



Engaging China in Copenhagen and Beyond:
Will G-2, and co-benefit concepts work?

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**International Consortium for Low Carbon Society
Inaugural Roundtable
International Forum for Sustainable Asia and the Pacific
26-27 June 2009 ♦ IGES, Hayama, Japan**

China

- China has the largest population in the world.
- China has the 3rd largest economy in GDP, or the 2nd largest at PPP.
 - » GDP in 2008: U.S. \$14.3 trillion; China \$4.2 trillion. (CIA est)
 - » 2008 GDP at PPP: U.S. \$14.6 trillion; China \$7.8 trillion. (CIA est)

- China is the 2nd largest energy-user in the world following the United States.

Total Primary Energy Use (EJ)	1980	2007
China	17.9	78.3
The United States	75.9	99.6

- According to IEA, 20% of the increase in world's energy demand during 2000-2030 will come from China.
- By 2030, China's net oil imports are projected to reach almost 10 mbpd, more than 8% of world oil demand, and imported NG will contribute to about 30% of the supply.
- China is the largest national source of GHGs. About 1/7 of world's CO₂ emissions is due to China's coal use.

New strategies to engage China

- Many new strategies have been proposed to engage China in Copenhagen, in post-Kyoto climate regime, to pull/push China to make a “legally binding commitment.”
- Here are two of them that have received great attention and discussion:
 - » “Group of Two”, G-2, to address global issues including climate change;
 - » Integrating Energy Security Concerns into the Post-2012 Climate Regime

Group of Two (G-2) concept

- Zbigniew Brzezinski is a strong advocate of G-2: China and United States.
- *“The Group of Two that could change the world”*, Financial Times, Jan 13, 2009
- G-2 could address issues including:
 - » the international financial crisis (*echoed by Zoellick & Lin*);
 - » **climate change**;
 - » proliferation of weapons of mass destruction; and
 - » maybe even the Israeli-Palestinian conflict.



Will it work on climate change issue?

- G-2 concept has certainly generated some excitement in China. It is appealing because of
 - » China's desire of being a "responsible power",
 - » a sense of being recognized as a major-/super-power.
- But it won't work – or at least won't work well – because of mismatched interests, values, and capabilities.
 - » Central government's international obligations vs local governments' interests in economic growth
 - » Enforcing laws and regulations requires transparency in emission reporting and accountability for violation.

“ Some say that world affairs will be managed solely by China and the United States. I think that view is baseless and wrong.”



“It is impossible for a couple of countries or a group of big powers to resolve all global issues. Multipolarization and multilateralism represent the larger trend and the will of the people.”

Premier Wen Jiabao, at the 11th China-EU Summit, Prague, 20th May, 2009

*Is energy-security
concerns an effective
leverage?*

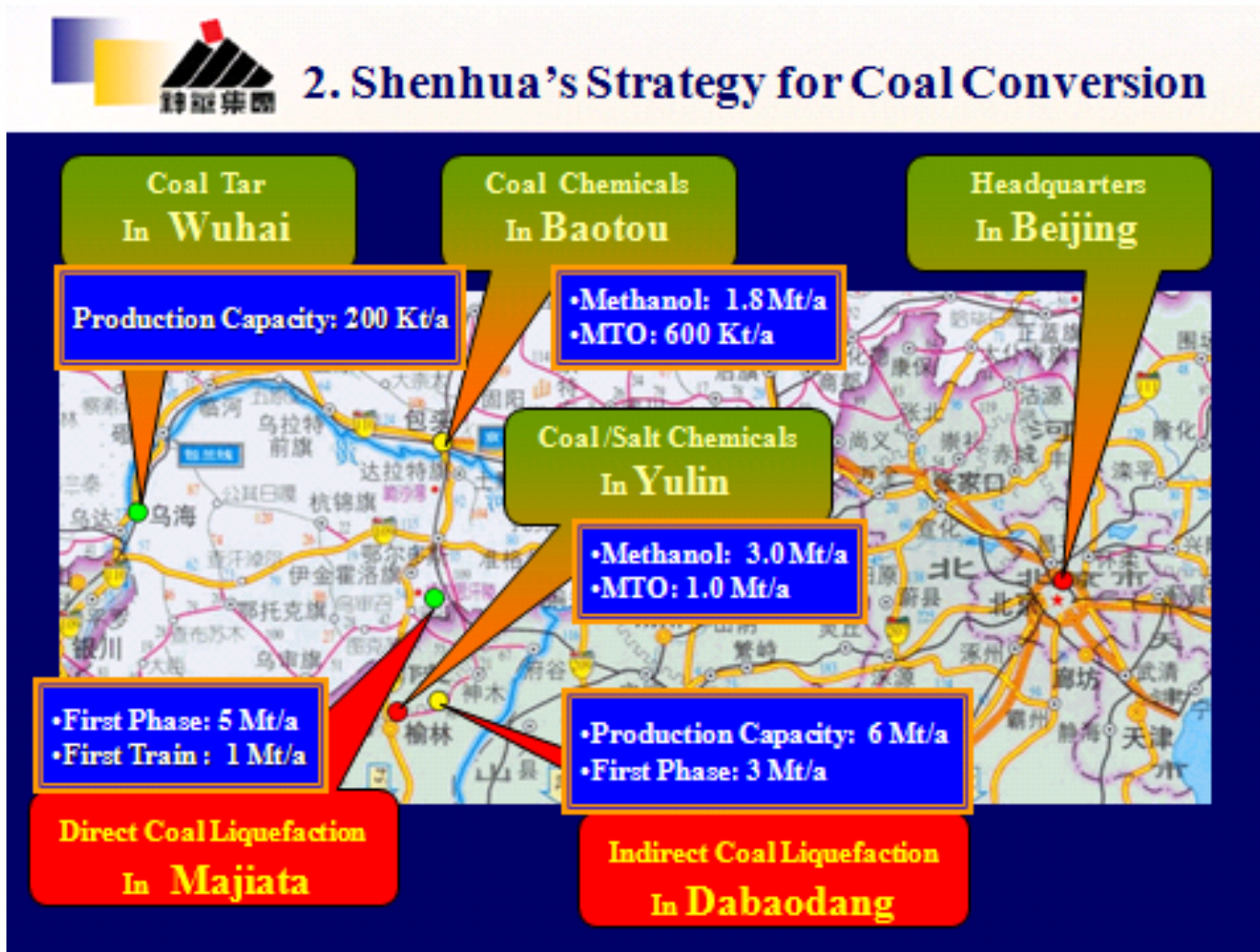
The story of a large energy firm



2. Shenhua's Strategy for Coal Conversion



What investment decisions did they make?



What actions did they take?



3. Development of Shenhua coal conversion projects

Shenhua Direct Coal Liquefaction Project

Site Construction Commencement Ceremony



What risks did they take?

Synfuel option (<i>mine mouth plants</i>)	CO ₂ :	ER	BCOP
DCL	Vented	1.60-1.84	\$18
DCL	CC + CS	1.05-1.41	\$19
MeOH (<i>worth 1.15X gasoline</i>) [*]	Vented	1.8	\$17
MeOH (<i>worth 1.15X gasoline</i>) [*]	CC + CS	0.035	\$15
DME (<i>worth 1.0X Diesel</i>) [*]	Vented	1.8	\$27
DME (<i>worth 1.0X Diesel</i>) [*]	CC + CS	0.86	\$23
DME (<i>worth 1.30X gasoline</i>) [*]	Vented	1.5	\$14
DME (<i>worth 1.30X gasoline</i>) [*]	CC + CS	0.64	\$11

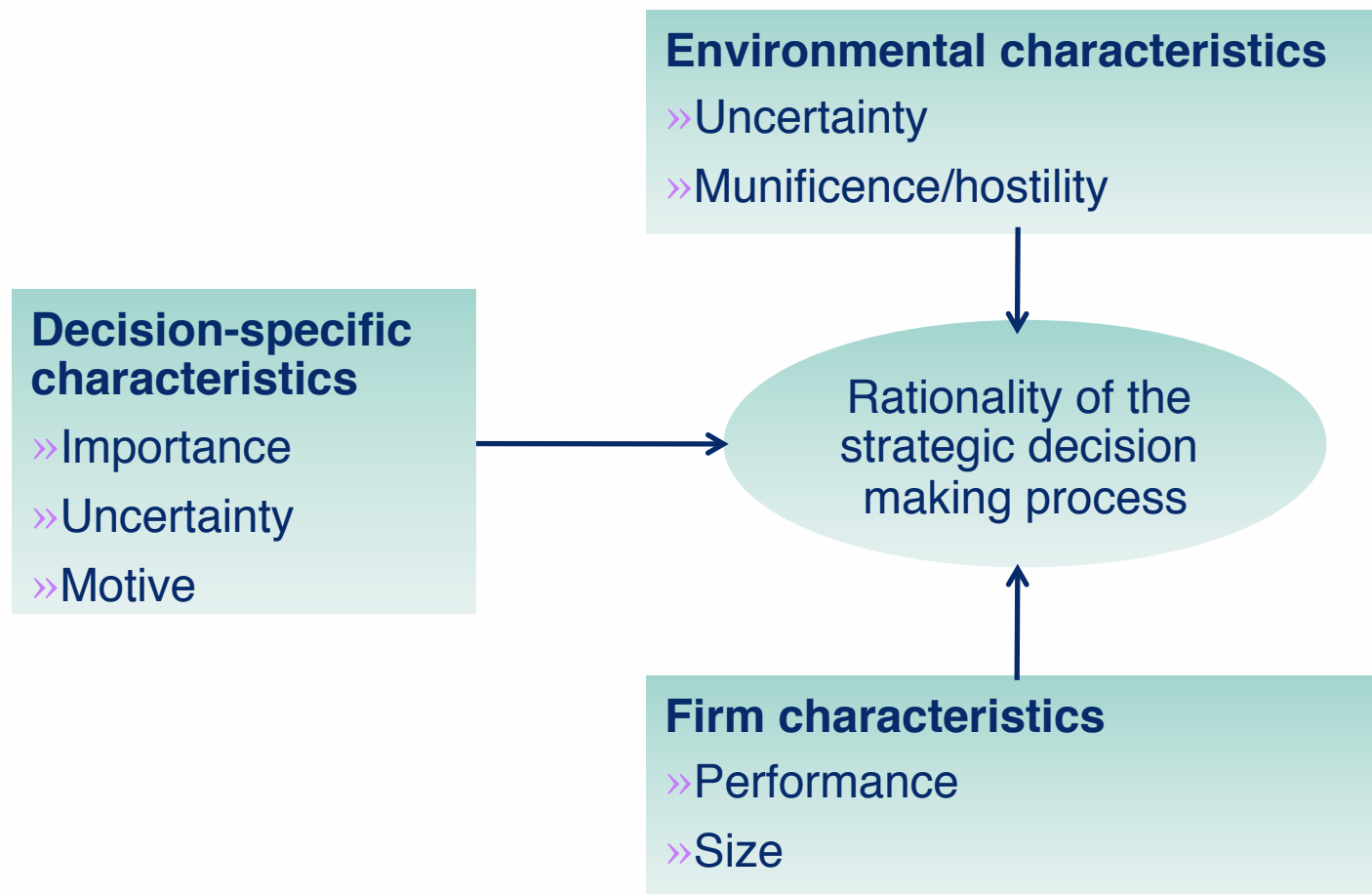
^{*}ICL cases involve coproduct electricity for which assigned GHG emission rate = fuel cycle GHG emission rate for coal IGCC. CC + CS = co-capture + co-storage; ER = fuel cycle GHG emission rate relative to petroleum crude-derived HC fuels; BCOP = breakeven petroleum crude oil price in US dollars per barrel

Source: R. Williams, 2003

Integrating energy security concerns

- Will energy security concerns be an effective leverage?
- China coal-to-liquid (CTL) investment
 - » China's current CTL investments will be hit by a "predictable surprise."
 - » GHG emission reduction is inevitable. CO₂ emission will have a price before these investment can be fully recovered.
 - » Relevant knowledge are available when the investment decisions were made.
 - » Why did decision makers fail to take wise strategy to prevent and control these predictable risks?

Rationality of strategic decision-making



Adopted from Elbanna and Child, 2007

Problem, policy, and politics streams

- Big firm, huge investment, friendly business environment, but where was the rationality?
- Shenhua DCL project is a typical case of “solution looking for problem”
 - » In 1998, too much coal; but in 2000, too many unemployed coal-miners and rising oil-dependence; in between, enough oil.
 - » Initial investment was financed with a government grant to lower high debt-equity ratio in 1997.
- YE, also a policy entrepreneur, provided solution to problems.

Discussions

- Not considering future climate-policy change was also due to other factors
 - ›› Industrialized countries should be responsible for global climate change.
 - ›› Strong optimism that project at this huge scale and of high strategic importance to energy security will be protected if changes in climate policy are inevitable.
 - ›› Retired government officials who still have strong political influence.
 - ›› Climate change? No way !
- How effective is energy insecurity in opening policy windows for the adoption of technical measures that can mitigate GHG emissions?
 - ›› Energy insecurity and climate risks are closely related in their causes and solutions. But they are two different challenges with distinctive characteristics.

Temperature rise	CO ₂	CO ₂ -eq.	Year of peak emissions	% change in global emissions
Global average temperature increase above pre-industrial at equilibrium, using "best estimate" climate sensitivity	CO ₂ concentration at stabilisation (2005 = 379 ppm)	CO ₂ -eq. concentration at stabilisation including GHGs and aerosols (2005 = 375 ppm)	Peaking year for CO ₂ emissions	Change in CO ₂ emissions in 2050 (percent of 2000 emissions)
°C	ppm	ppm	year	percent
2.0 - 2.4	350 - 400	445 - 490	2000 - 2015	-85 to -50
2.4 - 2.8	400 - 440	490 - 535	2000 - 2020	-60 to -30
2.8 - 3.2	440 - 485	535 - 590	2010 - 2030	-30 to +5
3.2 - 4.0	485 - 570	590 - 710	2020 - 2060	+10 to +60
4.0 - 4.9	570 - 660	710 - 855	2050 - 2080	+25 to +85
4.9 - 6.1	660 - 790	855 - 1130	2060 - 2090	+90 to +140

Table 1

Characteristics of various emission trajectories to achieve stabilisation of atmospheric greenhouse gas concentrations, in CO₂ and CO₂-eq. The equilibrium global average temperature increase above pre-industrial is given for each stabilisation target. Only the first scenario, shown in the first row, has a possibility to meet the 2°C guardrail. Note that current atmospheric greenhouse gas concentrations are about 385 ppm CO₂ and 396 ppm CO₂-eq (including the cooling effect of aerosols). Modified from¹ (table S.1, p. 67).

Source: International Scientific Congress Climate Change: Global Risks, Challenges & Decisions, Synthesis Report, Page 19

Need new ideas, urgently!

- International community as a whole has failed to devise policy instrument to engage China.
- Most obvious facts can be easily forgot.
 - » “Legally binding” has been proved toothless, and is no more than a fantasy.
 - » China’s sovereignty will be well preserved and protected.
- Recognizing these facts, international community needs to find creative yet programmatic ways to mitigate China’s GHG emissions, with strong sense of urgency !