BRIEFING PAPER

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Coal finance: will the OECD lag behind emerging countries because of Japan?

SUMMARY

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While efforts within the OECD to limit Export Credit Agency (ECA) public support for coal projects have stalled due to claims that such restrictions would lead to a proliferation of "dirtier" projects from non-OECD countries like China, recent commitments and data prove these fears to be unfounded. Indeed, China has just made a commitment to limit financing for coal projects domestically and internationally, and India has banned the construction of low efficiency subcritical coal plants. Such moves negate Japan's claims that public financing of higher efficiency coal plants is necessary to incentivize such technologies.

- In a September 2015 high level joint statement with the USA, China pledged to 'strictly control' financing of high-carbon projects domestically and internationally, making the Chinese commitment more ambitious than the latest OECD and G7 statements;
- New data analysis indicates that China is exporting higher-efficiency ultra-supercritical technology – the same technology Japan claims it needs ECA support to bolster;
- India has enacted policies banning the construction of subcritical coal plants.

In light of these developments, and with the COP21 climate conference fast approaching, there are no longer any excuses for delay. Adding any more new coal plants, no matter what their efficiency, is not in line with the internationally agreed objective of keeping global warming below 2 degrees. **It is time for the OECD countries to take a leadership role by ending ECA support for coal and directing public resources instead to clean renewable energy technologies.**

Coal is a major driver of climate disruption, and any argument that deploying highly-efficient coal technology can make a contribution towards climate mitigation is detrimental for staying below 2 degree because of the high-carbon lock-in over lifetime of any coal plant.

INTRODUCTION

According to the IEA, even if not another single coal plant was built today, we would still need to retire two-thirds of the world's existing coal fleet by 2040 to keep global warming within 2°C.[1] Public support for new coal capacity should therefore be banned immediately.

Discussions within the OECD to limit ECA support for coal are currently not on this track. Key emerging countries are moving forward, however, and the OECD risks lagging behind.

1. A GAME CHANGER: THE US-CHINA STATEMENT LIMITING PUBLIC FINANCING TO HIGH CARBON PROJECTS

On 25 September 2015, the USA and China issued an ambitious joint presidential statement on climate change.[2] In the statement, China pledges to *"strengthen green and low-carbon policies and regulations with a view to strictly controlling public investment flowing into projects with high pollution and carbon emissions both domestically and internationally"*.

The accompanying factsheet adds that*: "The United States and China reached an important new understanding on the need to control financing for high-carbon projects internationally. Today, China – one of the largest providers of public financing for infrastructure worldwide – agreed to work towards strictly controlling public investment flowing into projects with high pollution and carbon emissions both domestically and internationally. This follows a commitment in 2013 by the United States to end public financing for new conventional coal-fired power plants except in the poorest countries, and a growing number of other countries and financing institutions moving in a similar direction*".[3]

The Chinese statement mirrors the wording used by the US in their own commitment to end export credits for coal. We understand that the US fully expects that China will adopt policies to "strictly control" public support to coal power plants both internationally and domestically. In that respect, after the statements or support from the US, France, UK, Netherlands and Finland to severely restrict (or even end) export credits for coal, China is putting itself on the progressive side.

The Chinese commitment is a major step forward. China is a Middle Income Country that is not part of the OECD, and one of the two largest providers of

[1] International Energy Agency, World Energy Outlook 2014
[2] The White House, Office Of The Press Secretary, 25/09/15, US-China joint presidential statement on climate change
[3] The White House, Office Of The Press Secretary, 25/09/2015, Factsheet: The United States and Chine issue joint presidential statement on climate change

public finance for coal power plant technology overseas, along with Japan.[4] Though it is not fully clear what this means in detail, the strength of the Chinese high level commitment to '*strictly control*' its own international finance for coal is particularly notable when compared to less ambitious high level statements from the G7 and the OECD on the same issue:

- G7 statement of 7-8 June 2015: "*We remain committed to continued progress in the OECD discussions on how export credits can contribute to our common goal to address climate change*".[5]
- 2014 OECD Ministerial Statement on Climate Change: *"We welcome OECD work on climate change and affirm our common resolve to (…) continuing discussions on how export credits can contribute to our common goal to address climate change*"[6].

The Chinese commitment makes irrelevant Japan's argument that reducing OECD export credits for coal will lead to an increase in Chinese export credits for more polluting projects. In fact, the Chinese commitment is much bolder than what Japan has been proposing for the OECD, indicating that Japan is indeed far behind most other countries in the world when it comes to recognizing the need to restrict public finance for coal projects.[7] It is time for laggards within the OECD to step up their commitments and end export credits for coal.

2. NEW DATA SHOW THAT JAPANESE COAL TECHNO-LOGY EXPORTS ARE COMPARABLE TO CHINESE EXPORTS

In OECD discussions, Japan has argued for continued support of supercritical (SC) and ultra-supercritical (USC) coal technology exports, claiming that "*self-restriction by the OECD countries on the official support to coal-fired power plants is most likely to invite private funds or non-OECD official development funds to fill the gaps, and more importantly, to introduce low-efficient technologies in some emerging countries, rather than high-efficient technologies with higher initial costs. In short, self-restriction of the OECD's official support could 'crowd-in' low-efficient technologies, resulting in the increase of the global CO_2 emission compared to the status quo.*"[8]

This rationale is false, not only because China has committed to restricting support for high carbon exports (see above), but also because it is based on the incorrect assumption that Japanese USC coal technology is dramatically better, and that the implementation of this

[4] NRDC, Oil Change International, WWF, 2015, Under the Rug. We are not welcoming the China's large amount of coal finance.
[5] G7 Summit, 7-8 June 2015, Leaders' Declaration (page 13)
[6] OECD, 2014, Ministerial Statement on Climate Change
[7] Japan, August 2015, Joint Meeting: Room Document No.1, ECG and Participants to the Arrangement, Comments on the revised chairman's proposal. This submission even fails to ban export support for the worst type of coal plant technology (subcritical)
[8] Ibidem, paragraph 4, page 4

Japanese technology will somehow reduce emissions. **However, new evidence shows that China is exporting USC coal plant technology in Asia.**

Related to the faulty rationale is an assertion in a May 2015 paper by the Graduate School of Public Policy, University of Tokyo (GraSPP) that "*Overseas plants supplied by Japanese manufacturers are more highly efficient than those supplied overseas by Chinese manufacturers.*"[9] As evidence for its assertion, GraSPP developed charts based on the Platts UDI WEPP database (March 2015 release)[10] comparing sales of Japanese and Chinese boiler manufacturers. These charts show a larger share of USC technology in the mix of sales by Japanese boiler makers than in the mix of sales by Chinese boiler makers.
However, these charts are misleading because of the inappropriate selection of countries, giving the impression that Japan is the leading provider of high-efficiency plants. While excluding the enormous sales of Chinese-made USC boilers within China itself – which dominate worldwide market share of high-efficiency by far – the charts include sales by Japan to the two highly developed countries that make up the lion's share of Japanese high-efficiency equipment purchases: South Korea and Taiwan. **A more relevant comparison between Japanese and Chinese boiler exports would instead focus on South Asia and Southeast Asia, the two emerging economic zones with the most expanding coal power.**[11] Together, these two regions account for 72% of coal plants built outside China since 2010, as well as 65% of coal plants currently in the developmental pipeline outside China.

The tables below provide a comparison of SC and USC plant capacity (operating, under construction and planned) with Japanese, Chinese, South Korean, Indian or Russian boilers in South Asia, Southeast Asia, and the two regions combined. The data is provided by Platts UDI WEPP (June 2015 edition),[12] with the correction of two factual errors for a Malaysian and an Indian plant.[13]

Table 1. Southeast Asia Coal Plant Capacity (MW) Operating, Under Construction and Planned Boiler Manufacturers

	Japan	China	South Korea	India	Russia
Supercritical	850	7,610	3,800	0	0
Ultra-supercritical	2,000	2,680	2,680	0	0

Table 1 shows that in Southeast Asia both Chinese and South Korean manufacturers are providing larger amounts of SC and USC capacity than Japanese manufacturers. Moreover, boilers manufactured by Wuhan Boiler Company in China were used in the first adoption of USC technology anywhere in Southeast Asia (Manjung power station Unit 4, Malaysia, commissioned in April 2015).[14]

[9] University of Tokyo Graduate School of Public Policy (GraSPP), May 2015, Working paper series
[10] Platts, March 2015, World electric power plants database
[11] South Asia: Bangladesh, India, Pakistan, Sri Lanka; Southeast Asia: Cambodia, Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam
[12] Platts, June 2015, World electric power plants database
[13] Tanjung Bin 4 (Malaysia) is categorized by Platts as a SC plant, but will in fact be an USC plant manufactured by Wuhan Boiler Company in China (see Alstom fact sheet). The North Karanpura power station (India) is categorized by Platts as USC, but will in fact be SC (The Economic Times, 17 June 2013, NTPC's proposed North Karanpure plant gets back coal linkage)
[14] EODG Asia, 24 April 2015, Now that Manjung 4 is completed, TNB negotiating coal plant in Vietnam,

	Table 2. South Asia Coal Plant Capacity (MW) Operating, Under Construction and Planned Boiler Manufacturers				
	Japan	**China**	**South Korea**	**India**	**Russia**
Supercritical	9,240	48,040	7,500	40,320	1,980
Ultra-supercritical	0	0	0	1,320	0

Table 2 shows that in South Asia, China is the leading provider of SC boilers; followed by India, Japan, South Korea, and Russia. India is the sole provider of USC boilers.[15]

Table 2 does not include three plants that are under early development in Bangladesh and will, according to press reports, use USC boilers. Platts WEPP (June 2015) does not identify the boiler manufacturers for any of these plants. However, two are Chinese-backed: Maheshkali[16] (1320-6000 MW) and Kalapara[17] (4 units of 660 MW). A third one is Japanese-backed: Matarbari[18] (1200 MW). These developments indicate that China is also taking the lead in the export of USC technology in South-Asia.

	Table 3. SE Asia and South Asia Combined Coal Plant Capacity (MW) Operating, Under Construction and Planned Boiler Manufacturers				
	Japan	**China**	**South Korea**	**India**	**Russia**
Supercritical	10,090	55,650	11,300	40,320	1,980
Ultra-supercritical	2,000	2,680	2,680	1,320	0

Table 3 shows that **Japan is by no means the only - or even the most significant - provider of SC and USC technology in the emerging regions of South and Southeast Asia.** Instead, China is a larger exporter of both SC and USC technologies in these regions, a fact that completely undermines any argument that continued export credit support for coal plants from OECD countries will reduce emissions.

Instead of directing export credit support to coal projects, which are carbon intensive regardless of their technology, OECD countries should reserve export finance for clean renewable energy technologies.

See also:

[15] All USC capacity planned for India is from a single India-based and India-controlled joint venture, L&T-MHPS Boilers Pvt Ltd., which is providing the boiler for the 1,320 MW Khargone power station. L&T-MHPS Boilers Pvt Ltd. is a 51:49 joint venture between Indian conglomerate Larsen & Toubro Limited, India, and Mitsubishi Hitachi Power Systems, Japan (See L&T-MHPS overview). Manufacturing will take place in India (Business Standard, 2 April 2015, L&T bags NTPC's Rs 5580-cr order for ultra-supercritical power plant)

[16] Maheshkhali power station (1,320 - 6,000 MW) is being sponsored by China Huadian (Financial Express, 30 September 2015, Deal likely with Chinese firm for another coal-fired power plantt and Bangladesh Power Development Board, 1 August 2014, EOI)

[17] Kalapara power station, (4 x 660 MW, 2 units unspecified and 2 units USC) was initially reported to be supported by JICA but more recently is reported to be a joint venture between Chinese power company CMC and Bangladesh state-owned North-West Power Generation Company Limited (SourceWatch, Kalapara power station)

[18] Matarbari power station,(1200 MW) is financed by JICA and sponsored by Coal Power Generation Company Bangladesh (See "Matarbari power station," SourceWatch at http://bit.ly/1lR71O5)

- Annex 1: outdated Japanese assertions on countries' experience of operation in USC and in SC;
- Annex 2: classifying boilers manufacturers by country;
- Annex 3: at least 5,8 to 6,4 GW Chinese ultra-supercritical capacity in progress outside China.

3. INDIA BANS SUBCRITICAL TECHNOLOGY

Outside of China, India is by far the single largest market for new coal plants in the world. The Indian government is moving towards a ban on subcritical technology for all new coal plants in the country. This means that a large percentage of the future market for coal plants in the world will necessarily be for higher efficiency coal plants. **This makes the claim that an end to OECD ECA support for coal will lead to a flood of subcritical coal projects unfounded.**

The Indian government has explicitly ruled out subcritical coal plant technology in a number of statements and policy documents, which are backed up by actions in the country's manufacturing industry:

- The Indian government recently stated that *'supercritical technology has been made mandatory for Ultra Mega Power Projects (UMPPs) being implemented*'.[19]
- The twelfth five-year plan stipulates that in the thirteenth plan (2017-2022) *'all coal fired capacity addition shall be through supercritical units'*.[20]
- In addition, according to the Platts UDI WEPP database, Bharat Heavy Electricals Limited (BHEL) – India's largest integrated power plant equipment producer – is already manufacturing supercritical boilers.
- Finally, the Indian government is pushing for domestic R&D to develop advanced ultra-supercritical technology. According to the Platts UDI WEPP database, one ultra-supercritical coal plant is currently being built in India (see part 2 above).

According to the Global Coal Plant Tracker database, **India alone represents almost 40% of the global pipeline of coal plant projects outside China**[21], and it is by far the largest future market for OECD ECAs. The Indian ban of subcritical technology accelerates the global market trend to phase out this technology.[22] Suh a ban is bolder than the latest Japanese submission to the OECD, that still proposes to support subcritical technology.[23]

[19] Government of India Ministry of Power, 12 March 2015, Initiatives to improve the efficiency of coal based power plants
[20] http://planningcommission.gov.in/plans/planrel/12thplan/pdf/12fyp_vol2.pdf
[21] WWF, 2015, Global Coal Plant Tracker database: proposed coal plants by country since 1st of January 2010 (MW): for announced, pre-permitted, permitted coal plant projects
[22] WWF,January 2015, Analysis of the global coal power plant market trends
[23] Japan, August 2015, Joint Meeting: Room Document No.1, ECG and Participants to the Arrangement, Comments on the revised chairman's proposal, paragraph 1, page 5

CONCLUSION

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Coal is a major driver of climate disruption, and any argument that deploying highly-efficient coal technology can make a contribution towards climate mitigation is detrimental on the mid- and longer term for staying below 2°C because of the high-carbon lock in of lifetime of any coal plant. Yet these arguments have persisted, even while the need to act becomes increasingly urgent. However, the state of play is changing fast: **new data shows that high efficiency coal technology is now exported by both OECD and non-OECD countries, combined with commitments from China to control support for high-carbon exports and from India to prohibit the least efficient coal technology**. The OECD must take the lead and abandon these dangerous claims once and for all.

Now that the last underpinnings for the old arguments defending coal technology have fallen away, the OECD has an opportunity to show true leadership in the weeks preceding the COP21 climate conference in Paris by shifting support from carbon intensive coal technology to clean renewable energy solutions.

ANNEX 1. OUTDATED JAPANESE ASSERTIONS ON COUNTRIES' EXPERIENCE OF OPERATION IN USC AND SC

USC: ultra-supercritical
SC: supercritical

The latest Japanese OECD submission[24] states: "*there are only eight countries with the experience of operating ultra-supercritical combustion coal plants, which are the U.S., Japan, Germany, Italy, Republic of Korea, Netherlands, Denmark, and China, and there are only about twenty countries with the experience of operating supercritical combustion coal plants.*"

Both of these figures are out of date. According to Platts WEPP (June 2015), USC plants are operating in 10 countries: China, Denmark, Germany, Italy, Japan, Malaysia, Netherlands, Russia, South Korea and U.S. In the following 7 additional countries USC plants are currently under construction and it can be assumed that operation capacities will be instituted for operating those plants: Czech Republic, India, Morocco, Poland, Slovenia, Taiwan, Vietnam. As a result these 17 countries either currently operate or will soon be operating USC plants. **These 17 countries represent 86% of world electricity production and consumption. Far from being limited to a few utilities in a few countries, experience in the operation of USC is fast becoming commonplace**.

For supercritical combustion, Japan's discussion paper asserts that SC operating experience is limited to 20 countries. According to Platts WEPP the correct number is 25, including the following: Australia, Bosnia-Herzogovina, Canada, China, Denmark, Finland, Germany, Greece, India, Indonesia, Italy, Japan, Kazakhstan, Mexico, Netherlands, Poland, Russia, South Korea, Taiwan, Thailand, Turkey, Ukraine, United States, Uzbekistan, Vietnam. **These 25 countries represent 93% of world electricity production and consumption. Experience with SC is nearly universal**.

The Japanese submission paper is therefore misleading: accurate analysis shows that experience in USC operation is quickly becoming commonplace while experience in SC operation is already nearly universal. In this context, the added value of public OECD export support for such technologies is strategically wrong and a waste of taxpayers money. The OECD should ban such export support

[24] Japan, August 2015, Joint Meeting: Room Document No.1, ECG and Participants to the Arrangement, Comments on the revised chairman's proposal, paragraph 1, page 5

ANNEX 2. CLASSIFYING BOILERS MANUFACTURERS BY COUNTRY

In a world of increasingly multi-national ownership structures and joint ventures, assigning boilers to a particular country requires care. We assign boiler manufacturers as listed below. In cases of joint ventures, we classify according to location of manufacture.. For that reason Alstom boilers in Asia are classified under China (following the GraSPP paper's "Pattern 3"). L&T-MHI is classified under India, since press reports state that boilers will be manufactured in India.

China

- Dongfang, Harbin, Shanghai Electric
- BWBC (Babcock & Wilcox Beijing Co Ltd)
- Alstom (owned by US company General Electric but manufacturing USC boilers at 51%-owned Wuhan Boiler Company in China)

India

- BHEL, BHEL/ALS and ALST/BHL (Bharat Heavy Electricals Ltd, BHEL/Alstom joint venture, Alstom/BHEL)
- L&T-MHI (Larsen & Toubro Limited, India, and Mitsubishi Hitachi Power Systems, Japan 51:49 joint venture)
- DSPI (Doosan Power Systems India)
- BGR-HIT (BGR Boilers Pvt Ltd, formerly BGR-Hitachi joint venture)

Japan

- IHI (Ishikawajima-Harima Heavy Industries Co Ltd)

Russia

- Taganrog

South Korea

- Doosan.

ANNEX 3. AT LEAST 5.8 TO 6.4 GW CHINESE USC CAPACITY IN PROGRESS OUTSIDE CHINA

The May 2015 paper by the Graduate School of Public Policy, University of Tokyo (GraSPP) states: "*For Chinese manufacturers… there are practically no shares of ultra-supercritical technology*"[25].

This statement is substantially wrong. A close look at the data compiled for the GraSPP paper shows that it omits several large ultra-supercritical coal plants either completed, under construction or in advanced planning with Chinese ultra-supercritical technology, amounting to thousands of megawatts of capacity. **In all, at least 5.8 to 6.4 GW of Chinese ultra-supercritical capacity is either completed, under construction, or in progress outside China**. The under-statement of this reality in the GraSPP paper is due to:

- Misclassification of one project in the Platts UDI WEPP database (Tanjung Bin);
- Incomplete information on one project in the Platts UDI WEPP database (Cenal Karabiga);
- Omission of a third project (Opole);
- A fourth project (Mae Moh), according to the Platts UDI WEPP database, will use an ultra-supercritical boiler supplied by Alstom – whose ultra-supercritical boilers in Asia are now being manufactured by Wuhan Boiler Company in China.
- Additional projects are under development in Bangladesh (Maheshkhali and Kalapara).

Judging by actual power stations completed, it is China, not Japan, that has led the way in bringing ultra-supercritical technology to Southeast Asia. The first ultra-supercritical plant to be built in Southeast Asia is the 1080 MW Manjung 4 power station Unit 1 [26], which went into commercial operation in April 2015. Its ultra-supercritical boiler was built in Wuhan, China, by Wuhan Boiler Company.

[25] University of Tokyo Graduate School of Public Policy (GraSPP), May 2015, Working paper series
[26] SourceWatch, Manjung power station

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