CLIMATE ANALYTICS

Paola Yanguas-Parra
Climate Policy Analyst

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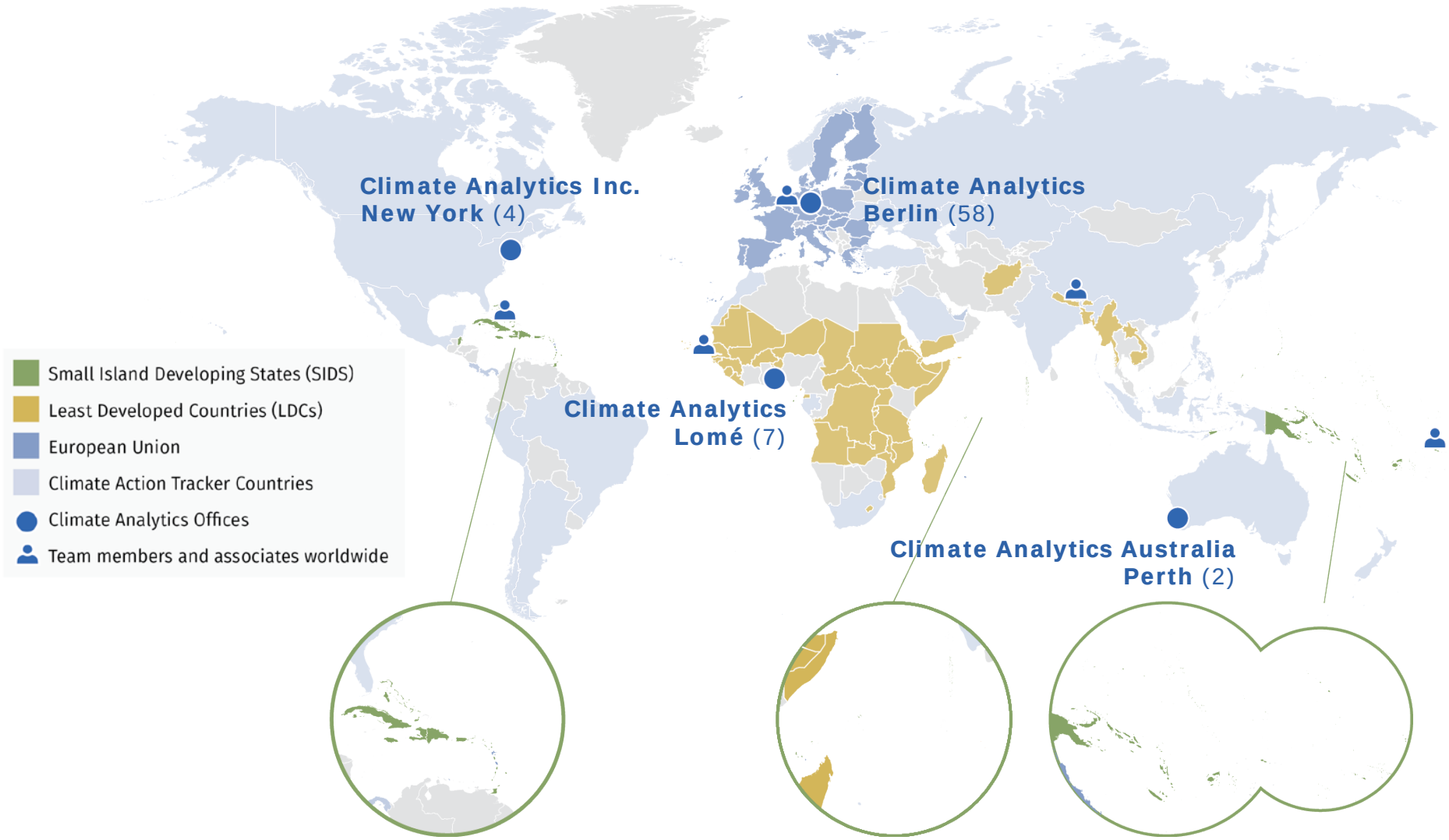
Climate Analytics - Our Mission

- Synthesize and advance scientific knowledge in the area of climate change
- Provide support and capacity building to stakeholders.
- Provide state-of-the-art solutions to global and national climate change policy challenges.

Climate Analytics team and offices



Climate Analytics - Our Work

"By linking scientific and policy analysis, we provide state-of-the-art solutions to global and national climate change policy challenges."

What we do

- Science Assessment,
- Research on Energy
- Climate Impacts & Risk Assessment
- Economics and Climate Change
- Climate Finance
- Adaptation
- Mitigation Scenarios and Pathways
- Climate Diplomacy and Capacity Building
- Implementation Strategies

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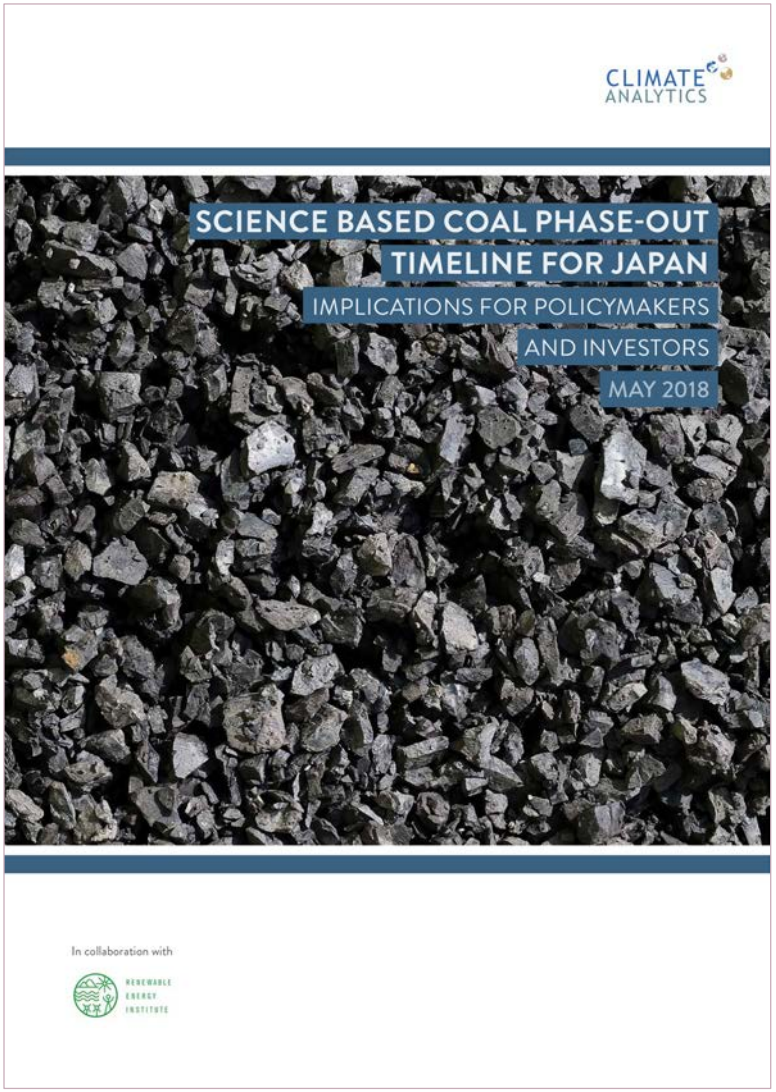
In collaboration with

RENEWABLE ENERGY INSTITUTE



The Paris Agreement long-term goal

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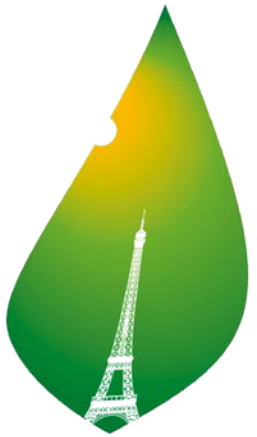
To hold "the increase in the global average temperature to ***well below 2° C*** *above pre-industrial levels and pursuing efforts to* ***limit the temperature increase to 1.5° C****(..)"*

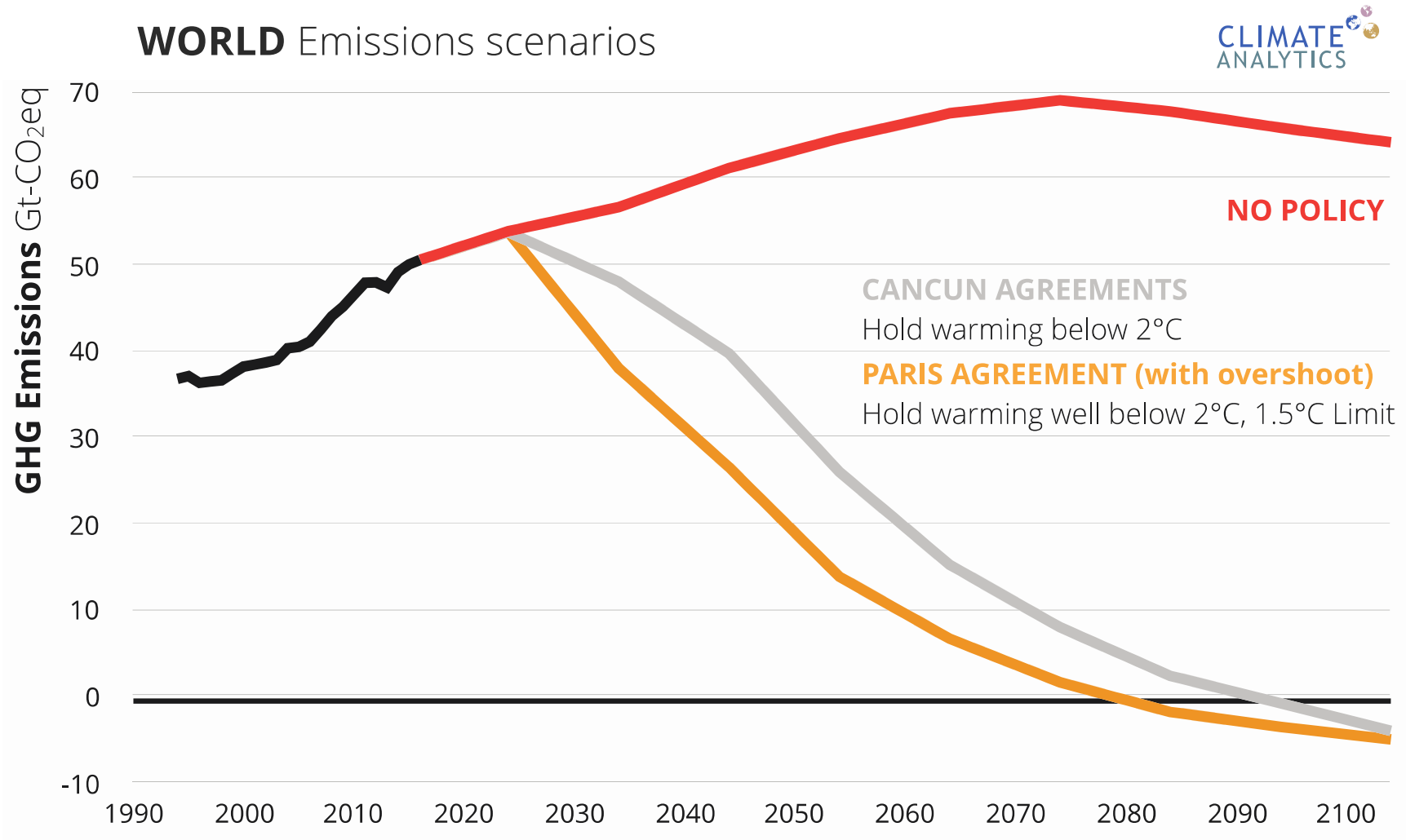
"Parties aim to reach global peaking of greenhouse gas emissions as soon as possible … to achieve a ***balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century****…"*

174 Parties have ratified including Japan, US, China, India and EU



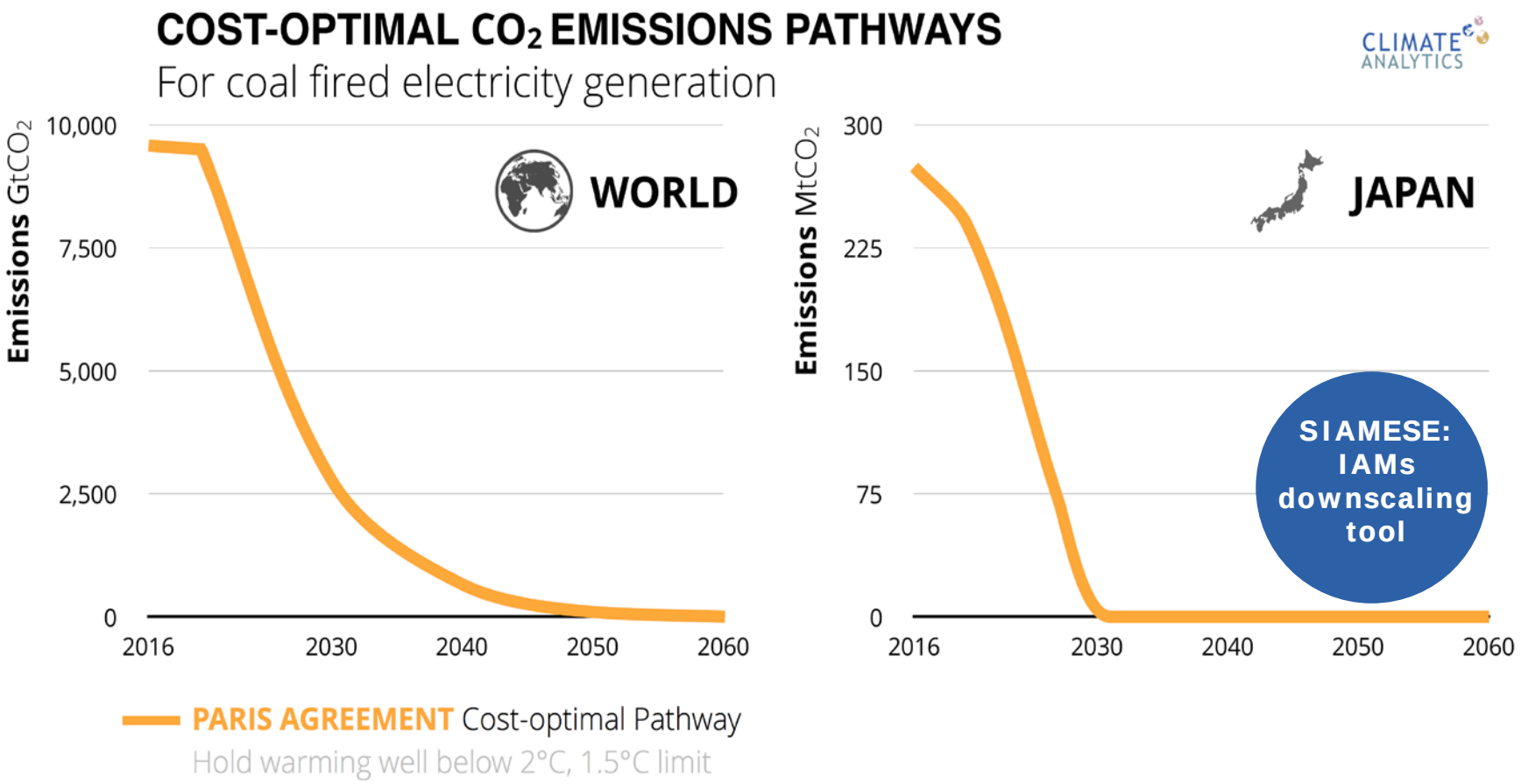
COP21 · CMP11
PARIS 2015
UN CLIMATE CHANGE CONFERENCE

The Paris Agreement long-term goal
Global GHG emissions

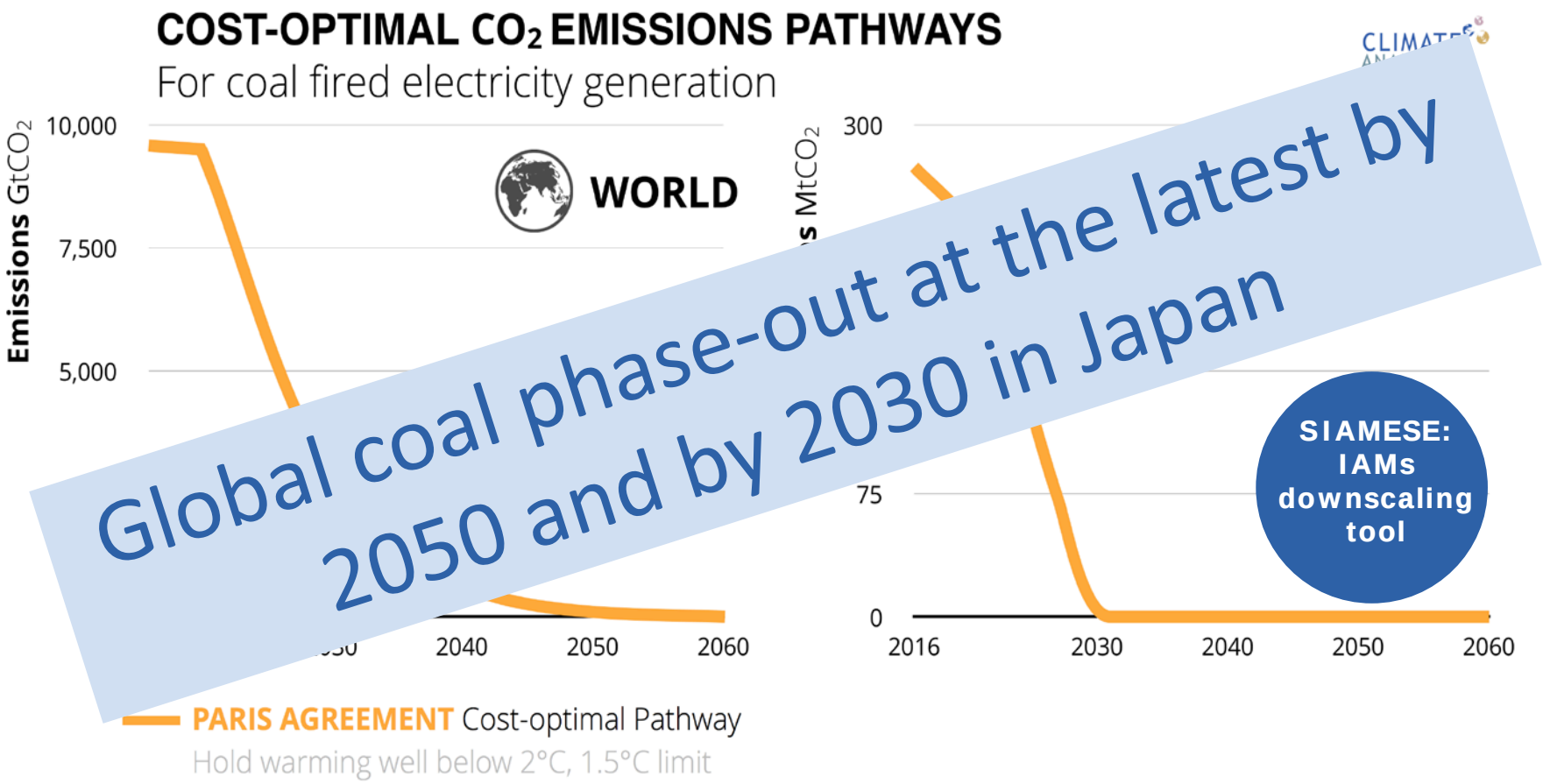


Source: Climate Analytics 2016. Implications of the Paris Agreement for coal use in the power sector.

The Paris Agreement long-term goal
Coal-based power generation

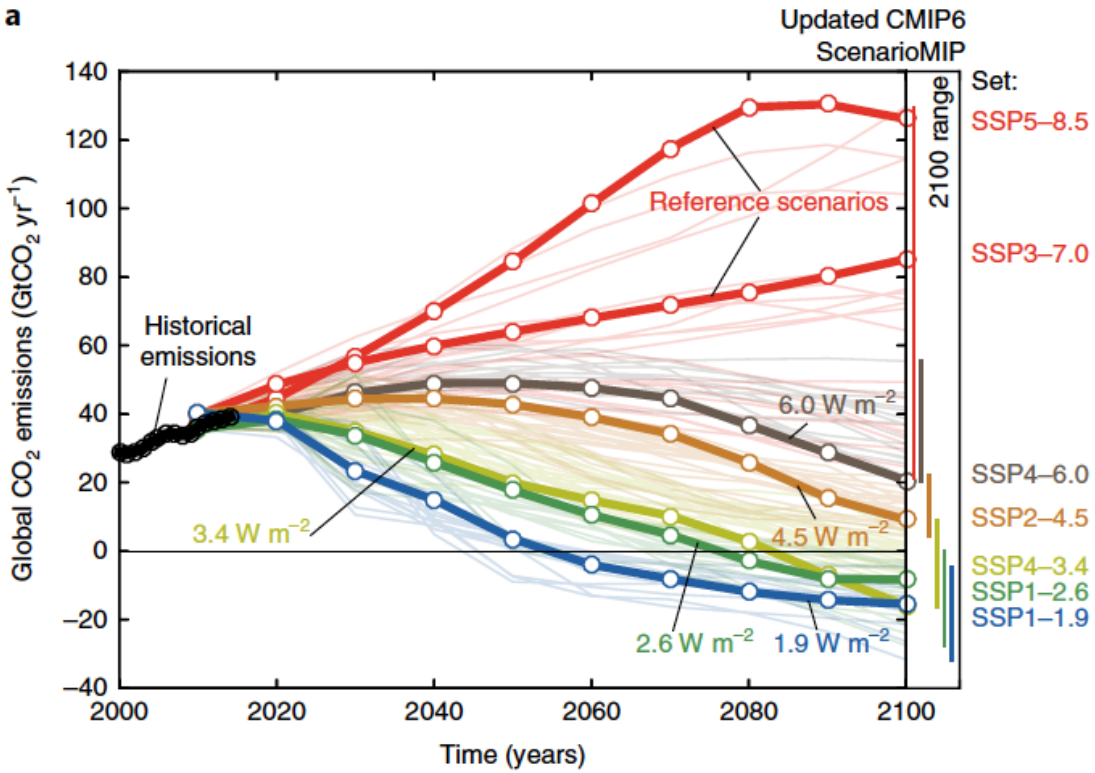


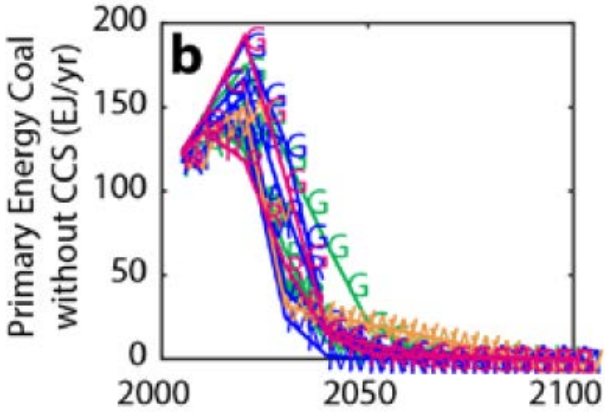
The Paris Agreement long-term goal
Coal-based power generation



Global coal phase-out at the latest by 2050 and by 2030 in Japan

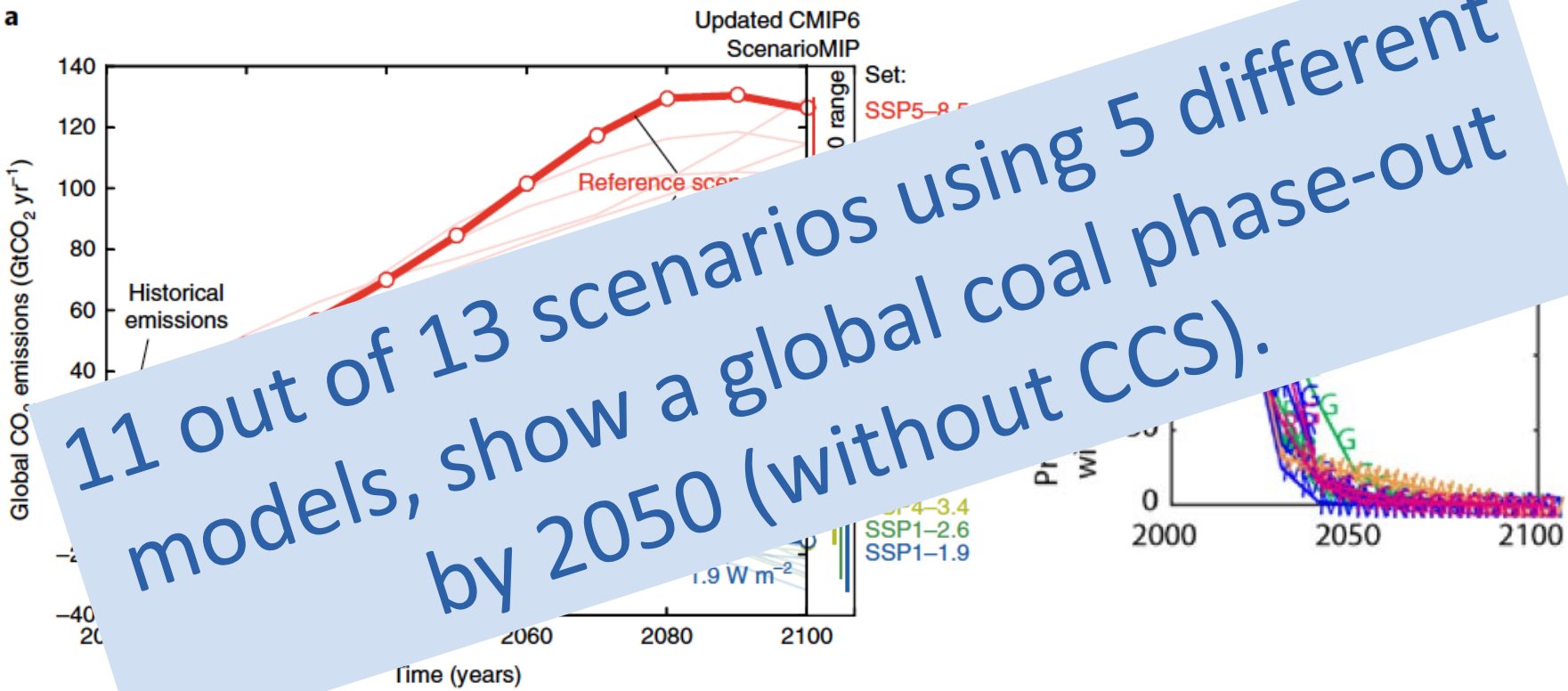
New IPCC scenarios for 1.5° C





Source: Rogelj et al (2018). Scenarios towards limiting global mean temperature increase below 1.5 ° C

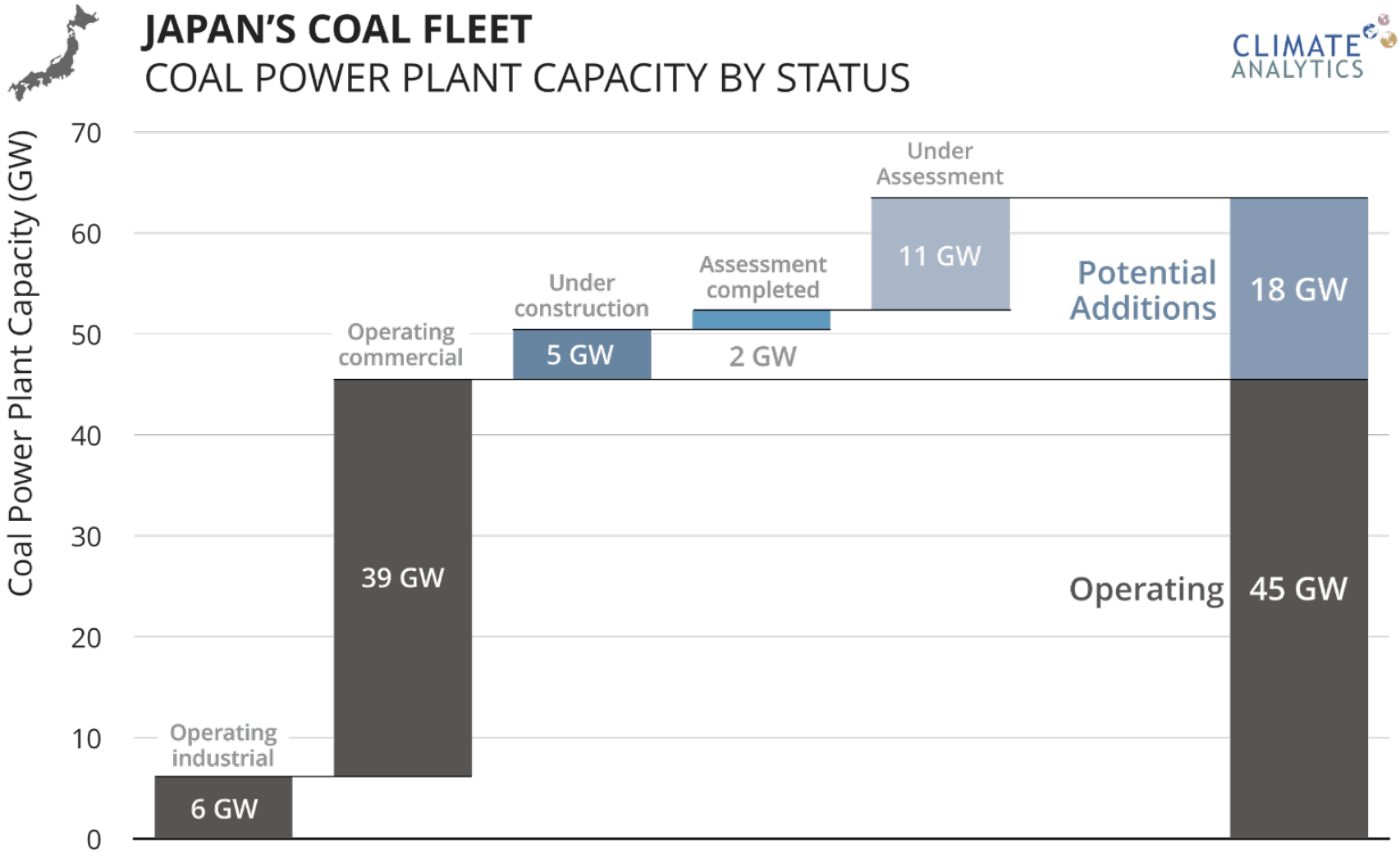
New IPCC scenarios for 1.5° C



11 out of 13 scenarios using 5 different models, show a global coal phase-out by 2050 (without CCS).

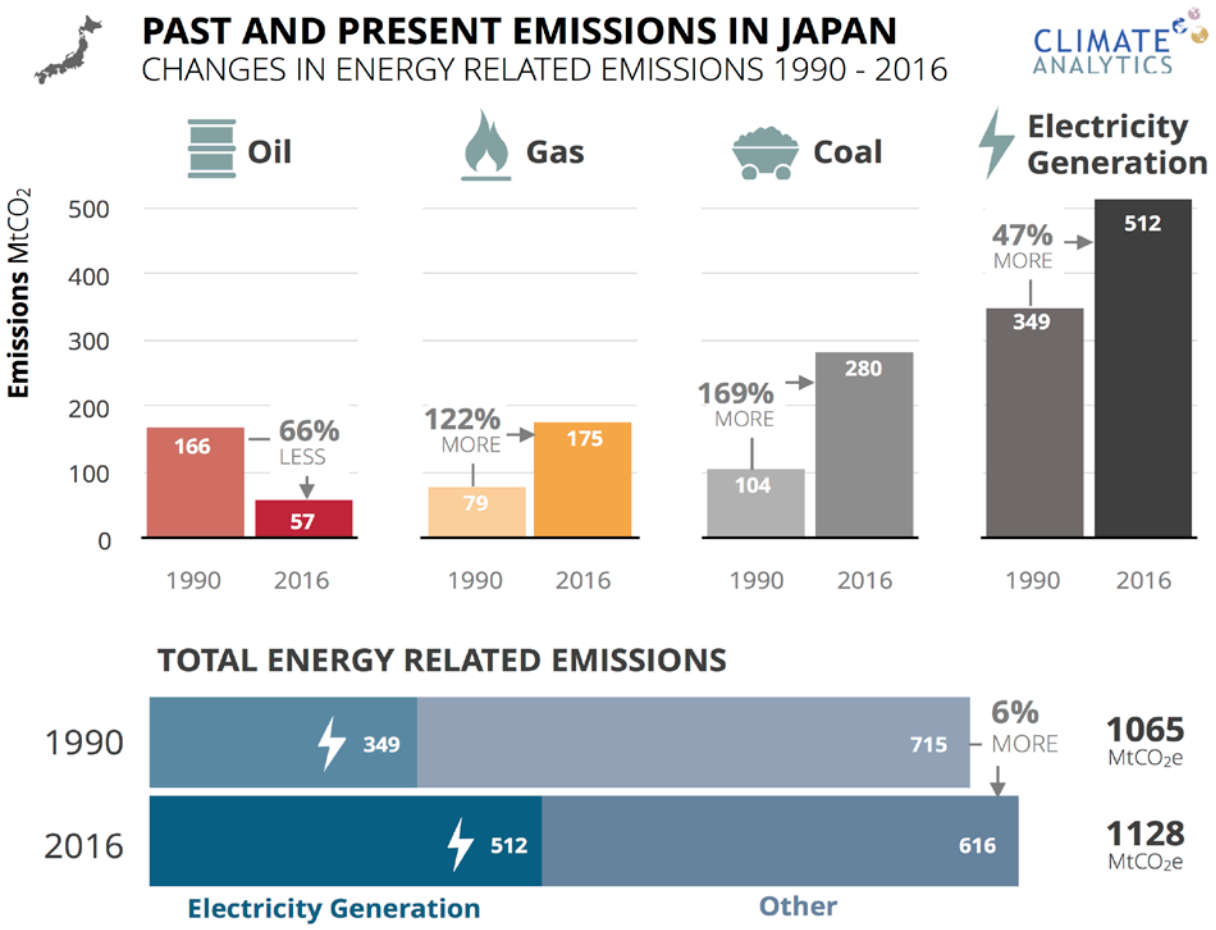
Source: Rogelj et al (2018). Scenarios towards limiting global mean temperature increase below 1.5 ° C

Current and planned coal capacity



Source: Calculations Climate Analytics based on REI coal plants database (version Feb 2018).

Contribution to GHG emissions

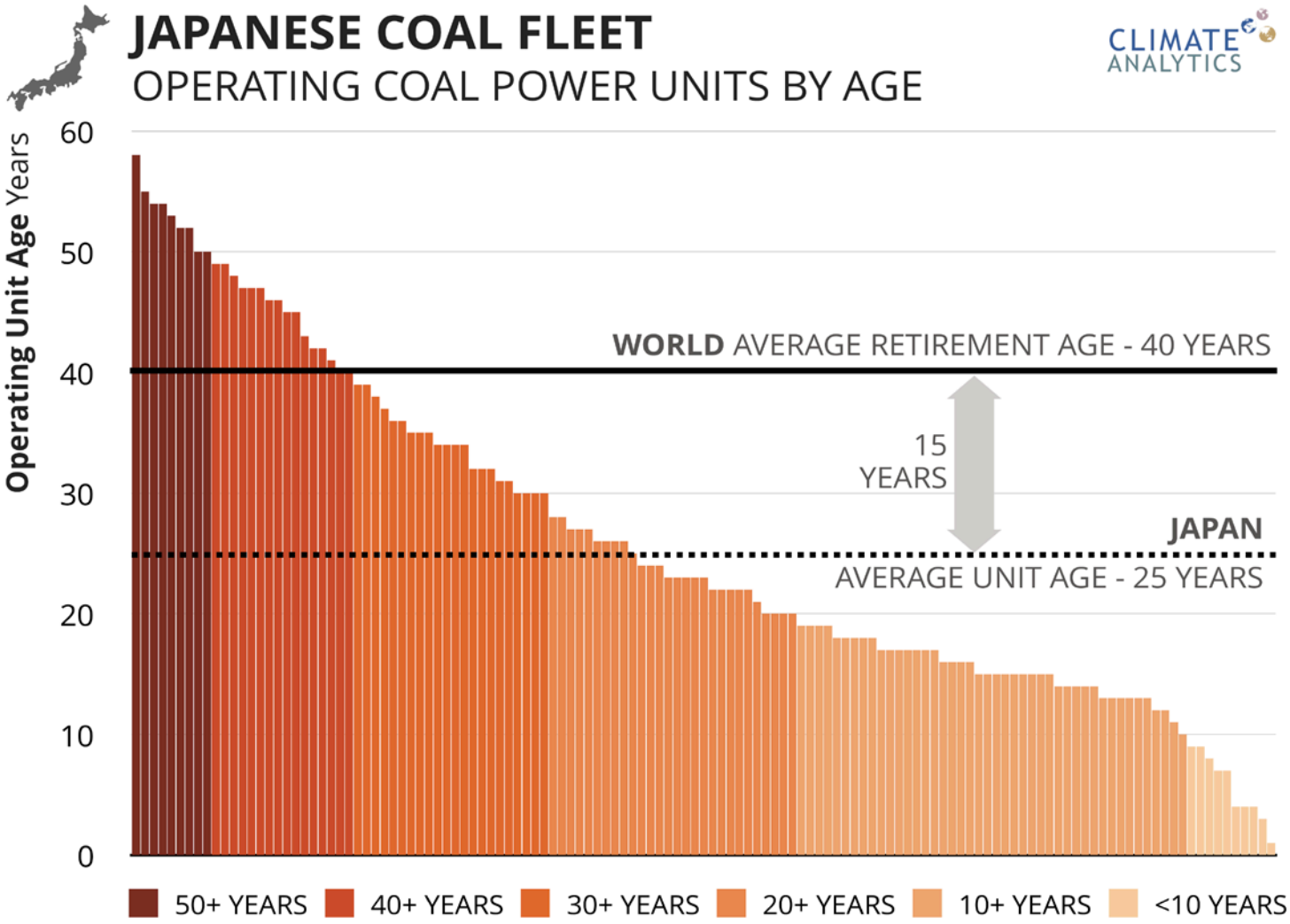


55 % of electricity related emissions

20 % of total GHG emissions

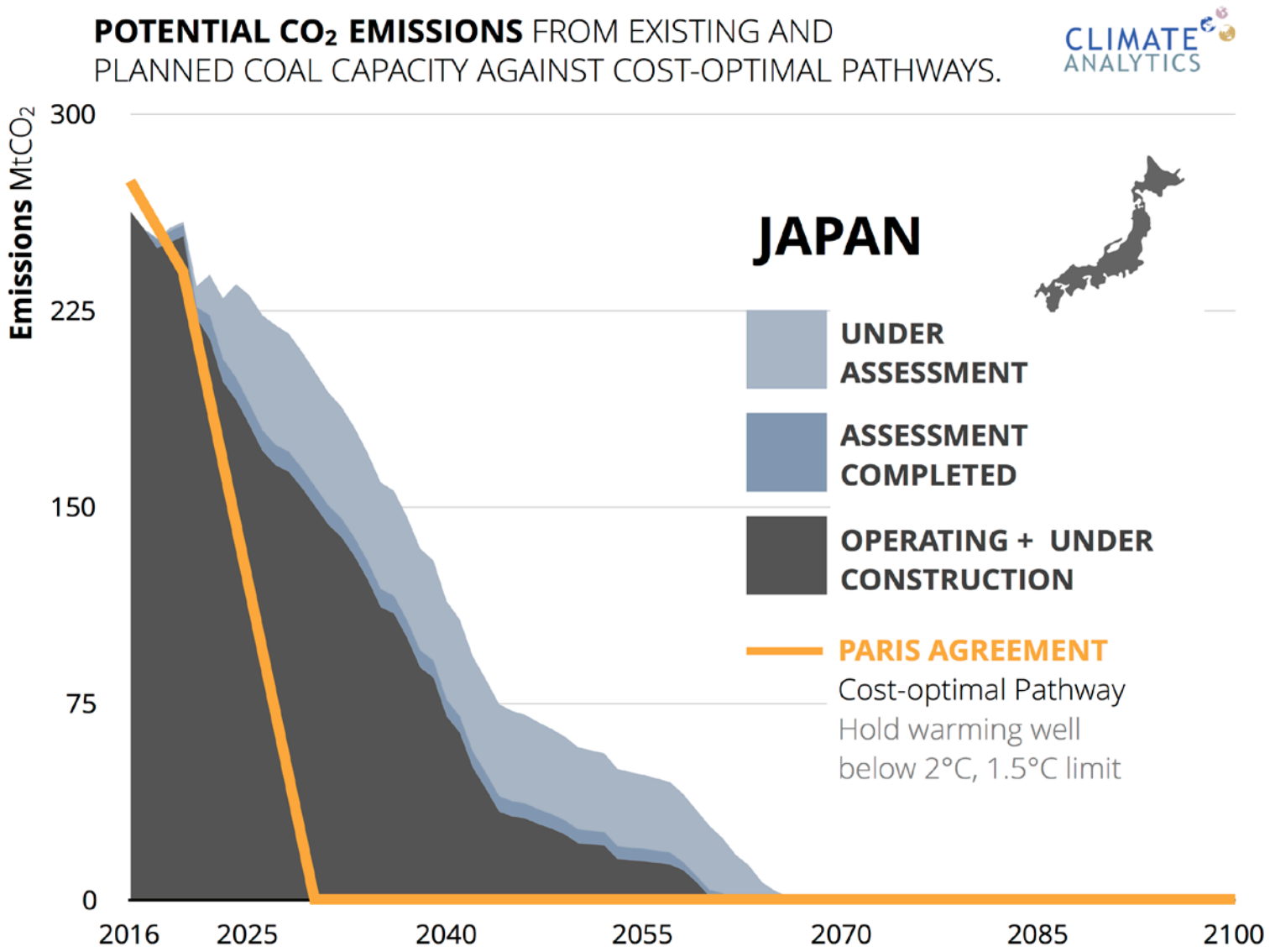
Source: Own elaboration based on (MOEJ, 2017) and (METI, 2018)

Age structure of Japan's coal fleet



Source: own calculations based on REI coal plants database (version Feb 2018).

Emissions resulting from coal-based power generation capacity vs. PA budget



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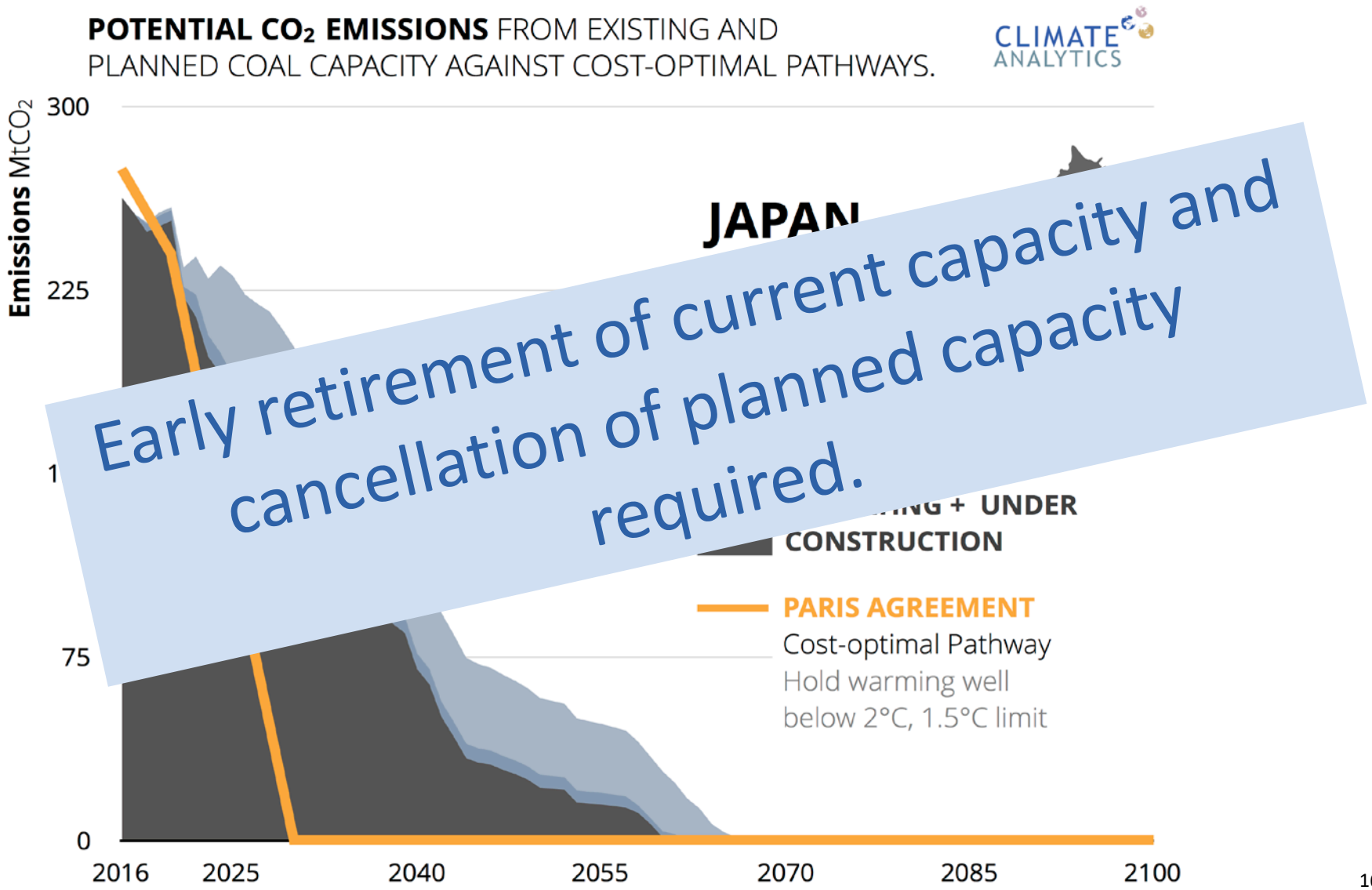


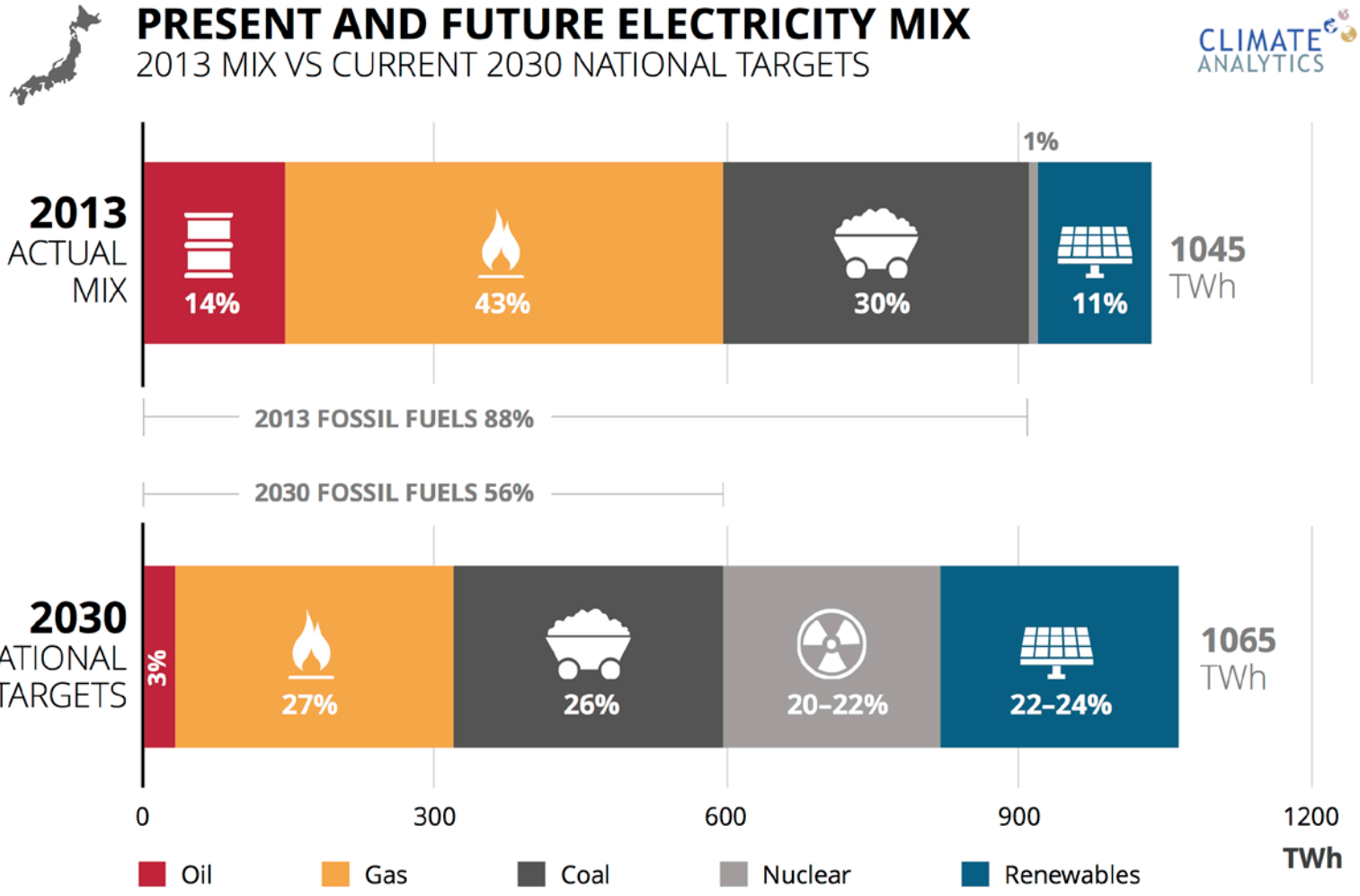
Early retirement of current capacity and cancellation of planned capacity required.

Alternative emissions scenarios

Scenario	2018- 2050		2018-2100	
	Cumulative emissions (Mt CO_2)	Share of PA coal budget	Cumulative emissions (Mt CO_2)	Share of PA coal Budget
Full expansion	5,328	292%	5,843	320%
Moderate Expansion	4,904	269%	5,212	286%
Limited expansion	4,789	263%	5,017	275%

- **Moderate expansion scenario:** assumes that only half of the projects currently under assessment and announced (6.5 GW) will come online.
- **Limited expansion scenario:** assumes that only a quarter of the projects currently under assessment and announced (3.3 GW)will come online.

Implications for policy makers – Adequacy of national targets



Source: Own elaboration based on (MOEJ, 2017) and (METI, 2018)

Adequacy of national targets

SHARES OF DIFFERENT FUELS IN ELECTRICITY MIX				
Fuel	2015	2030		
	Observed	Japan's Long-term Energy Outlook	World Energy Outlook 2017- Current Policy Scenario	Cost-optimal Paris Agreement electricity mix
Nuclear	1%	20-22%	17%	10%
Renewables*	16%	22-24%	22%	35%
Coal	33%	26%	32%	3%
Oil	10%	3%	3%	1%
Gas	40%	27%	25%	51%

Adequacy of national targets

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Fuel	2015				
	Observed	Japan'			is
Nucle					
Re					
Coa					3%
Oil				3%	1%
Gas		40%	27%	25%	51%

NDC targets are not yet aligned with PA, as they allow for a continuation of coal beyond 2030 and have a very conservative renewable energy target

Implications for policy makers – Adequacy of national targets

Current policies: (1) 42% efficiency standard for coal power plants (USC level). (2) Retailers need to make the non-fossil power supply ratio equal to 44% or more. (3) Voluntary target of power producers to achieve emissions factor of 0.37 kg-CO_2/kWh.

- There are several problems and loopholes in these regulations.
- There are currently no policies that can stop new capacity additions.
- There are no binding reduction targets for the energy sector, nor an effective compliance system. The policies instead give incentives to build new, energy-efficient coal power plants.

Implications for policy makers – Adequacy of national targets

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Substantial change in climate and energy policy needed

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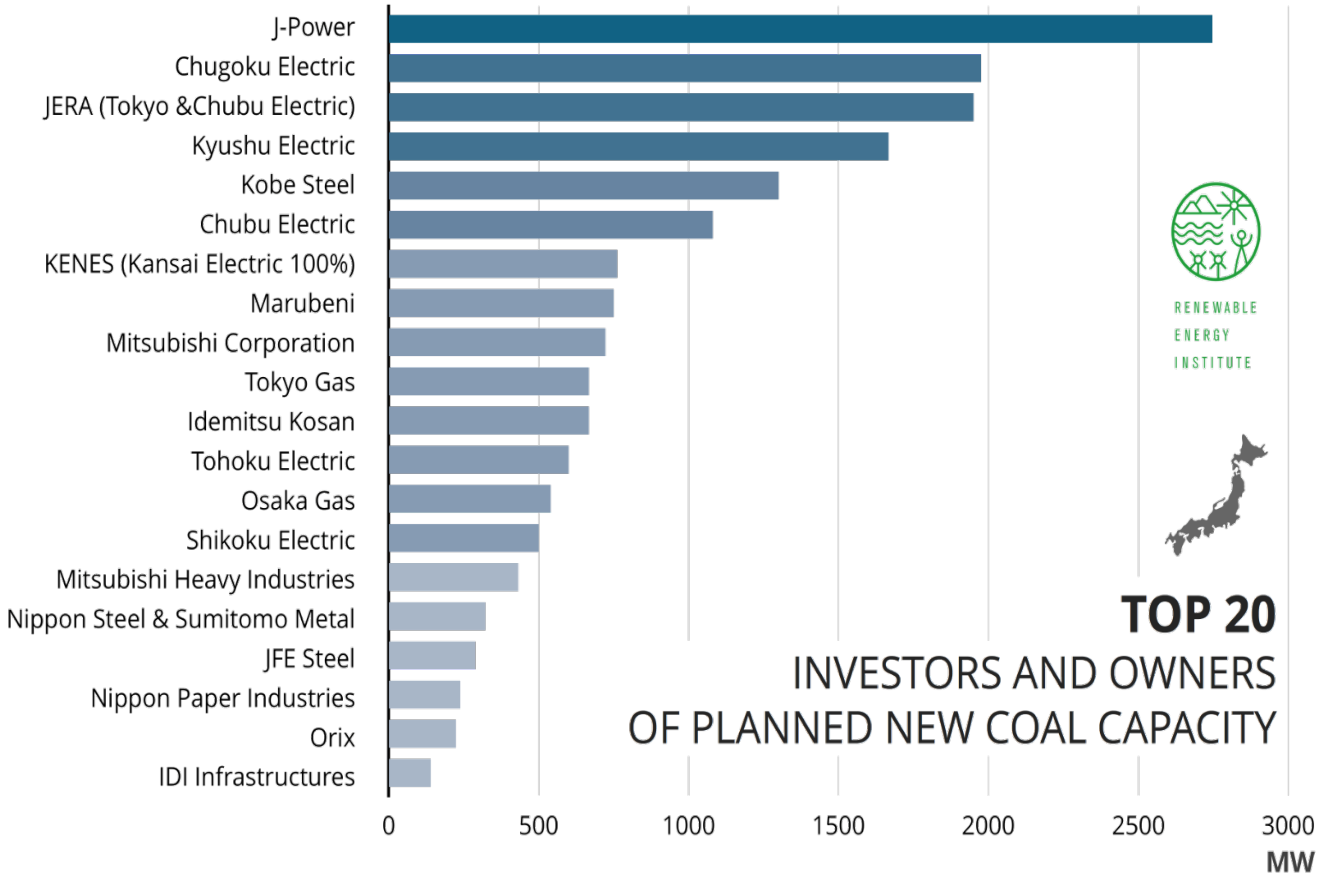
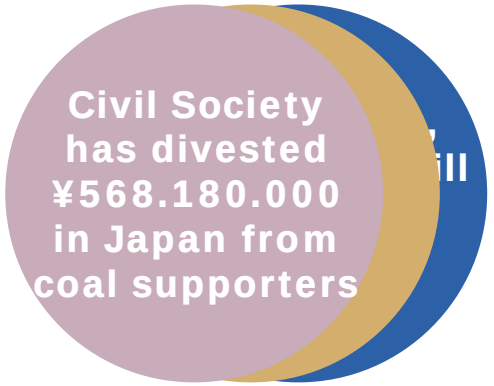
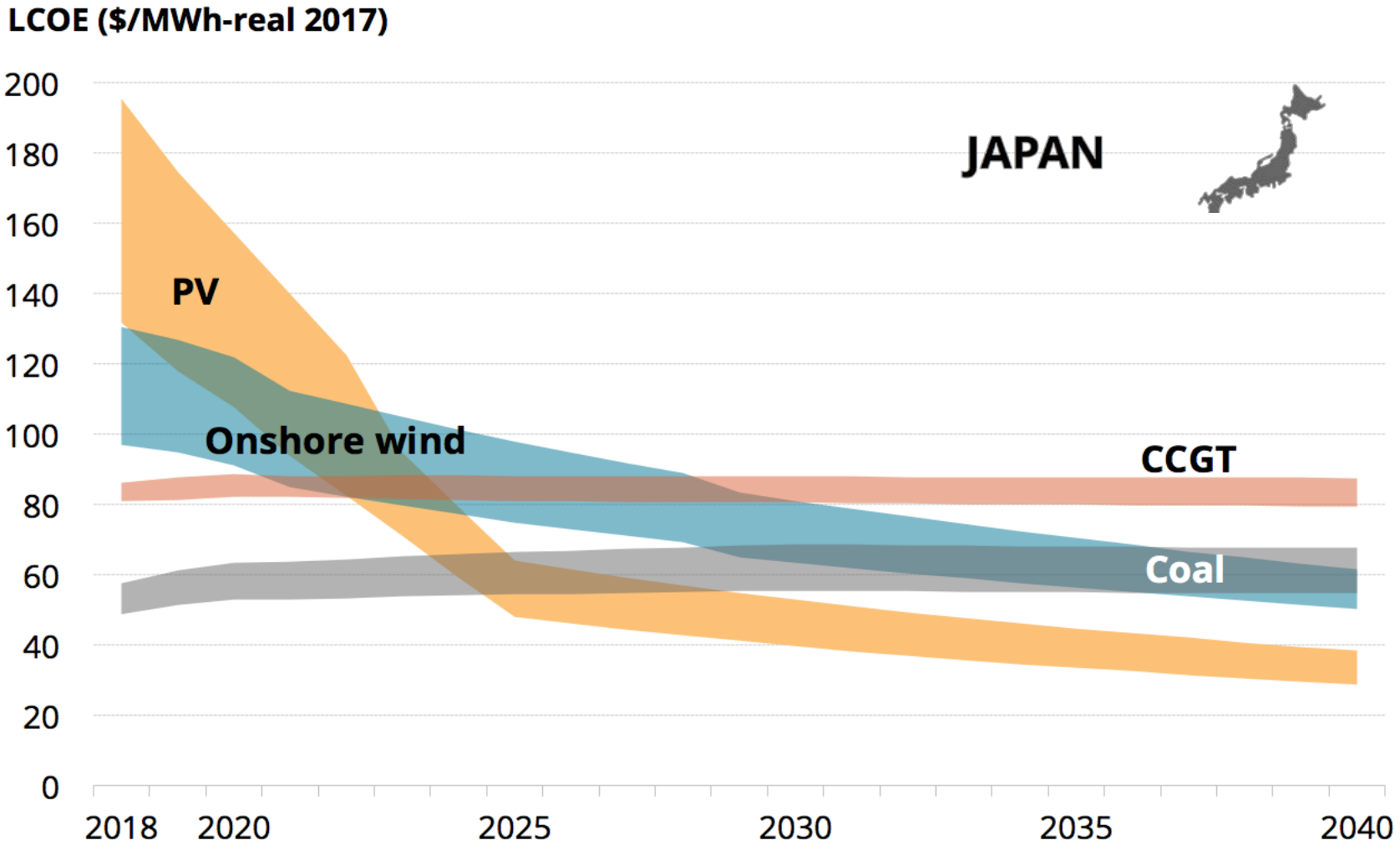
Implications for investors – risks





Source: own elaboration based on REI coal plants database (version Feb 2018).

Implications for investors – opportunities



Source: Own elaboration based on Bloomberg New Energy Finance

How to get there? Coal phase-out policies

- Carbon pricing has already proved to be an effective policy to discourage the use of coal.
- 60 national & subnational jurisdictions including seven out of the world's ten largest economies, have carbon pricing schemes. China started implementation and Brazil is in planning phase.
- Carbon pricing currently under consideration by the Ministry of Environment

How to get there? Coal phase-out policies

- Despite price competitiveness, being more capital-intensive than coal, renewable energy technologies can still be perceived as risky by some investors. **Policy instruments for de-risking RE, and additional investments grid infrastructure and storage are needed.**

- Measurement and communication of co-benefits of RE (air quality, energy independency, etc.) play an important role in shaping energy planning.

How to get there? Coal phase-out policies

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Regulatory approach for coal phase-out

- Coal phase-out by regulation, can reduce the lifetime of coal plants while providing stakeholders with certainty to ensure a smooth transition.
- By discouraging new coal investments this measure also reduces the risk of stranded assets.
- An increasing number of countries, states, cities, and companies have already announced phase-out of coal (PPCA)

Conclusions

- In order to honour its commitments under the Paris Agreement, Japan will need to reverse its current trend of expanding coal-fired generation capacity and instead urgently implement policies to enable a quick coal phase-out from the electricity mix.

- Need to substantially speed up the deployment of low carbon and carbon neutral technologies for electricity production, with the aim of phasing out all fossil fuel emissions from the electricity mix by around mid-century.

Outlook and next steps

- A clearer understanding of the social and economic impacts associated with phasing-out coal in Japan is crucial to ensure a smooth transition to alternative power sources and to implement any retirement plan on the ground. Follow-up analysis seeks to better understand:
  - The potential for renewables in the different regions in the Japan
  - Estimate the costs of phase-out, necessary investment and resulting co-benefits at the regional level
  - Social impacts and opportunities

Arigato!

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