

Pre-G7 International Symposium
Climate Change and Energy: Coal-fired Power Generation Issues

Problems of the Financial Support for Overseas Coal-fired Power Generation by Japan Bank for International Cooperation (JBIC)

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Japan Center for a Sustainable Environment
and Society (JACSES)
Yuki Tanabe

4 Questions on Overseas Coal-fired Power Generation funded by JBIC

1. Why we focus on the overseas coal-fired power generation funded by JBIC?
2. What impacts does the OECD Agreement have on the investment of JBIC?
3. Will emerging countries provide lower efficiency plants, when OECD stops the support?
4. Are overseas coal-fired plants supported by Japanese companies low-pollution?

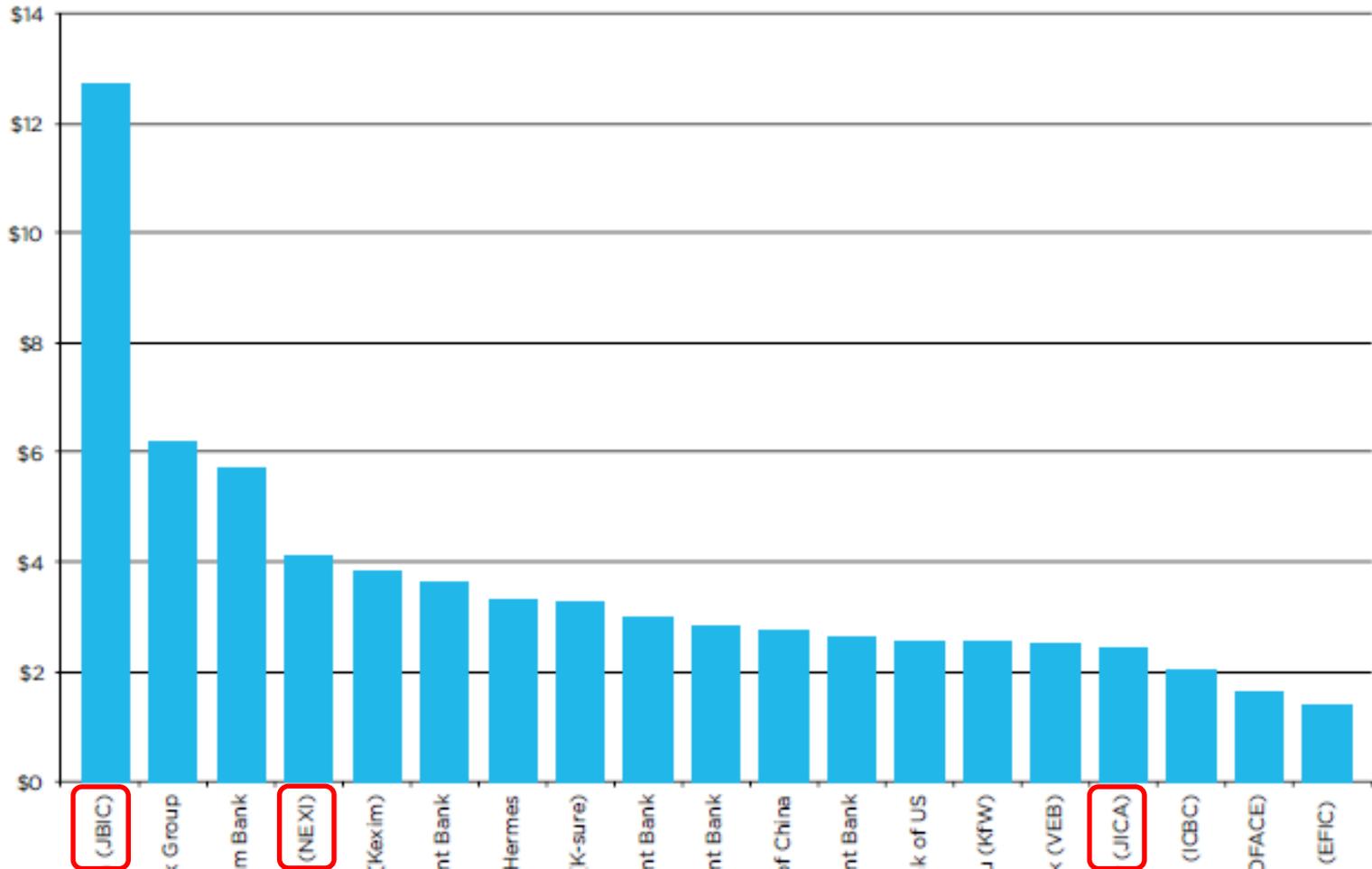
Question1: Why we focus on the overseas coal-fired power generation funded by JBIC?

- JBIC is a 100% government-owned financial institution with missions of promoting the resource acquisition in foreign countries and improving the competitiveness of Japanese industries.
- In 2003-2016, JBIC has invested in 24 coal-fired power plants including 6 projects in Vietnam, 5 in India and 4 in Indonesia, with a total capacity of 24GW at a total lending of 8.5 billion USD.
- The estimated annual CO2 emission of those 24 coal-power plants is about 140 million tons, which is 10% of that in Japan.

Finance for Coal by Financial Institutions

The amount of Investment, 2007-2014 (billion USD)

Figure 5. Financial Institutions Above \$1 Billion in Public Finance for Coal, 2007-2014 (billion USD)

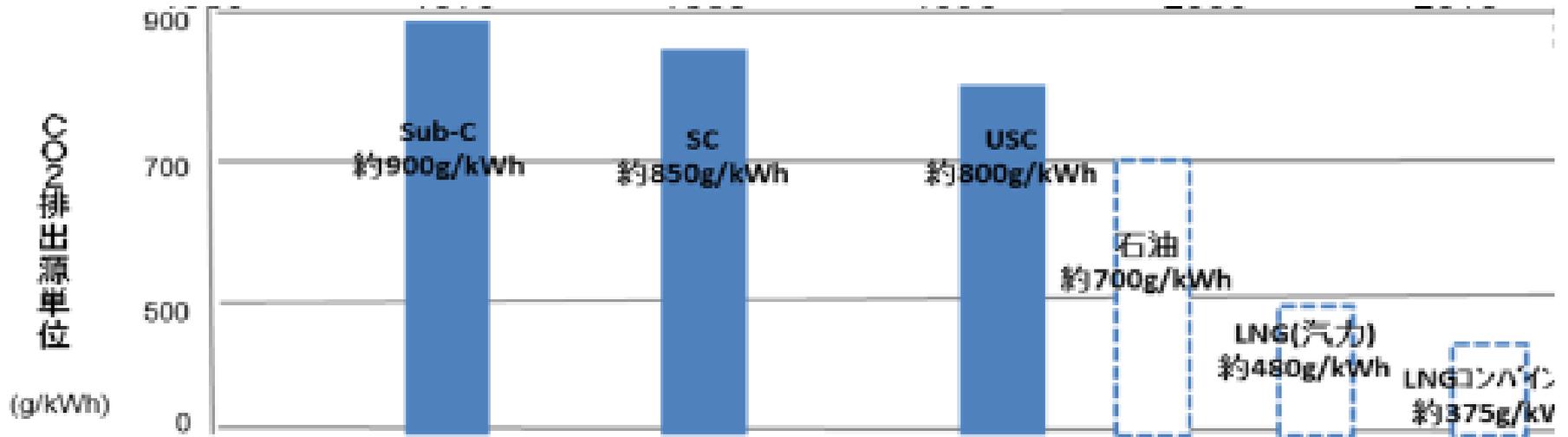


Source : Under The Rug (NRDC, Oil Change International and WWF)

Question 2: What impacts does the OECD Agreement have on the investment of JBIC?

- OECD members established the OECD Export Credits Arrangement, which is a common rule on interest rates and repayment terms of official export credits.
- On November 2015, the Sector Understandings of coal-fired generation projects was agreed, as an appendix of the Arrangement.
- However, the support for Ultra Supercritical (USC) is almost unconditionally accepted. And so do that of small and medium-sized Supercritical (SC) and Subcritical in low income countries
- Moreover, as the Sector Understandings cover Export Credits, only 10% of JBIC portfolio is potentially affected. The expansion of scope is needed.

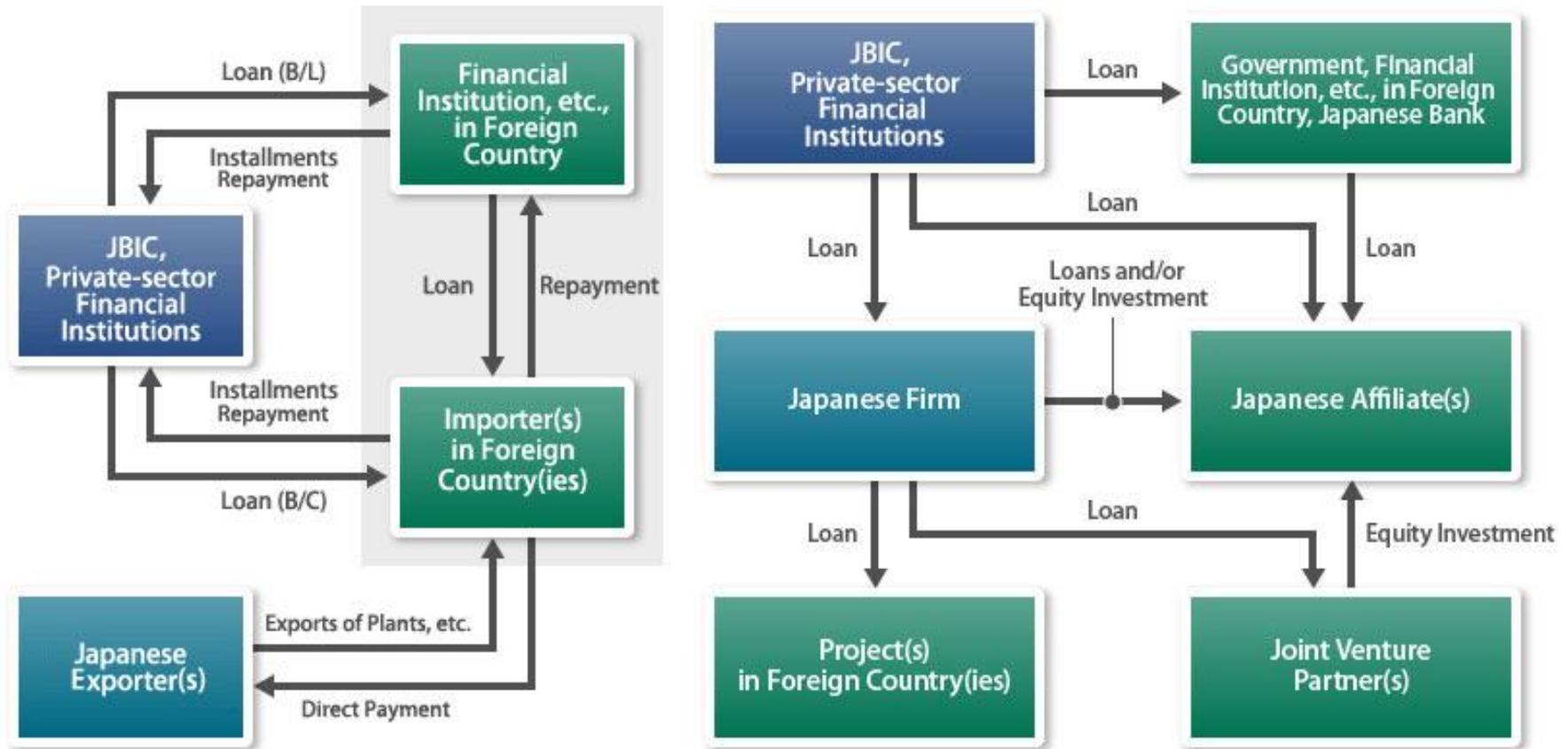
Is Ultra Supercritical (USC) the low carbon technology?



Source: Agency for Natural Resources and Energy Japan, The issues of thermal power generation

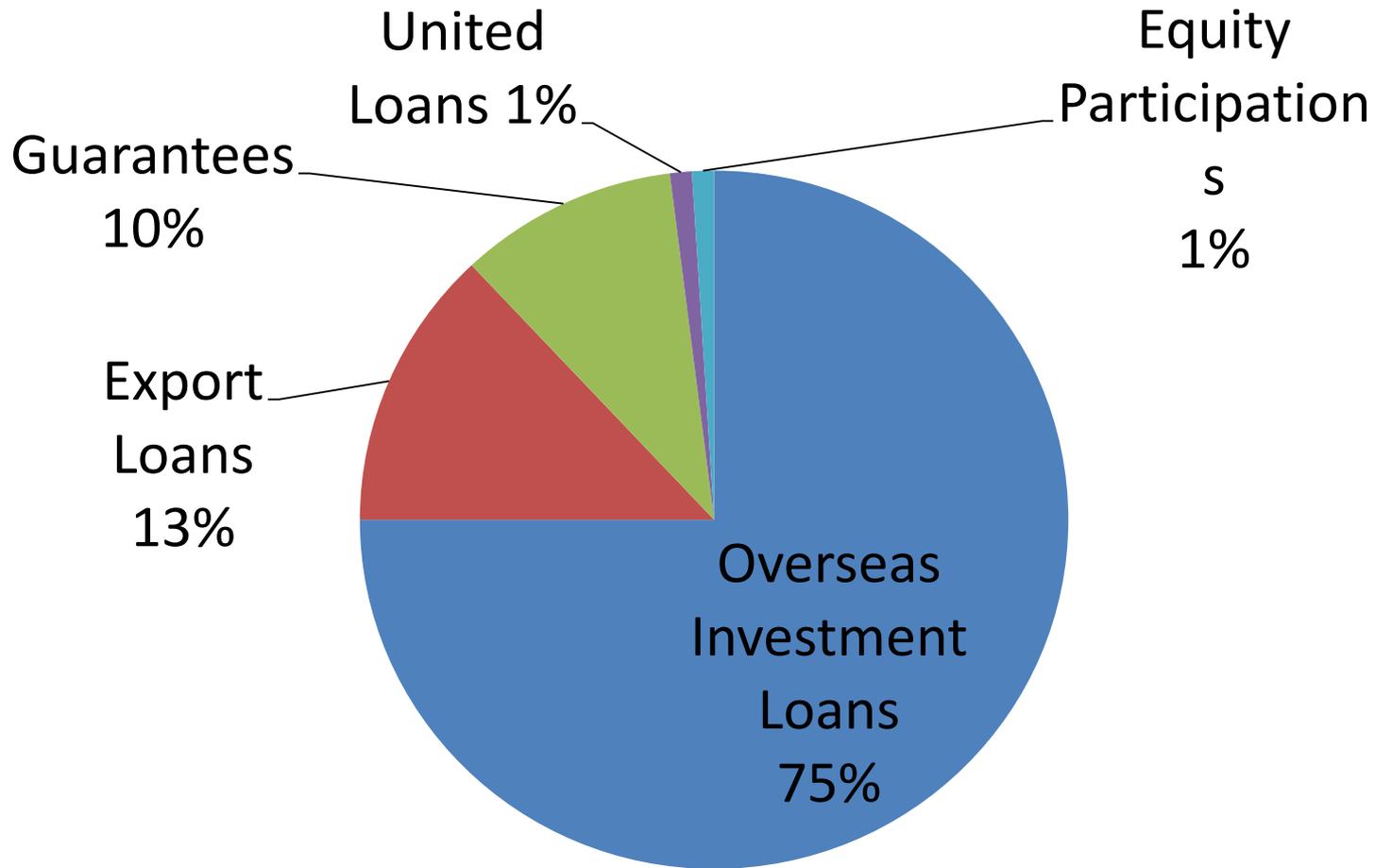
→ Even with the use of USC, the amount of CO2 emissions is around 800g-CO2/kWh, which is approximately twice as much as with LNG plants.

The Scheme Examples of Export Loans (Left) and Overseas Investment Loans (Right) of JBIC



Source : JBIC Website

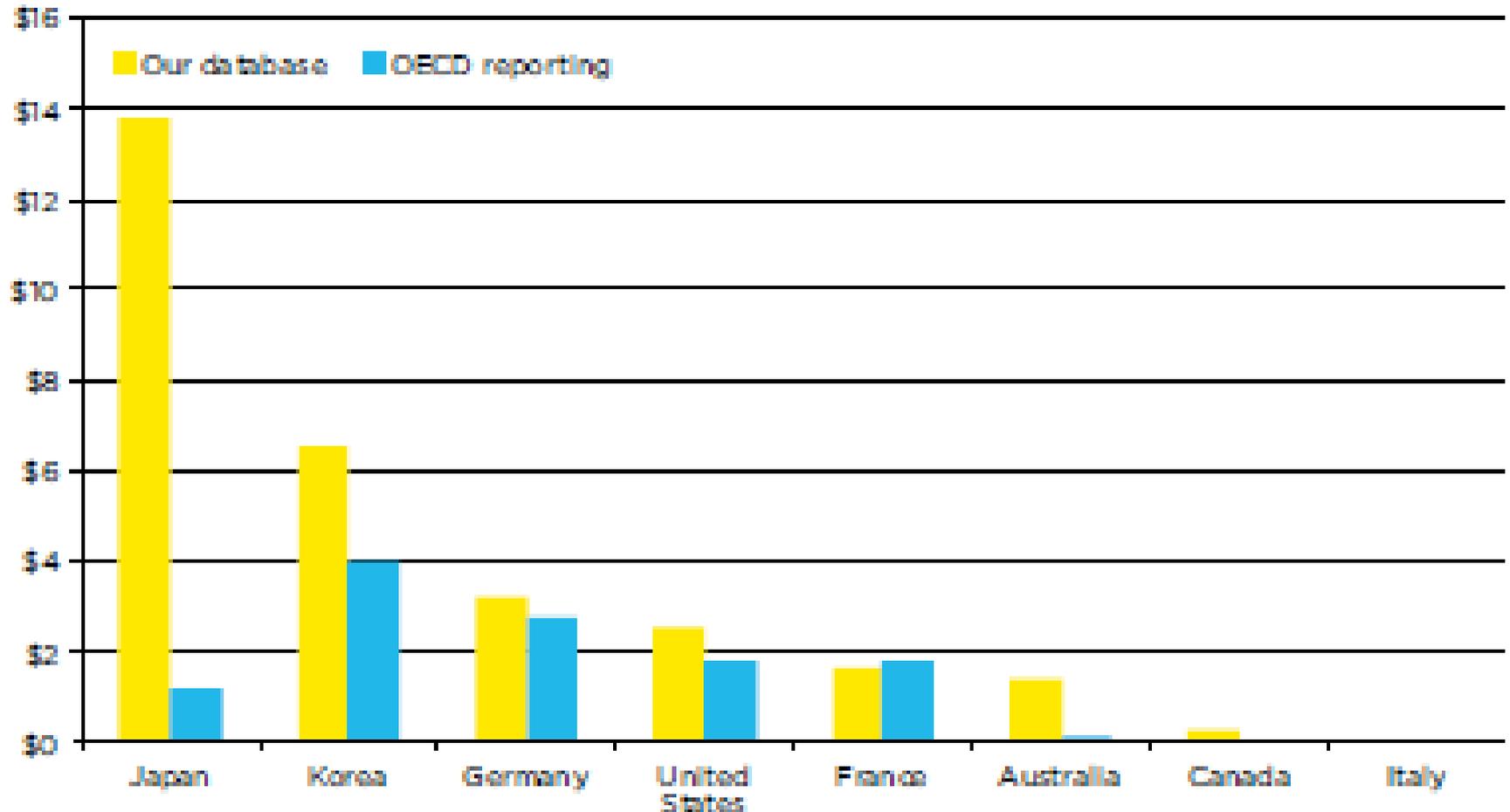
JBIC Portfolio of Loans, Equity Participations and Guarantees (FY2014)



Source: JBIC Annual Report 2015

Comparison of Coal Support with/without OECD Arrangement, 2007-2013 (billion USD)

Figure 11. Comparison of Coal Support from Official Export Credit Agencies, 2007-2013 (billion USD)



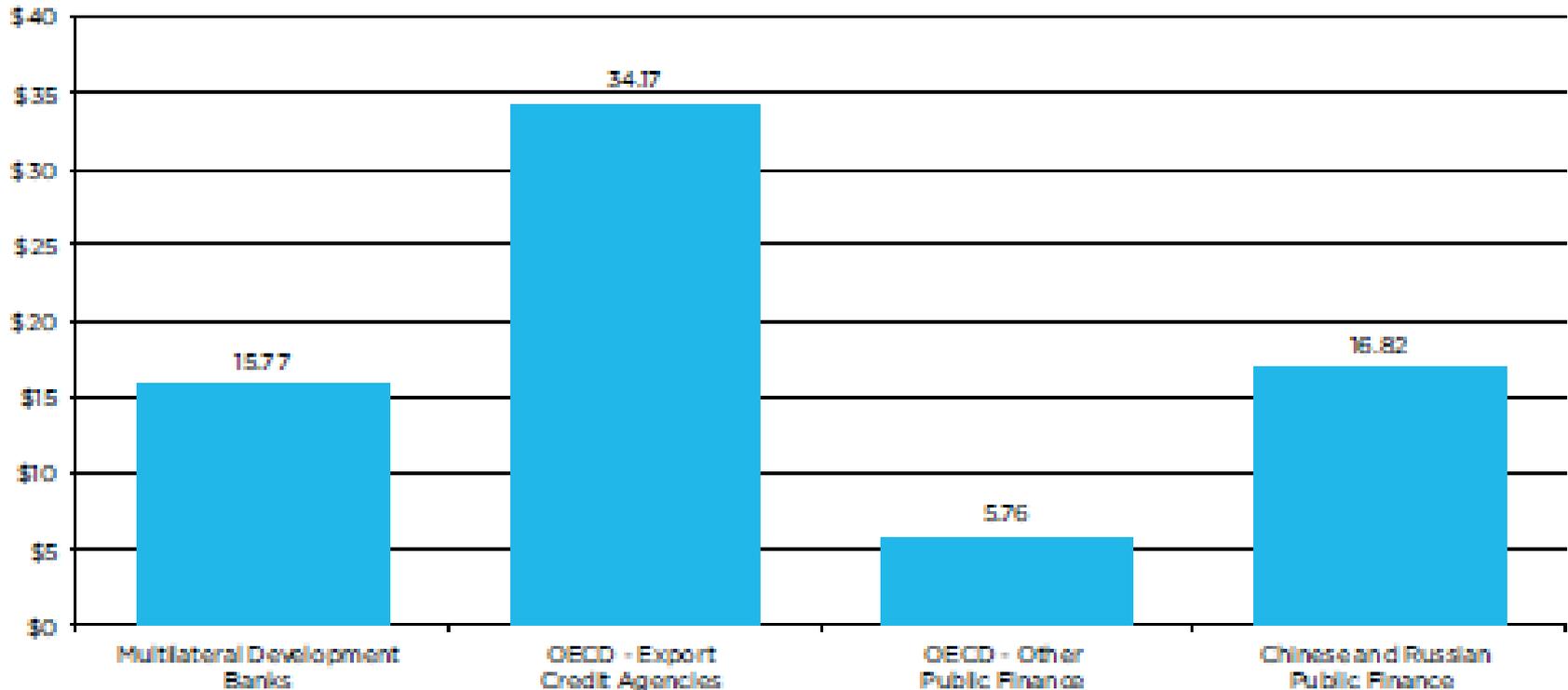
Source : Under The Rug (NRDC, Oil Change International and WWF)

Question 3: Will emerging countries provide lower efficiency plants, when OECD stops the support?

- 80% of public finance for coal is by international finance institutes and public institutions of OECD.
The constructions could be restrained, since emerging countries can not be replaced in all cases.
- At the U.S.-China Summit, the Chinese Government committed to strictly control as for public support of overseas coal-fire power generations.
- Ultra Supercritical (USC) is also exported from China, so only facilities from Japan are not high efficiency.
- Under the situation of competitive cost of renewable energy, the cost of coal projects will increase without the public support by OECD, eventually power source selecting can be changed.

International Public Finance for Coal 2007-2014 by Institution Type (billion USD)

Figure 2. International Public Finance for Coal 2007-2014 by Institution Type (billion USD)



Source : Under The Rug (NRDC, Oil Change International and WWF)

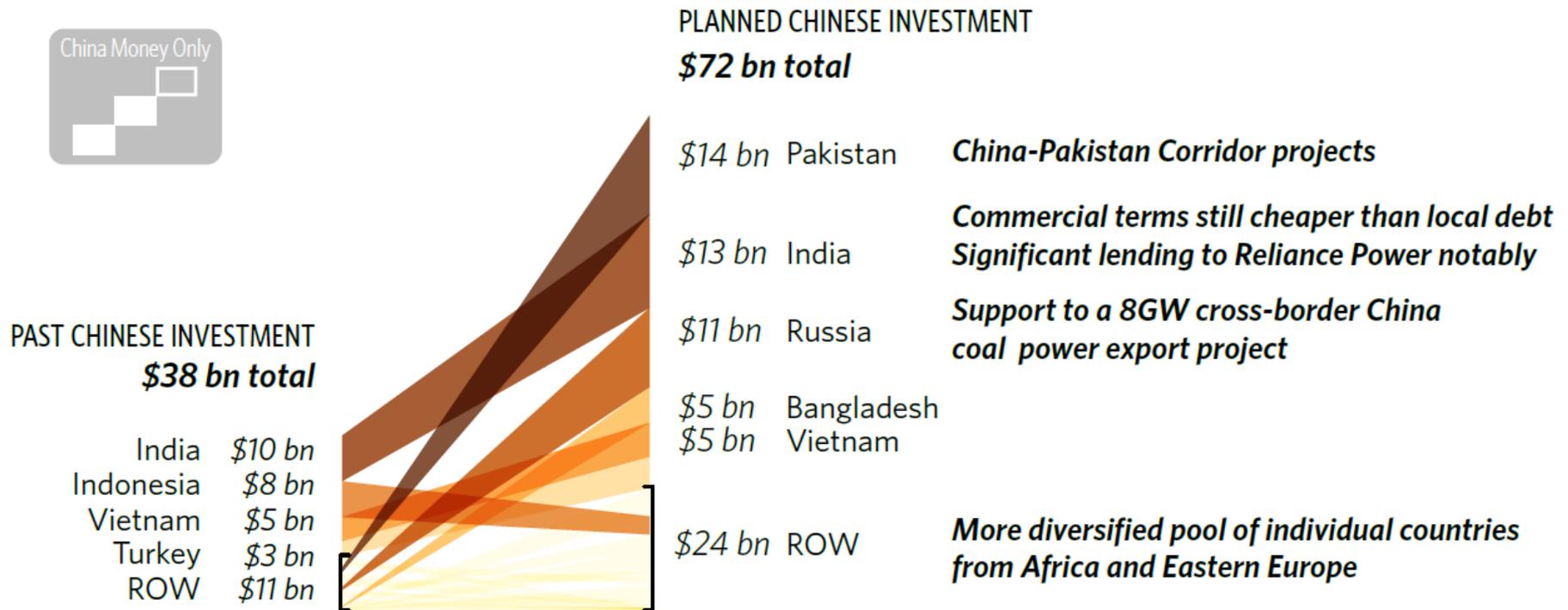
→80% of the finance for coal is by international finance institutions and public institutions of OECD. ECA of OECD is the biggest finance institution as it takes 47%.

Boiler Manufactures for Operating/Under Construction/Planned Coal Plants Capacities (MW) in SE Asia and South Asia Combined

	Japan	China	South Korea	India	Russia
Super critical	10,090	55,650	11,300	40,320	1,980
Ultra Super critical	2,000	2,680	2,680	1,320	0

Source: WWF etc, Will the OECD lag behind emerging countries because of Japan?

Overseas Coal-fired Power Generation funded by China



→ According to CPI report, 30 billion of 72 billion dollars of investment could be canceled. It is notable how much China will invest overseas coal-fire power generation hereafter.

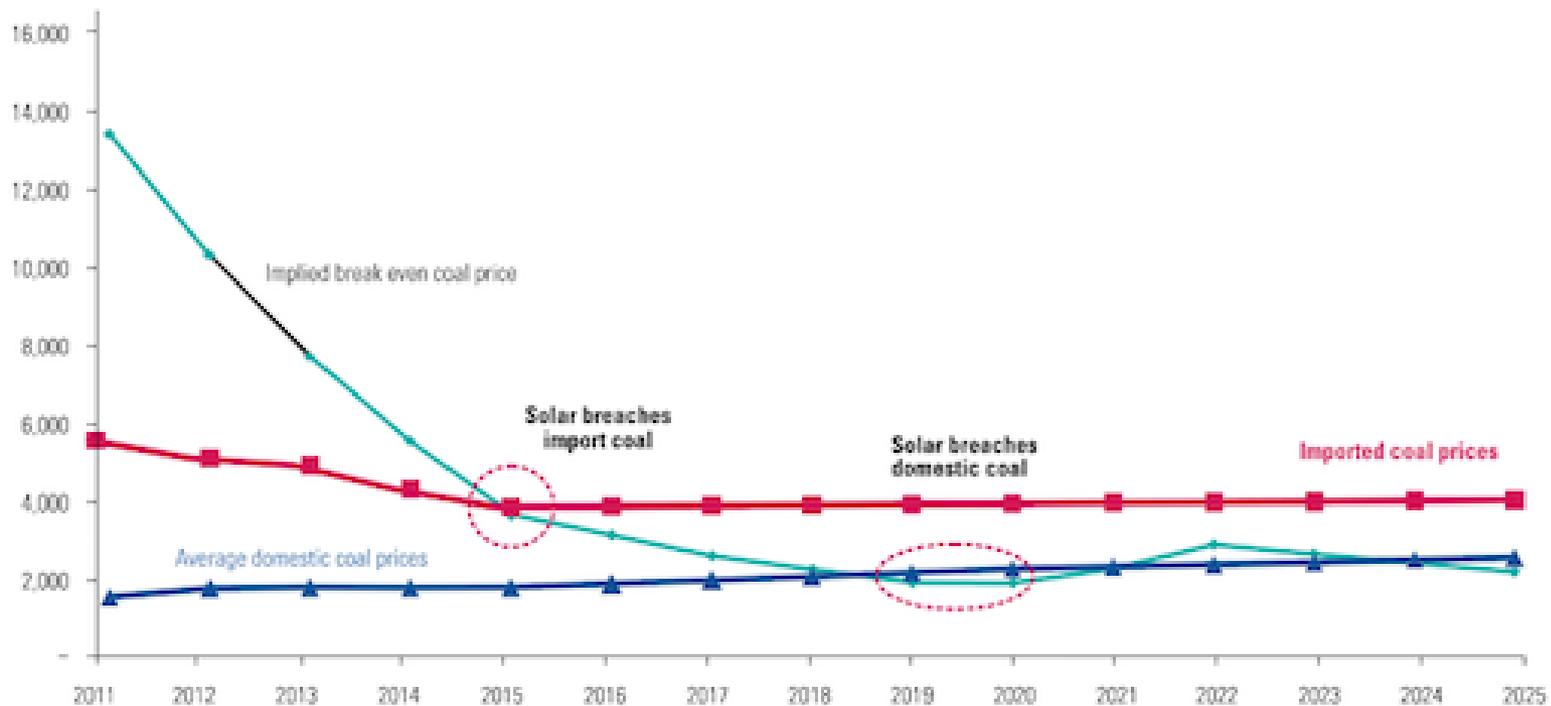
Outcome of Coal Power Proposals in the Developmental Pipeline 2010-2015 (MW)

	Halted (Shelved or Cancelled)	Implemented (In Conclusion of Operating)	Percent halted
East Asia	236,870	512,855	32%
Southeast Asia	38,560	49,555	44%
South Asia	405,840	175,605	70%
World Total	885,708	812,534	52%

Source :Coalswarm etc, Prosperity and Depression in 2016

Comparison of the Cost in Coal-fired Power Generation (Imported Coal and Domestic Coal) and Solar Generation in India

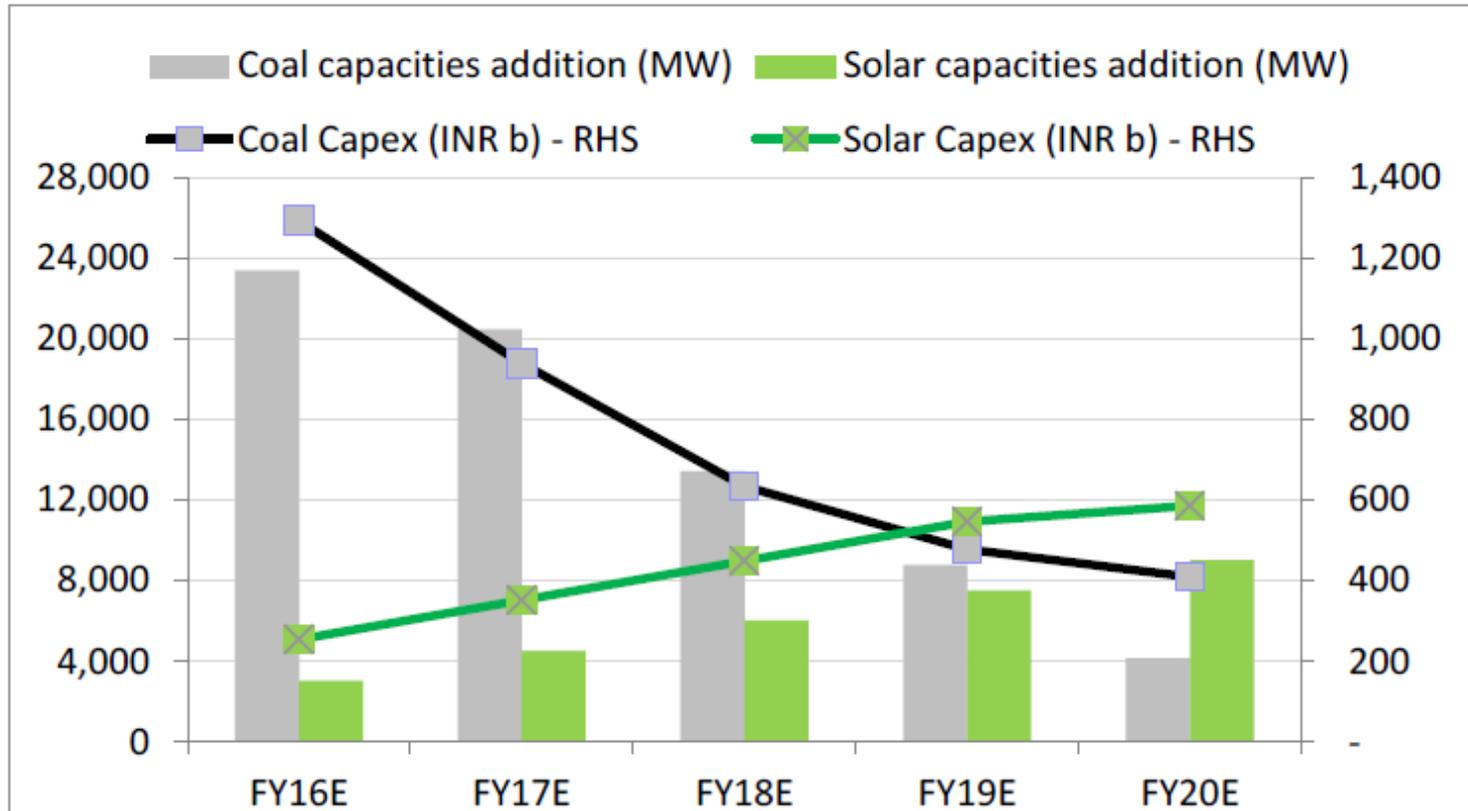
Figure 06: From 2020, solar power will influence domestic coal pricing: INR per tonne



Source: Coal India Limited (CIL) Annual Reports, Indonesia Coal Price Reference – HBA, KPMG in India's analysis, October 2015

Prediction of New Capacity of Coal-fire Power Generation and Solar Generation in India

Figure 11: Solar capex and capacities could overtake coal



Source: Deutsche Bank estimates

Source : Deutsche Bank, India 2020: Utilities and Renewables

In September 2015, Reliance announced the withdraw from 12GW of coal-fire power generation plans.

Question 4: Are Coal-fired Plants Supported by Japanese Companies Low-Pollution?

	Batang (Indonesia)	Kudgi(India)	Isogo New 2	Hekinan 5
Capacity(MW)	2000	2400	600	1000
Start of operation	2018 (Proposed)	2016	2009	2002
Type of power generation	USC	SC	USC	USC
SOx measures	SWFGD	None	DFGD	FGD
SO2 emission conc. (ppm)	105	321	10	25
NOx measures	LNB	Unknown	SCR/LNB/TSC	SCR/LNB/TSC
NO2 conc.(ppm)	127	316	13	15
PM conc. (mg/Nm3)	50	100	5	5

JBIC funded projects' SO2 removal technology

Technology	Proportion
Seawater Desulfurization	20%
Circulating Fluidized Bed Semi-Dry FGD	2%
Fluidized Bed	7%
Wet Limestone FGD	22%
Wet Lime FGD	1%
<u>Usage of low-sulphur coal</u> (no desulfurization equipment)	<u>36%</u>
<u>No desulfurization equipment</u>	<u>11%</u>

Source : Platts WEEP, January 2015

Of all JBIC funded coal-fired power plant facilities, approximately half lack desulfurization equipment.

New emission standards in India and International standards

	The expecting emission from Coal-fired power generation in Darlipali	The domestic standards in India (From Jan 2017)	World Bank Group's EHS Guideline
SO ₂ /SO _x	1224mg/Nm ³	100mg/Nm ³	200-850 mg/Nm ³
NO ₂ /NO _x	860mg/Nm ³	100mg/Nm ³	510mg/Nm ³
PM	50mg/Nm ³	30mg/Nm ³	50mg/Nm ³

Source: JBIC, Indian Government Gazette, International Finance Corp. (IFC)

→ Lower pollution cannot be achieved by investing based on international standards. These standards should be strengthen.

Recommendations for G7

- Make financial flows consistent with the 2 degree goal. (coal fired power is an inconsistent)
- Include a condition of consistency with the 2 degree goal in the “Quality Infrastructure.” (coal fired power is an outside of the scope)