

Toward climate neutrality

Transition and challenges for Asia-Pacific region

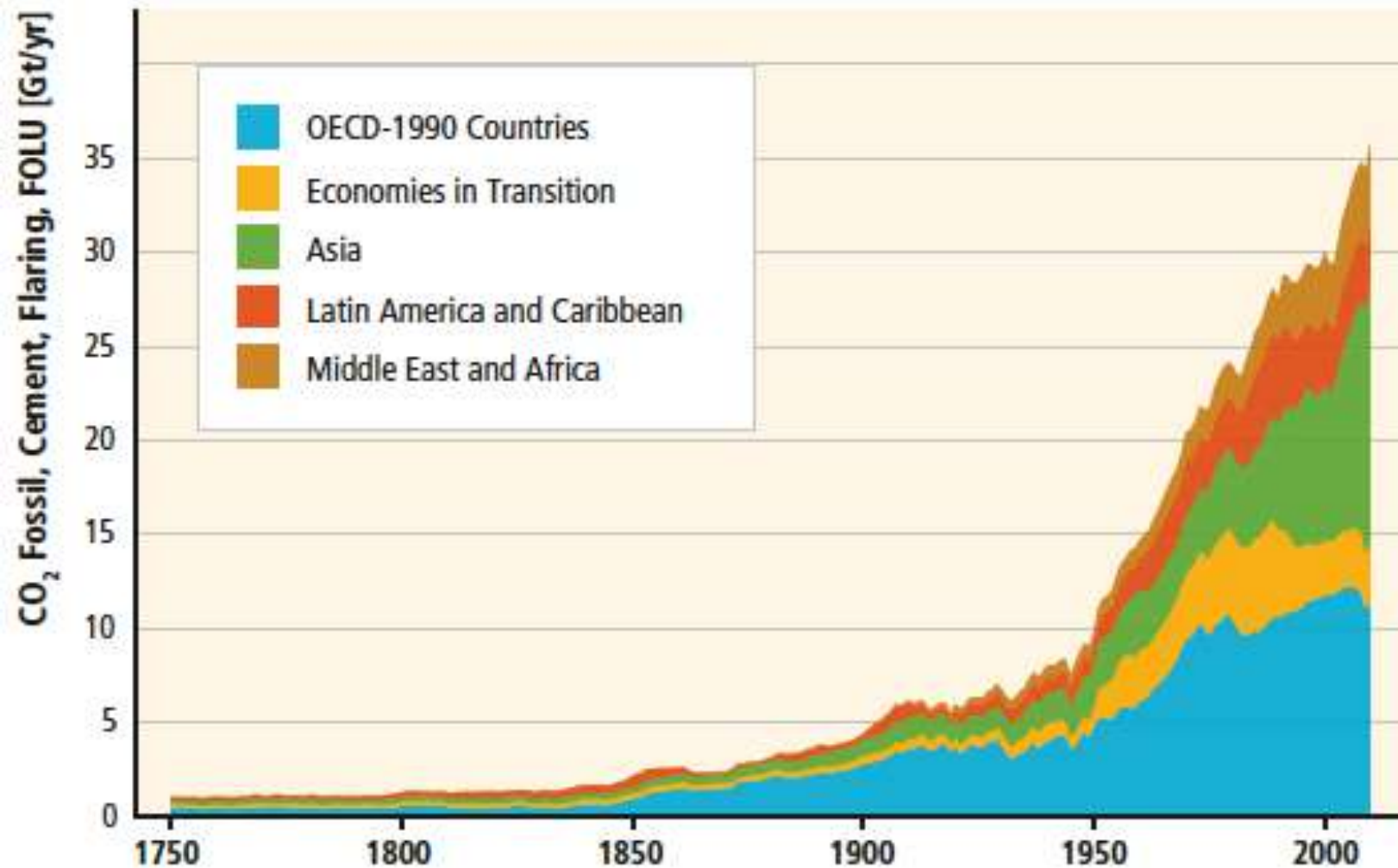
APFSD seminar
Carbon neutrality: The future of Asia-Pacific
: Contribution to the transition

March 23, 2021

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CO₂ emission by region (IPCC, 2014)



Climate impacts in Asia (IPCC, 2014)

- **Warming trends and increasing temperature extremes** have been observed across most of the Asian region over the past century.
- **Water scarcity** is expected to be a major challenge for most of the region as a result of increased water demand and lack of good management.
- The impacts of climate change on **food production and food security** in Asia will vary by region, with many regions to experience a **decline in productivity**.
- **Terrestrial systems** in many parts of Asia have responded to recent climate change with shifts in the phenologies, growth rates, and the distributions of plant species, and with permafrost degradation, and the projected changes in climate during the 21st century will increase these impacts.
- **Coastal and marine systems** in Asia are under increasing stress from both climatic and non-climatic drivers.
- **Multiple stresses** caused by rapid urbanization, industrialization, and economic development will be **compounded by climate change**.
- **Extreme climate events** will have an increasing **impact on human health, security, livelihoods, and poverty**, with the type and magnitude of impact varying across Asia.

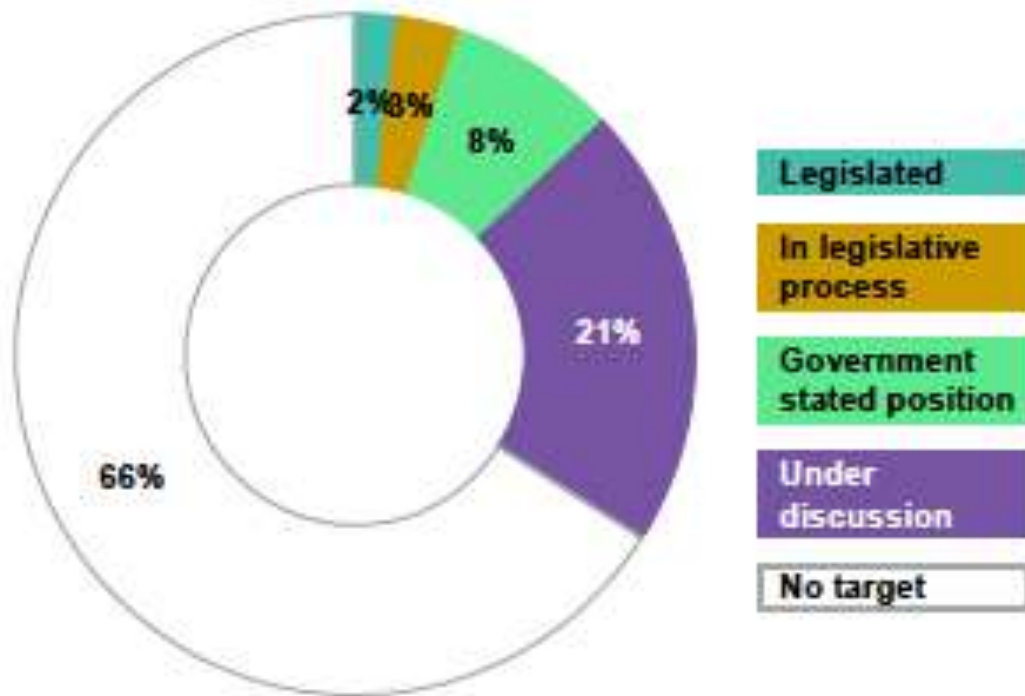
Towards climate neutrality (net zero) by 2050

- Paris Agreement (2015)
 - Holding the increase in the global average temperature to **well below 2 °C** and pursuing efforts to limit the temperature increase to **1.5 °C above pre-industrial levels** (Art. 2.1 (a))
 - **“Net zero emission” “De-carbonization” in the second half of this century** (Art. 4.1)
- Prime minister of Japan’s first policy speech to the Parliament on 26 October 2020
 - Under the third pillar of his general policy: **Toward realization of a green economy**
 - Declares **“Japan pledges to, by 2050, reduce GHG emission in Japan to net zero, namely become carbon neutral and achieve a decarbonized society”**.
- **More than 120 countries and EU including all G7 countries** have now pledge to reduce emission to net zero by 2050.

More than half of all global emissions are now covered by net-zero target

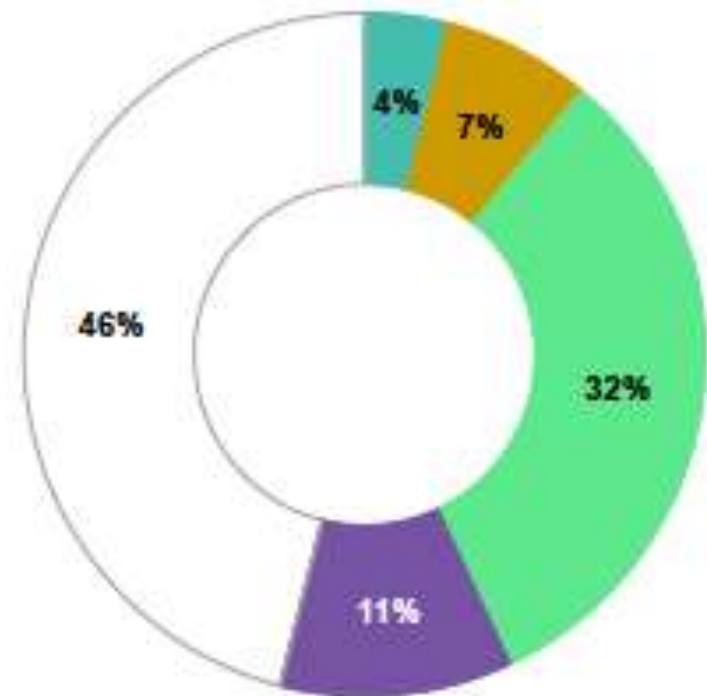
January 2020

34% with at least a net-zero discussion



December 2020

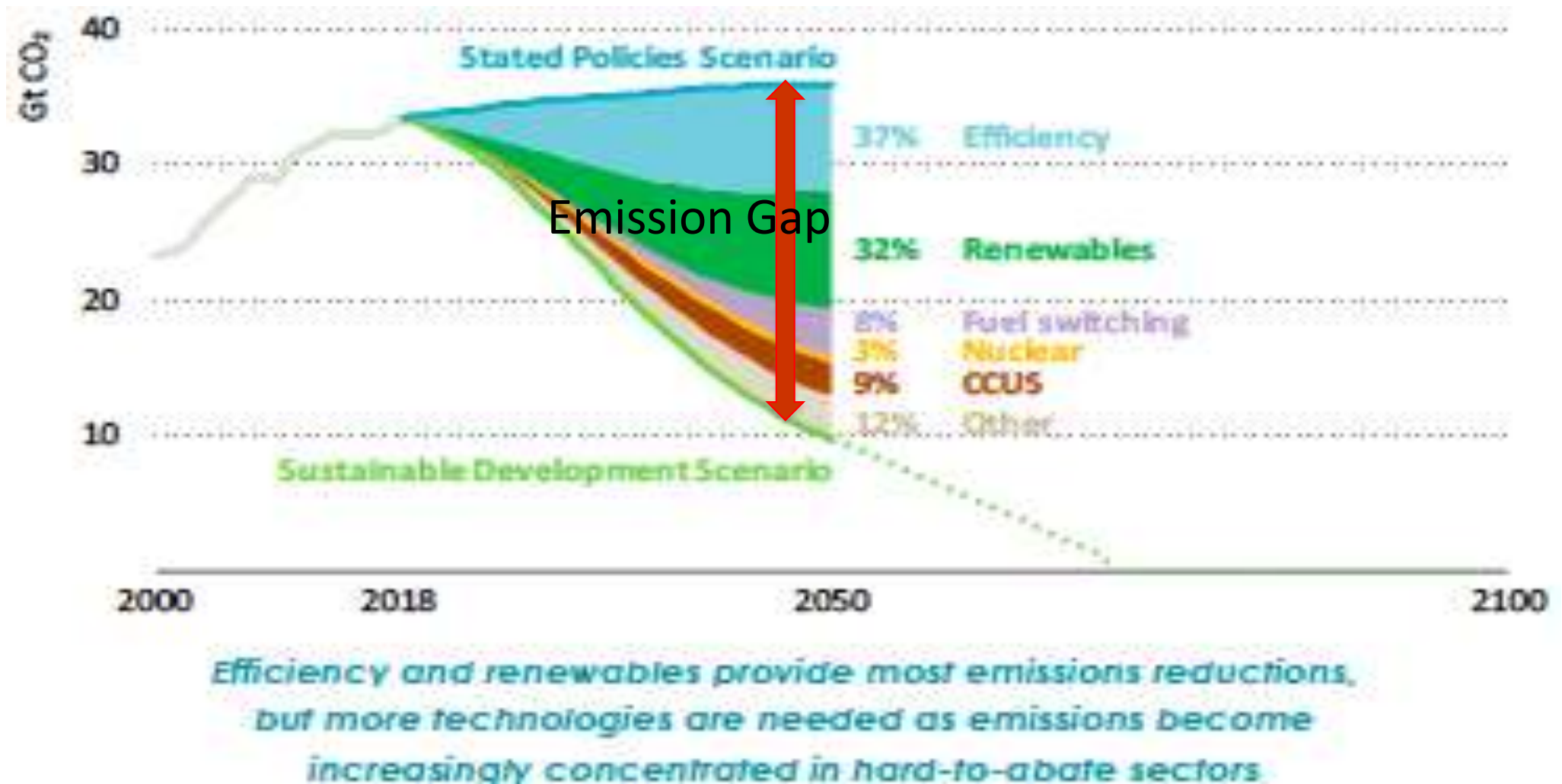
54% with at least a net-zero discussion



Climate policy (EU, UK, US, China)

EU	<ul style="list-style-type: none"> ▪ Dec 2019: "European Green Deal" as strategy of transformation to sustainable society and growth strategy "Climate neutrality by 2050)" Proposal for carbon border adjustment ▪ May 2020年: "Green Recovery" ▪ 2030 NDC: aiming to reduce GHG emission by at least 55% below 1990
UK	<ul style="list-style-type: none"> ▪ Hosting G7 and COP26 ▪ 2030 NDC: raise the level of ambition from 53% to 68 reduction below 1990 ▪ Climate Change Act (amended June 2019) providing for net zero emission by 2050 ▪ Oblige a part of listed companies to undertake climate related disclosure (Comply or Explain) in line with TCFD by 2020
US	<ul style="list-style-type: none"> ▪ 20 January 2021: Re-ratification of the Paris Agreement (entered into force on 19 Feb) ▪ Climate policy of Biden administration: Net zero emission by 2050. Carbon free electricity by 2035. 2 trillion dollars of investment in infrastructure such as in green energy. Possibility of carbon border adjustment
China	<ul style="list-style-type: none"> ▪ Top 1 of installed renewable capacity and of renewable power generated. Strategic focus on hydrogen and fuel cell industries ▪ Peak emissions before 2030 and achieve carbon neutrality before 2060 (22 Sept 2020) ▪ Reduce carbon emissions per unit of GDP by over 65% from the 2005 level; - Increase non-fossil fuels in primary energy consumption to around 25%; - Increase wind and solar power generation capacity to at least 1,200 GW.

What long-term goal would suggest?



GHG net zero by 2050

Prime Minister's first policy speech

- “Climate actions are no longer constraints on economic growth. Aggressive climate actions will bring transformation of industrial structure and economy and society, leading to higher economic growth.”
- Key words
 - Disruptive innovation such as next generation photovoltaic module and carbon recycling; R&D; regulatory reform; green investments; new space for deliberation between the government and local authorities; digitalization; green industry
- Framing energy policy
 - Drastic energy conservation (improvement in energy efficiency)
 - Introducing renewable energy as much as possible
 - Implementing nuclear policy, keeping in mind safety issue as matter of the highest priority
 - Ensuring stable energy supply
 - Drastically change policy on coal fired plants

Orchestration in climate governance

- Regulation of CO2 emission from international aviation by International Civil Aviation Organization (ICAO)
 - Long term goal(2010): Improving fuel efficiency by 2% per year, carbon neutral growth from 2020.
 - General Assembly Resolution A38-18 (2013)
 - March 2017, 36-State ICAO Council has adopted a new aircraft CO2 emissions standard.
 - for which the application for a type certificate was submitted on or after 1 January 2020
 - Global market based mechanism (Carbon offsetting and Reduction Scheme for International Aviation (CORSIA))
 - October 2016 Assembly Resolution A39-3
 - Step-by-step Introduction since 2020.
 - Voluntary participation by countries
- Long-term goal for CO2 emission reduction from International maritime transport by International Maritime Organization (IMO)
 - Reducing GHG emission at least 50% by 2050 compared to 2008 emission and seeking net zero emission in line with long term goal of the Paris Agreement
- 15 October 2016: Amendment of the Montreal Protocol to phases down HFCs (Kigali Amendment)

Local authorities are now moving towards carbon neutrality by 2050

- More than 330 of local authorities (including Tokyo, Kyoto, Yokohama...) covering about 100 million population has now declared they pledge to reach carbon neutral by 2050 (as of 19 March 2021).
- Declaration of "Carbon half by 2030" by the Governor of Tokyo Koike in the World Economic Forum (27 Jan. 2021)
 - Zero emission by 2050 and its strategy (2019)
 - Halving GHG emission in Tokyo below 2000 by 2030 (current target: 30% reduction)
 - Increase share of renewable power to 50% in the power used in Tokyo by 2030

Science Based Target (SBTs)

- Initiative created by CDP, UN Global Compact, WRI, and WWF
- **Targets adopted by companies** to reduce greenhouse gas (GHG) emissions are **certified as “science-based”** if they are **in line with the level of de-carbonization required to keep global temperature increase well below 2 degrees Celsius** compared to pre- industrial temperatures.
- **1274** companies have committed to having such targets, **647** of which have set certified science-based targets (**447** of which have set 1.5 degrees goal) (as of 22 March 2021)

➤ <https://sciencebasedtargets.org>

Japanese companies setting SBTs (as of 22 March 2021)

<p>Companies setting SBTs (93)</p> <p>*Companies setting 1.5 degrees target underlined (27)</p>	<p>Aeon, <u>Ajinomoto</u>, Anritsu, <u>Asahi Group Holdings</u>, ASICS, <u>ASKUL</u>, Astellas Pharma, Azbil, Brother Industries, <u>Comany</u>, <u>DAIDO TRADING</u>, Dai Nippon Printing, Daiichi Sankyo, <u>Daito Trust Construction</u>, Daiwa House Industry, Dentsu, <u>Digital Grid</u>, <u>Eco Works</u>, Eisai, FamilyMart, FUJI OIL HOLDINGS, FUJIFILM Holdings, Fujitsu, Furukawa Electric, HAZAMA ANDO CORPORATION, <u>HITACHI</u>, Hitachi Construction Machinery, J. FRONT RETAILING, <u>Fujitoppa Printing</u>, Japan Tobacco, <u>JENEX</u>, KAO, <u>Kawada Feather</u>, Kawasaki Kisen Kaisha, <u>Kirin Holdings</u>, Komatsu, Konica Minolta, Kumagai Gumi, KYOCERA, <u>KYOHATSU INDUSTRY</u>, Lion, LIXIL Group, Maeda Corporation, <u>MARUI GROUP</u>, Mitsubishi Electric Corporation, MITSUBISHI ESTATE, MITSUI FUDOSAN, <u>Miyakoda Construction</u>, Nabtesco, NEC, Nikon, Nippon Sheet Glass (NSG Group), <u>Nippon Weston</u>, Nippon Yusen Kabushiki Kaisha, Nissin Foods Holdings, Nomura Real Estate Holdings, Nomura Research Institute, <u>NTT Data</u>, <u>NTT Docomo</u>, NTT Corporation, <u>Ohkawa Printing</u>, <u>ONO PHARMACEUTICAL</u>, Otsuka Pharmaceutical, Panasonic, Re:CS, REMATEC Holdings, <u>Ricoh</u>, <u>Sakakibara Industry</u>, SCREEN Holdings, Seiko Epson, SEKISUI CHEMICAL, Sekisui House, Sharp, SHIMADZU CORPORATION, Shimizu Corporation, <u>Sony</u>, SUMITOMO CHEMICAL, Sumitomo Forestry, Suntory Beverage & Food, Suntory Holdings, TAIHO PHARMACEUTICAL, Taisei Corporation, <u>Takeda Pharmaceutical</u>, Terumo, TODA Corporation, Tokyu Construction, TOPPAN PRINTING, Toshiba Corporation, Unicharm, USHIO, <u>WasteBox</u>, Yamaha, YKK.AP</p>
<p>Companies committing to set SBTs (29)</p>	<p>Advantest, ANA Holdings, Benesse Corporation, CASIO COMPUTER, ESPEC, FAST RETAILING, Hamamatsu Photonics, Hitachi Capital, KOBAYASHI PHARMACEUTICAL, Kokusai Kogyo, KOSÉ, MEIDENSHA, MS & AD Insurance Group Holdings, Murata Manufacturing, Nissin Electric, OMRON, Shionogi, Sompco Holdings, Sumitomo Electric Industries, Takasago International Corporation, Takasago Thermal Engineering, Teijin, TIS, Tokyo Marine Holdings, Tokyu Fudosan Holdings, TOTO, YAMAHA MOTOR, YKK</p>

SBT companies in ASEAN

	Companies setting its SBT	Companies preparing its SBT
Singapore	City Developments Limited (CDL) , Olam, Singapore Telecommunications Limited (Singtel), CapitaLand	Asia Pacific Resources International Holdings, Sembcorp Industries, Zuellig Pharma, ComfortDelGro Corporation
Malaysia	Ramatex, Tai Wah Garment Industry Sdn. Bhd.	Sarawak Energy Berhad
Thailand	Fortune Parts Industry Public Company Limited	NR Instant Produce Co., Charoen Pokphand Group
Indonesia	-	PT Ecogreen Oleochemicals
Viet Nam	-	Maple Company Limited
Cambodia	Olive Apparel (Cambodia)	-

Other companies also committing to net zero by 2050

- Nissan motors (2009)
- Toyota motors (2015)
- Tokyo gas (2019)
- JR East (2020)
- JAL group (2020)
- JERA (2020)
- Daigas (2021)
- ENEOS (2020)
- INPEX(2021) and others.



RE100: 293 companies to go
'100% renewable'.
(March 2021)



50 Japanese companies committing to RE100 (March 2021)

- RICOH
 - target to source 100% renewable electricity by 2050, with an interim goal of at least 30% by 2030.
- 2017 (3): RICOH, Sekisui House, ASKUL
- 2018 (10): Daiwa House Group, AEON, Watami Co., Johnan Shinkin Bank, Marui Group, Envipro Holdings, Fujitsu, Sony Corporation, COOP Sapporo, Fuyo General Lease
- 2019 (17): Toda Corporation, Daito Trust Construction, Konica Minolta, Nomura Research Institute (NRI), Tokyu Land Corporation, FUJIFILM Holdings Corporation, Asset Management ONE, Dai-ichi Life Group, Panasonic Corporation, Asahi Kasei Homes, Takashimaya, Fujikura, Tokyu Corporation, Hulic Co., Lixil Group Corporation, Hazama Ando Corporation, Rakuten
- 2020 (16): Mitsubishi Estate, Mitsui Fudosan, Sumitomo Forestry Group, Ono Pharmaceutical Co., Nihon Unisys Group, Advantest, Ajinomoto Group, Sekisui Chemical, ASICS, J front retailing, Asahi group holdings, Kirin, Diamond Electric Holdings, Noritsu, Seven & I holdings, Murata
- 2021 (4): Ichigo, Kumagaigumi, Nikon, Nisshin group
- <https://www.there100.org>

Business taking the lead

- **Business** has been demanding policies for decarbonization.
 - July 2020: **Japan Association of Corporate Executives** demands that **40% of power should come from renewable sources by 2030**.
 - 6 October 2020: in the Council on economic and fiscal policy under the cabinet. Mr. Nakanishi, Chairman of The Keidanren (Japan Business Federation) (Chairman of the Board of Hitachi), proposed **"Green growth"** as one of the pillars of a new growth strategy, which refers to **"aiming to reach carbon neutral by 2050"**.
- **Why?**
 - Aware of **increasing risk of climate impacts**
 - **Moves towards decarbonizing supply chain**
 - Pressures from **financial institutions and investors** (shareholders).
 - **Changing markets**
 - **Demand side** seeks and claims clean/renewable energy.

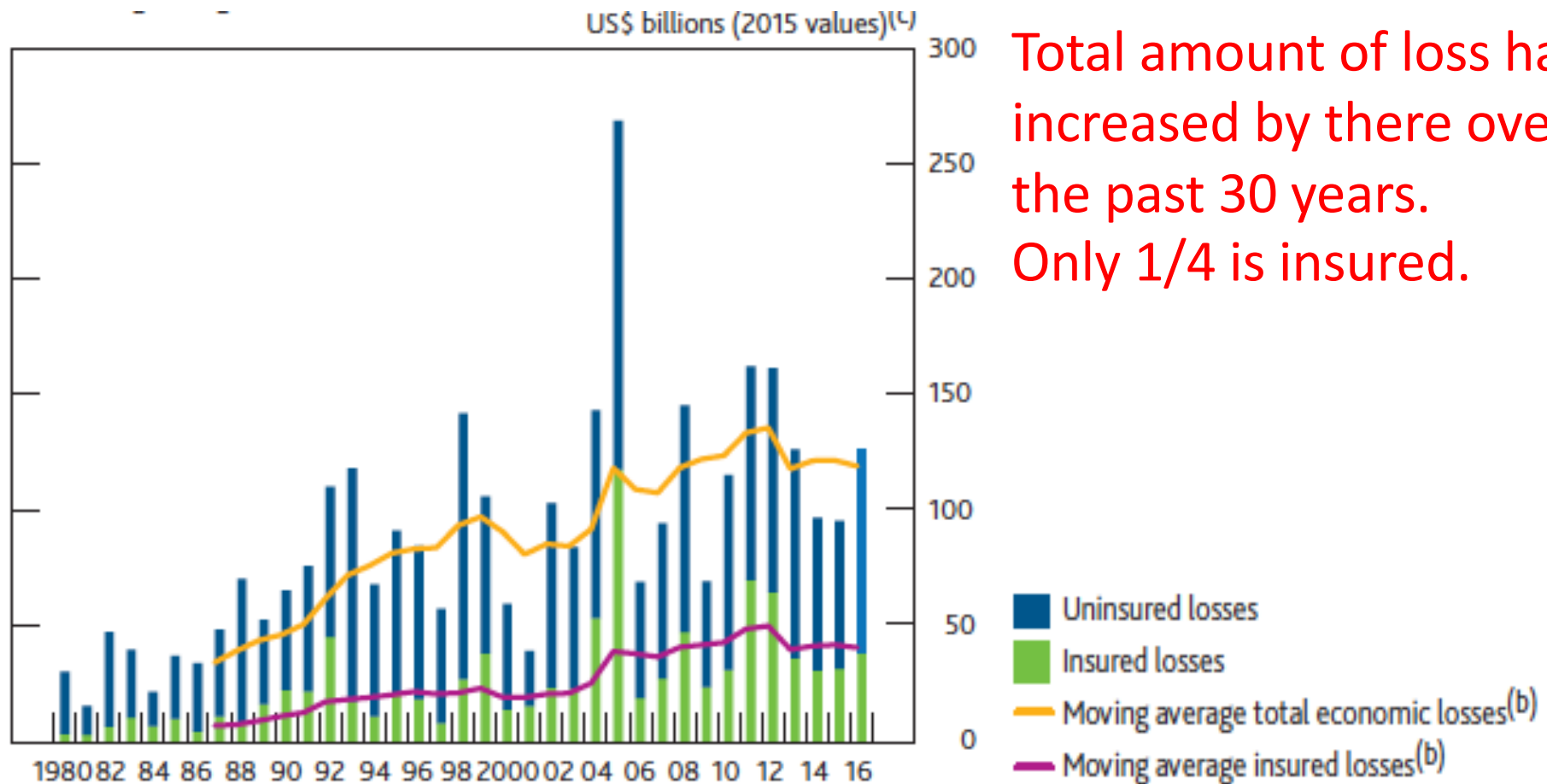
2018 Top 10 Global Economic Loss Events

Date (s)	Event	Location	Deaths	Economic Loss (billion USD)	Insured Loss (billion USD)
October 10-12	Hurricane Michael	US	32	17.0	10.0
September 13-18	Hurricane Florence	US	53	15.0	5.3
November	Camp Fire	US	88	15.0	12.0
September 4-5	Typhoon Jebi (No. 21)	Japan	17	13.0	8.5
July 2-8	Flooding	Japan	246	10.0	2.7
Spring & Summer	Drought	Central & Northern Europe	N/A	9.0	0.3
September 10-18	Typhoon Mangkhut	Oceania, East Asia	161	6.0	1.3
July - September	Flooding	China	89	5.8	0.4
November	Woolsey Fire	US	3	5.8	4.5
August 16-19	Tropical Storm Rumbia	China	53	5.4	0.3
	All Other Events		-	123.0	45
Source : AON, 2019		Totals		225.0	90.0

2019 10 Global Economic Loss Events

Date (s)	Event	Location	Deaths	Economic Loss (USD billions)	Insured Loss (USD billions)
October 6-12	Typhoon Hagibis (No. 19)	Japan	99	15.0	9.0
June - August	Monsoon Floods	China	300	15.0	0.7
September 7-9	Typhoon Faxai (No. 15)	Japan	3	10.0	6.0
May - July	Mississippi Basin Floods	United States	0	10.0	4.0
August 25 – Sep 7	Hurricane Dorian	Bahamas, Caribbean, US, Canada	83	10.0	3.5
March 12-31	Missouri Basin Floods	United States	10	10.0	2.5
June - October	Monsoon Floods	India	1750	10.0	0.2
August 6-13	Typhoon Lekima	China, Philippines, Japan	101	9.5	0.8
March - April	Flooding	Iran	77	8.3	0.2
May 2-5	Cyclone Fani	India, Bangladesh	81	8.1	0.5
		All Other Events		126 billion	44 billion
Source : AON, 2020		Totals		232 billion	71 billion

Global Climate related Economic Loss Trends (1980-2016)

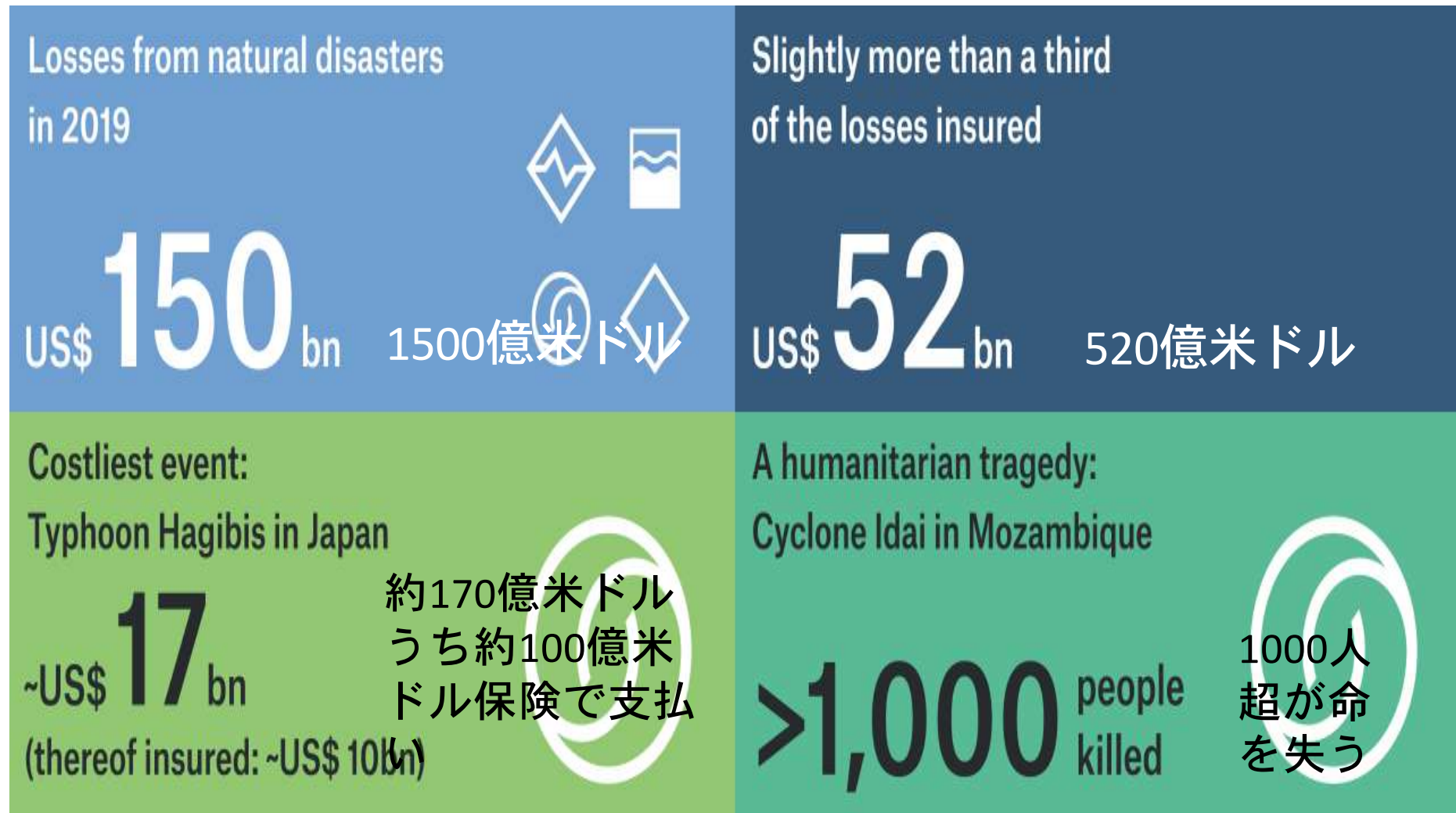


Total amount of loss has increased by there over the past 30 years.
Only 1/4 is insured.

Sources: Geo Risks Research, Munich Reinsurance Company and NatCatSERVICE 2017 (data does not account for reporting bias).

Source : Bank of England, Quarterly Bulletin 2017 Q2, 2017

Loss caused by climate related disasters in 2019



© Munich Re NatCatSERVICE

Source : Munich Re, 2020

Asahi Carbon Zero

(Base year: 2015)

2050	Aiming to achieve GHG net zero emission 温室効果ガス排出量「ゼロ」をめざす	
2030	Scope 1 & 2 emission	30% reduction
	Scope 3 emission	30% reduction

Microsoft: “Climate Moonshot” (16 January 2020)

- Carbon negative by 2030
- Remove our historical carbon emission by 2050
- \$1 billion climate innovation fund
- Scope 1 and 2 emissions to near zero by the middle of this decade
 - By 2025, shift to 100 percent supply of renewable energy.
- Reduce scope 3 emissions by more than half by 2030 through new steps
 - By July of 2021, MS will begin to implement new procurement processes and tools to enable and incentivize our suppliers to reduce their scope 1, 2, and 3 emissions.



<https://blogs.microsoft.com/blog/2020/01/16/microsoft-will-be-carbon-negative-by-2030/>

Apple: carbon neutral 2030 (16 July 2020)

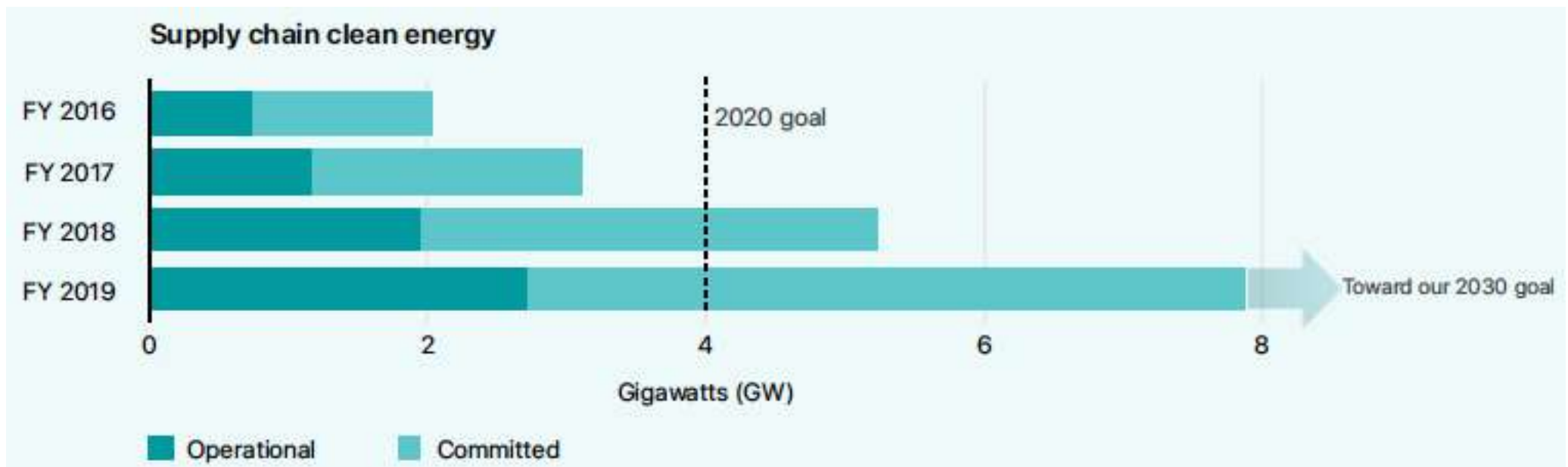
- Apple commits to be 100% carbon neutral for its supply chain and products
 - Low carbon product design
 - Energy efficiency
 - Renewable energy
 - Process and material innovations
 - Carbon removal
- Already 100% renewable energy for its operations
- Focusing on creating new projects and moving its entire supply chain to clean power.



<https://www.apple.com/newsroom/2020/07/apple-commits-to-be-100-percent-carbon-neutral-for-its-supply-chain-and-products-by-2030/>

Apple : Supplier Clean Energy Program

- Launched October 2015
- 2020 goal: 4GW additional clean energy
- 71 manufacturing partners in 17 countries have committed to 100 percent renewable energy for Apple production (as of July 2020) = equivalent to 8 GW
- Japanese companies already committing themselves to 100% renewable for Apple.
 - Dexerials Corporation, IBIDEN Co., Keiwa Incorporated, Nidec, Nitto Denko Corporation, Seiko Advance Ltd., Sony Semiconductor Solutions, Taiyo Holdings Co., Ltd.



“Sony warns it could move factories over Japanese energy policy”



- Sony warns it could move factories over Japanese energy policy (Financial Times, 27 Nov. 2020)
 - “So they told me either we do something about renewables or they have to move out of Japan.” (Minister Kono)

<https://www.ft.com/content/bbd59494-ac64-4dda-8da5-a2990d8936d3>

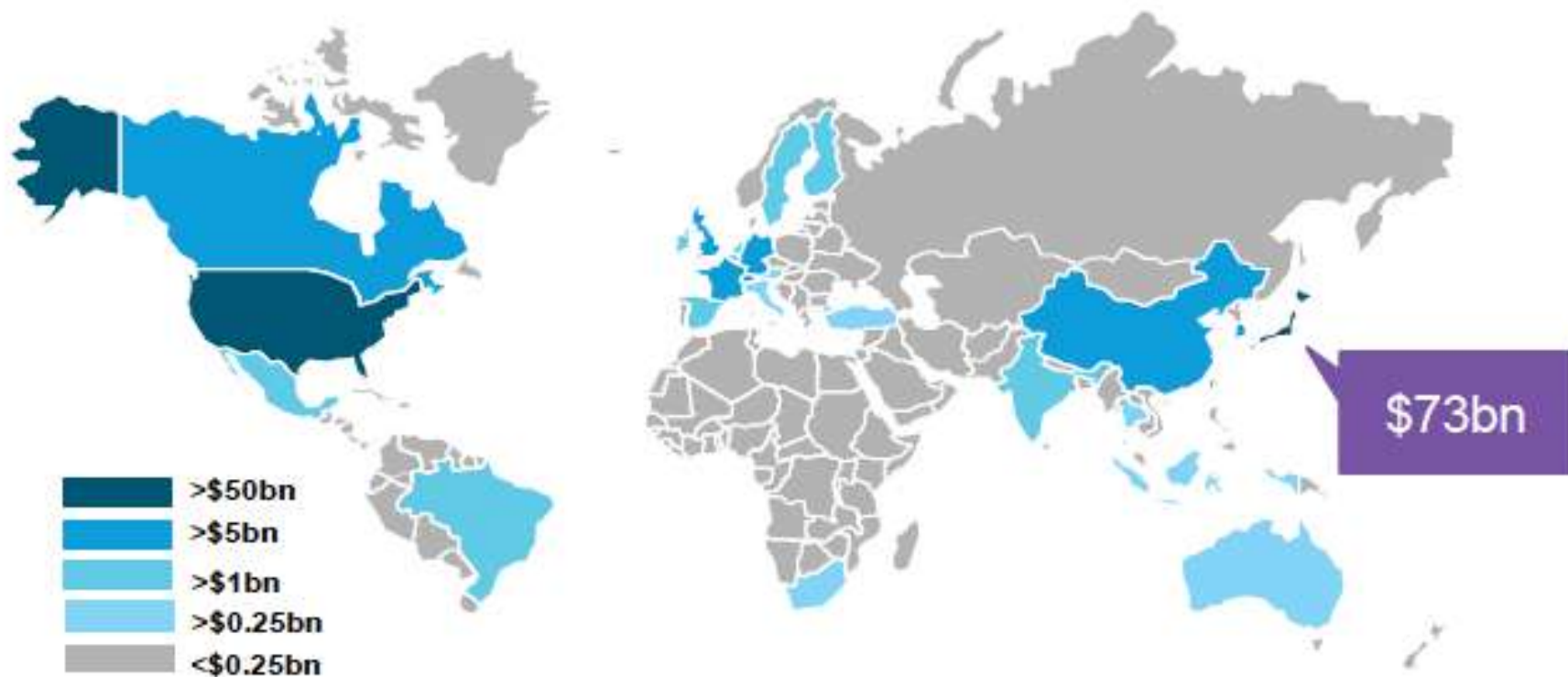
※規制改革推進会議第4回 再生可能エネルギー等に関する規制等の総点検タスクフォース（2021年2月3日）

Sony 神戸専務の報告

https://www.youtube.com/channel/UC06V_Ro0hwfbhCmTloWFNLA 57分あたりから

Business risk due to difficulty in procuring renewable energy

Japanese companies have faced business risk leading to **73 billion dollars**.

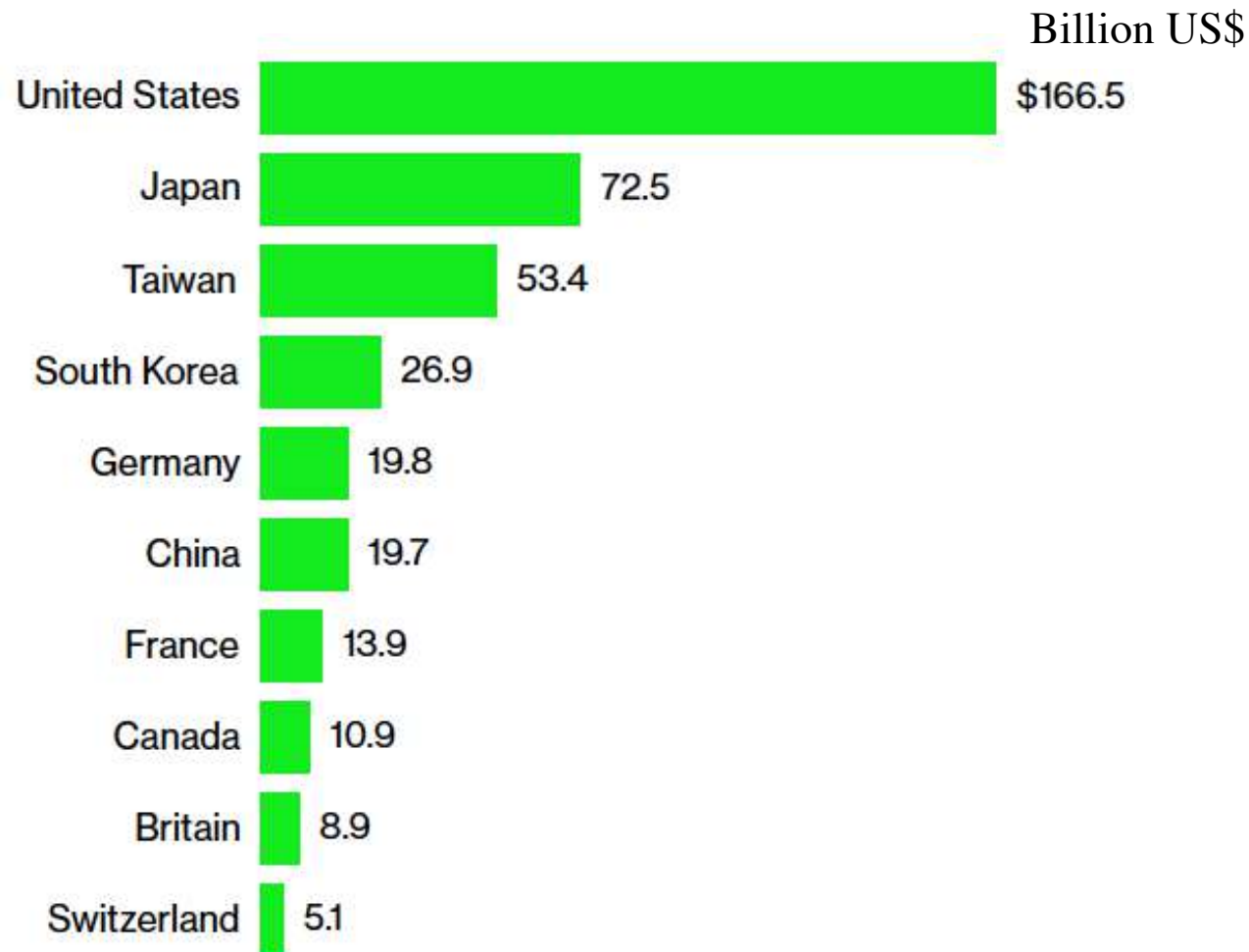


Source: BloombergNEF, Bloomberg Terminal

Note: Chart is based on data available on Bloomberg's SPLC function, and does not necessarily represent the entire supply chain for this group of selected companies.

Business risk due to difficulty in procuring renewable energy

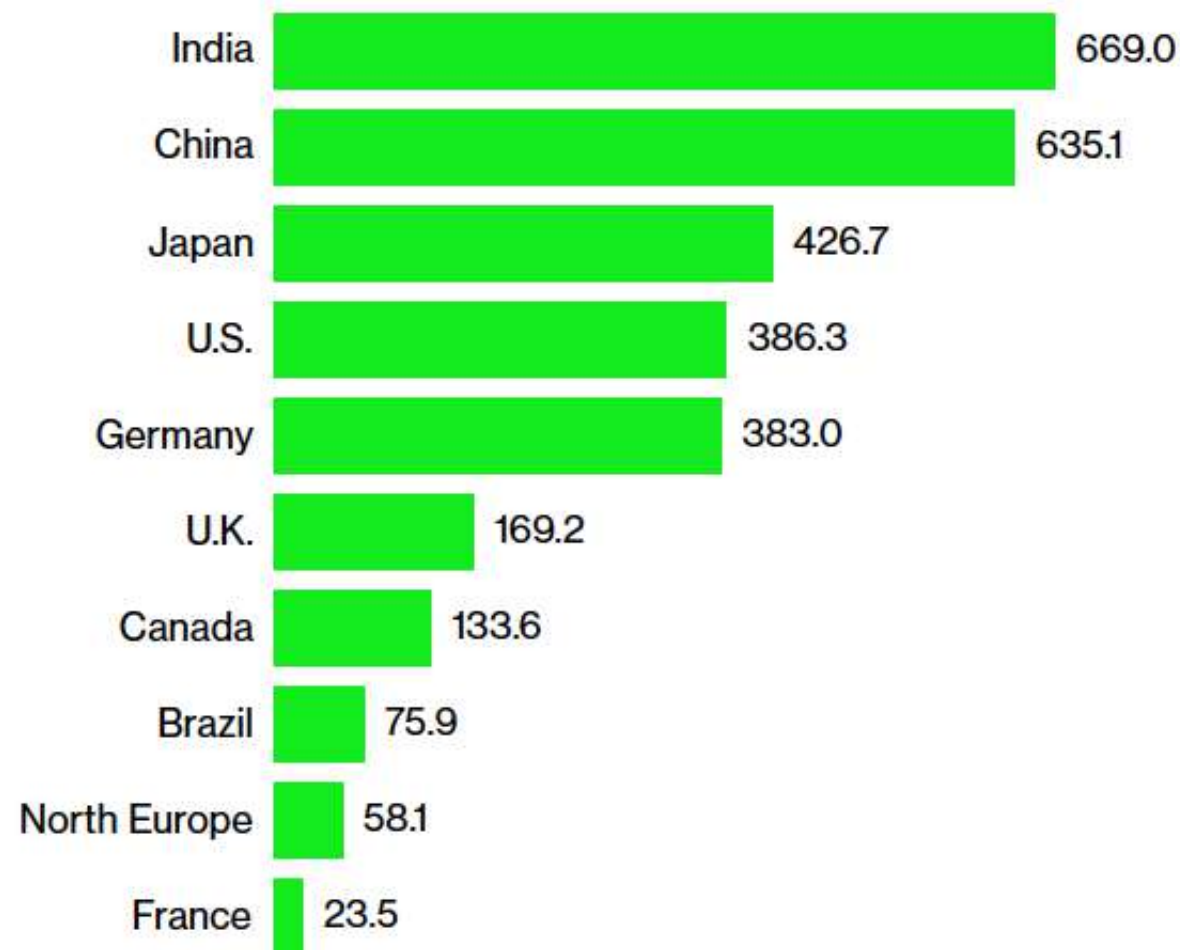
Japan is the country with the second highest business risk after the US.



Source : BloombergNEF, 2020

Emission intensity of electricity (2020) (grams CO₂/kWh)

Japan is the one of countries with highest emission intensity



Source : BloombergNEF, 2020

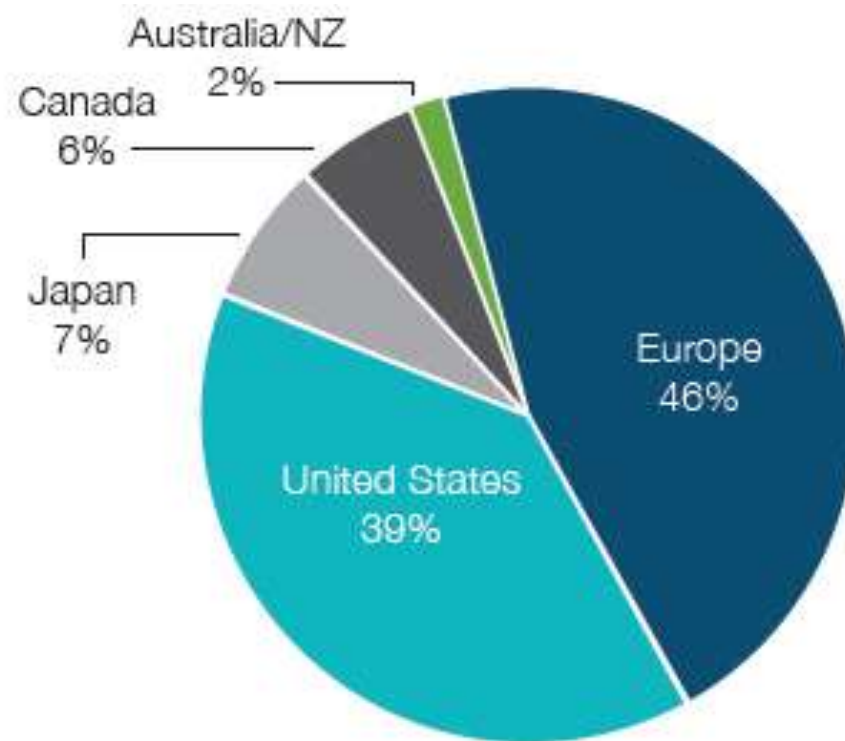
Financial institution and investors are changing and change business behavior

- UNPRI (Principles for Responsible Investment) and ESG investing
- Request companies to undertake disclosure of climate related risk, covering the whole supply chain
 - CDP (previously, Carbon Disclosure Project)
 - Recommendations by Task Force on Climate-related Financial Disclosures (TCFD) (June 2017)
- “Engagement, Voting and Divestment”
 - For instance, Norwegian Government Pension Fund (with about One trillion US dollar) has made divestment (about 8 billion US dollar) from 122 companies, more than 30% of business of which depends on coal exploitation and power generation (since 2016)
 - Engagement: Climate Action 100+
 - Revision of loan policy for new coal fired plants

Global Sustainable Investing Assets (2018)

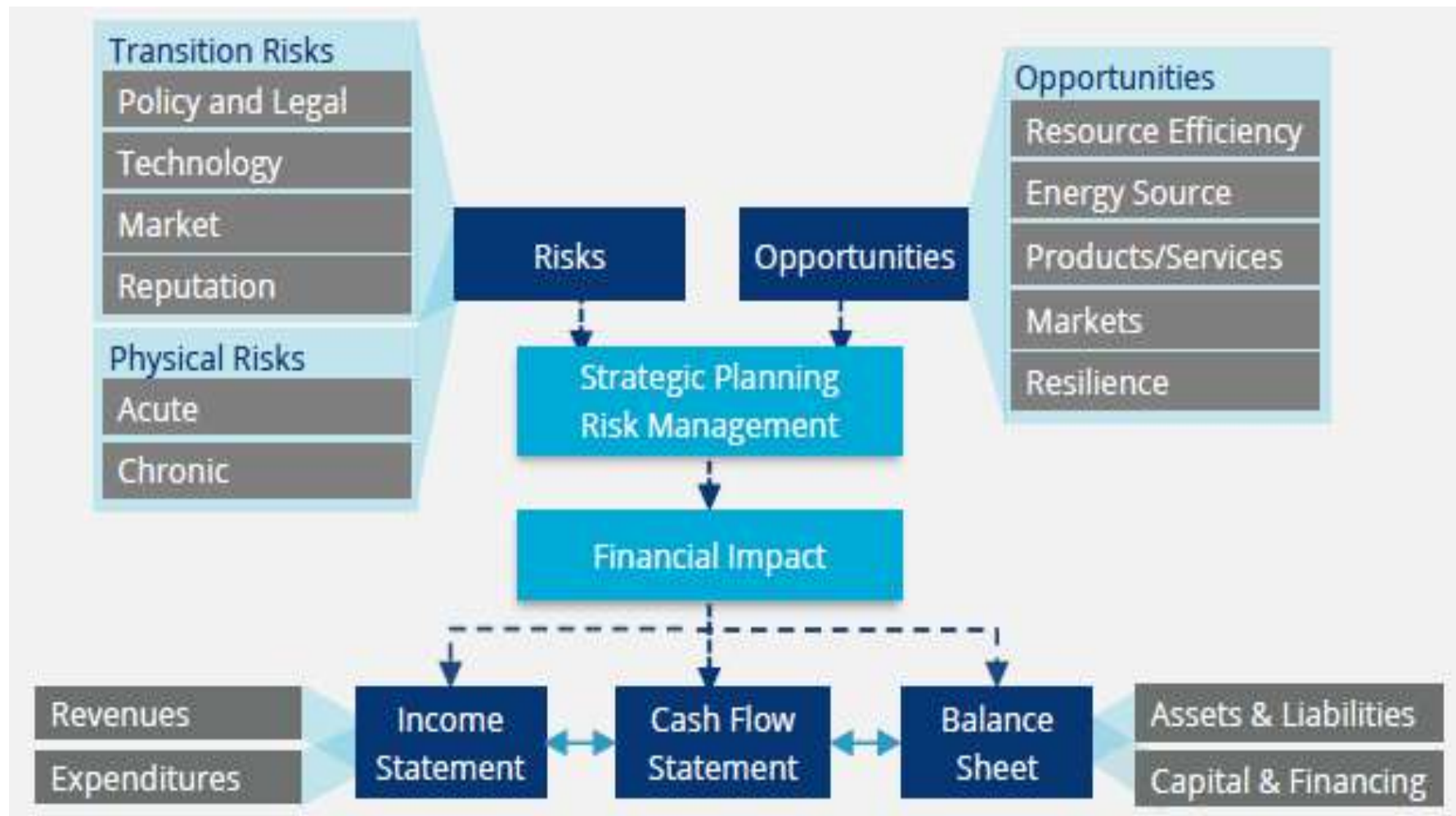
Region	2016	2018
Europe	\$ 12,040	\$ 14,075
United States	\$ 8,723	\$ 11,995
Japan	\$ 474	\$ 2,180
Canada	\$ 1,086	\$ 1,699
Australia/New Zealand	\$ 516	\$ 734
TOTAL	\$ 22,890	\$ 30,683

Note: Asset values are expressed in billions of US dollars. All 2016 assets are converted to US dollars at the exchange rates as of year-end 2016. All 2018 assets are converted to US dollars at the exchange rates at the time of reporting.



Source: Global Sustainable Investment Alliance, 2019

TCFD: Financial impact of climate related risks and opportunities



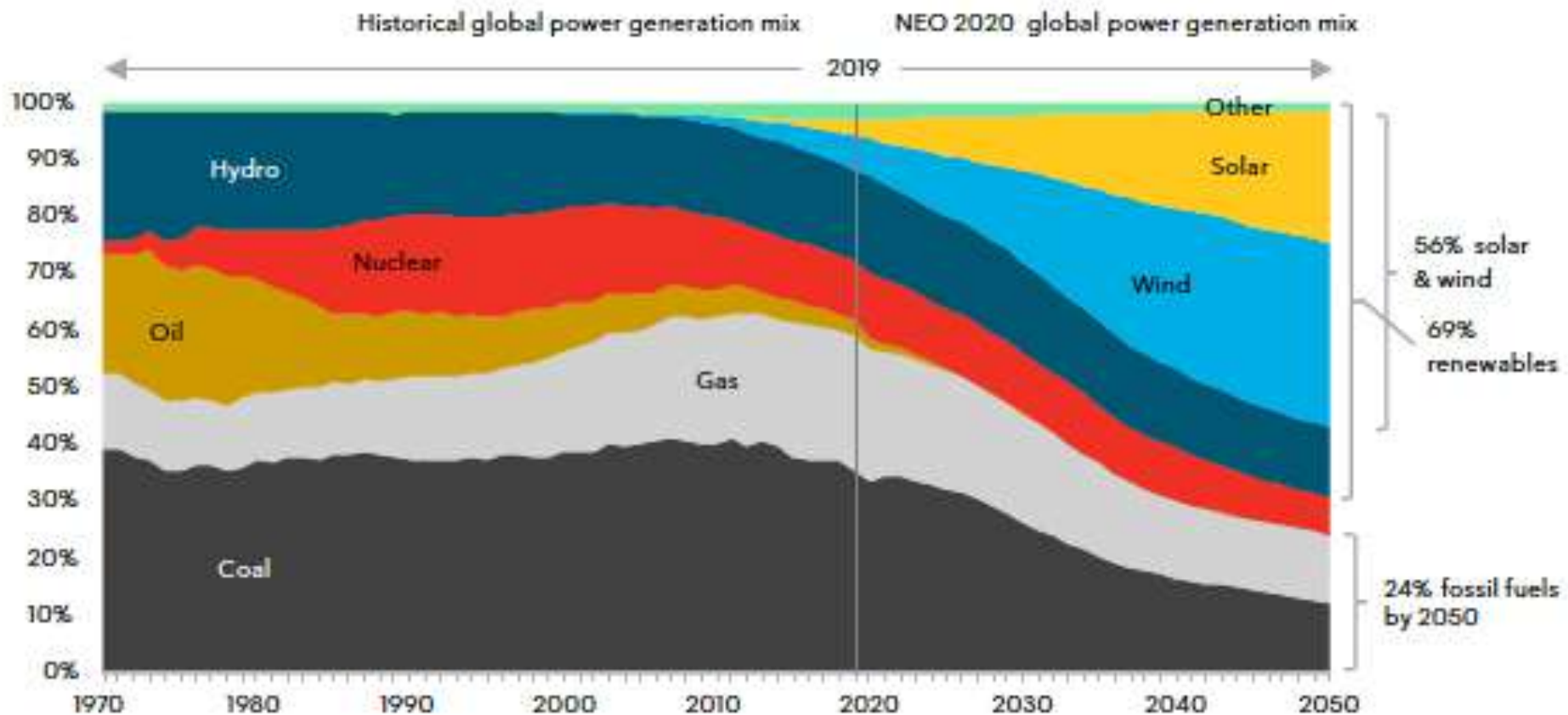
Climate Action 100 +

- Climate Action 100+ (launched in December 2017)
 - More than 540 investors with more than USD \$52 trillion in assets under management have signed on to the initiative (as of January 2021)
 - The initiative **aims to secure commitments from the boards and senior management to:**
 - **Implement a strong governance framework** which clearly articulates the board's accountability and oversight of climate change risk and opportunities.
 - Take action to **reduce greenhouse gas emissions across their value chain, consistent with the Paris Agreement's goal.**
 - Provide **enhanced corporate disclosure in line with the final recommendations of the Task Force on Climate-related Financial Disclosures (TCFD)**
 - **The 167 focus companies** have the highest combined direct and indirect Scope 1, 2 and 3 emissions (emissions associated with the use of their products)
 - Daikin Industry, Hitachi, Honda, JX holdings, Nippon Steel, Nissan, Panasonic, Suzuki, Toray, Toyota **are targeted Japanese companies.**
 - Asset Management One, Dai-ichi Life Insurance, Fukoku Capital Management, Mitsubishi UFJ Trust & Banking Corporation, Nikko Asset Management, Nomura Asset Management Co., Resona Asset Management Co., Sompo Asset Management, Sumitomo Mitsui DS Asset Management Company, Sumitomo Mitsui Trust Bank, The Dai-ichi Frontier Life Insurance Co., Sophia School Corporation and Sumitomo Life join the initiative.
 - **Government Pension Investment Fund (年金積立金管理運用独立行政法人; GPIF)** also joins the initiative in October 2018.

Global Power Generation Mix (Bloomberg NEF, 2020)

Unprecedented energy shift to renewables has been taking place.

Renewables will amount to 69% and fossil fuels will decline to 24% by 2050.



Source: BloombergNEF, IEA

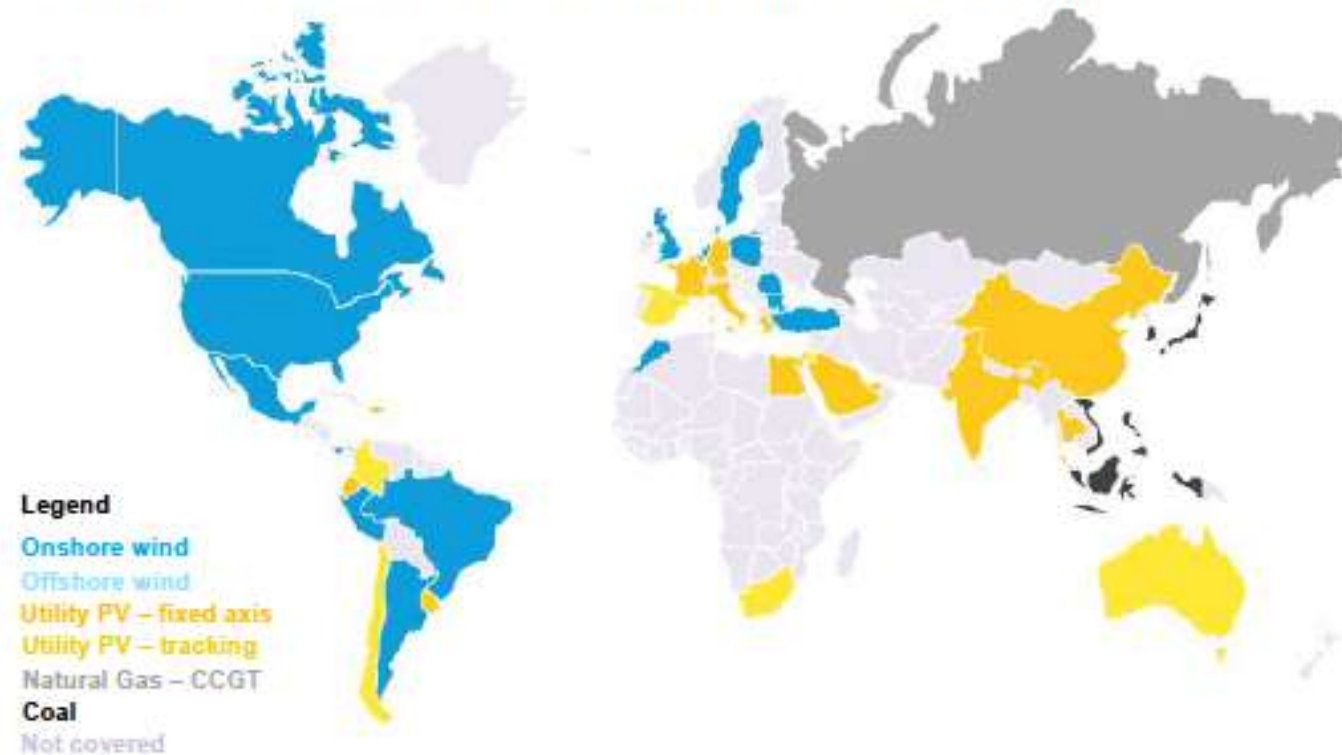
Source: BloombergNEF, 2020

Most competitive source of new bulk generation

2014

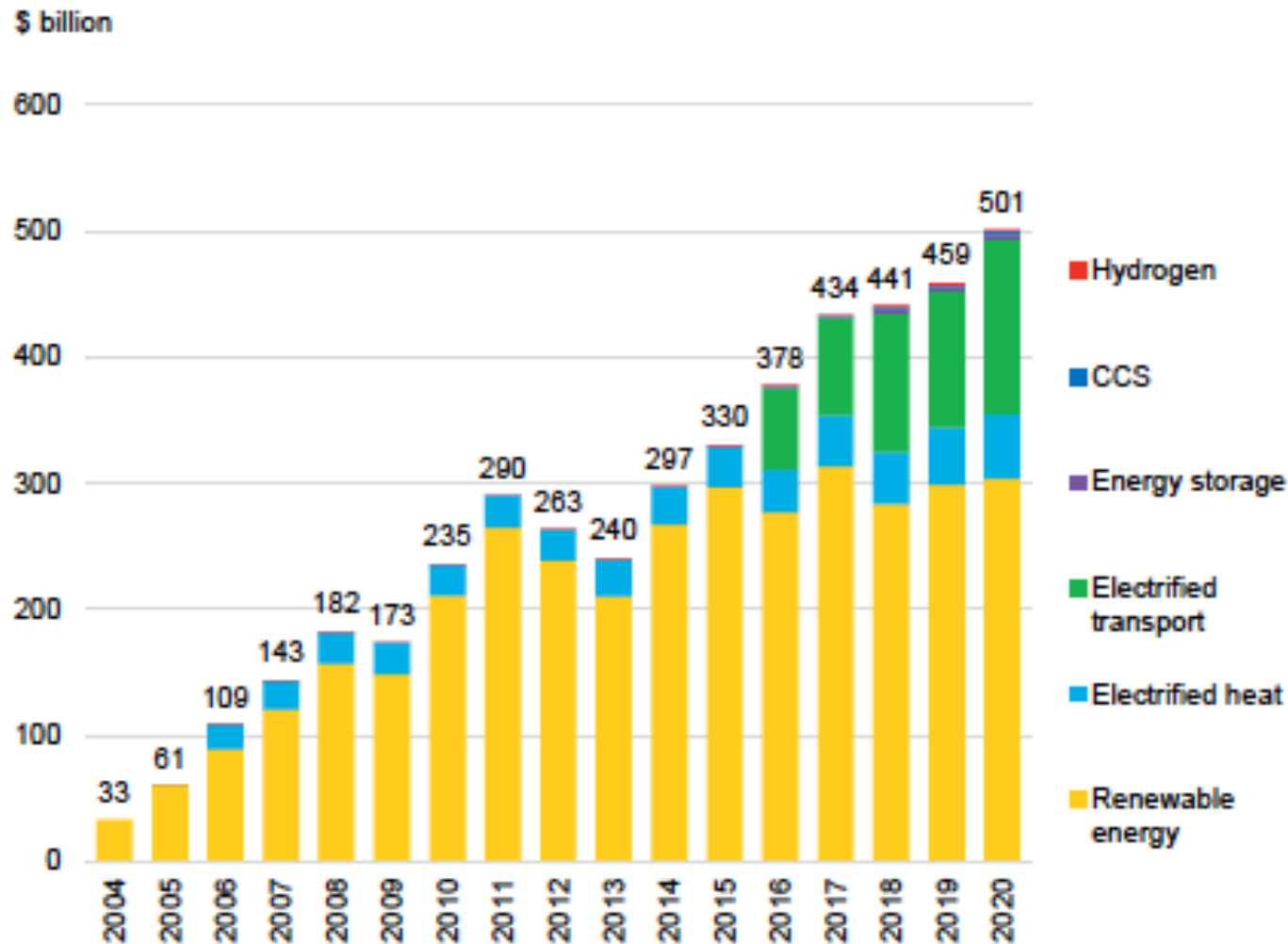


Lowest-cost source of new bulk power generation by technology, 2H 2020



Energy Transition Investment

Since 2014, more than 300 billion US \$ has been invested in clean energy.
More than twice than investment in coal and gas (around \$130 billion)

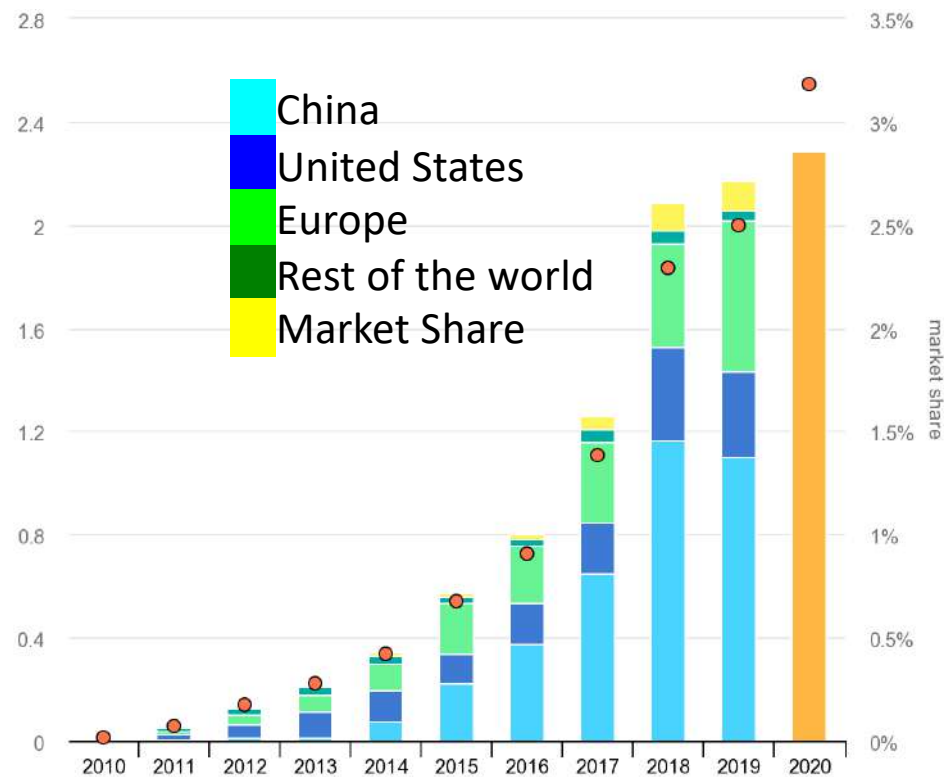
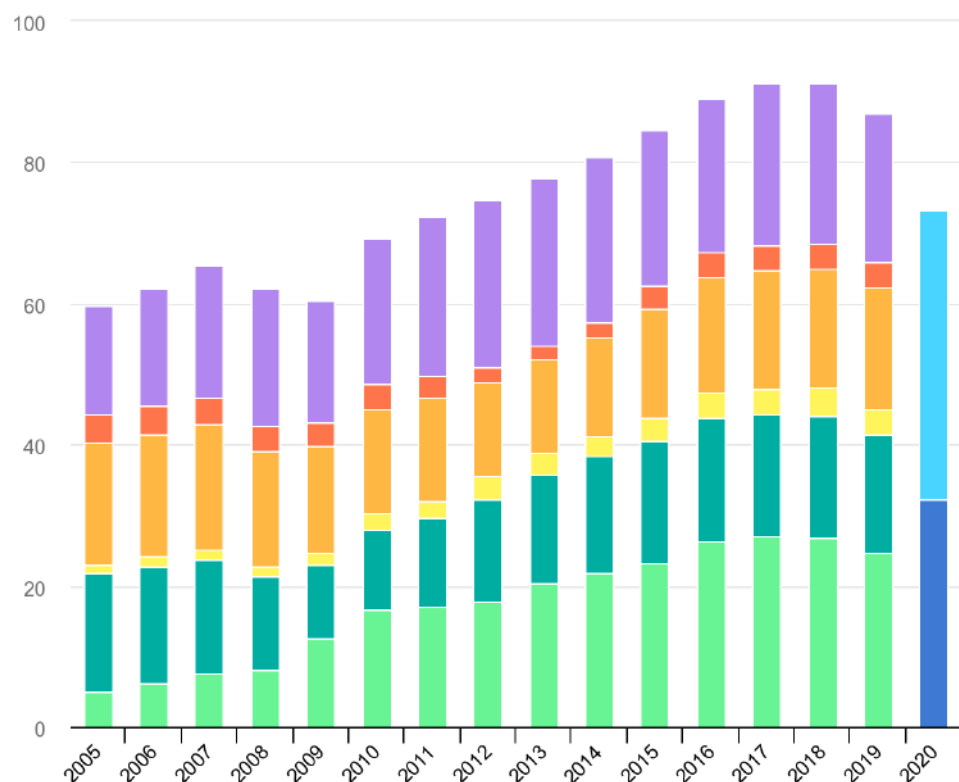


Source: BloombergNEF

Source: BloombergNEF 2021

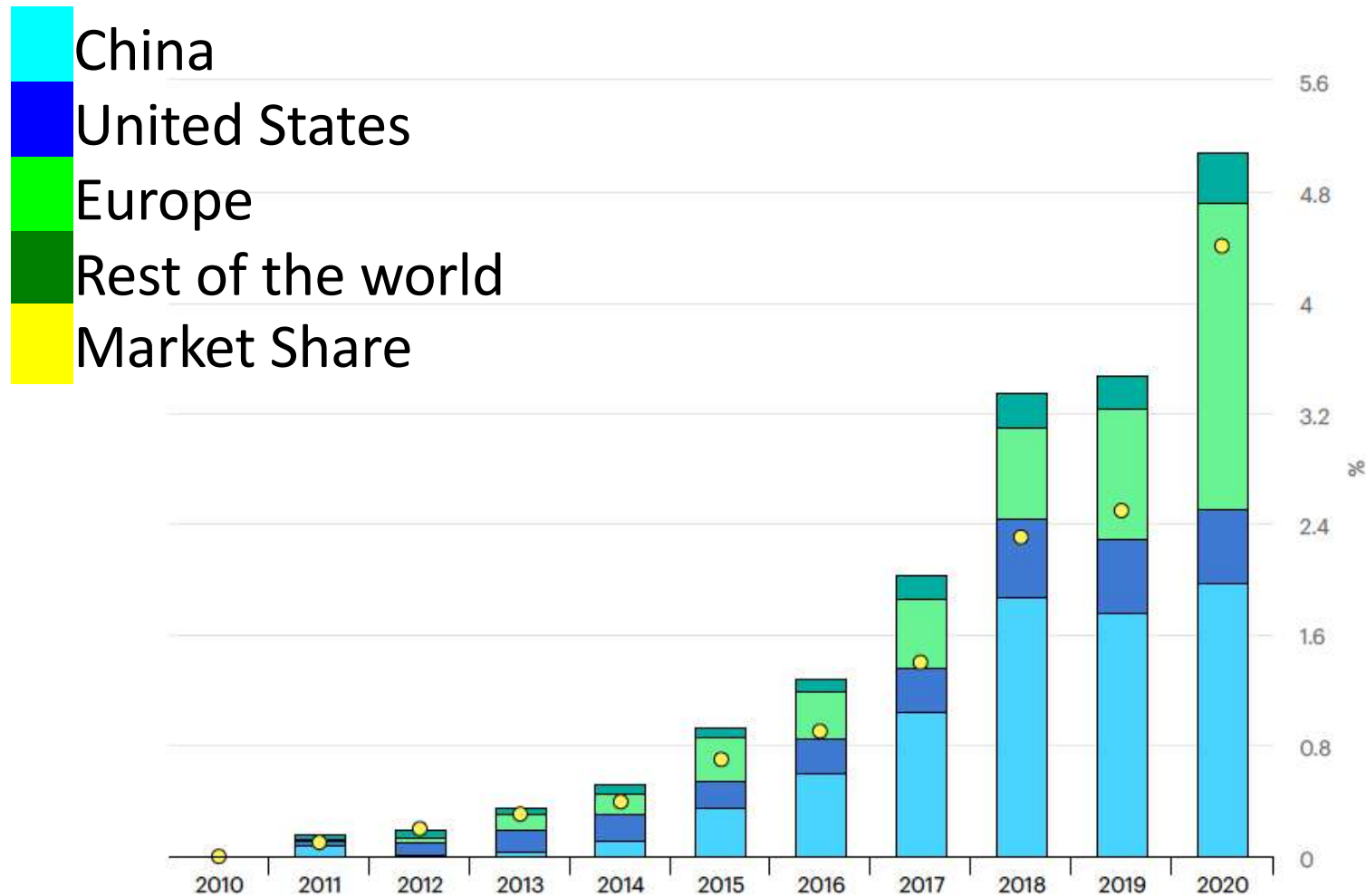
Global sales of vehicles (left)

Global sales of EV (right)



Global sales of electric passenger vehicles – cars, vans and small trucks – and market share, indicated by a red line (right chart). Total light-duty vehicle sales (left). 出典: IEA,2020.

Global sales of EV (2020)



Source: IEA, 2021.

<https://www.iea.org/commentaries/how-global-electric-car-sales-defied-covid-19-in-2020>

Changing approach in climate policy

- Presenting and sharing a long term vision/goal = vision for future society
 - Facilitate understanding of the scale of problem and identifying challenges
 - Aiming to incentivize innovation, investment, actions by States and non State actors...
- Internalization and mainstreaming of climate related risk consideration in business strategy and decision making
 - Through climate related financial disclosure (TCFD)
 - Impacted by investors' evaluation and behavior
 - Through emission management and reduction over its supply chain and value chain
- Narrative related to climate policy is changing
 - Climate action is not simply for environment, which influences corporate value from / corporate evaluation by capital market as well as from suppliers
- Climate policies as a part of stimulus package for recovery from COVID-19
- Approach is spreading to other issues
 - Engagement launched by Norwegian Government Pension Fund to integrate consideration on marine plastic issue into business strategy (September 2018)
 - Launch of Task force on Nature related Financial Disclosures (TNFD) (2020)
 - Ex. EU taxonomy for sustainable activities

Green Growth Strategies

14 focal areas

Transformational change in industries and economy through aggressive climate policies

2030 target and measures to achieve it under consideration toward next spring (May)

Energy related

- Offshore wind 45GW by 2040
- Green fuels (Ammonia)
- Hydrogen
- Nuclear

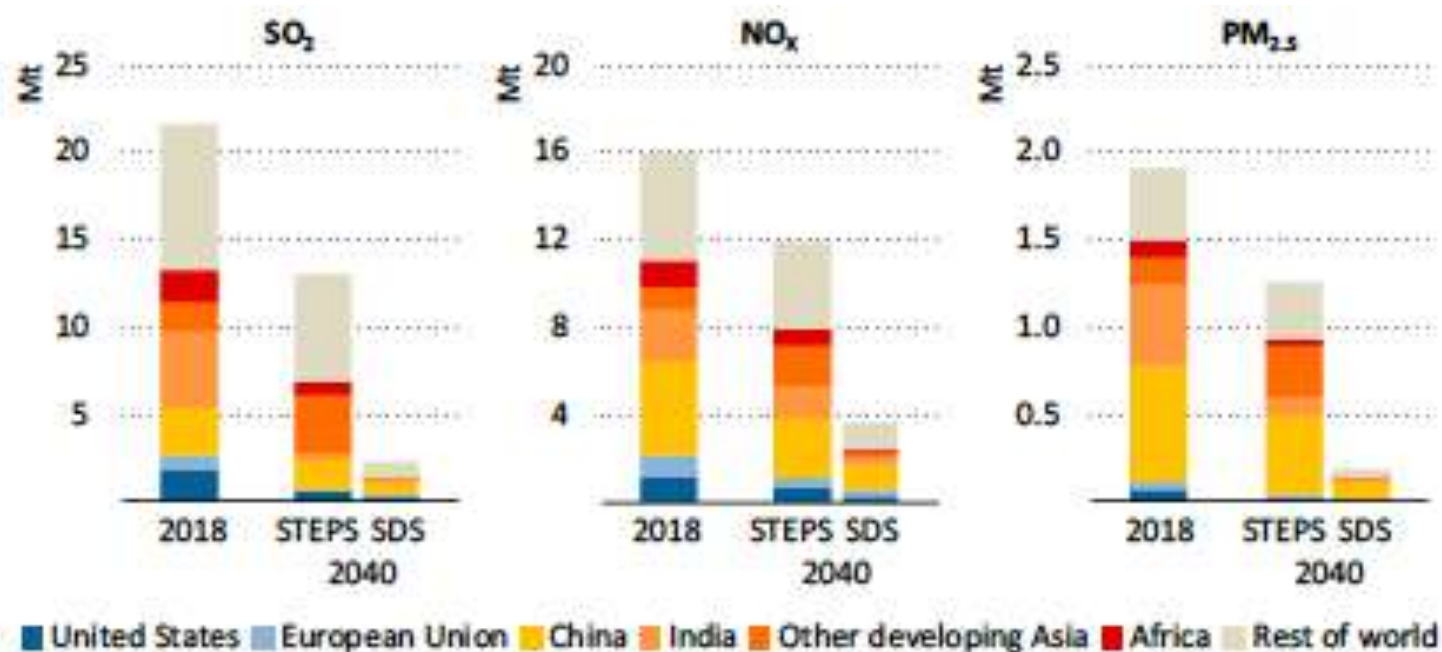
Transport and Manufacturing related

- Automobile • Batteries
- Semi-conductor • ICT
- Shipping
- Infrastructure etc
- Food and Agriculture/ Fishing
- Aviation
- Carbon recycling

Housing and office

- Homes and Buildings
- Circular Economy
- Lifestyle related

Energy transition will enhance reduction of air pollution



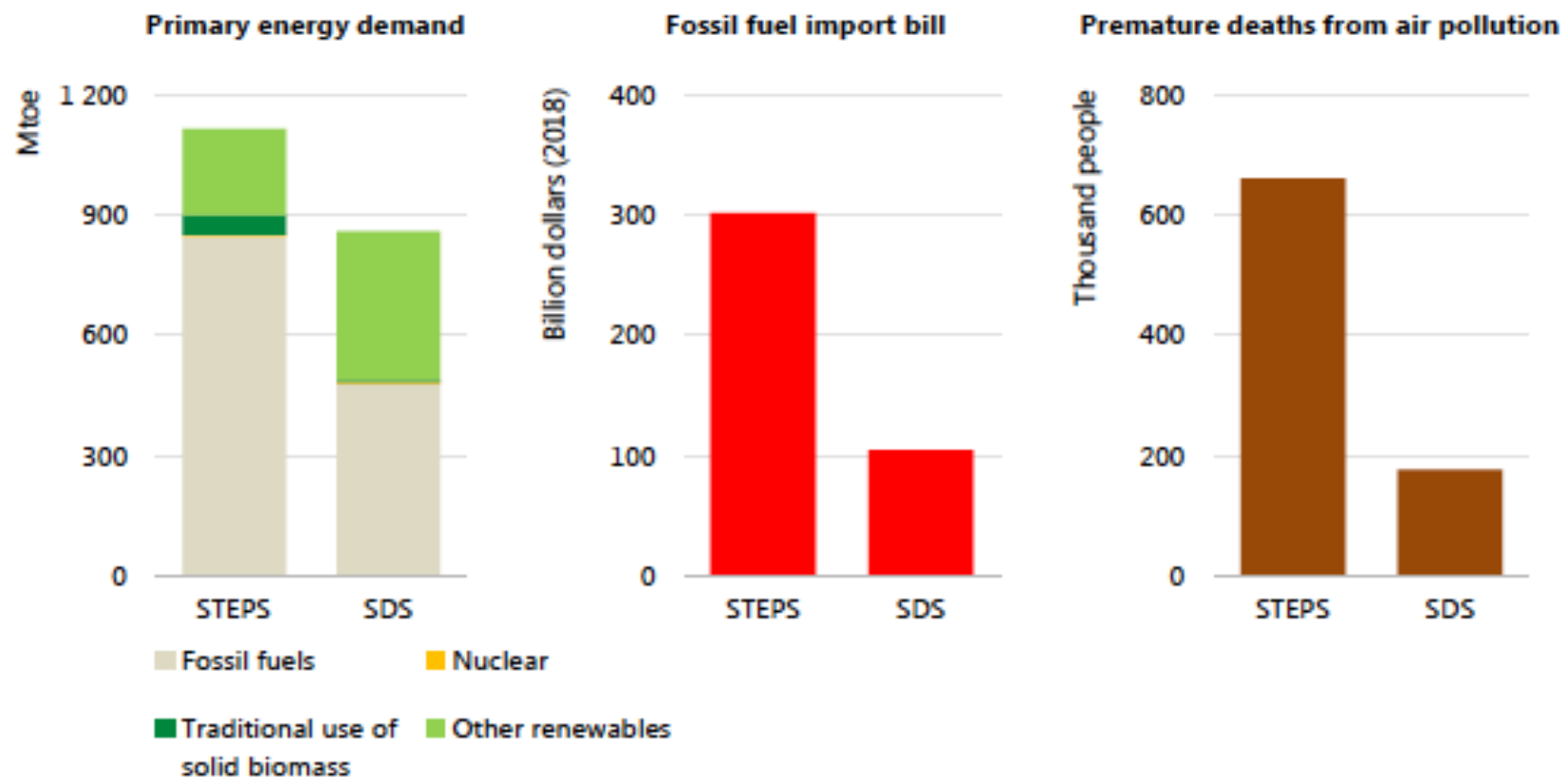
Pollutant emissions from the power sector, mainly driven by coal use in Asia, are projected to reduce by 2040, most significantly in the Sustainable Development Scenario, where end-of-pipe technologies and lower fossil fuel use drive the change

Note: Mt = million tonnes; STEPS = Stated Policies Scenario; SDS = Sustainable Development Scenario.

Source: International Institute for Applied Systems Analysis.

Multiple benefits of SD Scenario

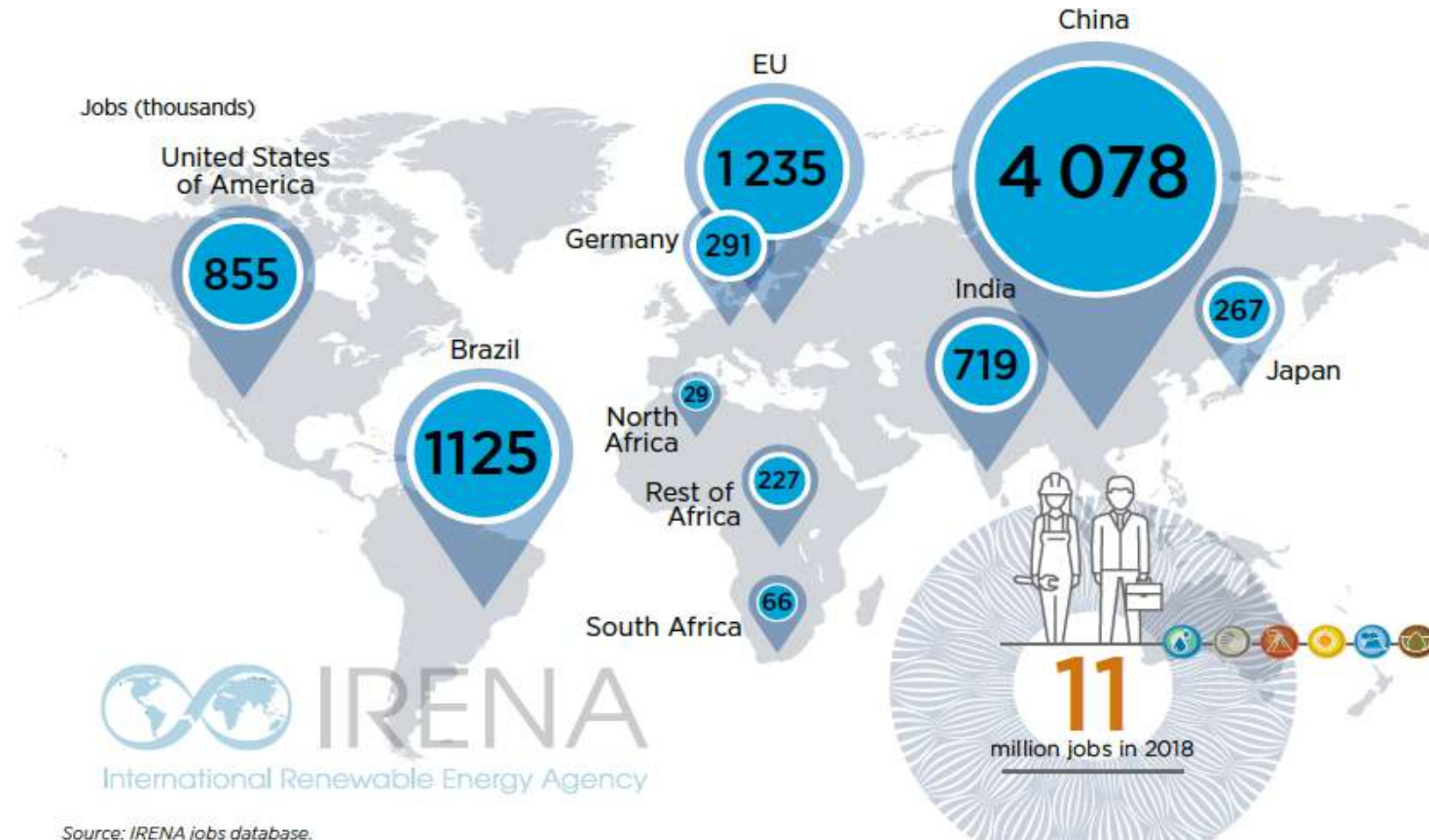
Comparison of selected energy indicators in the Stated Policies and Sustainable Development scenarios, 2040



Note: Mtoe = million tonnes of oil equivalent; STEPS = Stated Policies Scenario; SDS = Sustainable Development Scenario

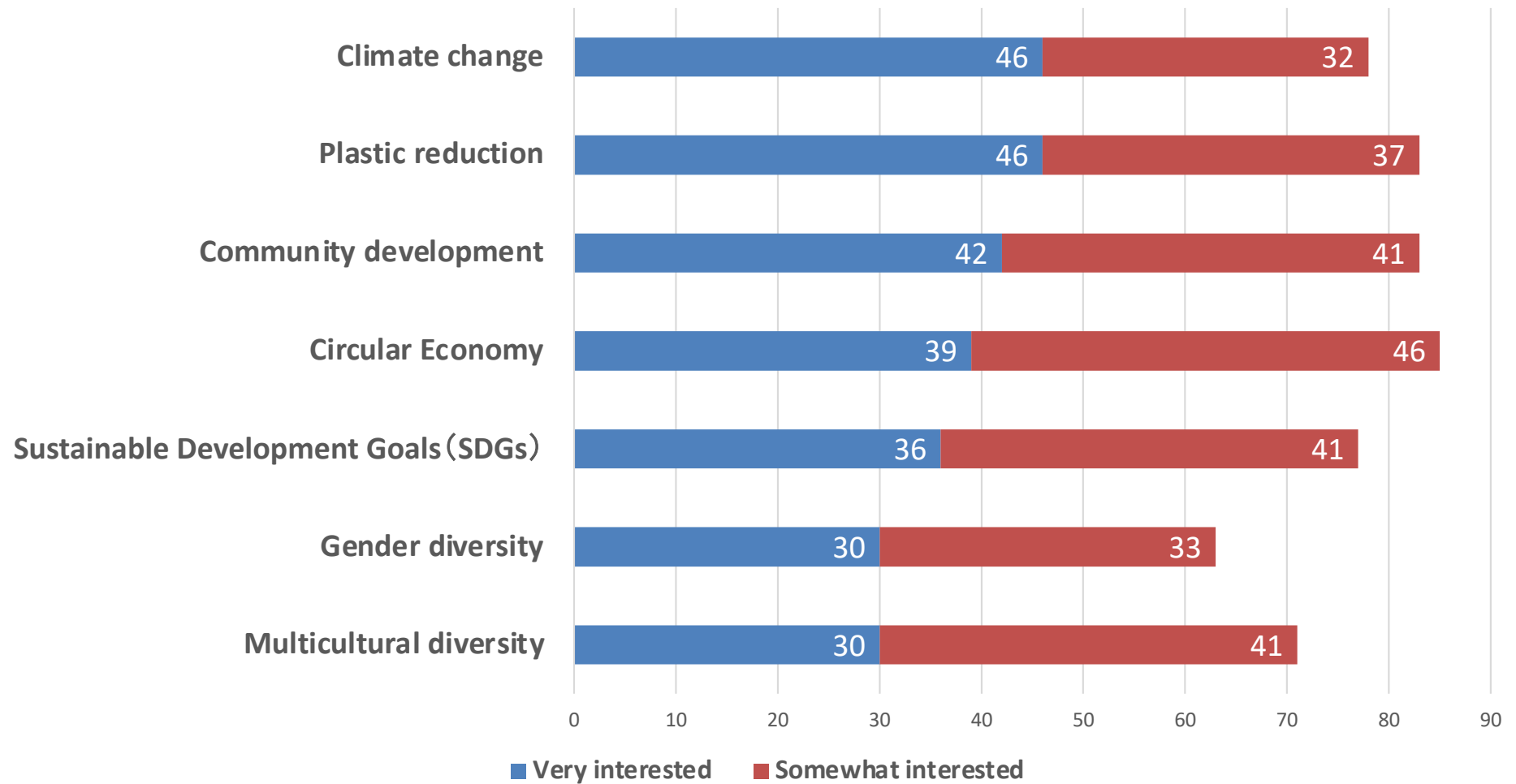
Global renewable energy employment (2018)

Employment in the renewable sector has been increasing.
In 2018, about 8.9 million jobs were created.



Source: IRENA, 2019

Individual investors shows the most interest in targeting Climate change and Plastic reduction



Toward carbon neutrality by 2050

- Clear long-term goal is essential to identify challenges for achieving it and to enhance understanding of them, which provide guidance and incentive for actions and investment by private sector.
- Climate action toward "2030" is critical. "Decisive Decade"
- Integrate and mainstream climate consideration with long-term horizon (ex. 2050) in decision makings of all level (government, local authorities and companies, financial institutions, etc.)
- 2 key directions with different time horizons: areas of collaboration
 - Accelerating existing technologies to reduce emissions as much as possible
 - For climate actions
 - For enhancing competitiveness of industries
 - For green recovery from COVID-19
 - R & D for developing new technologies
 - Challenge: uncertainty of cost and of feasibility

Strategic collaboration is far more important

- Especially far more important for businesses, because our supply chain and economies are interlinked.
- Strategic collaboration toward decarbonization will
 - Improve competitiveness and resilience through cost efficiency and resource efficiency
 - Enhance corporate value in the financial market and in supply chain
 - Create new markets and businesses. Co-innovation

Thank you for your attention!

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