Coal's terminal decline:

Trends in coal investment, coal phase-out commitments, and global energy finance

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Alex Doukas, Oil Change International

What does fulfilling the Paris Agreement mean for energy supply & the power sector?

Paris Agreement goals:
Links to fossil fuel finance

The Paris Agreement's objectives include:

- "Holding 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 above pre-industrial levels [...]"

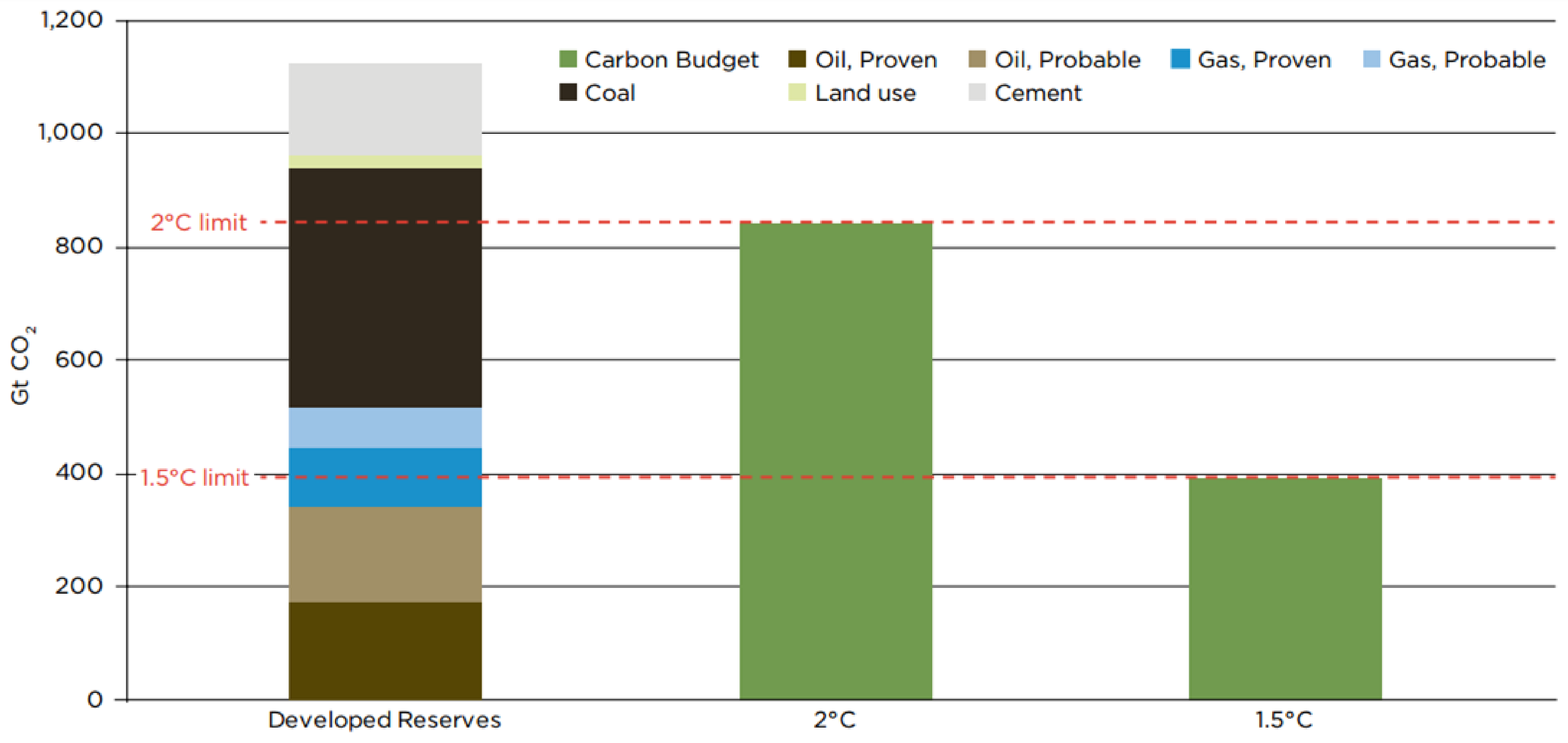
- "Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development."

New Oil Change International report:
The Sky's Limit

Our approach:

- Took IPCC carbon budgets and updated them to account for what we've burned in the last few years
- Assessed the carbon budgets for a likely chance (66%) of staying below 2°C, and a medium chance (50%) of staying below 1.5°C
- Used a proprietary industry database from Rystad Energy for oil and gas projects, and IEA data for coal mines, to determine emissions from **already-developed fields and mines**

Emissions from *developed* fossil fuel reserves vs. carbon budgets



Sources: Rystad Energy, International Energy Agency (IEA), World Energy Council, Intergovernmental Panel on Climate Change (IPCC)

Implications for the power sector?

- In 2016, researchers from the University of Oxford found that:

“Even under the very optimistic assumption that other sectors reduce emissions in line with a 2°C target, no new emitting electricity infrastructure can be built after 2017 for this target to be met, unless other electricity infrastructure is retired early or retrofitted with carbon capture technologies.”

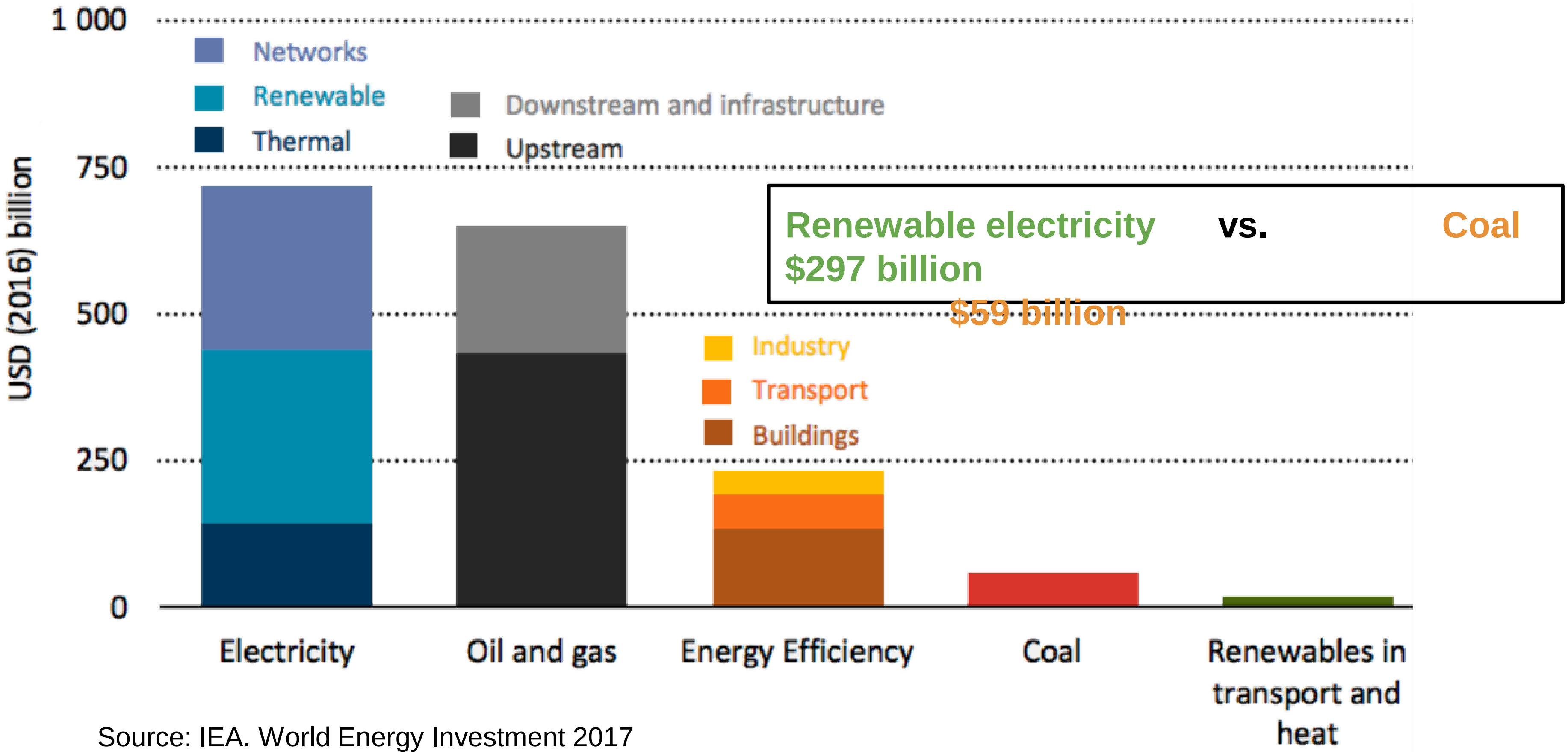
Implications for the power sector?

Therefore, betting on emitting power infrastructure means gambling on one of two highly uncertain factors:

1. That governments will not regulate climate change in line with the aims of the Paris Agreement (which assumes dire outcomes for the climate and society); or,
1. That carbon capture and storage technology will rapidly become cheap enough to retrofit onto fossil fuel power plants, while still being cost-competitive with renewable sources of electricity.

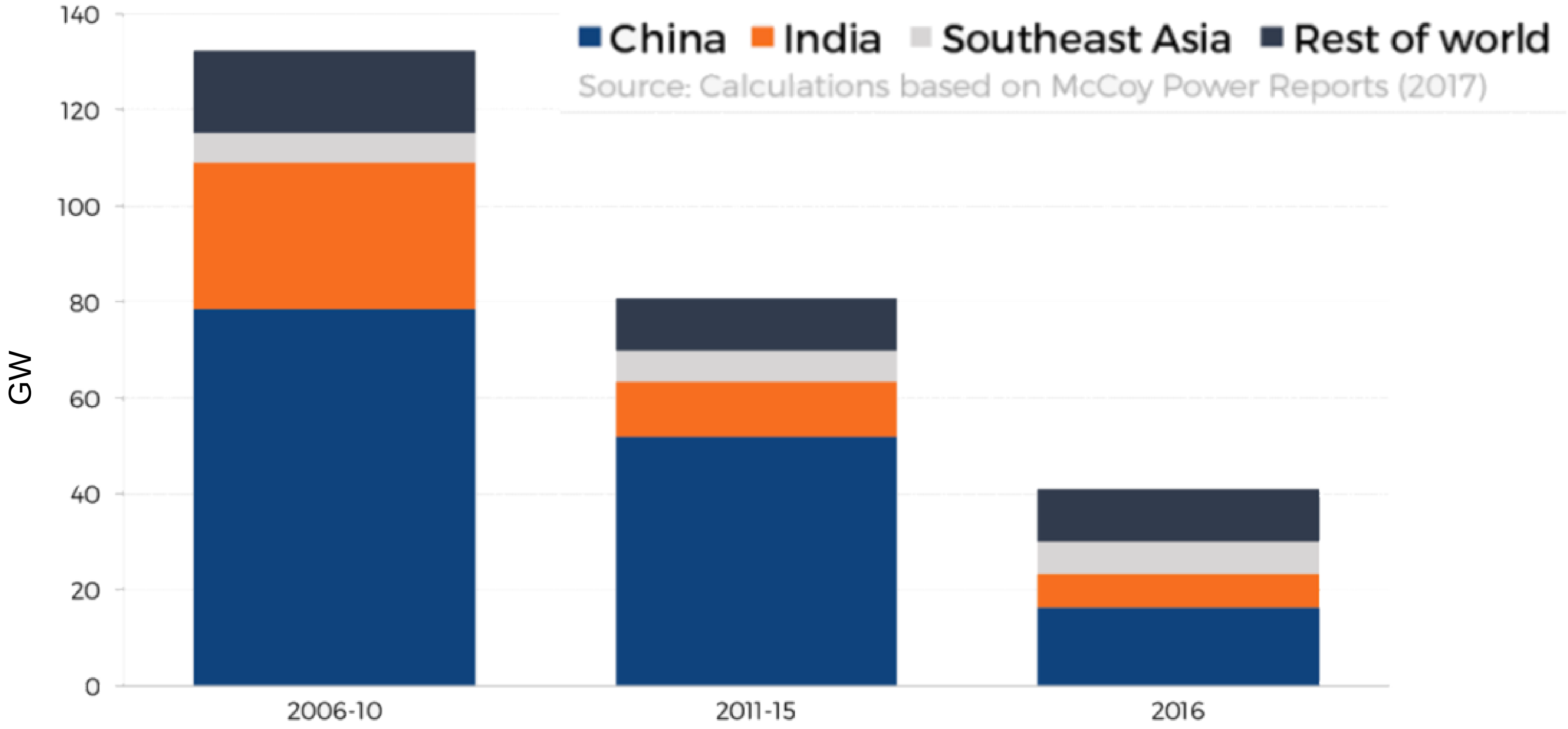
Coal is in terminal decline around the world

Global energy investment in 2016, by energy type



Source: IEA. World Energy Investment 2017

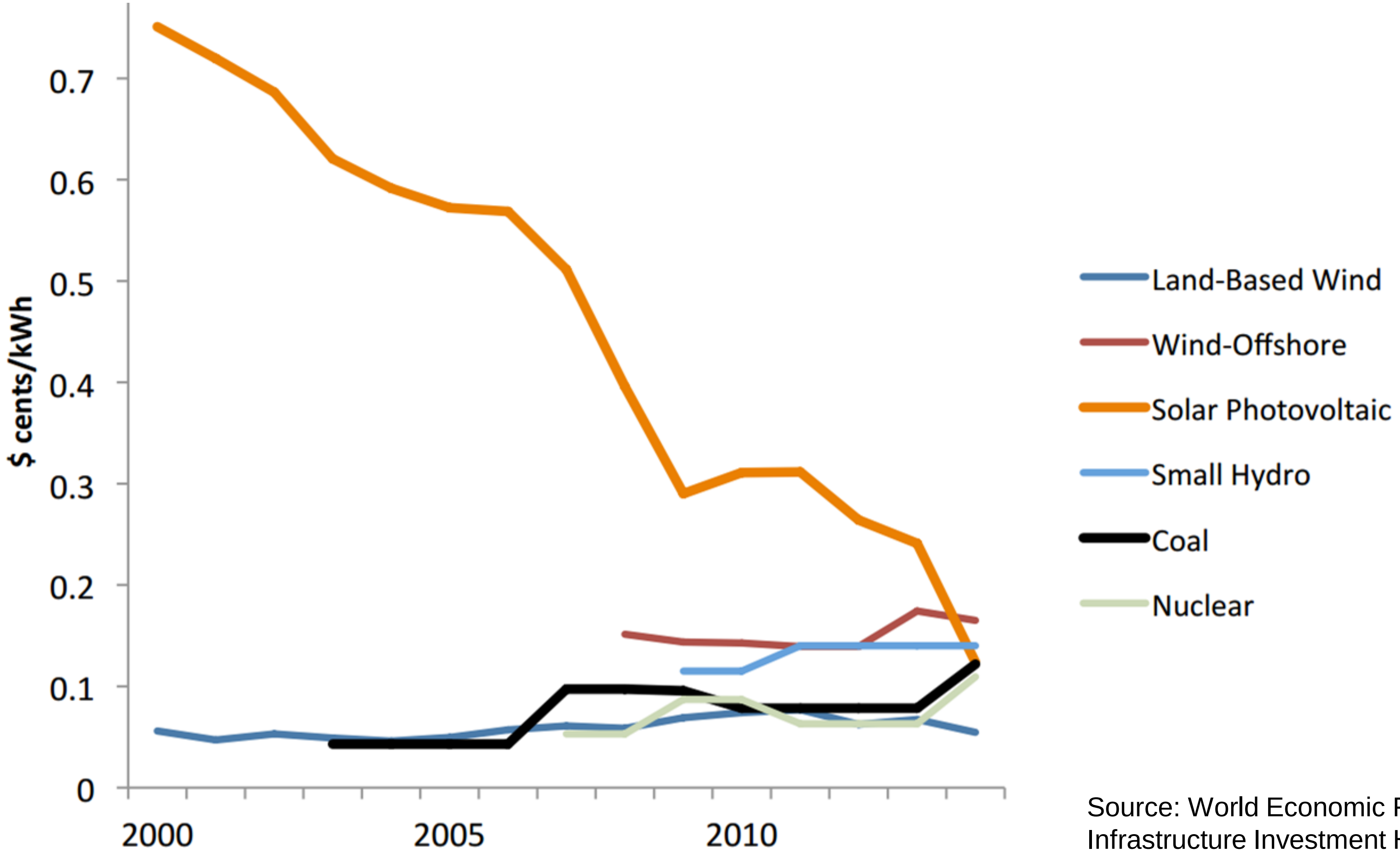
Average annual global coal power investment decisions



Source: IEA World Energy Investment 2017

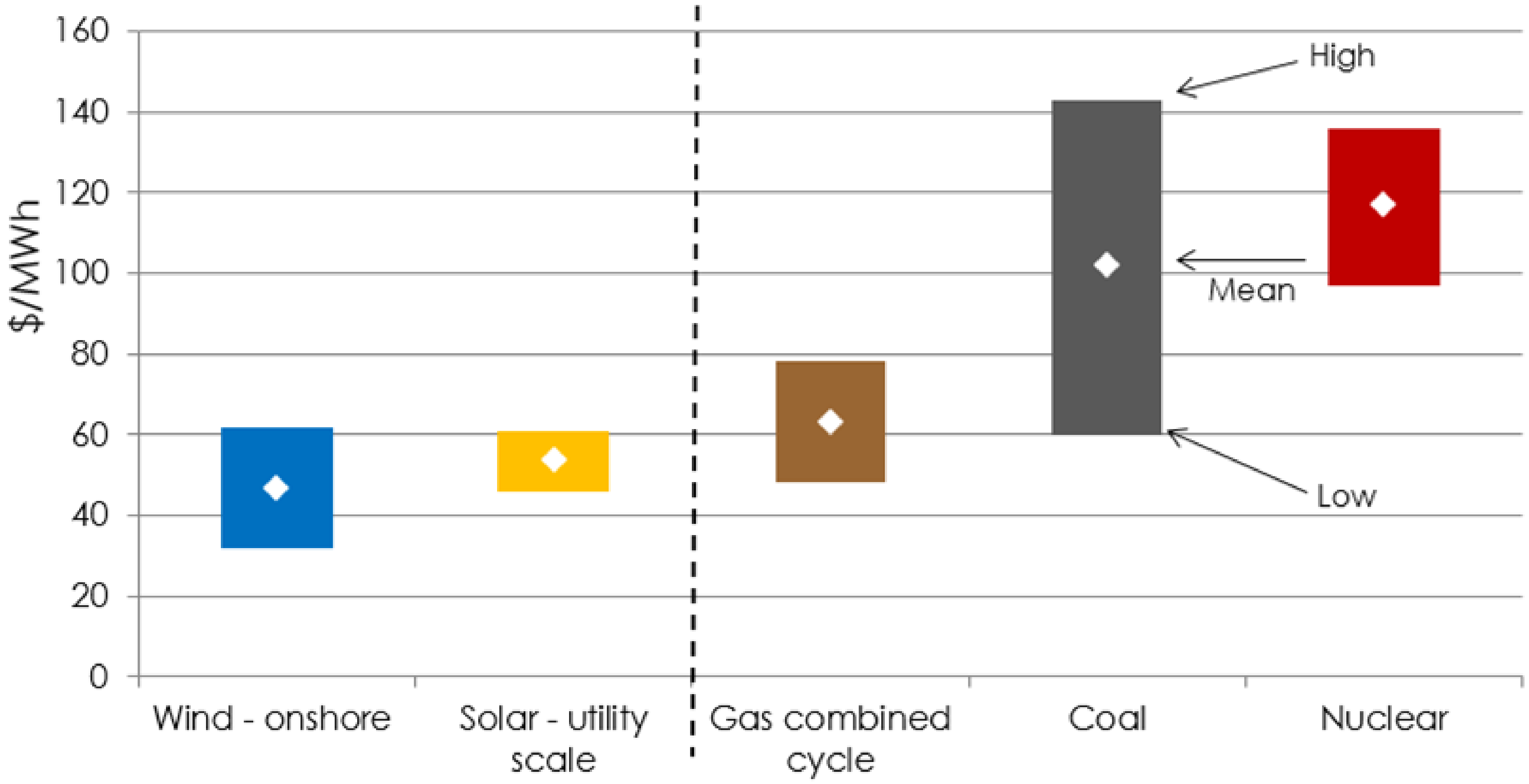
Cost of renewables rapidly undercutting cost of new (and even existing) coal

World average levelized cost of electricity by source



Source: World Economic Forum, Renewable Infrastructure Investment Handbook.

US levelized cost of electricity by source, 2016



Source: Lazard's LCOE analysis, Version 10

Record unsubsidized solar PV price

Country:	UAE
Bidder:	Marubeni
Signed:	2017
Construction:	2019
Price:	**US$ 2.42**

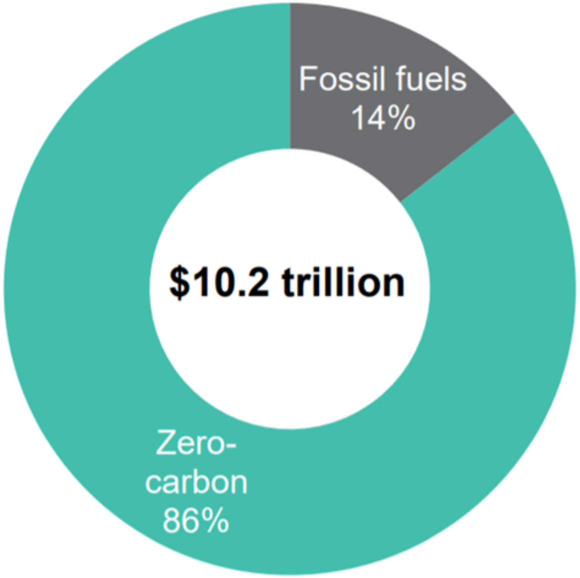
Source: Adapted from Bloomberg New Energy Finance; adapted from presentation by Michael Liebrich, BNEF (https://about.bnef.com/blog/michael-liebreich-state-industry-keynote-bnef-emea-summit-2017/)

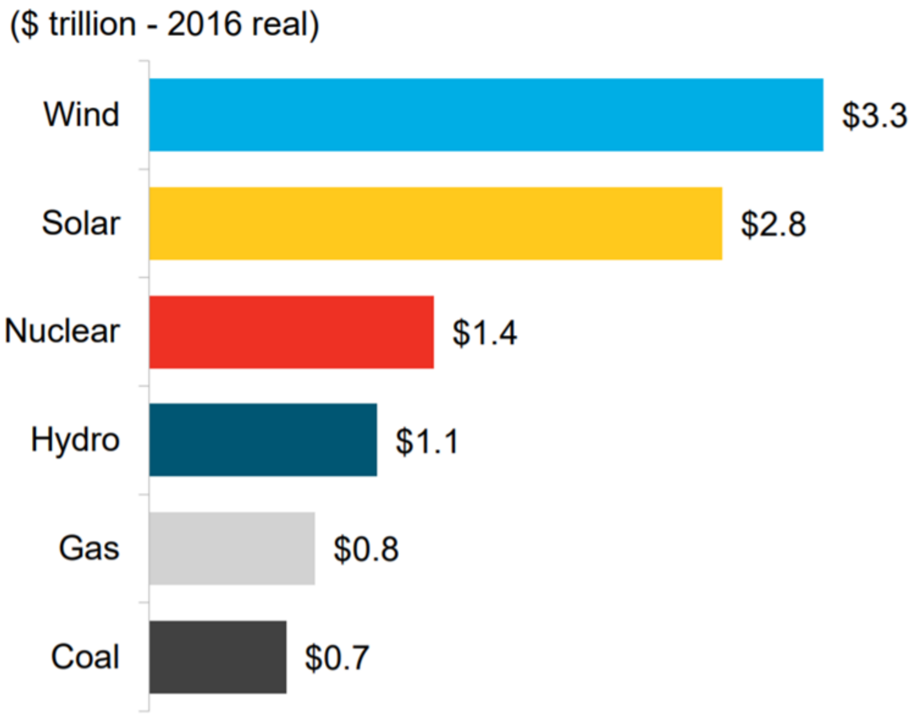
Record unsubsidized onshore wind price

Country: Morocco
Bidder: Enel Green
Signed: 2016
Construction: 2018
Price: US$ 3.0 c/k

Source: Adapted from Bloomberg New Energy Finance; adapted from presentation by Michael Liebrich, BNEF (https://about.bnef.com/blog/michael-liebreich-state-industry-keynote-bnef-emea-summit-2017/)

US levelized cost of electricity by source, 2016





Source: BNEF New Energy Outlook 2017

Commitments to phase out coal are accelerating globally

Coal phase-out commitments around the world

- **2016:** Belgium
- **2023:** France
- **2025:** UK, Portugal, Ireland, Austria, Sweden, Denmark
- **2030:** Canada, Finland, Netherlands (incl. plants built in 2015!)
  - Later, or currently considering concrete deadline: Germany, Italy, ?
  - Encouraging partial commitments from Korea
  - US experiencing rapid coal decline despite lack of commitment

Coal phase-out commitments around the world

- Recent analysis indicates OECD countries must phase out coal ***by 2030 at latest*** to get on track with Paris Agreement goals.
- Coal phase-out trends must accelerate, led by OECD countries such as Korea. **Could Korea join new Canada and UK coal phase-out coalition?**

Private finance trends:

Banks turn away from coal, with increasing damage to brands for banks that remain

Private finance is turning away from coal

Dozens of major banks have committed to restrict or end coal finance, including:

- BNP Paribas
- Barclays
- DeutscheBank
- HSBC
- Citi
- UBS
- Société Générale
- Standard Chartered
- RBS
- Morgan Stanley
- Goldman Sachs
- Bank of America
- Wells Fargo
- JPMorgan Chase
- Credit Suisse

Ratings agencies are taking note of coal's decline

Michael Wilkins, Standard and Poor's:

- "The tide has turned" in the global energy transition, regardless of political posturing from leaders like Donald Trump
- Economic viability of coal mines and coal-fired power stations will be "vastly impaired"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石炭投資
MIZUHO
STOP BANKING ON
CLIMATE CHANGE

Private finance: top global coal banks

	Bank name	2014	2015	2016
1	CHINA CONSTRUCTION BANK	$1.716 B	$3.034 B	$2.975 B
2	ICBC	$1.954 B	$2.440 B	$3.137 B
3	AGRICULTURAL BANK OF CHINA	$2.588 B	$1.470 B	$1.876 B
4	BANK OF CHINA	$1.073 B	$1.651 B	$2.286 B
5	JPMORGAN CHASE	$1.169 B	$1.418 B	$2.274 B
6	BANK OF AMERICA	$1.409 B	$1.073 B	$1.474 B
7	BARCLAYS	$1.227 B	$834 M	$1.767 B
8	MUFG	$652 M	$845 M	$2.162 B
9	WELLS FARGO	$765 M	$1.140 B	$1.305 B
10	MORGAN STANLEY	$1.175 B	$897 M	$1.044 B
11	MIZUHO	$506 M	$863 M	$1.430 B

- Concentrated in Asia (China & Japan)
- Large year-over-year increase in coal finance from Japan’s major private banks from 2015 to 2016

How does Korea's public energy finance measure up?

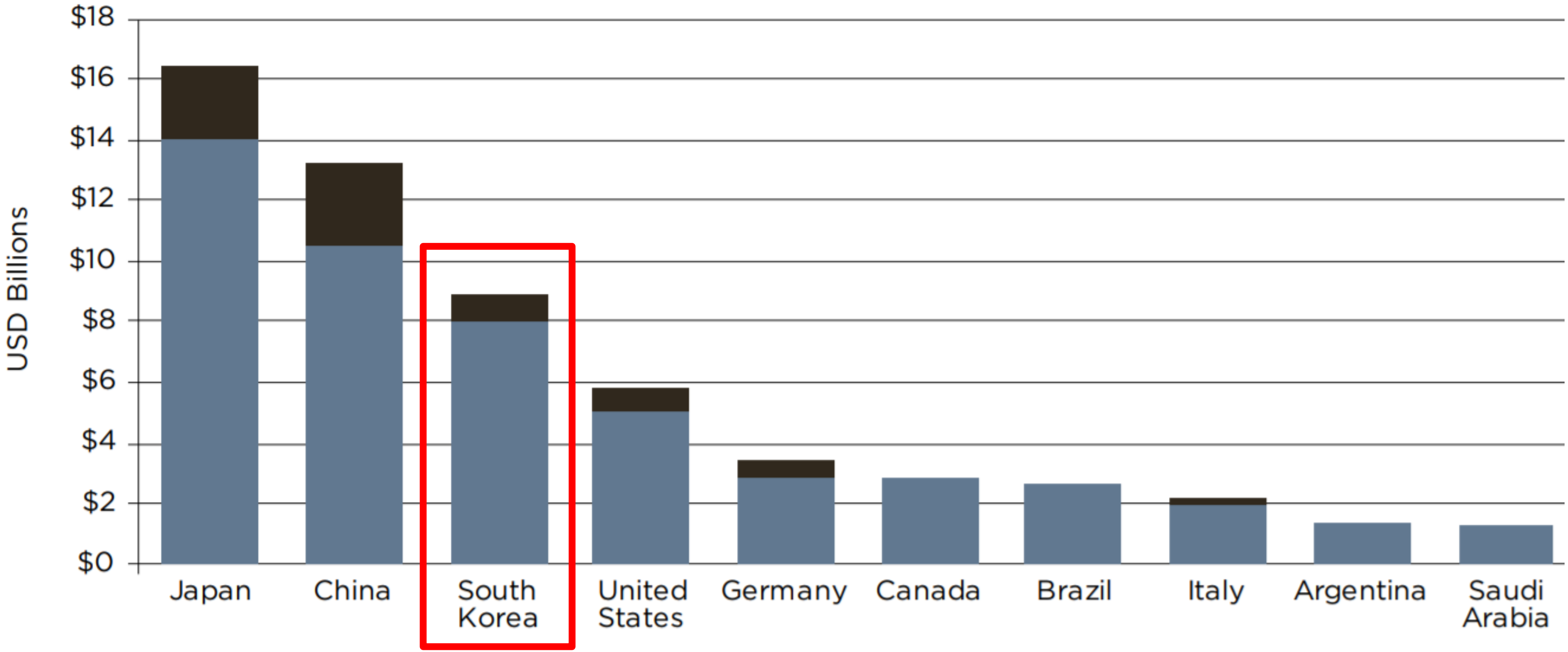
Commitments to restrict public finance for coal

- Restrictions on multilateral development bank coal finance, 2013: World Bank Group, European Investment Bank, and European Bank for Reconstruction and Development all restrict coal finance.
- More recently, executives of China-led Asian Infrastructure Investment Bank announced it has no plans to fund coal plants.

Commitments to restrict public finance for coal (cont'd)

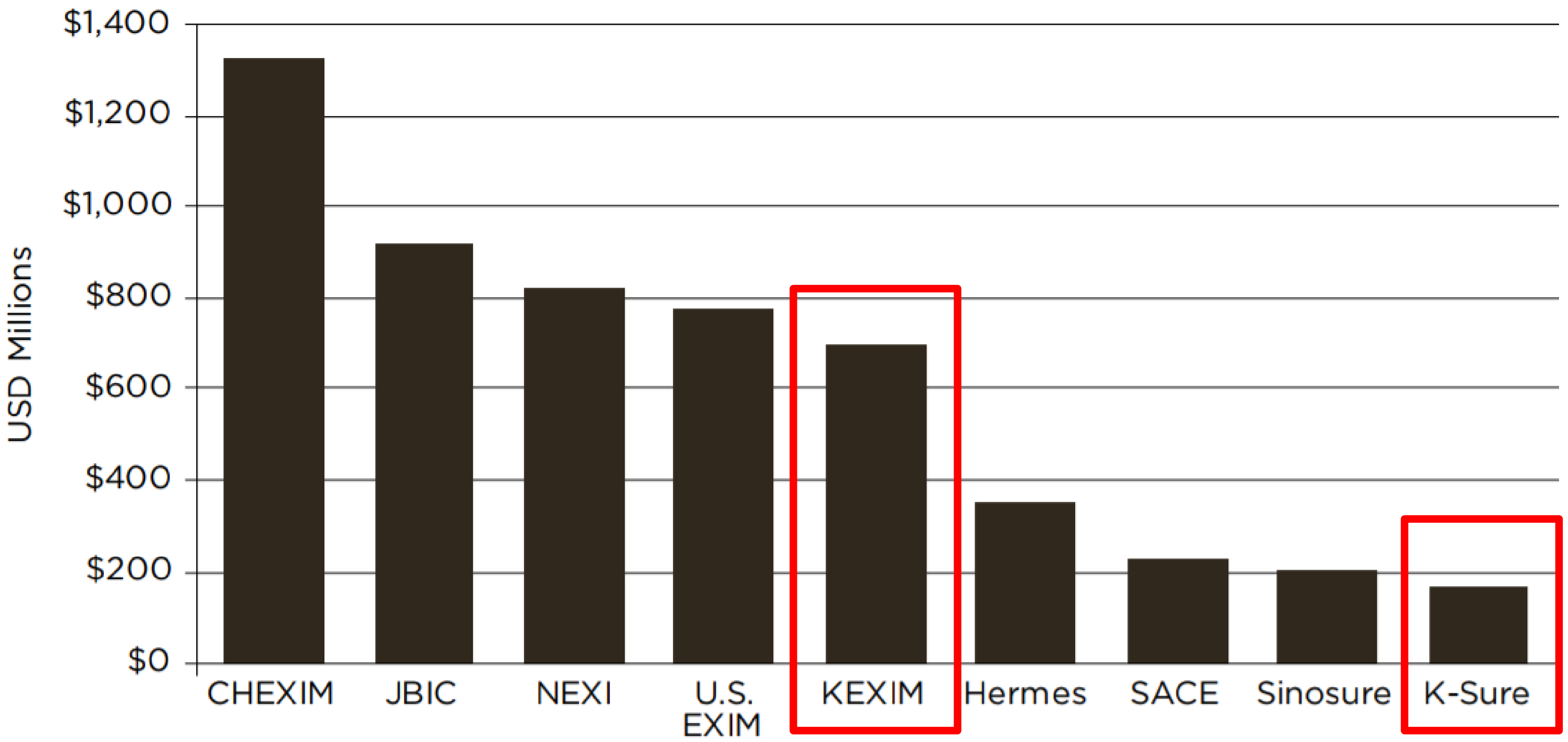
- Restrictions on bilateral public finance for coal including aid agencies, national development banks, development finance institutions, and export credit agencies, depending on the country.
- Countries with bilateral restrictions include the UK, Brazil, France, Germany, Denmark, Finland, the Netherlands, Iceland, Sweden, Norway, and the United States (notwithstanding Trump's efforts).
- In November 2015, 29 export credit agencies of OECD governments entered into an agreement to restrict financing for coal-fired power plants; Korea is a party to this, but it has significant loopholes.

Annual Average of Public Finance for Fossil Fuels, Top 10 G20 Countries, 2013-2015



Source: “Talk is Cheap.” 2017 report by Oil Change International, WWF, Sierra Club, & Friends of the Earth report with regional partners

Largest G20 ECA Financiers of Coal by Institution, Annual Average, 2013-2015



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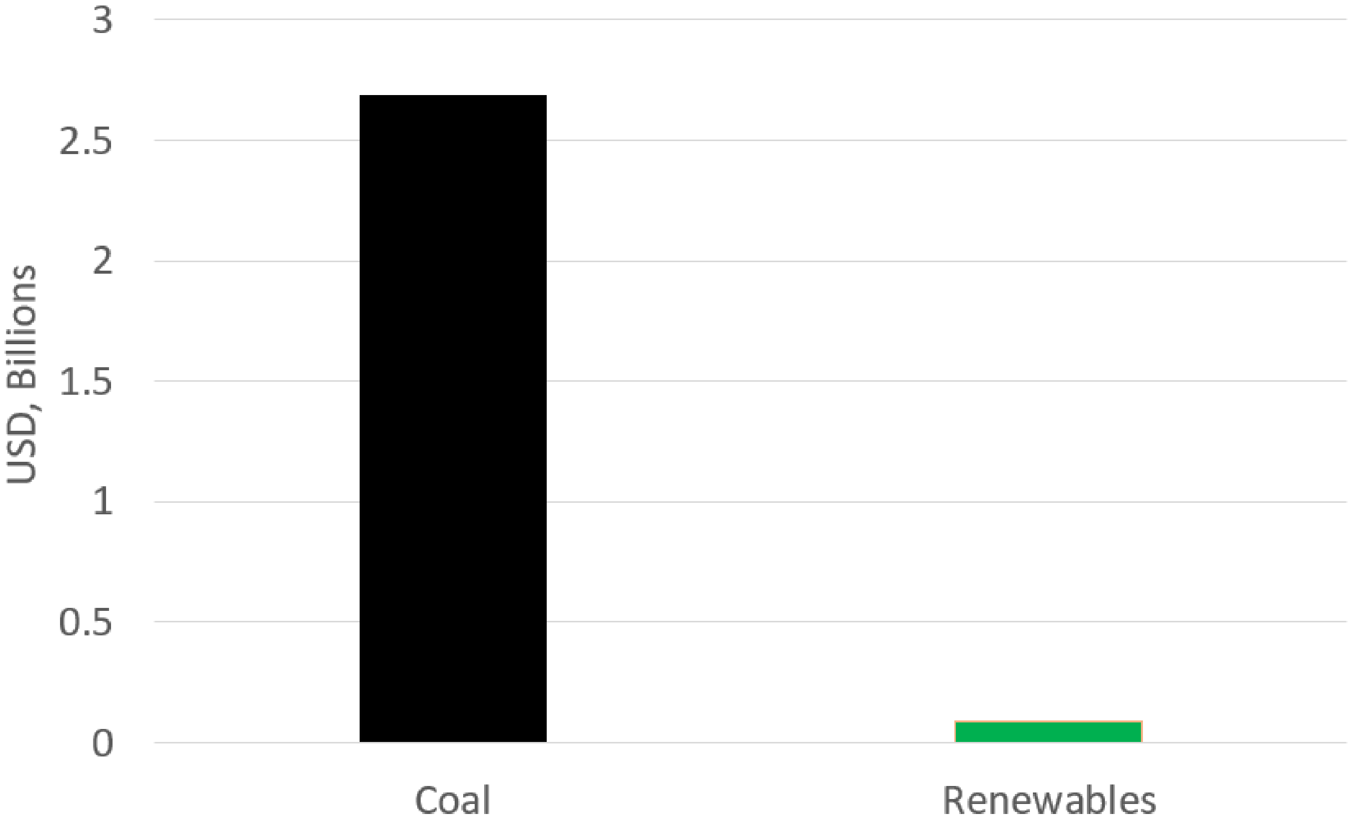
Pipeline of future coal vs. renewable projects in Korean public finance institutions, according to public data



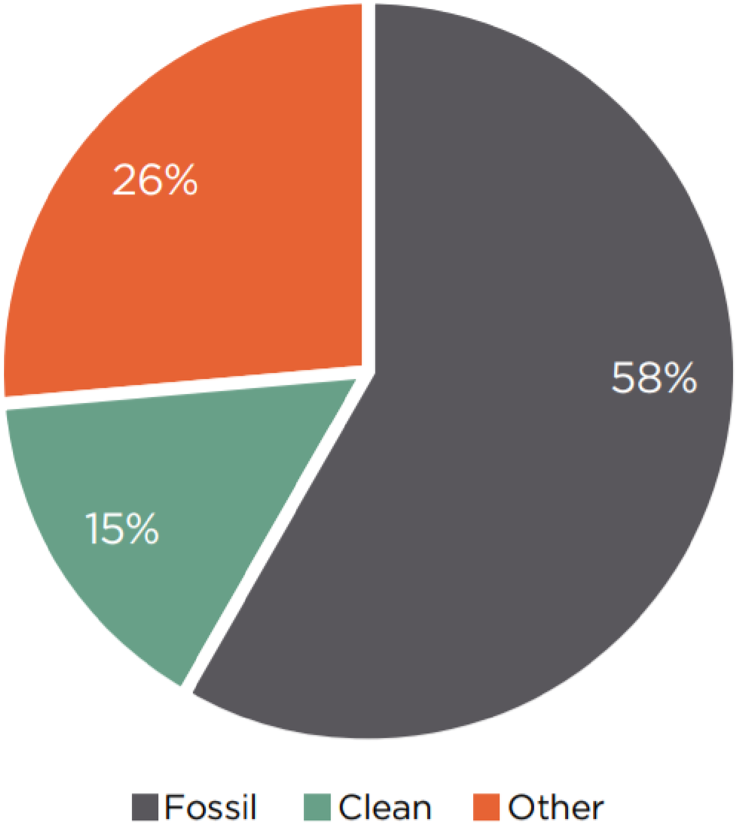
Korea's public finance for coal: Key takeaways

- Relative to the size of its economy, Korea is **the largest** provider of public finance for coal projects
- Korean public finance institutions currently have **31x** more potential coal finance in the pipeline than renewable energy finance
- To be a leader not just at home but around the world, **Korea can commit to phase out public finance for coal-related activities**, and boost its clean energy business

Beyond coal:

Korea’s public finance for oil & gas development

Public finance for energy, by energy type, G20 country bilateral institutions & key multilateral development banks



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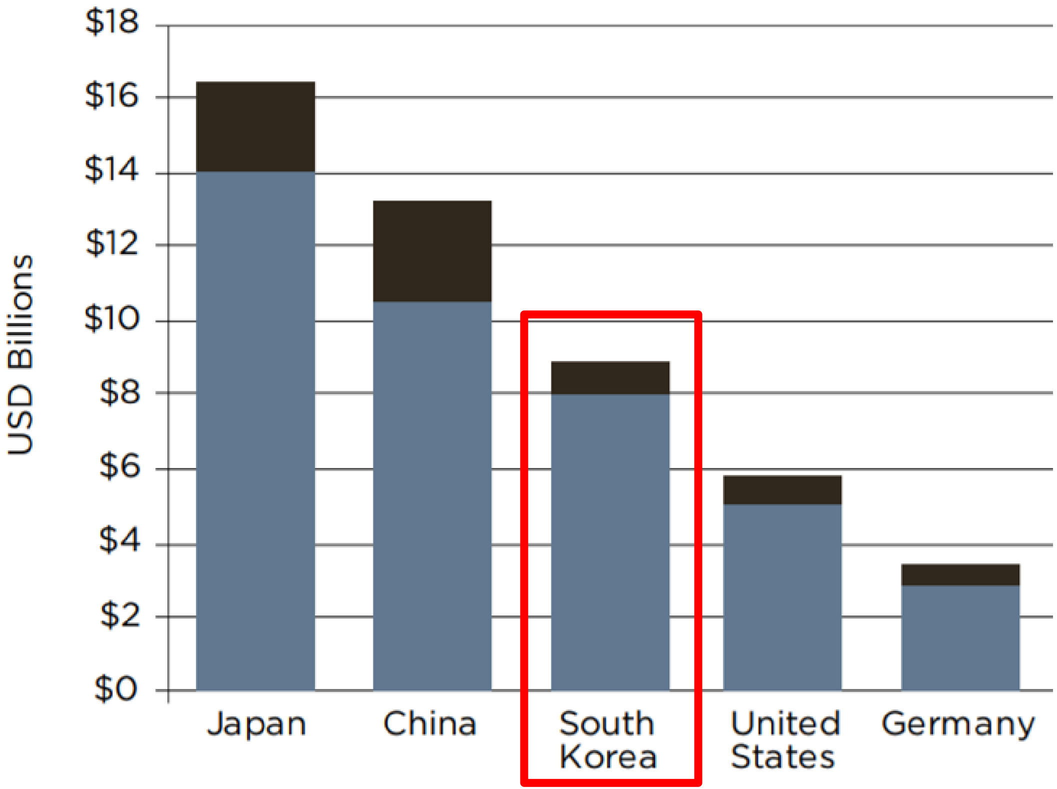
Public finance for energy, G20 country bilateral institutions and key multilateral development banks



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Korea's public finance for oil and gas: Key takeaway

- Korea's public finance for oil, gas, and coal is almost as large as the combined public fossil fuel finance of the United States and Germany, compared to less than $100 million per year for solar and wind projects.
- To demonstrate global leadership beyond coal, Korea could also reconsider its public finance for oil and gas, and is well positioned to grow its public finance for clean energy.

Conclusion

The world is at a turning point on energy and climate change.

The government, people, and businesses of Korea are well-positioned to make a conscious decision to lead the clean energy transition, and to avoid the imminent financial damage resulting from the global collapse of coal.

Contact

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Annex

5 percent

That's the proportion of multilateral development bank fossil fuel financing that was clearly linked to energy access objectives between FY12 and FY14

Development finance for fossil fuel projects is not serving the poor