Document 3

Provisional Translation

Global Warming

February 19, 2018

Agency for Natural Resources and Energy
Ministry of Economy, Trade and Industry

Table of Contents

The strategies of major countries for 2050 ・・・・・・・・・・ p.2

Transition of electricity market ・・・・・・・・・・・・・・・・・・・・ p.9

CO2 emissions of EU and U.S. ・・・・・・・・・・・・・・・・・・・ p.15

Power demand and supply in Denmark and Germany ・・・ p.18

The strategies of major countries for 2050

The strategies of major countries for 2050

	Reduction Target	Flexibility	Main Strategy, Posture: Zero Emission	Main Strategy, Posture: Energy Conservation /Electrification	Main Strategy, Posture: Overseas
United States	▲80% or more (as percentage of 2005)	**Ambitious vision towards reduction target** (not intended as current policy proposals) providing **an ambitious vision** to reduce net GHG emissions by 80 percent or more below 2005 levels by 2050.	**Increase** Variable renewable energy + Nuclear power	**Large-scale electrification** (20%→45~60%)	**Contribution through expanding market for US products**
Canada	▲80% (as percentage of 2005)	**Informing the conversation** (not a blue print for action) not a blue print for action. Rather, the report is meant to **inform the conversation** about how Canada can achieve a low-carbon economy.	**Securing the electricity** Hydro power・Variable renewables + Nuclear power Approx. 80% of electricity source already zero emission	**Large-scale electrification** (20%→40~70%)	**Looking to contribute internationally** (0~15%)
France	▲75% (as percentage of 1990)	**Possible path for achieving objectives** (not an action plan) the scenario is not an action plan: it rather **presents a possible path** for achieving our objectives.	**Securing the electricity** Renewable energy + Nuclear power ※Zero emission rate already at more than 90%	**Large-scale energy conservation** (half as percentage of 1990)	**Contribution through international development support by French businesses**
United Kingdom*	▲80% or more (as percentage of 1990)	**Helps players identify steps to take in the next few years by exploring potential pathways** (long-term predictions are difficult) exploring the plausible potential pathways to 2050 **helps us to identify low-regrets steps we can take in the next few** years common to many versions of the future	**Increase** Variable renewables + Nuclear power	**Promote energy conservation/electrification**	**Lead the world through environmental investment**
Germany	▲80~95% (as percentage of 1990)	**Point to the direction towards reducing emissions** (not a search for masterplan) ※Conduct regular reviews not a rigid instrument; it points to **the direction** needed to achieve a greenhouse gas-neutral economy.	**Increase** Variable renewable energy	**Large-scale energy conservation** (half as percentage of 1990)	**Maintaining and bolstering investment sentiment in LDCs**

* Not yet submitted to UNFCCC as long-term strategy. Created from *The Clean Growth Strategy* (November 2017).

National Long-term Strategies (United States)

Long-term Strategy Summary	Reduction Target: ▲80% or more (as percentage of 2005) Status: Ambitious Vision aimed at Reduction Targets

		Main Entries	Quantitative Target	
Shift to Zero Emission	Renewable Energy	Infrastructure and regulatory support necessary such as batteries, systems buildup towards expanding variable renewable energy.	Year 2015 13% (VRE※ 5%)	Year 2050 55~65% (VRE 45~59%)
Shift to Zero Emission	Nuclear Power	Necessary to extend lifespan of existing plants and invest in light water reactors and next-generation nuclear power.	Year 2015 19%	Year 2050 17~26%
Shift to Zero Emission	Thermal Power	Map out future without thermal power depending on CCS technology development.	Year 2015 0% (CCS thermal power)	Year 2050 0~25% (CCS Thermal power)
Energy Conservation/ Electrification	Energy conservation	Enhance efficiency of energy system as a whole Smart grids, raising fuel efficiency, making industrial processes more efficient, etc.	Year 2050 ▲24~30% (as percentage of 2005)	
Energy Conservation/ Electrification	Electrification	Greater electrification of autos, household heat demand, industrial steam, etc.	Year 2015 21%	Year 2050 45~60%
Energy Conservation/ Electrification	CCUS/ Hydrogen	Hydrogen may play important role in areas where electrification is difficult. (FCV, aircraft, industrial cogeneration)	No Quantitative Target	
Over seas	Overseas Contributions	Contribute to global emissions reduction by expanding market for US goods and services.	No Quantitative Target	

※VRE: Variable Renewable Energy

National Long-term Strategies (Canada)

Long-term Strategy Summary	Reduction Target :▲80% and more (as percentage of 2005) Status: Informing the Conversation

		Main Entries	Quantitative Target	
Shift to Zero Emission	Renewable Energy	Expand use of wind power, photovoltaics and hydro power.	Year 2015 63% (Hydro Power 57%)	Year 2050 50~80% (Hydro Power 30~70%)
Shift to Zero Emission	Nuclear Power	250 USD investment expected in 10 plants over the next 15 years.	Year 2015 15%	Year 2050 5～50%
Shift to Zero Emission	Thermal Power	Thermal power equipped with CCS may exist depending on scenario.	Year 2015 0% (CCS Thermal Power)	Year 2050 0~10% (CCS Thermal Power)
Energy Conservation/ Electrification	Energy conservation	Improving energy efficiency and demand management are the main elements of long-term emissions reduction strategy.	Year 2050 ▲5～35% (from 2014 level)	
Energy Conservation/ Electrification	Electrification	Electrification of Automobiles, buildings, heat systems, industry, etc. is essential to reducing emissions.	Year 2015 22%	Year 2050 40～72%
Energy Conservation/ Electrification	CCUS/ Hydrogen	Room for reduction in major emitting industries (gas and petroleum, iron and steel, paper manufacturing, chemicals, etc.) with CCS Potential for using hydrogen in heavy industries, shipping, etc.	Year 2015 0%	Year 2050 0~32%
Over seas	Overseas Contributions	Encouraging international cooperation contributes to efficient global cost reduction. Include cross-border reduction in international contribution.	Year 2015 0%	Year 2050 0~15%

National Long-term Strategies (France)

Long-term Strategy Summary	Reduction Target : ▲75% (as percentage of 1990) Status: Possible Path for achieving Objectives

		Main Entries	Quantitative Target
Shift to Zero Emission	Renewable Energy	Further flexibility necessary to integrate renewable energy (utilizing hydropower for peak demand, energy storage, international grids)	Year 2015 16% (VRE※ 5%) → Year 2030 40% (Details unknown)
	Nuclear Power	Reduce weight in electricity composition to 50% by 2025. (Energy Conversion Act) ※French government announced in 7/11/2017 that the target year will be postponed to 2030 ~ 2035.	Year 2015 78% → Year 2025 50%
	Thermal Power	Shift to zero emission CCS essential in complete shift to zero emission scenario.	Year 2015 0% (CCS Thermal Power) → No Quantitative Target (CCS Thermal Power)
Energy Conservation/ Electrification	Energy conservation	Large-scale energy conservation in industry, construction and transport sectors.	Year 2050 ▲50% (as percentage of 1990)
	Electrification	Electrification important to promoting energy conservation Timeframe for developing EV infrastructure, etc. important	Year 2015 25% → Year 2025 Approx. 40%
	CCUS/ Hydrogen	Restrain carbon intensity of products through CCS in industrial processes in iron and steel , cement, etc.	No Quantitative Target
Overseas	Overseas Contributions	Promote carbon intensity reduction through support for international development by French businesses (utilize export credit insurance, etc.)	No Quantitative Target

※VRE: Variable Renewable Energy

National Long-term Strategies (United Kingdom)

Long-term Strategy Summary	Reduction Target : ▲80% or more (as percentage of 1990) Status: Help identifying steps for the next few years by exploring potential pathways*

* Content aimed at achieving UK's "Fifth Carbon Budget" (2028-2032). Some entries up to 2050.

		Main Entries	Quantitative Target	
Shift to Zero Emission	Renewable Energy	Support more renewable energy market entries such as offshore wind Develop electricity storage, DR and new grid stabilization methods.	Year 2015 25% (VRE※ 14%)	Year 2030 44% (Details unknown)
	Nuclear Power	Reduce cost, maintain stability (support new construction) Support innovation towards developing next-generation nuclear power, etc.	Year 2015 21%	Year 2030 28%
	Thermal Power	Decommission coal-fired power plants without CCS by 2025.	Year 2015 0% (CCS Thermal Power)	No quantitative target (CCS Thermal Power)
Energy Conservation/ Electrification	Energy conservation	Achieve 20% energy conservation in the office and industrial sectors by 2030, raise energy efficiency in all households to specific levels.	Year 2030 ▲10% (as percentage of 2008)	
	Electrification	Electrify energy intensive industries, utilize heat pumps in household Promote adoption of EVs	Year 2015 21%	Year 2030 23%
	CCUS/ Hydrogen	Lead the world in CCUS technology development (invest 100 million GBP) Hydrogen to be used in FCVs, industrial processes, and heat supply to households and offices	No Quantitative Target	
Over seas	Overseas Contributions	Lead the world in environmental investment (establish task force to encourage public and private investment, 20 million GBP investment in immature technologies, etc.) ※UK actions to date are expected to save almost 500 million tons of CO_2, while they do not count these results against the domestic budgets	No Quantitative Target	

※VRE: Variable Renewable Energy

National Long-term Strategies (Germany)

Long-term Strategy Summary	Reduction Target :▲80～95% (as percentage of 1990) Status: Point to the Direction towards reducing Emissions

		Main Entries	Quantitative Target
Shift to Zero Emission	Renewable Energy	Fully promote renewable energy in areas where it is usable (mainly wind power). Optimize variable renewable energy by sector-coupling.	Year 2015 29% (VRE※ 18%) → Year 2050 80% (Details unknown)
Shift to Zero Emission	Nuclear Power	No entry.	Year 2015 14% → Year 2050 0%
Shift to Zero Emission	Thermal Power	New construction of coal-fire power plants will not be supported.	Year 2015 0% (CCS Thermal Power) → No Quantitative Target (CCS Thermal Power)
Energy Conservation/ Electrification	Energy conservation	Energy conservation first. (promote energy conservation in all sectors)	Year 2050 ▲50% (as percentage of 2005)
Energy Conservation/ Electrification	Electrification	Increase electricity demand through electrification of automobiles and heat use in buildings.	Year 2015 20% → Year 2050 Approximately 30%
Energy Conservation/ Electrification	CCUS/ Hydrogen	Consider CCU and CCS--in that order--when carbon reduction through new technology is difficult in the industrial sector. Hydrogen has potential for FCVs and as alternative fuel source.	No Quantitative Target
Overseas	Overseas Contributions	Contribute through partnerships for climate action plan. (maintain and strengthen investment sentiment in LDCs and contribute to their fundraising)	No Quantitative Target

※VRE: Variable Renewable Energy

Transition of electricity market

(1990 -> 2010 -> 2015)

Transition of Germany’s CO2 emissions from power generation

	1990		2010		2015
Power Generation	550 TWh	+80	630 TWh	+10	640 TWh
Renew-able	19 TWh	+90	100 TWh	+80	190 TWh
Nuclear	150 TWh	-10	140 TWh	-50	92 TWh
Thermal	380 TWh (coal 320, gas 40, oil 10)	+10	380 TWh (coal 270, gas 90, oil 20)	-20	360 TWh (coal 280, gas 60, oil 20)
CO2 Emissions (Power generation)	340 Million tons (0.64 kgCO2/kWh)	-40	300 Million tons (0.48 kgCO2/kWh)	-10	290 Million tons (0.45 kgCO2/kWh)

(Thermal generated volume change:+0
Thermal breakdown change: -50)

(Thermal generated volume change:-20
Thermal breakdown change: +10)

*Numbers are rounded. Totals may not match due to rounding errors.

Source: Produced from IEA Energy Balances, CO2 Emissions from Fuel Combustion

Transition of the UK's CO2 emissions from power generation

	1990		2010		2015
Power Generation	320 TWh	+60	380 TWh	-40	340 TWh
Renew-able	6 TWh	+20	26 TWh	+60	84 TWh
Nuclear	66 TWh	-4	62 TWh	+8	70 TWh
Thermal	250 TWh (coal 200, gas 10, oil 30)	+40	290 TWh (coal 110, gas 180, oil 10)	-110	180 TWh (coal 80, gas 100, oil 10)
CO2 Emissions (Power generation)	220 Million tons (0.69 kgCO2/kWh)	-50	170 Million tons (0.45 kgCO2/kWh)	-50	120 Million tons (0.35 kgCO2/kWh)

Thermal generated volume change: +40
Thermal breakdown change: -90

Thermal generated volume change: -60
Thermal breakdown change: +10

*Numbers are rounded. Totals may not match due to rounding errors.

Source: Produced from IEA Energy Balances, CO2 Emissions from Fuel Combustion

Transition of the EU's CO_2 emissions from power generation

	1990		2010		2015
Power Generation	2,600 TWh	+800	3,300 TWh	-100	3,200 TWh
Renew-able	310 TWh	+400	680 TWh	+300	940 TWh
Nuclear	790 TWh	+100	920 TWh	-100	860 TWh
Thermal	1,500 TWh (coal 1100, gas 200, oil 200)	+300	1,700 TWh (coal 900, gas 800, oil 100)	-300	1,400 TWh (coal 800, gas 500, oil 100)
CO_2 Emissions (Power generation)	1,290 Million tons (0.50 $kgCO_2/kWh$)	-120	1,170 Million tons (0.35 $kgCO_2/kWh$)	-160	1,010 Million tons (0.32 $kgCO_2/kWh$)

Thermal generated volume change:+230
Thermal breakdown change: -350

Thermal generated volume change:-220
Thermal breakdown change: +60

*Numbers are rounded. Totals may not match due to rounding errors.

Source: Produced from IEA Energy Balances, CO_2 Emissions from Fuel Combustion

Transition of the China's CO2 emissions from power generation

	1990		2010		2015
Power Generation	620 TWh	+3600	4,200 TWh	+1600	5,800 TWh
Renew-able	130 TWh	+700	780 TWh	+600	1,400 TWh
Nuclear	0 TWh	+70	74 TWh	+100	170 TWh
Thermal	490 TWh (coal 400, gas 0, oil 100)	+2800	3,300 TWh (coal 3200, gas 100, oil 0)	+900	4,300 TWh (coal 4100, gas 100, oil 0)
CO2 Emissions (Power generation)	520 Million tons (0.85 kgCO2/kWh)	+2660	3,180 Million tons (0.76 kgCO2/kWh)	+650	3,840 Million tons (0.66 kgCO2/kWh)
		Thermal generated volume change: +3020 Thermal breakdown change: -360		Thermal generated volume change: +890 Thermal breakdown change: -230	

*Numbers are rounded. Totals may not match due to rounding errors.

Source: Produced from IEA Energy Balances, CO2 Emissions from Fuel Combustion

Transition of the Japan's CO2 emissions from power generation

	1990		2010		2015
Power Generation	870 TWh	+200	1,100 TWh	-100	1,100 TWh
Renew-able	98 TWh	+10	110 TWh	+50	160 TWh
Nuclear	200 TWh	+100	290 TWh	-280	20 TWh
Thermal	570 TWh (coal 100, gas 200, oil 300)	+100	720 TWh (coal 300, gas 300, oil 100)	+200	870 TWh (coal 300, gas 400, oil 100)
CO2 Emissions (Power generation)	350 Million tons (0.46 kgCO2/kWh)	+80	430 Million tons (0.42 kgCO2/kWh)	+80	500 Million tons (0.52 kgCO2/kWh)
		Thermal generated volume change:+90 Thermal breakdown change: -10		Thermal generated volume change:+90 Thermal breakdown change: -20	

* Numbers are rounded. Totals may not match due to rounding errors.

* Definition of kgCO2/kWh in METI and IEA may be different.

Source: METI statistics, IEA Energy Balances etc.

CO2 emissions of EU and U.S.

(2015)

Emission coefficient and the electrical power generation mix of each country

CO2 Emission per kWh and Composition of Electricity Sources for Major EU Members and Japan (2015)

	Sweden	France	Denmark	Spain	EU Average※	Germany	Japan
	11gCO2/kWh	46gCO2/kWh	174gCO2/kWh	293gCO2/kWh	315gCO2/kWh	450gCO2/kWh	540gCO2/kWh
Stable Zero Emission	88%	88%	15%	33%	43%	25%	12%
	Stabel RE: 53% Nuclear：35%	Stable RE: 11% Nuclear：78%	Stable RE: 15% Nuclear：0%	Stable RE: 12% Niclear：21%	Stable RE: 16% Nuclear：27%	Stable RE: 11% Nuclear：14%	Stable RE: 11% Nuclear：1%
Variable Renewable Energy	10%	5%	51%	23%	13%	18%	4%
	PV：0% Wind：10%	PV：1% Wind：4%	PV：2% Wind：49%	PV：3% Wind：18%	PV：3% Wind：10%	PV：6% Wind：12%	PV：3% Wind：1%
Thermal Power	2%	7%	34%	44%	44%	56%	85%
	Coal：1% Gas：0% Oil：1%	Coal：2% Gas：4% Oil：1%	Coal：25% Gas：6% Oil：4%	Cola：19% Gas：19% Oil：7%	Coal：26% Gas：15% Oil：3%	Coal：44% Gas：10% Oil：2%	Coal：34% Gas：41% Oil：10%

※EU28

Source: IEA CO2 emissions from fuel combustion 2017, Comprehensive Energy Statistics

Emission coefficient and the electrical power generation mix of US states

CO2 Emission per kWh and Composition of Electricity Sources for Major US states (2015)

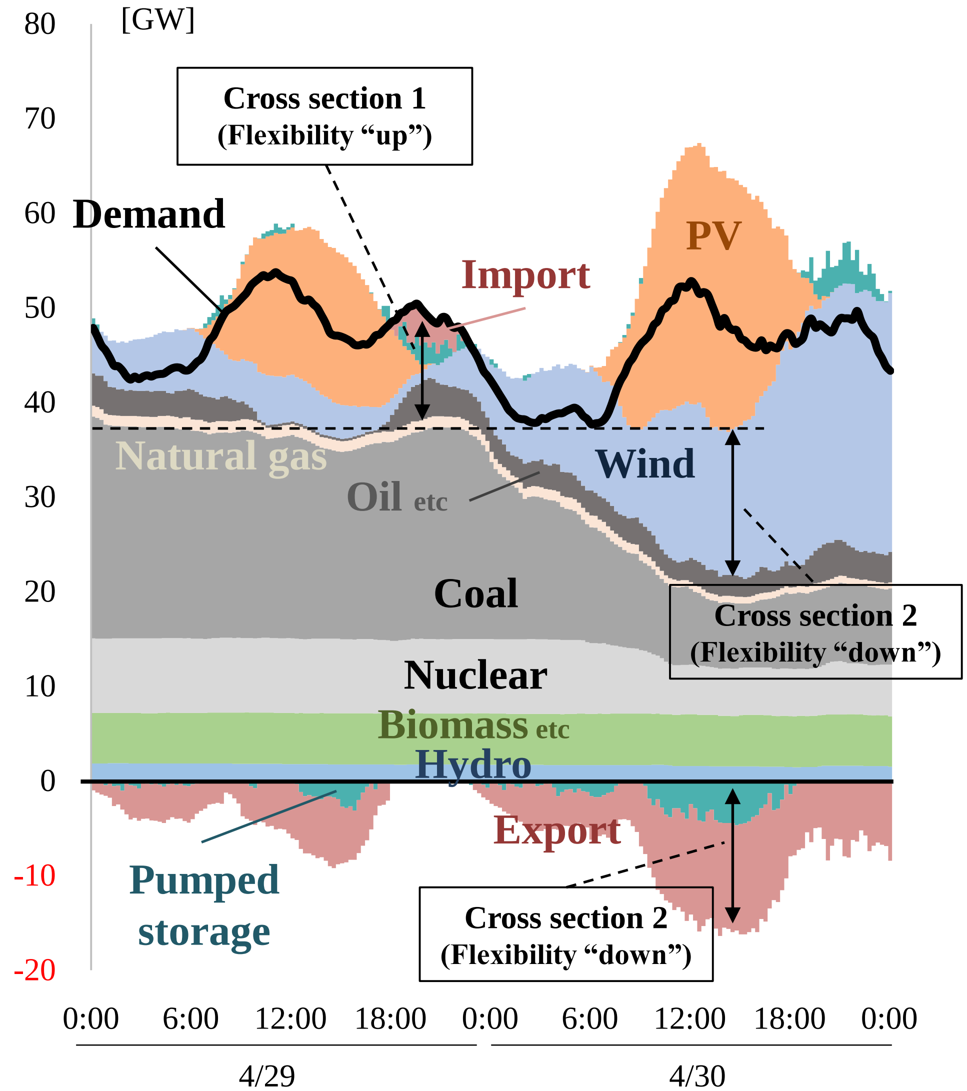
	Washington	New Hampshire	New York	California	Illinois	US average	Texas
	106gCO2/kWh	183gCO2/kWh	235gCO2/kWh	282gCO2/kWh	435gCO2/kWh	498gCO2/kWh	541gCO2/kWh
Stable Zero Emission	76%	62%	52%	26%	50%	27%	9%
	Stabel RE: 69% Nuclear：7%	Stable RE: 14% Nuclear：47%	Stable RE: 20% Nuclear：32%	Stable RE: 16% Niclear：9%	Stable RE: 0% Nuclear：50%	Stable RE: 8% Nuclear：19%	Stable RE: 1% Nuclear：9%
Variable Renewable Energy	6%	2%	3%	14%	6%	5%	10%
	PV：0% Wind：6%	PV：0% Wind：2%	PV：0% Wind：3%	PV：8% Wind：6%	PV：0% Wind：6%	PV：1% Wind：4%	PV：0% Wind：10%
Thermal Power	17%	36%	45%	60%	44%	67%	81%
	Coal：5% Gas：12% Oil：0%	Coal：5% Gas：30% Oil：1%	Coal：2% Gas：41% Oil：2%	Cola：1% Gas：59% Oil：0%	Coal：38% Gas：6% Oil：0%	Coal：34% Gas：32% Oil：1%	Coal：28% Gas：53% Oil：0%

Source: EIA Statistics

Power demand and supply in Denmark and Germany

Power demand and supply in Germany (2017/4/29~4/30)

Electricity balance in 2017/4/29~4/30 in Germany



Flexibility (kW) and power generation (kWh) for the 2 days

Flexibility (kW)

	Fossil	Pumped	Ex/Import	Total
Cross section 1 (Flexibility "up")	5 GW (45%)	2 GW (18%)	4 GW (36%)	10 GW (100%)
Cross section 2 (Flexibility "down")	13 GW (45%)	4 GW (14%)	12 GW (41%)	29 GW (100%)
Cross section 1 + 2 (total)	18 GW (45%)	6 GW (15%)	16 GW (40%)	40 GW (100%)

*Totals might not match due to rounding

Power Generation (kWh)

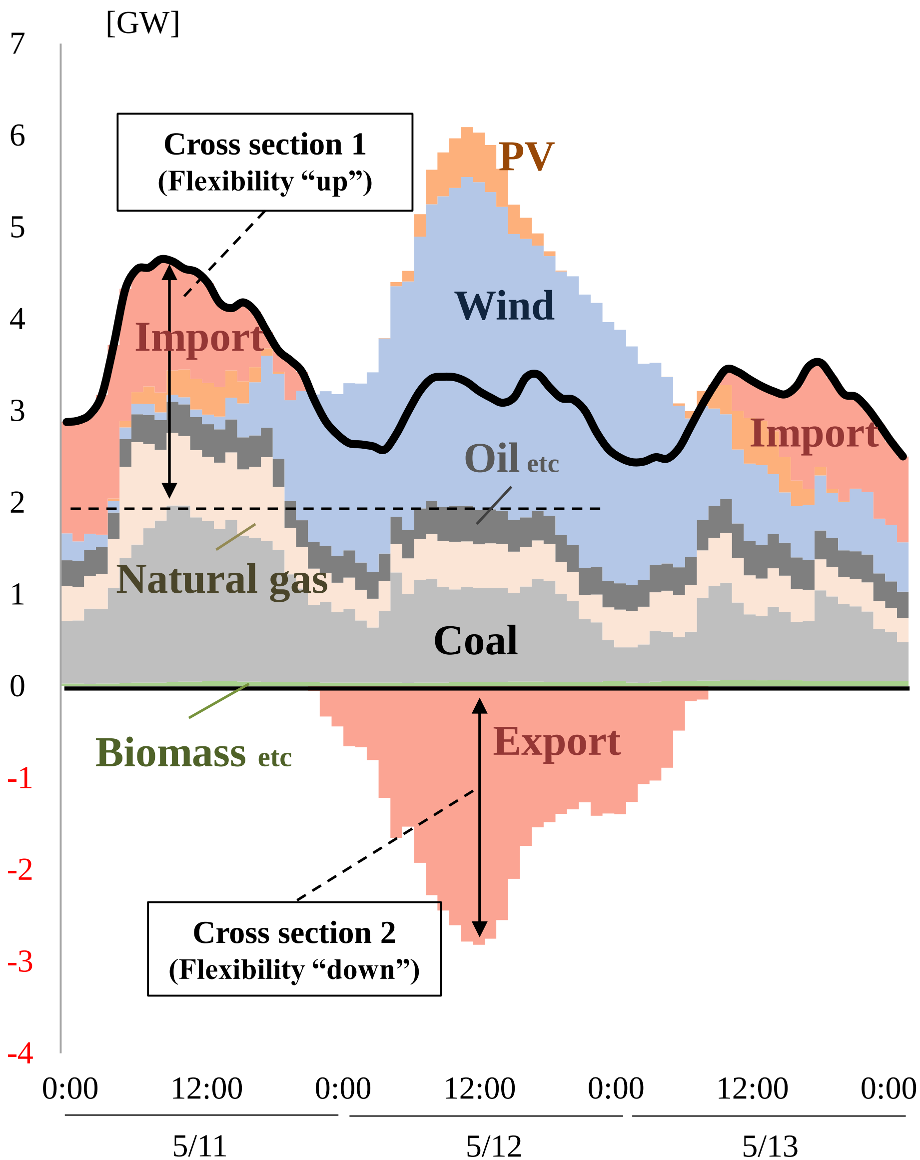
	Renewable	Fossil	Nuclear	Total
With Ex/Import (actual case)	1,200 GWh	920 GWh	300 GWh	2,500 GWh
Without Ex/Import*	900 GWh	860 GWh	300 GWh	2,100 GWh
Difference	▲300 GWh (▲25%)	▲60 GWh (▲7%)	±0 GWh (±0%)	▲400 GWh (▲15%)

※Preliminary calculation assuming fossil power increases as alternative energy of import, fossil decreases for 4/29 and renewables are curtailed for 4/30 instead of exporting power

Source: ENTSO-E "Transparency Platform"

Power demand and supply in Denmark (2017/5/11~5/13)

Electricity balance in 2017/5/11~5/13 in Denmark



Flexibility (kW) and power generation (kWh) for the 3 days

Flexibility (kW)

	Fossil	Pumped	Ex/Import	Total
Cross section 1 (Flexibility "up")	1.0 GW (40%)	0 GW (0%)	1.5 GW (60%)	2.4 GW (100%)
Cross section 2 (Flexibility "down")	0 GW (0%)	0 GW (0%)	2.8 GW (100%)	2.8 GW (100%)
Cross section 1 + 2 (total)	1.0 GW (20%)	0 GW (0%)	4.3 GW (80%)	5.3 GW (100%)

*Totals might not match due to rounding

Power Generation (kWh)

	Renewable	Fossil	Nuclear	Total
With Ex/Import (actual case)	120 GWh	130 GWh	0 GWh	250 GWh
Without Ex/Import*	70 GWh	160 GWh	0 GWh	240 GWh
Difference	▲50 GWh (▲39%)	+30 GWh (+27%)	±0 GWh (±0%)	▲10 GWh (▲5%)

※Preliminary calculation assuming fossil power increases as alternative energy of import, renewables are curtailed instead of exporting power.

Source: ENTSO-E "Transparency Platform"

V-RE ratio and power import/export in Denmark and Germany

			Denmark		Germany		Japan
Power demand (annual generation)			30TWh	<	600TWh	<	1,100TWh
Ratio of variable renewables			51% (PV 2% Wind 49%)	>	18% (PV 6% Wind 12%)	>	6% (PV 5% Wind 1%)
Power Export/Import	<kW> Dependence of flexibility on abroad Ex/Import on the day with high V-RE ratio		80% 4.3GW Import: 1.5GW Export: 2.8GW	>	40% 16GW Import: 12GW Export: 4GW	>	No Export/ Import
	<kWh> Annual export/ import	Export	33% (10TWh)	>	13% (85TWh)	>	No Export/ Import
		Import	55% (16TWh)	>	5% (34TWh)	>	

Source: ENTSO-E “Transparency Platform”, “Statistical Factsheet” etc

(Reference) Transition of Electricity mix, CO2, Price in EU countries

		Group1: Continental, High V-RE ratio					
		Germany		**Spain**		**Denmark**	
		2010	**2015**	**2010**	**2015**	**2010**	**2015**
Power Mix	**Fossil**	**61%** (Coal 44, Gas14)	**56%** (Coal 44, Gas 10)	**46%** (Coal 9, Gas 32)	**44%** (Coal 19, Gas 19)	**68%** (Coal 44, Gas 20)	**34%** (Coal 25, Gas 6)
	Stable zero emission	**31%** (Nuclear 22, Hydro 3)	**25%** (Nuclear 14, Hydro 3)	**36%** (Nuclear 21, Hydro 14)	**33%** (Nuclear 21, Hydro 10)	**12%** (Nuclear 0, Hydro 0) ※All biomass	**15%** (Nuclear 0, Hydro 0) ※All biomass
	Variable zero emission	**8%** (PV 2, Wind 6)	**18%** (PV 6, Wind 12)	**17%** (PV 2, Wind 15)	**23%** (PV 3, Wind18)	**20%** (PV 0, Wind 20)	**51%** (PV 2, Wind 49)
CO2 emission [kgCO2/kWh]		**0.48kg**	**0.45kg**	**0.24kg**	**0.29kg**	**0.36kg**	**0.17kg**
Price for household [Yen/kWh]		**32yen**	**40yen**	**24yen**	**26yen**	**36yen**	**41yen**
Commnets		<Points> ✓ V-RE: Increase ✓ Nuclear: Decrease ✓ Coal: Remain **⇒CO2 emission: Remain** **⇒Price: Increase**		<Points> ✓ V-RE: Increase ✓ Nuclear: Remain Hydro: Decrease ✓ Coal: Increase **⇒CO2 emission: Increase** **⇒Price: Increase**		<Points> ✓ V-RE: Increase ✓ Stable Zero Emission: Remain ✓ Fossil (Coal): Decrease **⇒CO2 emission: Decrease** **⇒Price: Increase**	

*Rough calculation assuming EUR 1 = JPY 135

Source: IEA Energy Balances, CO2 Emissions from Fuel Combustion, Energy Prices & Taxes etc.

(Reference) Transition of Electricity mix, CO2, Price in EU countries

		Group2: Island, Both RE & Nuclear		Group3: High stable zero emission ratio			
		United Kingdom		**France**		**Sweden**	
		2010	2015	2010	2015	2010	2015
Power Mix	Fossil	**77%** (Coal 29, Gas 46)	**54%** (Coal 23, Gas 30)	**10%** (Coal 5, Gas 4)	**7%** (Coal 2, Gas 4)	**6%** (Coal 2, Gas 2)	**2%** (Coal 1, Gas 0)
	Stable zero emission	**21%** (Nuclear 16, Hydro 1)	**32%** (Nuclear 21, Hydro 2)	**88%** (Nuclear 76, Hydro 11)	**88%** (Nuclear 78, Hydro 10)	**92%** (Nuclear 39, Hydro 45)	**88%** (Nuclear 35, Hydro 47)
	Variable zero emission	**3%** (PV 0, Wind 3)	**14%** (PV 2, Wind 12)	**2%** (PV 0, Wind 2)	**5%** (PV 1, Wind 4)	**2%** (PV 0, Wind 2)	**10%** (PV 0, Wind 10)
CO2 emission [kgCO2/kWh]		**0.45kg**	**0.35kg**	**0.08kg**	**0.05kg**	**0.03kg**	**0.01kg**
Price for household [Yen/kWh]		**18yen**	**23yen**	**17yen**	**22yen**	**22yen**	**20yen**
Commnets		＜Points＞ ✓ V-RE: Increase ✓ Nuclear: Increase Hydro: Increase ✓ Coal(Fossile): Decrease **⇒CO2 emission: Decrease** **⇒Price: Increase**		＜Points＞ ✓ V-RE: Increase ✓ Stable zero emission: Remain ✓ Coal: Slightly decrease **⇒CO2 emission: Decrease** **⇒Price: Increase**		＜Points＞ ✓ V-RE: Increase ✓ Stable zero emission: Remain ✓ Fossil: Slightly decrease **⇒CO2 emission: Decrease** **⇒Price: Decrease**	

*Rough calculation assuming EUR 1 = JPY 135, GBP 1 = JPY 150

Source: IEA Energy Balances, CO2 Emissions from Fuel Combustion, Energy Prices & Taxes etc.

(Reference) Transition of CO2 emission and Electricity Price in EU countries