear Energy GmbH	a) 243.606 025 million euros b) 1. 181 809 277 billion euros

Source: AtG, Art. 7e (18th amendment)

National Citizens' Oversight Committee (NBG)

- Germany's goal: selection of a site for a high-level radioactive waste repository by 2031, disposal to start in 2050
- NBG: Established in 2016 to searching a final disposal site for high-level radioactive waste. **Randomly selected citizens** as committee members.
- 18 members in total: 6 citizen members, two of whom are **citizens representing the youth generation** between the ages of 16 and 27

Comparing the Scholz and Merkel Governments



Field	Legislative goals under the Merkel government		Goals in the coalition agreement of the Scholz government	
Renewables	2030	65% of total electricity consumption generated by renewables	2030	Supply 80% of total electricity demand with renewable energy
	2050	Domestic electricity generation and consumption covered completely by climate-neutral generation		
Coal	2038	Complete coal phase-out	2030	Complete coal phase-out: “ideally”
Nuclear	2022	Complete nuclear phase-out	→	No change
Climate	2030	65% GHG emissions reduction (compared to 1990)		
	2040	88% GHG emissions reduction (compared to 1990)		
	2045	Achieve climate neutrality	→	No change
	2050	Negative emissions		

Source: KSG, AtG, KVVG, EEG 2021 and coalition agreement.

Renewable energy:

- 80% of total electricity demand (680-750 TWh) to be supplied by renewables in 2030
- 2% of land area to be used for onshore wind power
- Significant expansion of offshore wind power: at least 30 GW in 2030, 40 GW in 2035, 70 GW in 2045
- Expand solar power capacity to about 200 GW by 2030
- Mandatory installation of PV systems in new commercial buildings, and “as a rule” on new residential buildings
- Abolish the renewable energy surcharge via electricity prices in January 2023 for social fairness

Coal:

- Ideally, bring forward the completion of coal phase-out to 2030
- In the transition period of coal phase-out: Large-scale expansion of renewables & construction of modern gas-fired power plants (H2 ready)
- Accelerate measures under the Structural Development Act for Coal-mining Regions, and adjust measures for adjustment allowances

Nuclear: Adherence to Germany's nuclear phase-out

The Scholz Government: Climate Policy in the Coalition Agreement

Cross-cutting climate policy:

- Leading Germany onto a 1.5-degree trajectory as a key task
- Achieve climate neutrality by 2045 at the latest
- Amend the Federal Climate Change Act (KSG) again in 2022 and introduce a new Immediate Climate Action Programme
- Create a Federal Ministry for Economic Affairs and Climate Protection and set a Federal Minister from the Green Party (→ Robert Habeck)
- **Climate check:** Verify the consistency of ministries' bills with national climate protection goals

Others

- At least 15 million electric passenger cars (EVs) by 2030
- Accelerate the development of hydrogen economy and infrastructure to achieve about 10 GW of electrolysis capacity by 2030

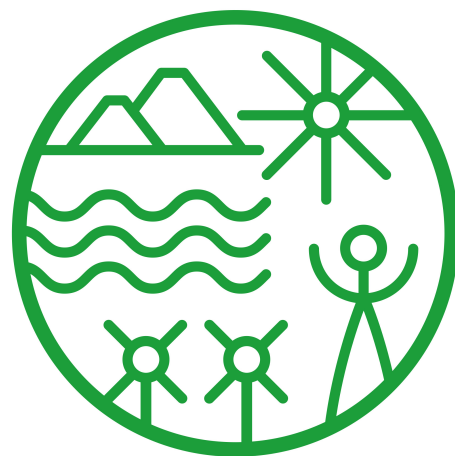


6. Conclusion

- Legislation for sectoral medium- and long-term goals and detailed policy design by combining a number of laws
- Stipulate the procedure to shut down nuclear- and lignite power plants in the laws: Which plants? Until when?
- For nuclear phase-out: compensation payment to operators. For coal phase-out: compensation payment to regions, operators, and workers
- Structural transformation of coal regions: encourage shift to new industries such as renewables
- Use multiple independent committees: for nuclear phase-out, coal phase-out, hydrogen strategy, and final disposal site search

Implications for Japan:

- (1) Legislate a step-by-step procedures for realizing ambitious goals
- (2) Energy policy formation process with a variety of stakeholders



自然エネルギー財団
RENEWABLE ENERGY INSTITUTE

Thank you very much for your attention.

Emi Ichiyanagi, Researcher, Renewable Energy Institute