

# Prospects of powering past coal

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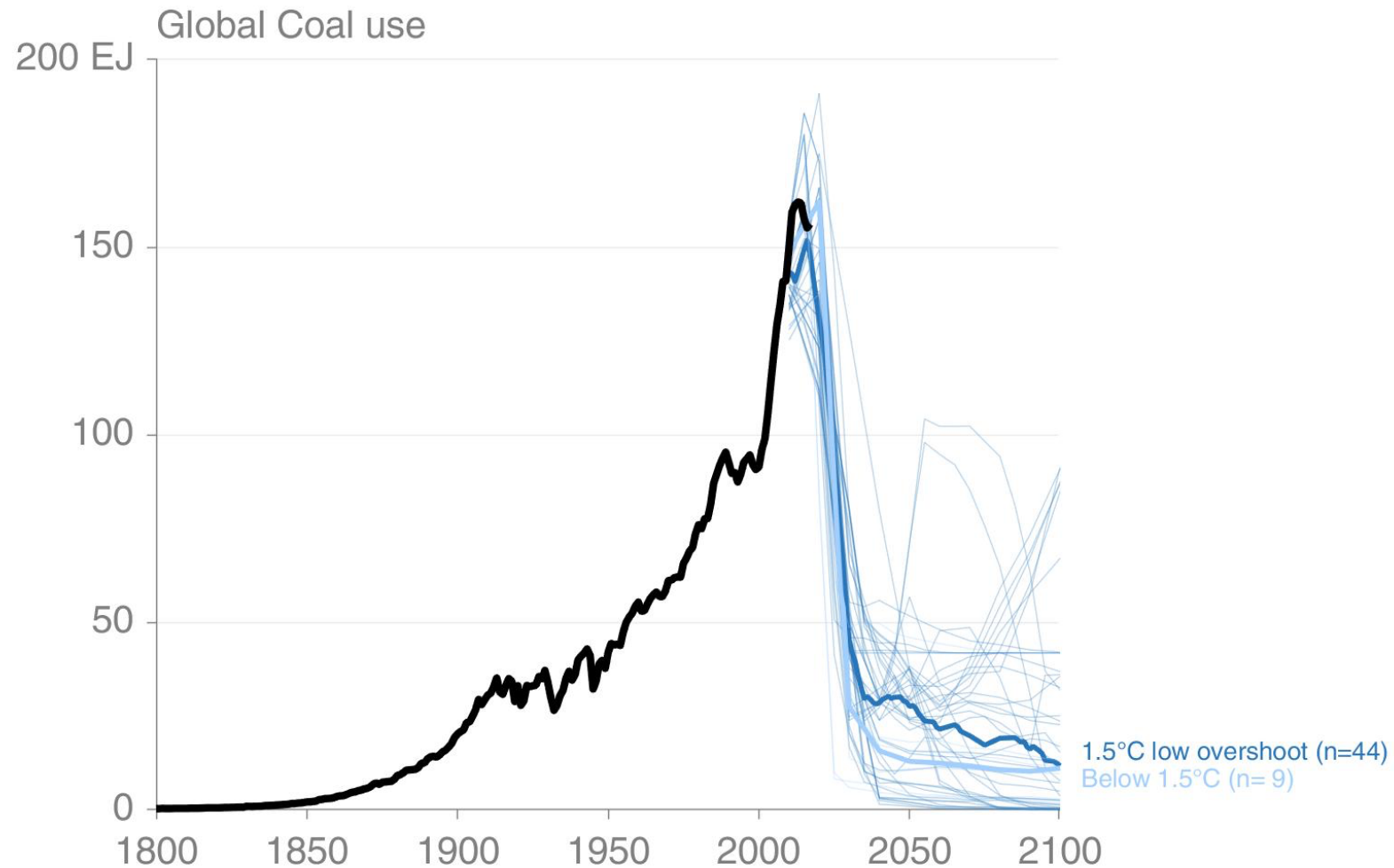
5 November 2019

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# Why coal?

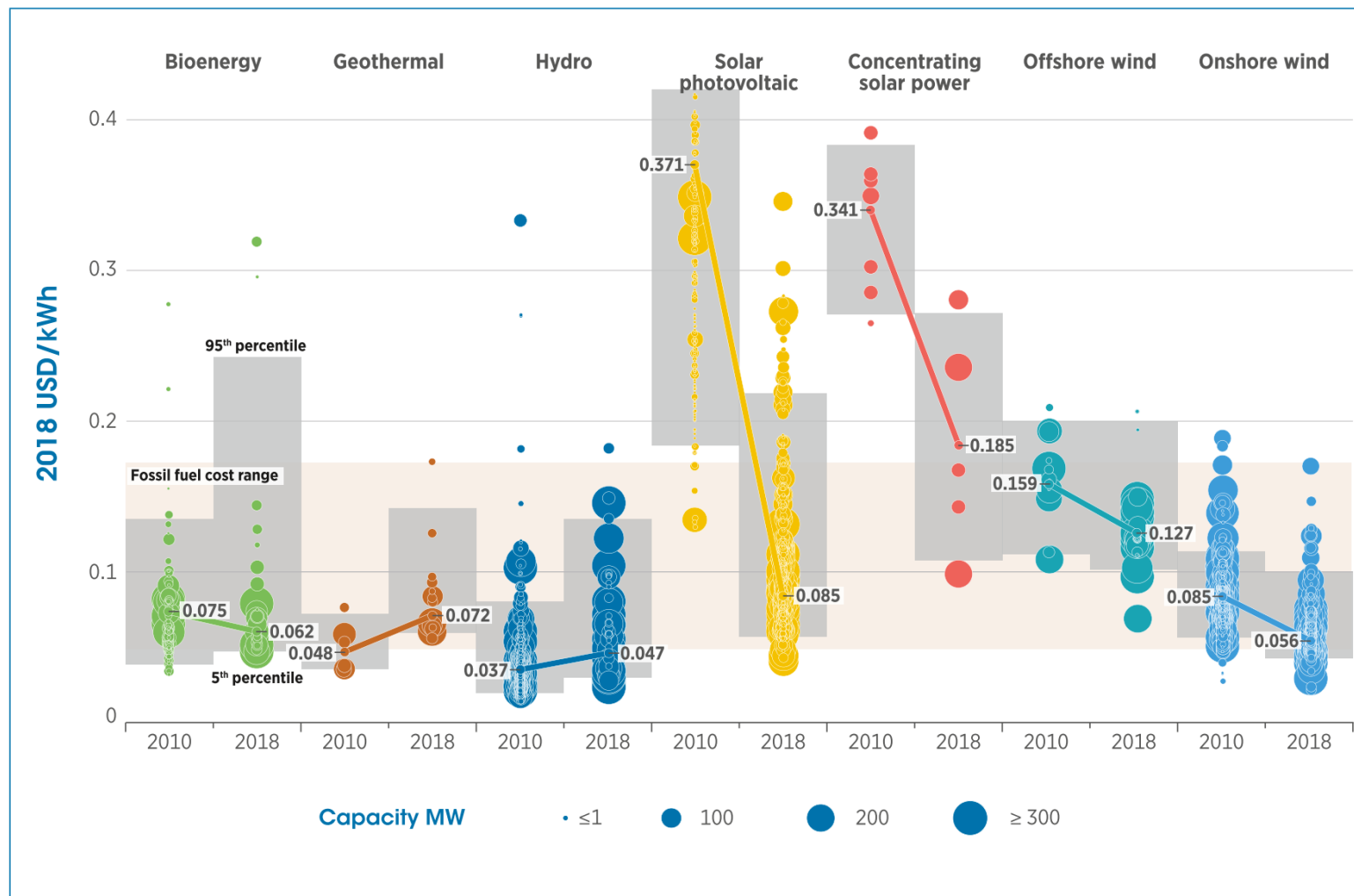
- We need to phase it out urgently
- There are alternatives & they're better
- Global coal phase-out underway

# Coal phase-out urgency: The challenge is huge



# Coal phase-out: There are alternatives and they're better!

**Figure S.1** Global LCOE of utility-scale renewable power generation technologies, 2010–2018



# A global coal phase-out is underway

## Powering Past Coal Alliance (PPCA)

### COP23, Bonn, Nov 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”

# 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

Damian Carrington in Bonn

@dpcarrington  
Thu 16 Nov 2017 14:53 GMT



This article is 3 months old

8,706 892



▲ 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.

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



## Anti-fossil fuel norms

Fergus Green<sup>1</sup>

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# Powering Past Coal Alliance (PPCA)

30 nations

22 sub-national

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

Angola  
Costa Rica  
El Salvador  
Ethiopia  
Fiji  
Latvia  
Liechtenstein  
Lithuania  
Luxembourg  
Marshall Islands  
Niue  
Senegal  
Switzerland  
Tuvalu  
Vanuatu

Alberta (Canada)  
City of Rotterdam (Netherlands)  
Balearic Islands (Spain)  
South Chungcheong (S.Korea)  
Scotland (UK)  
Wales (UK)  
Washington (US)  
Oregon (US)  
California (US)  
New York (US)  
Connecticut (US)  
Hawaii (US)  
Minnesota (US)

Australian Capital Territory  
City of Melbourne (Australia)  
City of Sydney (Australia)  
British Columbia (Canada)  
City of Vancouver (Canada)  
Ontario (Canada)  
Quebec (Canada)  
City of Los Angeles (US)  
City of Honolulu (US)

**No coal power plants**

**No coal power plants**

**50 GW**

**256 power plants**

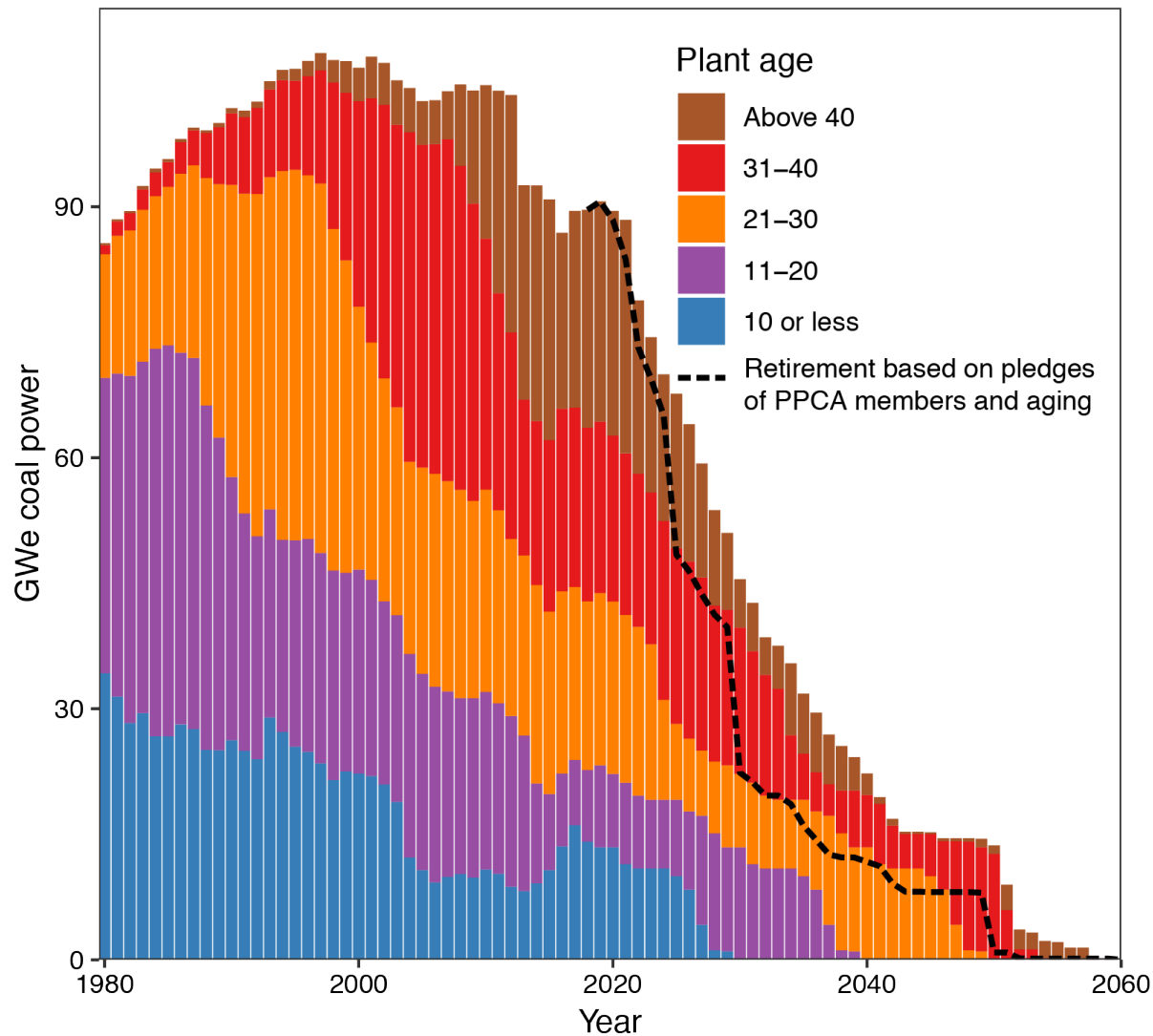
**4.4% of global coal capacity**

# 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



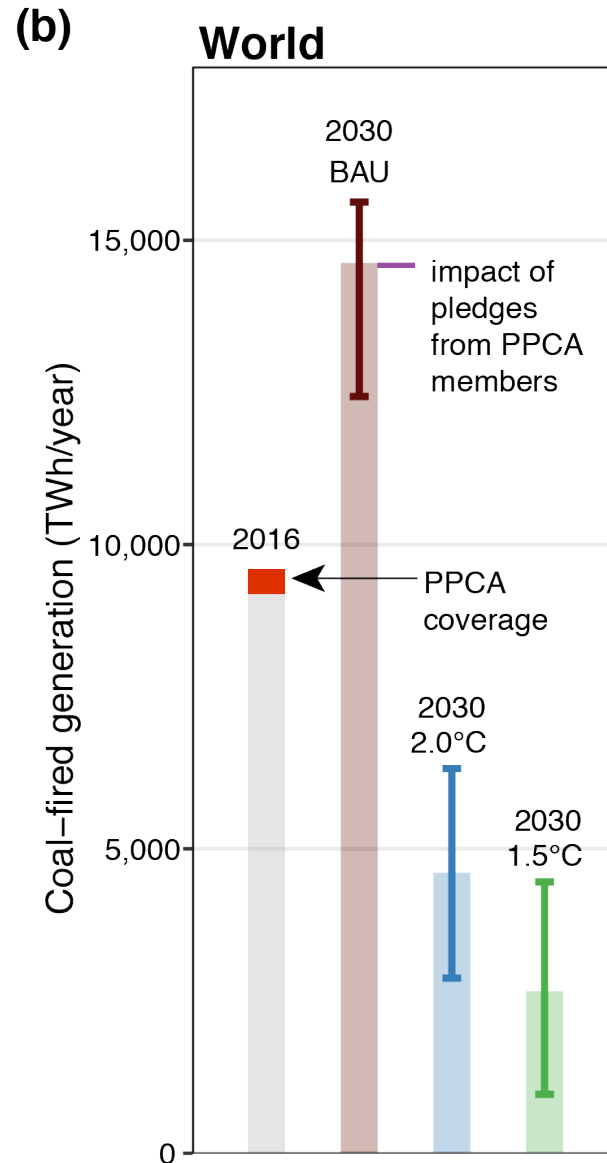
**Saves 1.6 GtCO<sub>2</sub>**  
**by 2050**

# 1.6 GtCO<sub>2</sub> by 2050

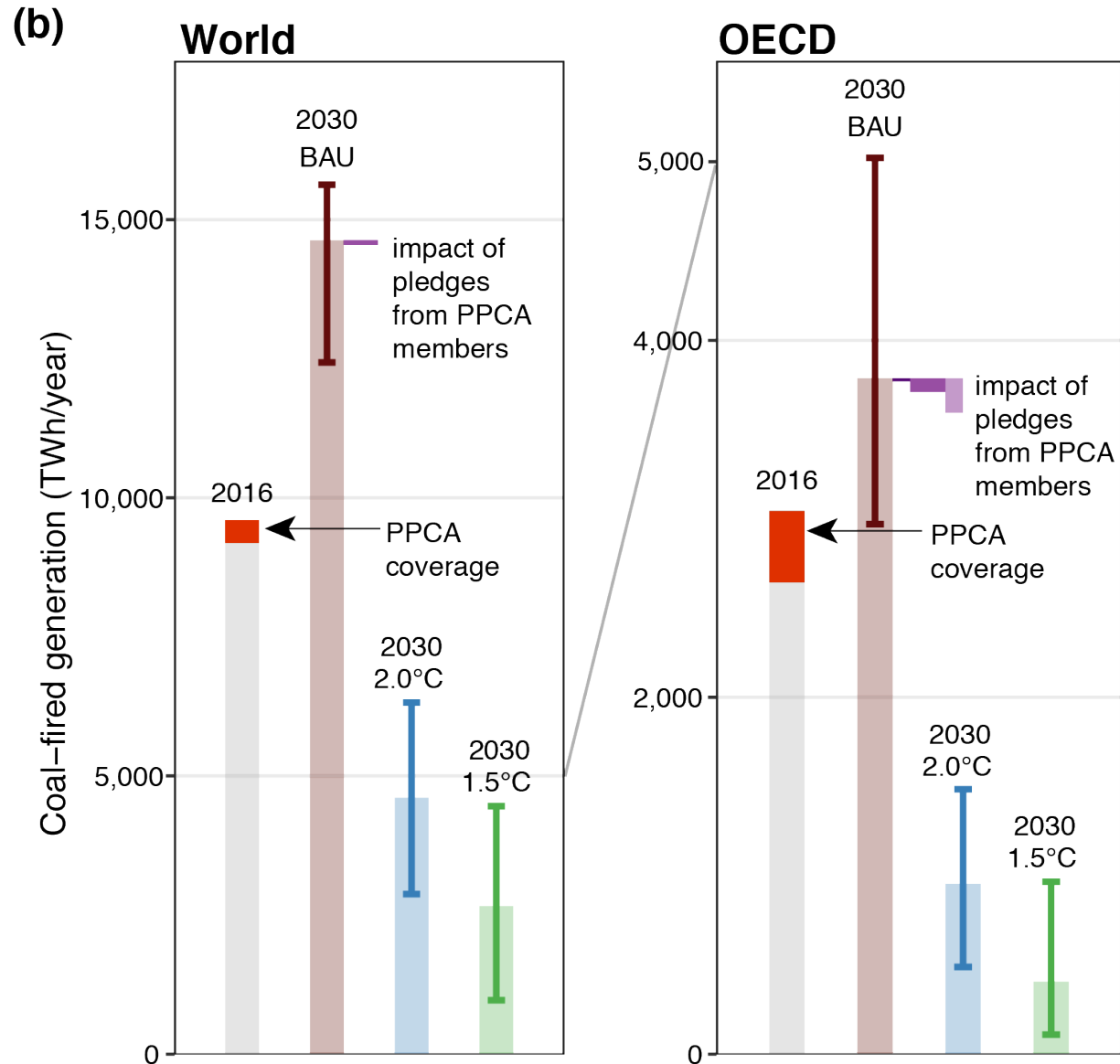
- 260 GtCO<sub>2</sub> committed from coal power plants in operation
- 100 GtCO<sub>2</sub> from plants under construction and planned

Tong et al. 2019

# 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. 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?

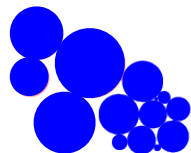
- Functioning of government (FOG) index
  - Absence of undue influence on elected government
  - Government transparency
  - Checks against political corruption

*Freedom House*

# PPCA countries versus largest coal consumers

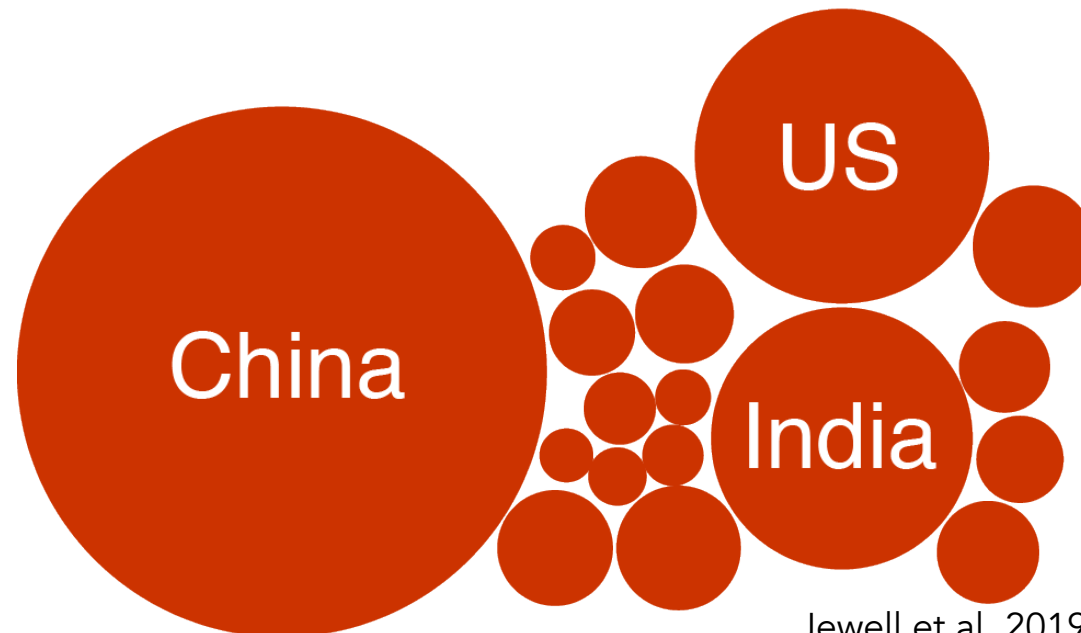
## PPCA countries

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

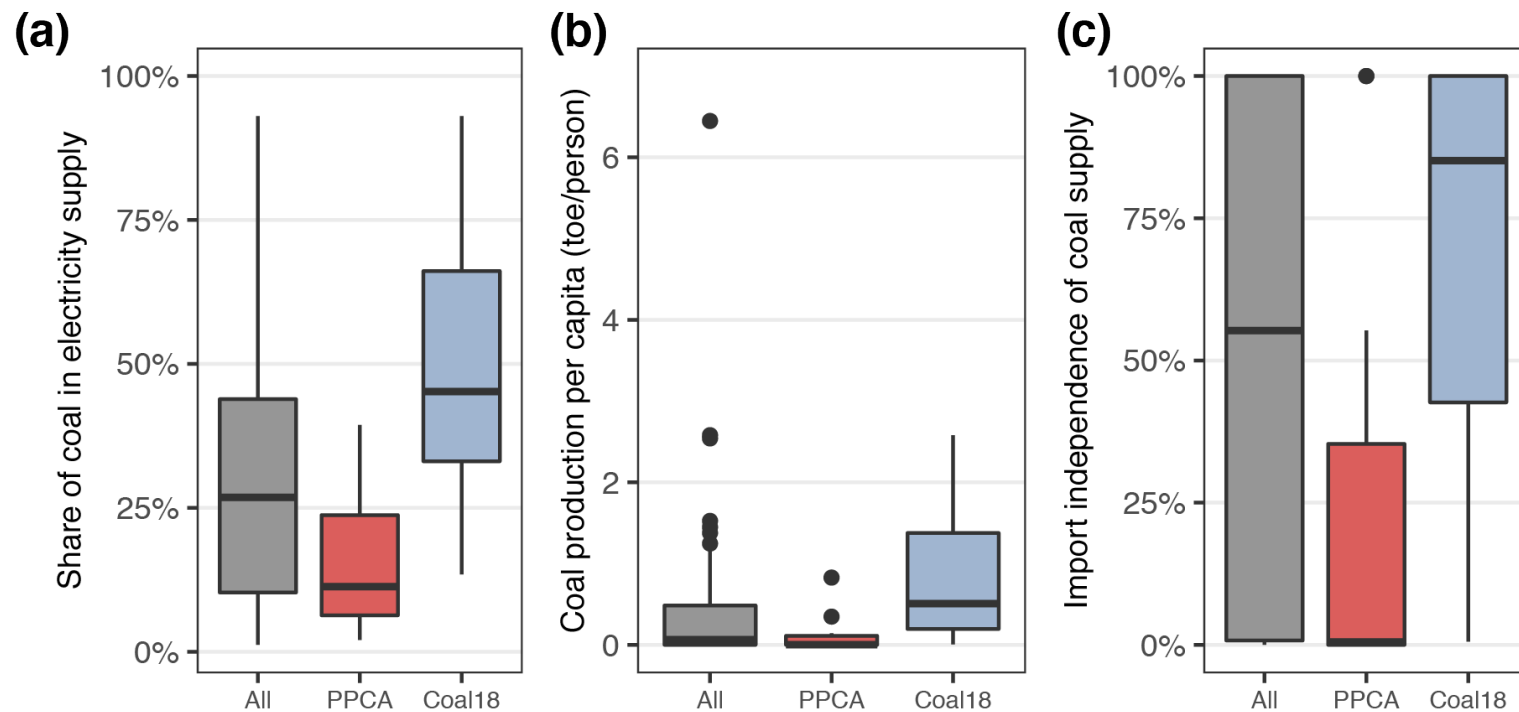


## Biggest 18 Coal Consumers > 90% of coal power

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

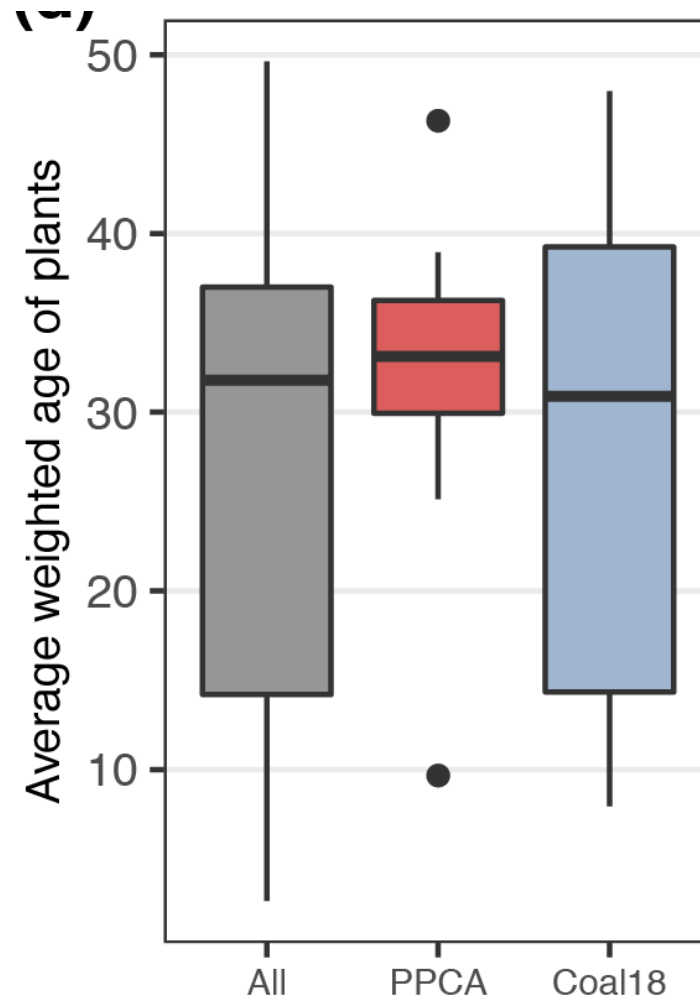


# PPCA countries produce and use less coal

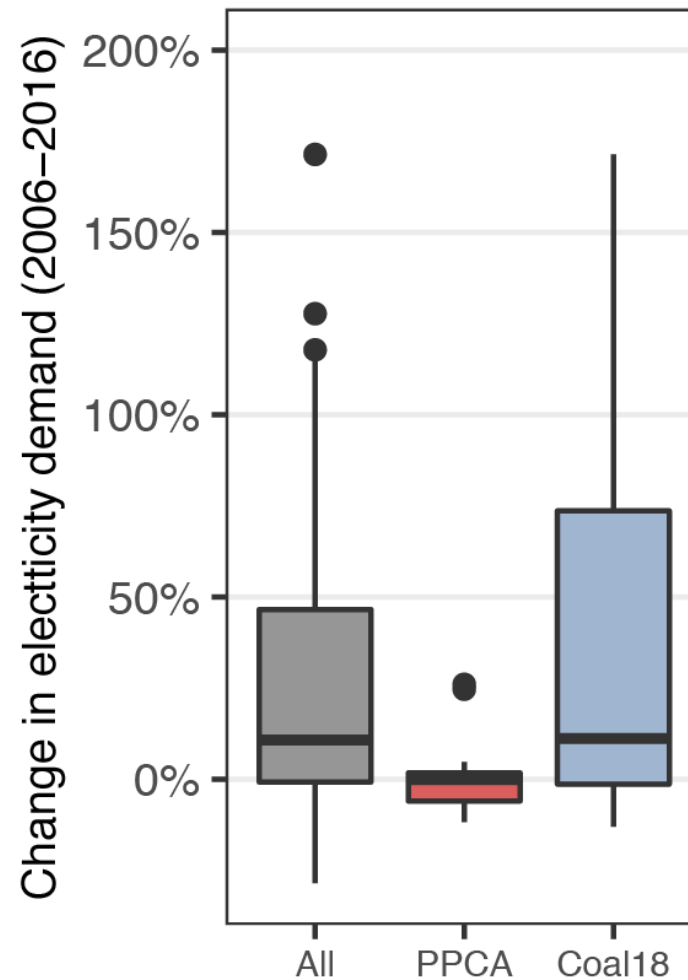




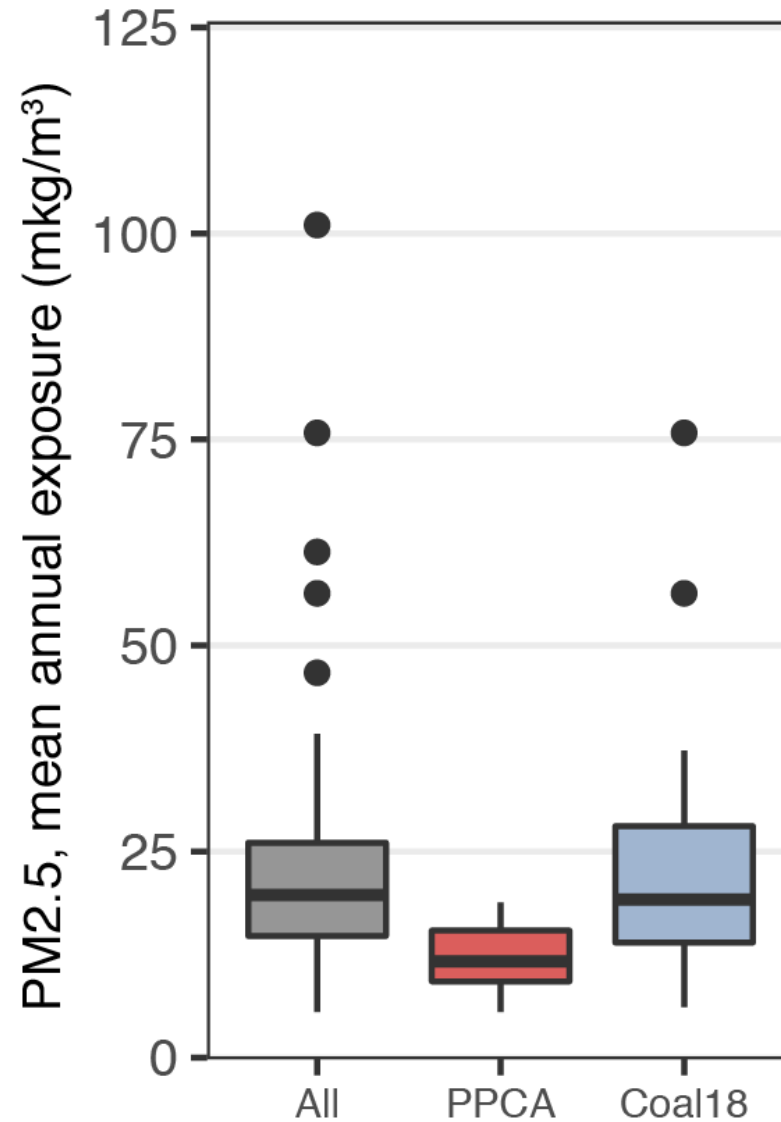
# PPCA countries have **older power plants**



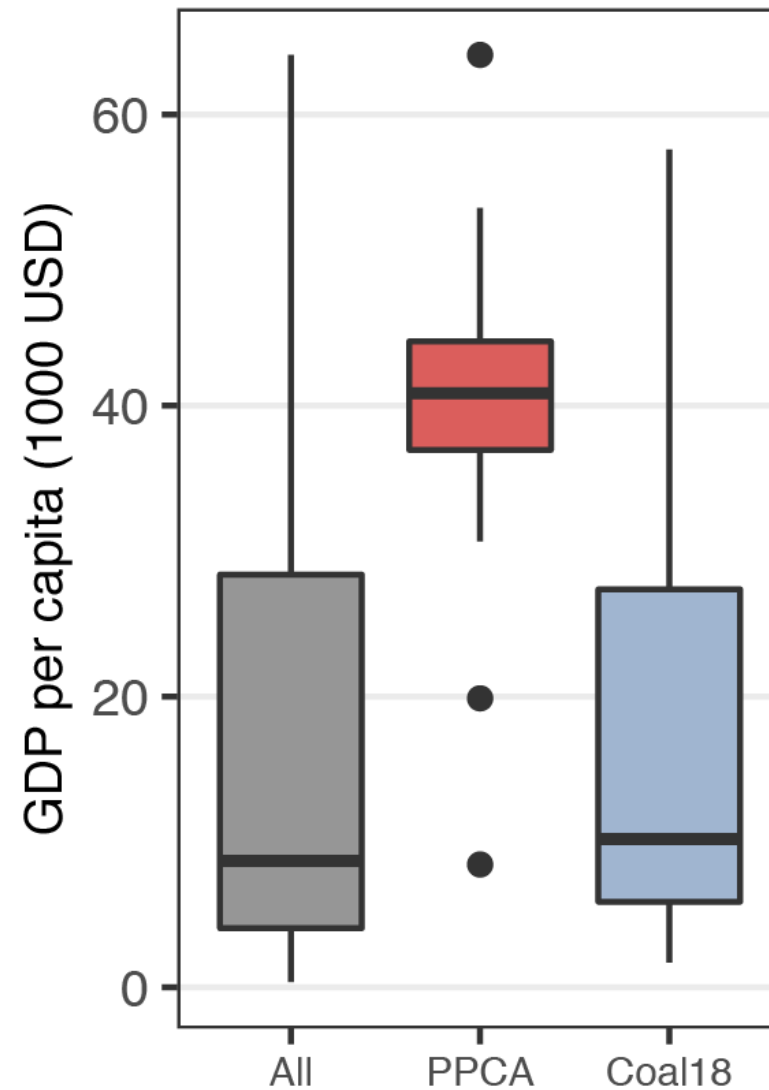
# PPCA countries have **declining electricity demand**



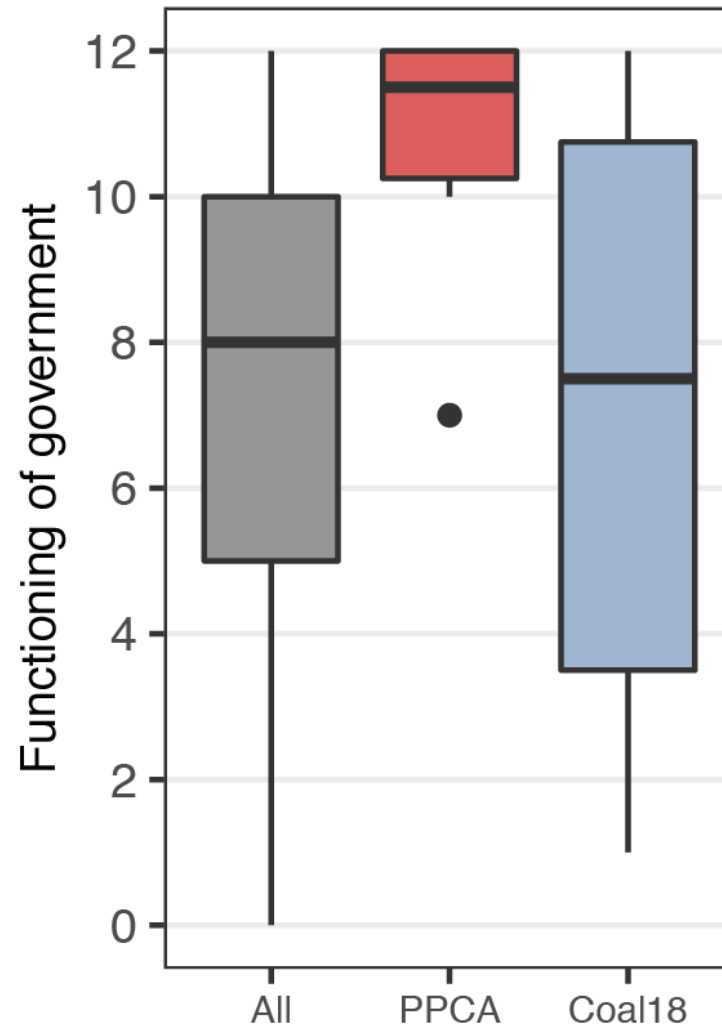
# PPCA countries have **less** air pollution



# PPCA countries are **richer**



# PPCA countries have **better functioning governments**



# PPCA countries

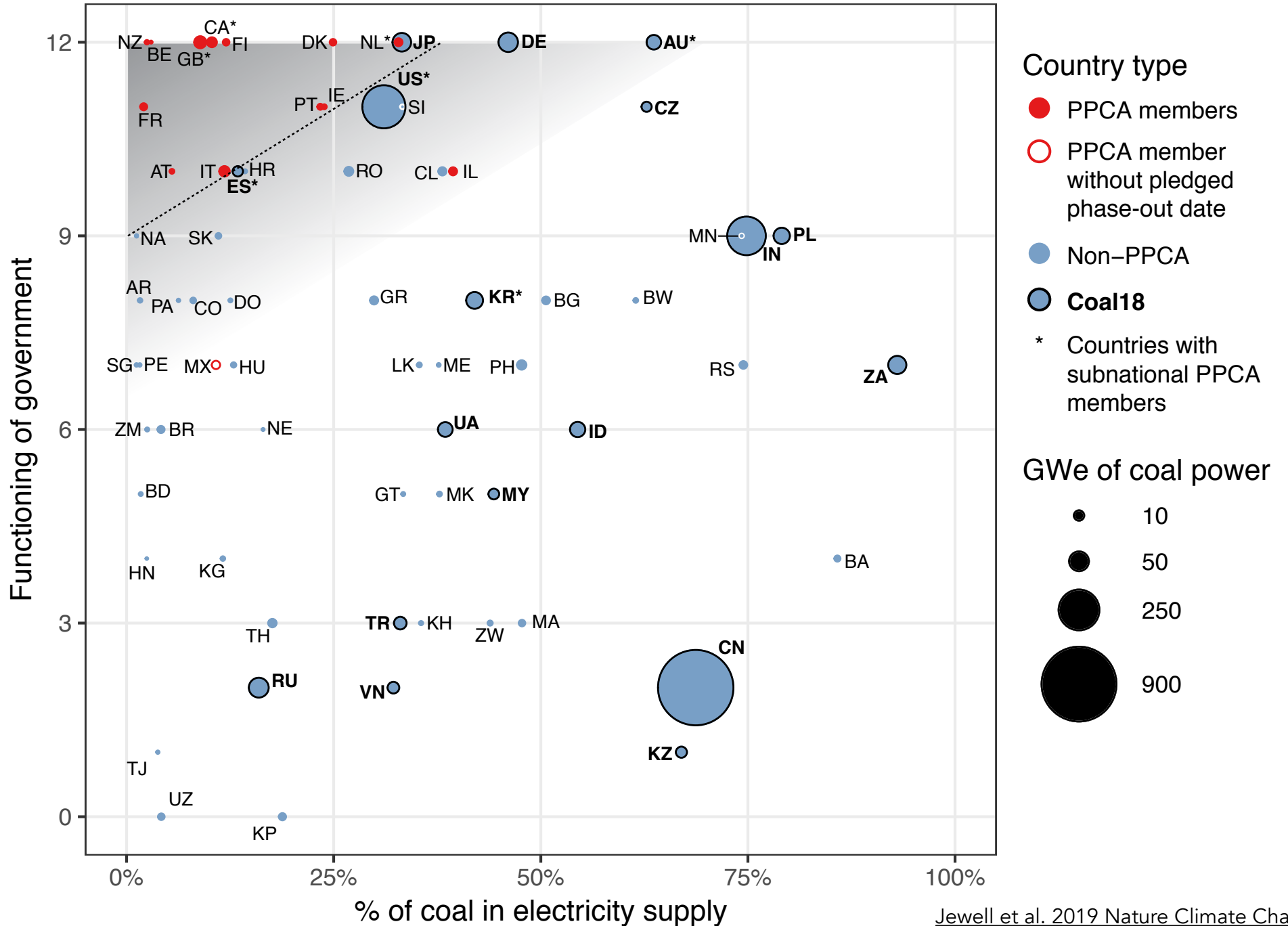
- Produce and use less coal
- Rely on imported coal
- Have older power plants
- Have zero electricity demand growth
- Are richer
- Have better governments

**What's most important?**

# What's most important?

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

# PPCA = little coal + good government





# Germany

Kommission “Wachstum,  
Strukturwandel und Beschäftigung”

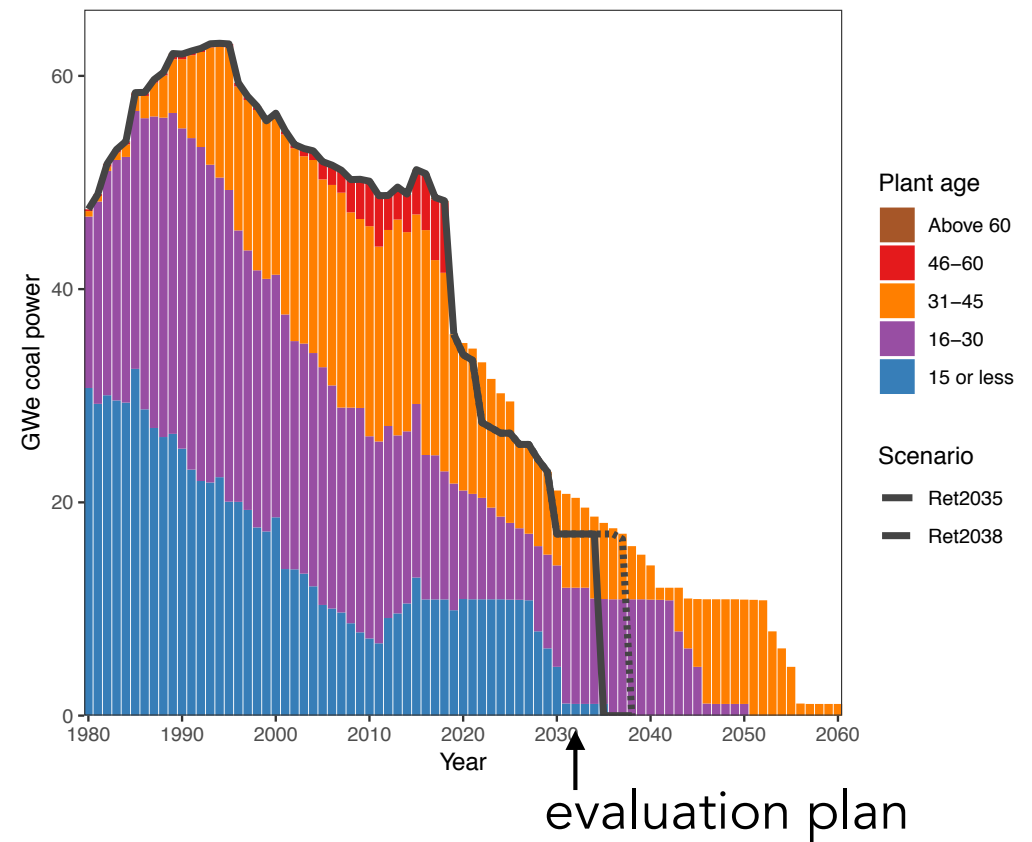
- Almost same capacity as all PPCA countries together
- Many plants built in the 2000s



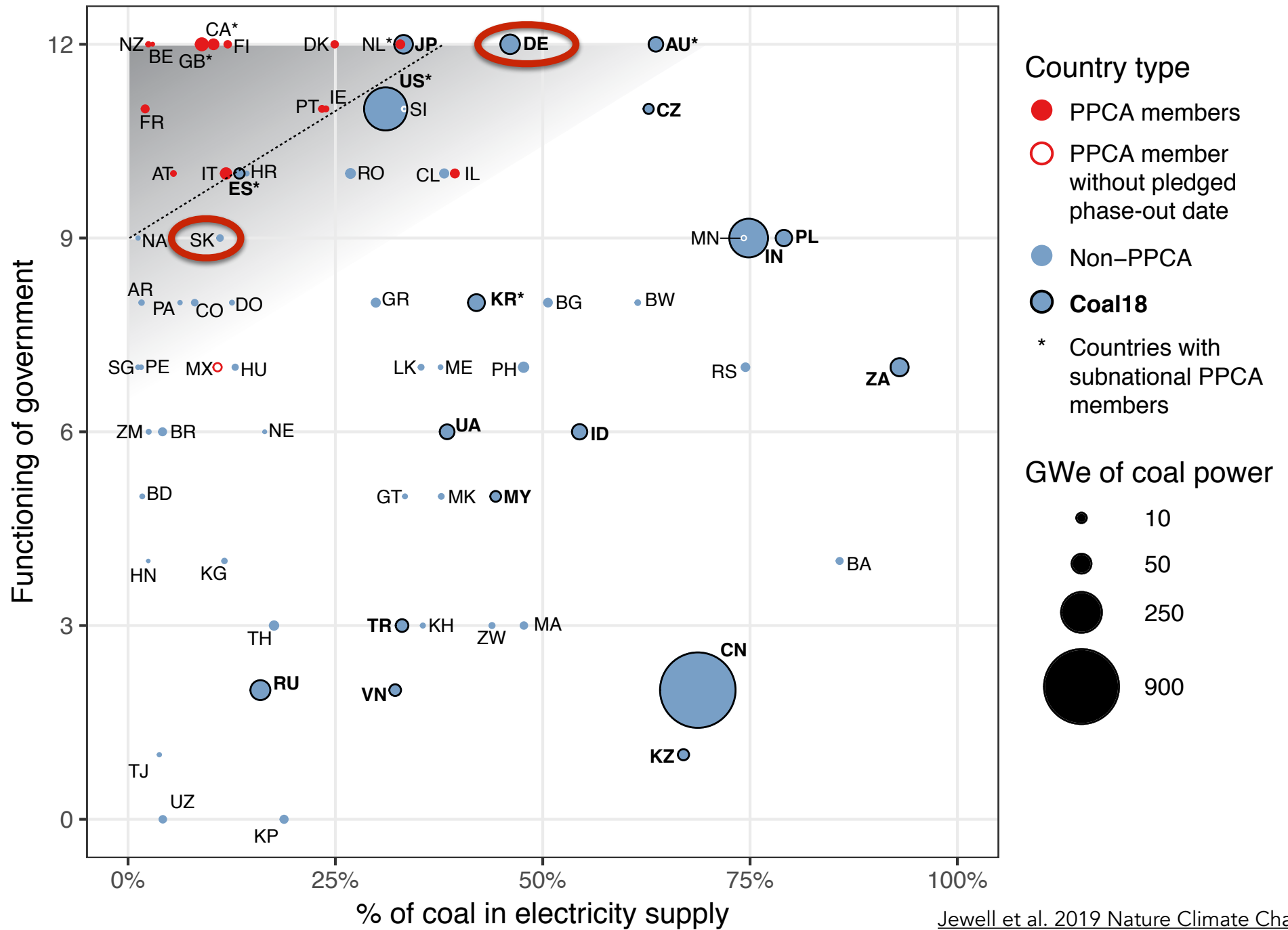
Commission for growth, structural  
change and employment

# Germany

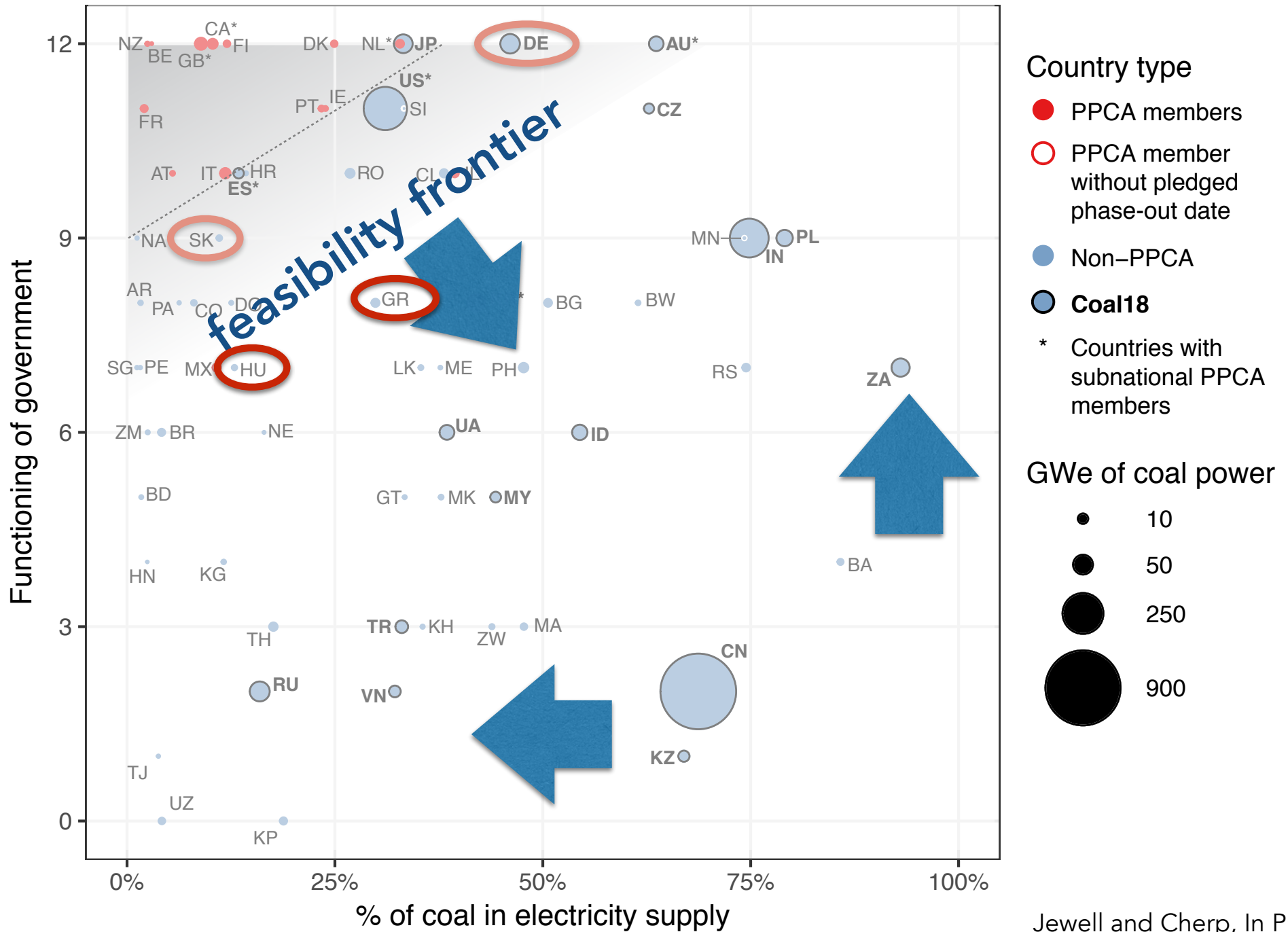
- In 2019, pledged to phase out coal in three steps by 2038
- May avoid up to 1.6 GtCO<sub>2</sub>
- Cost up to €40 bln + compensation to utilities



# PPCA new members



# So what can we generalize?



# Conclusion

- Coal phase-out is urgent but there are good alternatives and it's an instructive case
- Impact of PPCA is insufficient but Germany's pledge doubles the emission reductions
- The best predictors of joining the Alliance are low costs and high capacities to overcome those costs
- This concept is dynamic and can be used to inform how we analyze the evolution of policy commitments