

Powering Past Coal Alliance: impacts and the prospects for expansion

Jessica Jewell (Chalmers, University of Bergen)

with contributions from Vadim Vinichenko (Chalmers) Aleh Cherp (CEU, IIIEE) & Lola Nacke (Chalmers)

11 January 2021 | Funded by the Norwegian Research Council

Powering Past Coal Alliance (PPCA)

COP23 in November 2017

Canada and the UK launch a global alliance to phase out coal electricity



Canada and the UK launch a global alliance to phase out coal electricity

commit to: “phasing out existing unabated coal power generation and a moratorium on new coal power generation without operational carbon capture and storage”

nature
climate change

LETTERS

<https://doi.org/10.1038/s41558-019-0509-6>

Prospects for powering past coal

Jessica Jewell^{1,2,3,4,7*}, Vadim Vinichenko^{2,3,5,7}, Lola Nacke⁵ and Aleh Cherp^{5,6,7}

2019

Powering Past Coal Alliance (PPCA)

Coal

'Political watershed' as 19 countries pledge to phase out coal

New alliance launched at Bonn climate talks hopes to signal the end of the dirtiest fossil fuel that kills 800,000 people a year with air pollution



▲ A child holds a sign reading 'stop coal' during a demonstration at the UN climate talks in Bonn, Germany. Photograph: Philipp Guelland/EPA

A new alliance of 19 nations committed to quickly phasing out coal has been launched at the [UN climate summit in Bonn, Germany](#). It was greeted as a "political watershed", signalling the end of the dirtiest fossil fuel that currently provides 40% of global electricity.

New pledges were made on Thursday by Mexico, New Zealand, Denmark and Angola for the [Powering Past Coal Alliance](#), which is led by the [UK](#) and Canada.

Damian Carrington in Bonn

@dpcarrington
Thu 16 Nov 2017 14:53 GMT



This article is 3 months old

8,706 892

Climatic Change (2018) 150:103–116
<https://doi.org/10.1007/s10584-017-2134-6>



Anti-fossil fuel norms

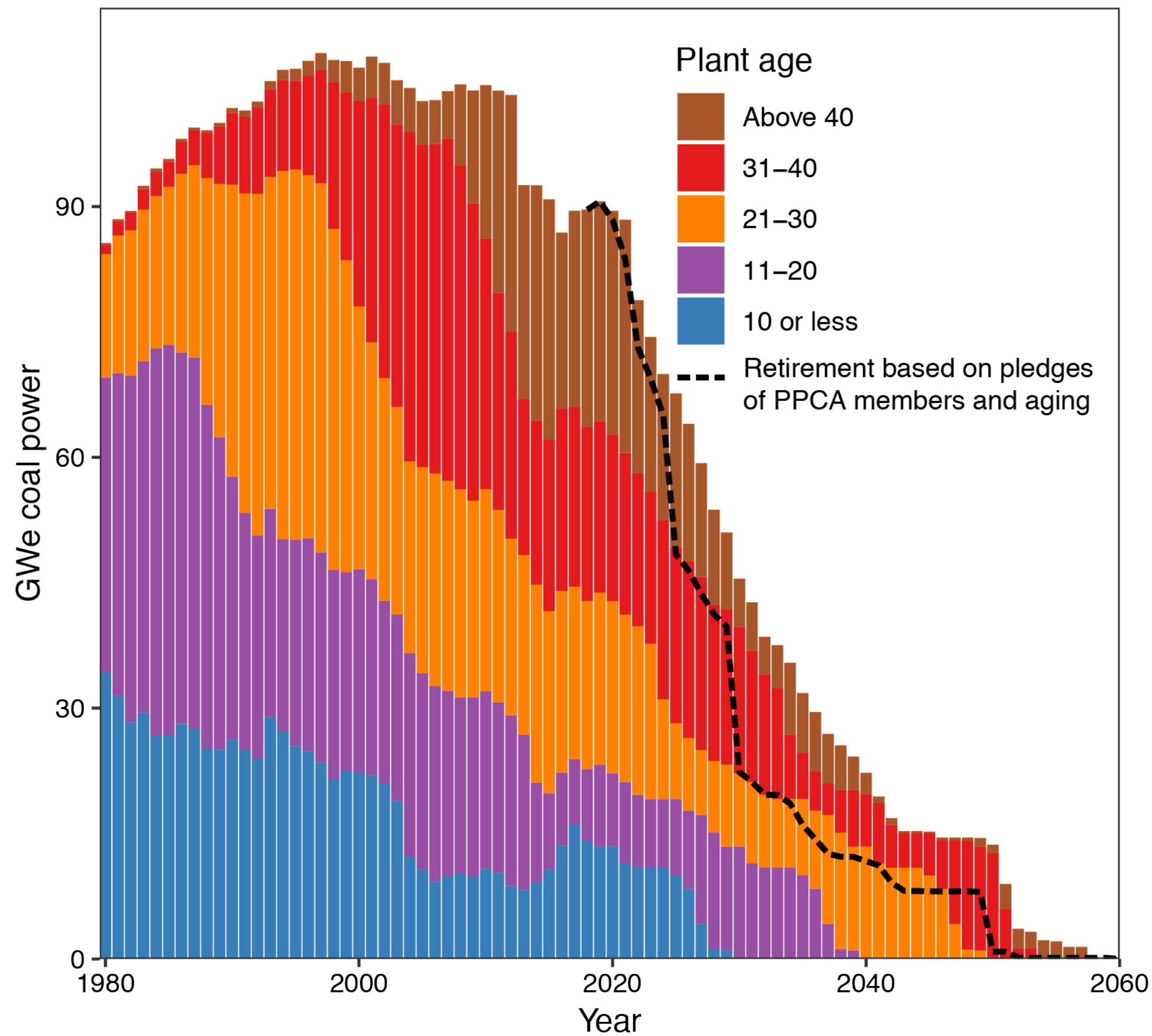
Fergus Green¹ 

Would coal power plants be retired anyway?

The case of United Kingdom

- Average age of power plants: **47 years** (min 28).
- Average recent retirement age: **44 years** (min 34)
- Phase-out planned for **2025**.

Baseline vs premature retirement



Saves **1.6 GtCO₂** by 2050

PPCA saves: 1.6 GtCO₂ by 2050

RESEARCH LETTER

- **260 GtCO₂** committed from coal power plants in operation
- **188 GtCO₂** from plants under construction

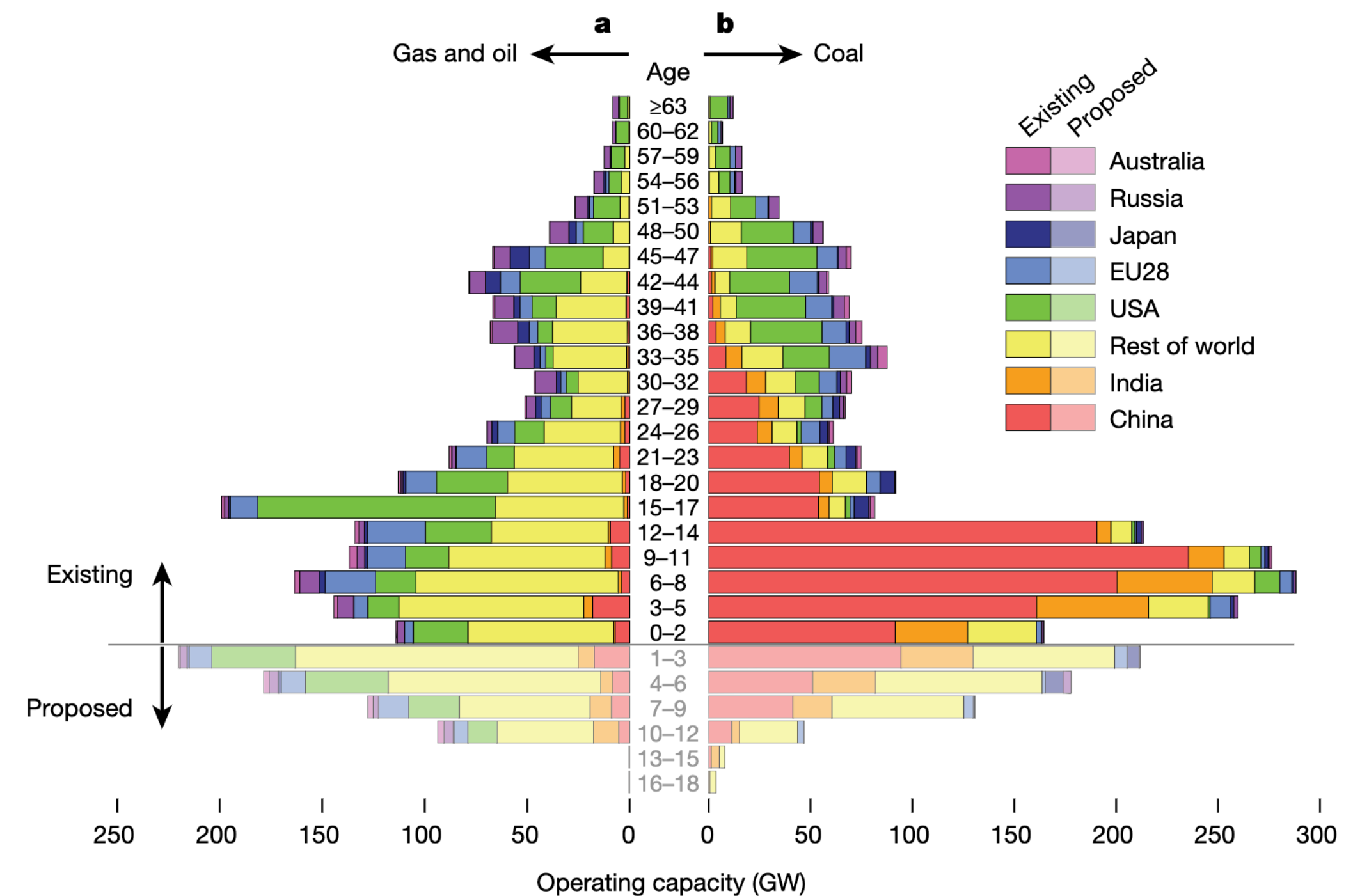
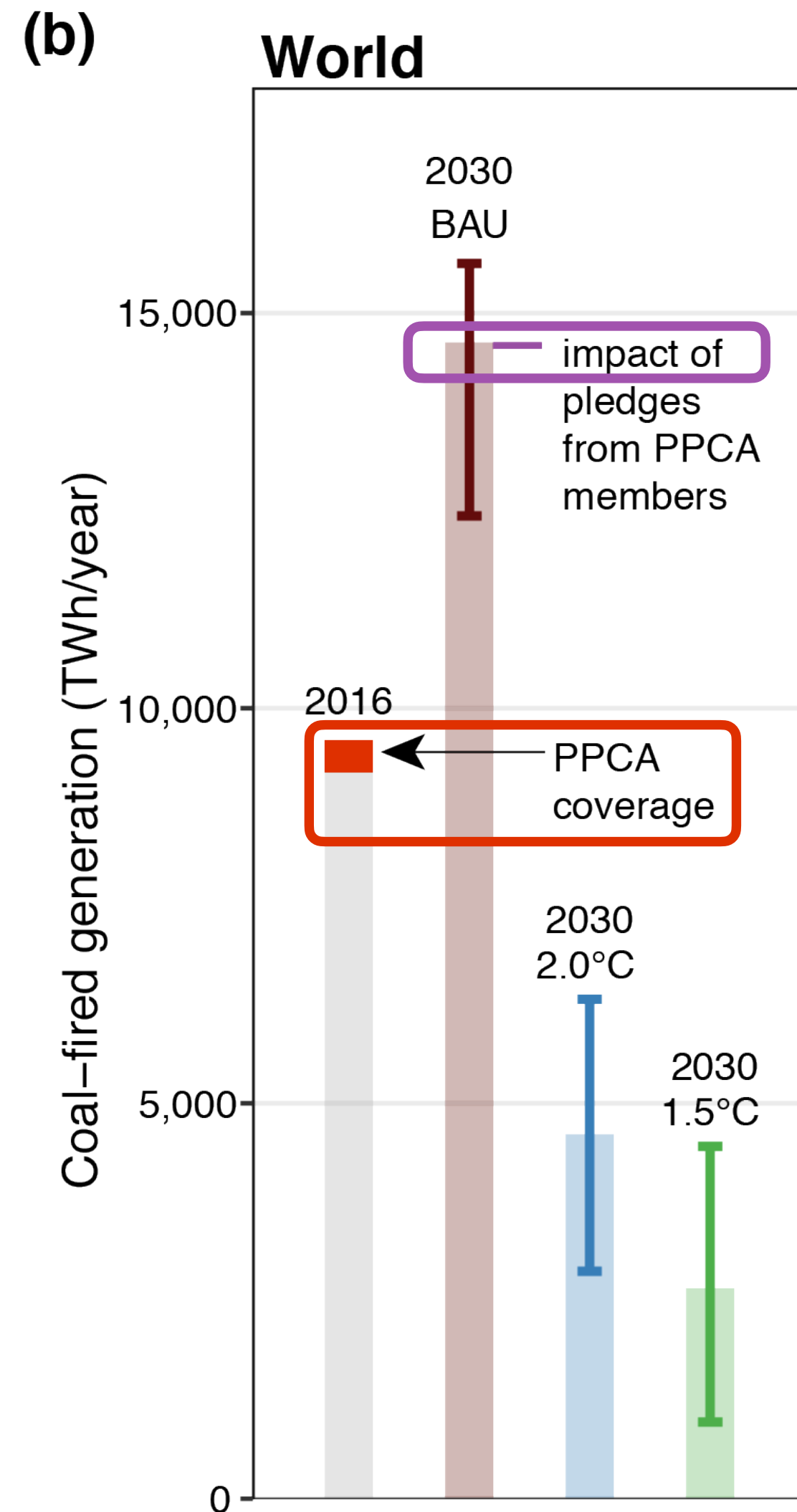


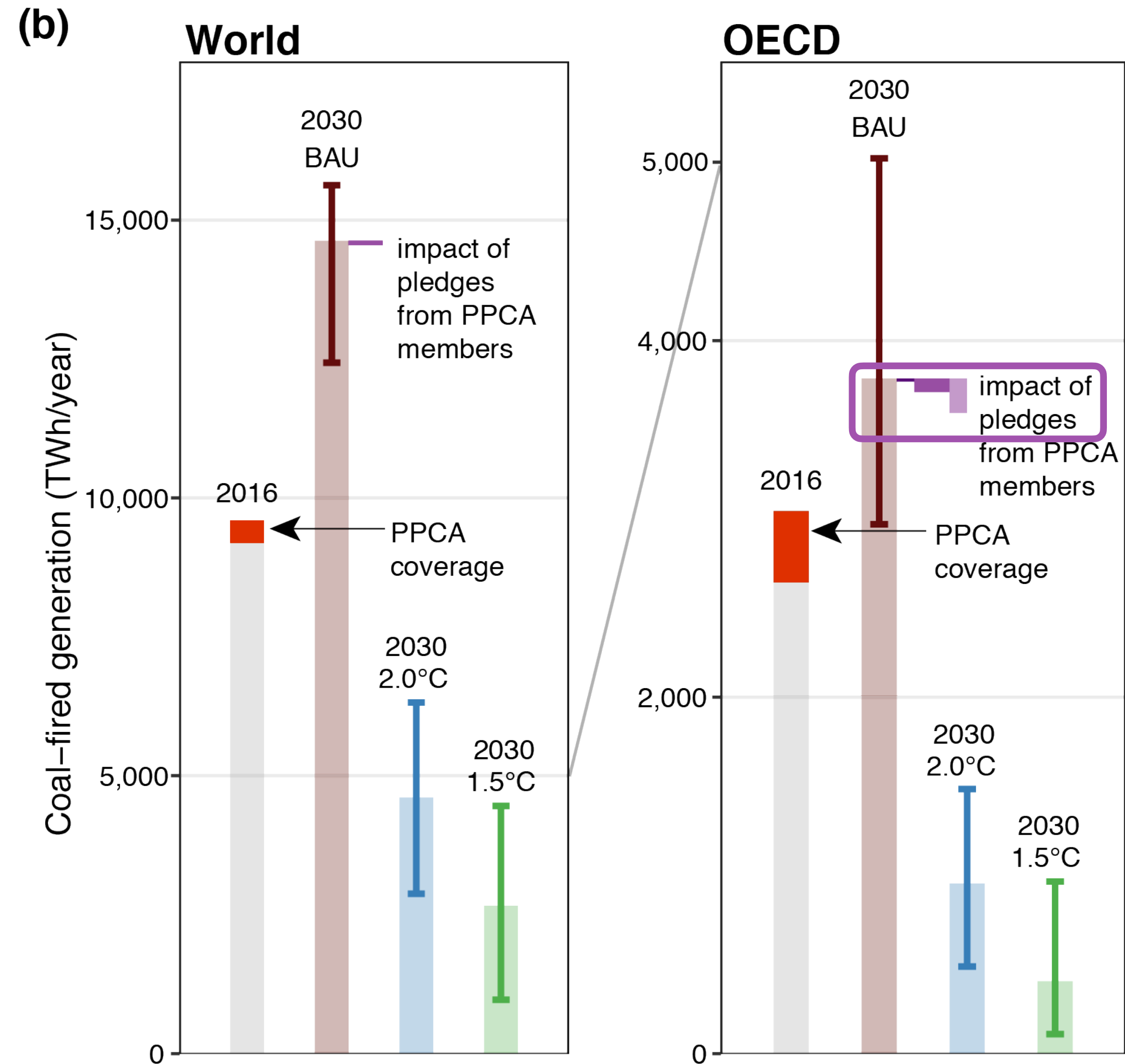
Fig. 2 | Age structure of global electricity-generating capacity. a, b, The operating capacity of gas- and oil-fired electricity-generating power units (a) and coal-fired units (b). The youngest existing units are shown at the bottom of the 'existing' section. The more lightly shaded bars underneath show proposed electricity-generating units according to the year (from

now) that they are expected to be commissioned. The recent trends in Chinese and Indian coal-fired units (red and orange at the lower right) and US gas-fired units (green at the left) are easily apparent. '0 years old' means that the power units began operating in 2018.

Effect of PPCA on coal power generation and climate scenarios



Effect of PPCA on coal power generation and climate scenarios



Can PPCA be expanded to countries with more coal?

1. What is going on in PPCA countries?
2. Can this happen in other countries?

Can PPCA be expanded to countries with more coal?

1. How much **coal** is used in electricity?
2. How much **coal** is imported?
3. How much **coal** is produced (per capita)?
4. How much **coal** is used in industry and heating?
5. How old are **coal** power plants?
6. How fast does the electricity demand grow?
7. How much non-hydro renewables are used?
8. How serious is air pollution?
9. Is the country rich?
10. Is the country member of the EU?
11. How functional is the government?

How functional is the government?

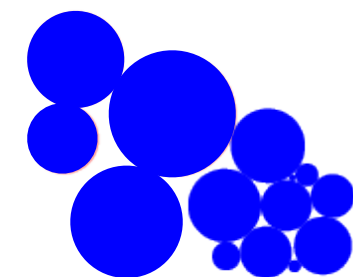
- Functioning of government (FOG) index
 - Absence of undue influence on elected government
 - Government transparency
 - Checks against political corruption

Freedom House

PPCA countries versus largest coal consumers

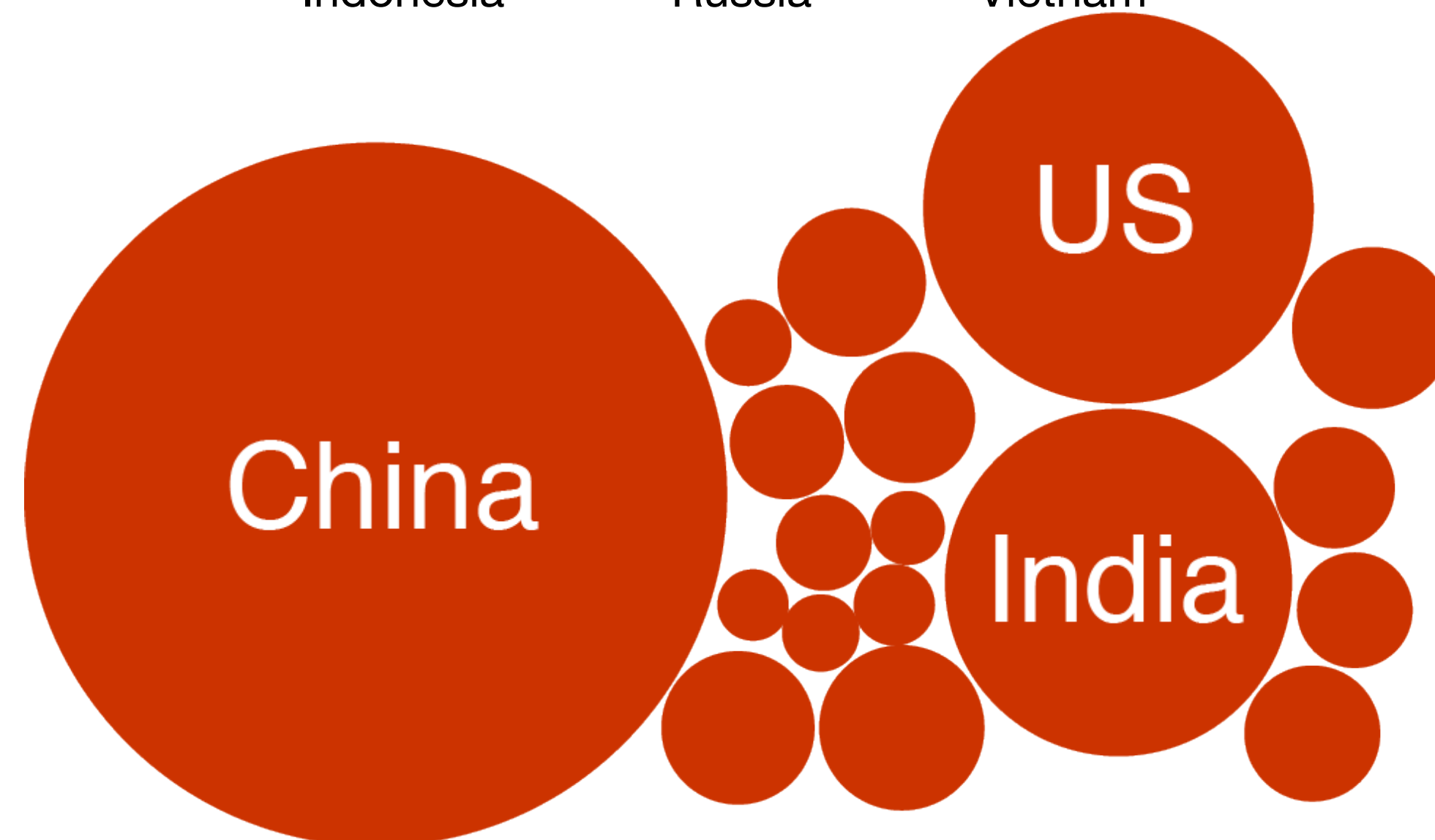
PPCA countries

Austria
Belgium
Canada
Denmark
Finland
France
Ireland
Israel
Italy
Mexico
Netherlands
New Zealand
Portugal
Sweden
United Kingdom



Biggest 18 Coal Consumers > 90% of coal power

Australia	Kazakhstan	South Africa
China	Korea	Spain
Czech Republic	Japan	Turkey
Germany	Malaysia	Ukraine
India	Poland	US
Indonesia	Russia	Vietnam



PPCA countries

- Produce and use less coal
- Rely on imported coal
- Have older power plants
- Have zero electricity demand growth
- Are richer
- Have better governments

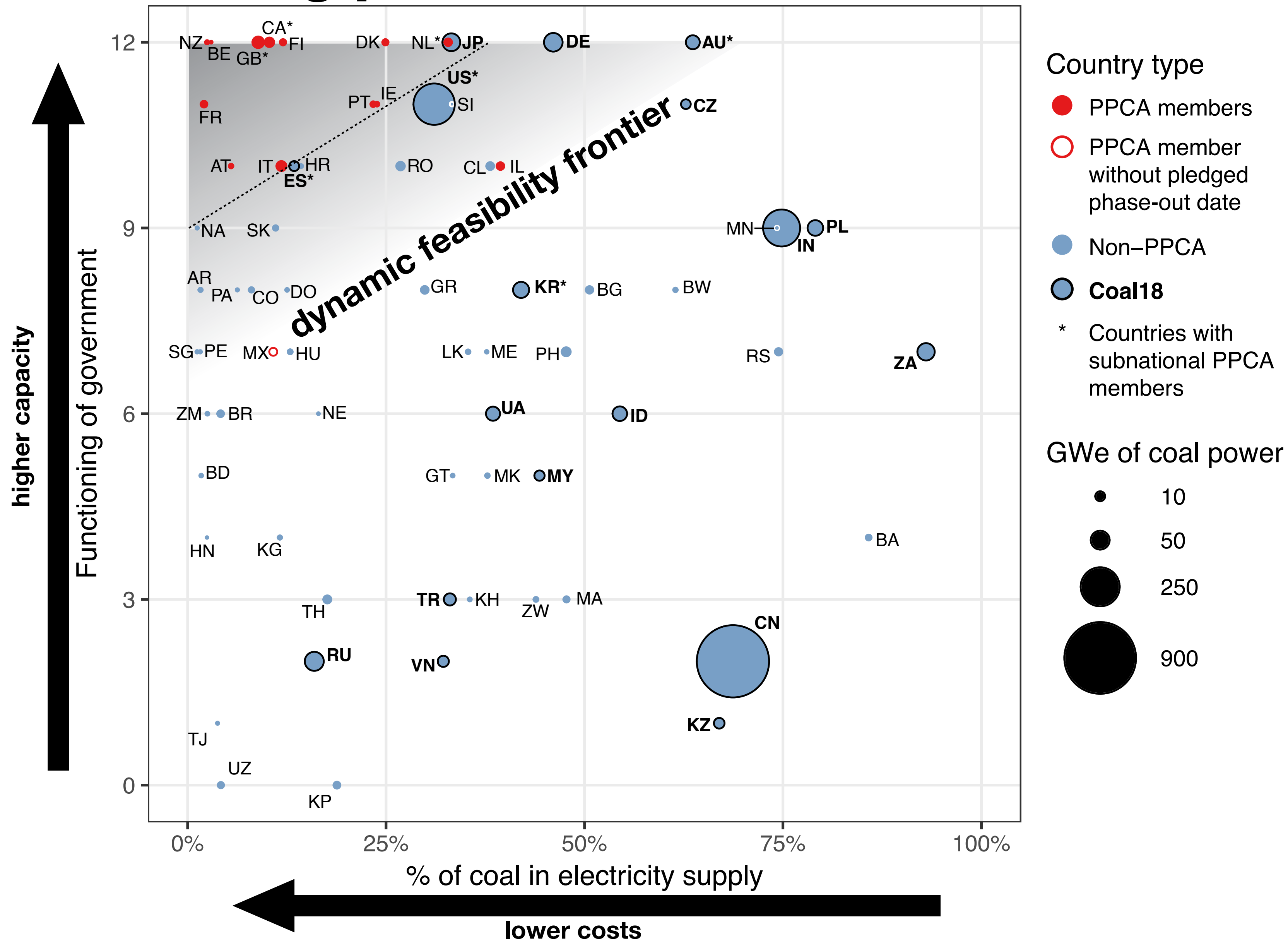
What's most important?

What's most important?

in other words what best predicts membership in PPCA?

- Produce and use less coal
- Are richer and have better governments

Powering past coal alliance = little coal + good government



Germany joined in 2019

- Almost same capacity as all PPCA countries together
- Many plants built in the 2000s

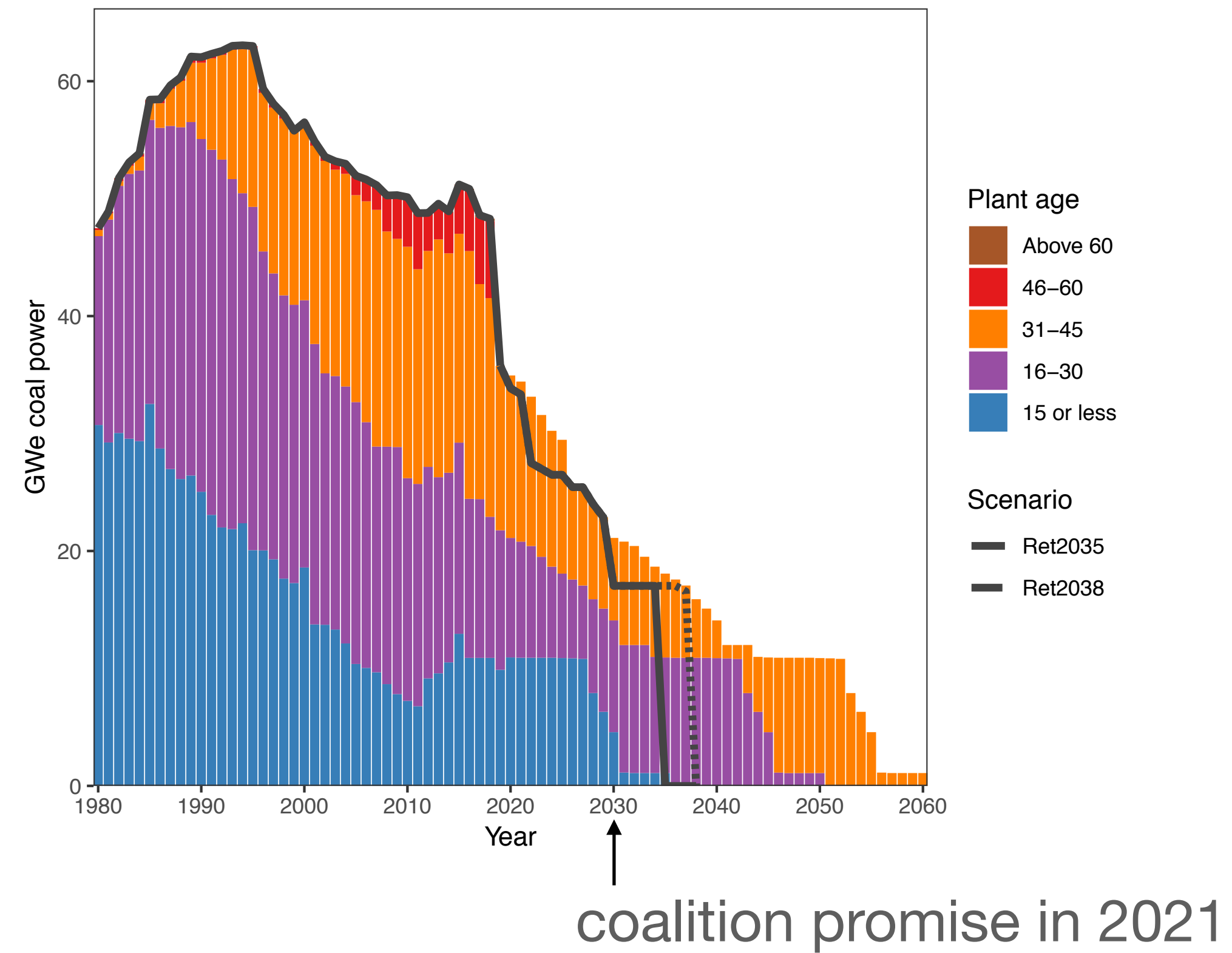
Kommission “Wachstum, Strukturwandel und Beschäftigung”



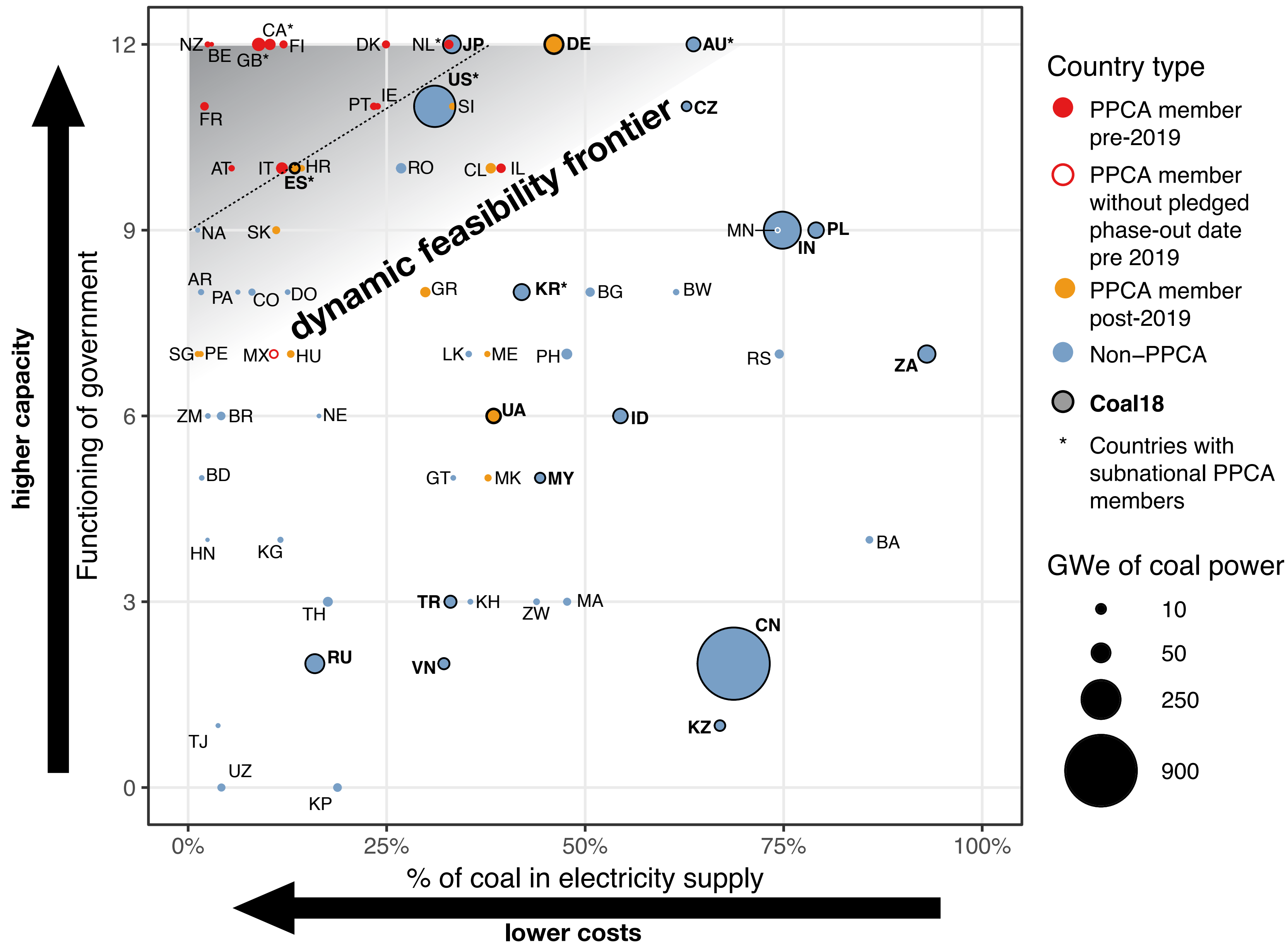
Commission for growth, structural change and employment

Germany

- In 2019, pledged to phase out coal in three steps by 2038
- Would avoid up to 1.6 GtCO₂
- Cost up to €40 bln for affected regions + compensation to utilities



New members of Powering past coal alliance indicate new opportunities



Recent PPCA expansion and additional coal reduction pledged

- Share of global coal capacity in original PPCA original members in 2018 4.4%
- Share of global coal capacity in original PPCA members in 2021 2.3%
- Share of global coal capacity in PPCA members joined since 2019: 3.8%
- Share of global coal capacity in *Global coal to clean power*: 6.2%
 - Most of these countries are developing and emerging economies

Conclusions and future directions

- Impact of the existing PPCA pledges is small compared to what is needed to attain climate targets
- Countries pledging coal phase-out have low costs and high capacities to overcome these costs: the feasibility frontier
- The feasibility frontier shifts overtime retaining its salient characteristics of costs and capacities
- It is critical to understand the costs of phase-out to understand how to shift the feasibility frontier in the future