

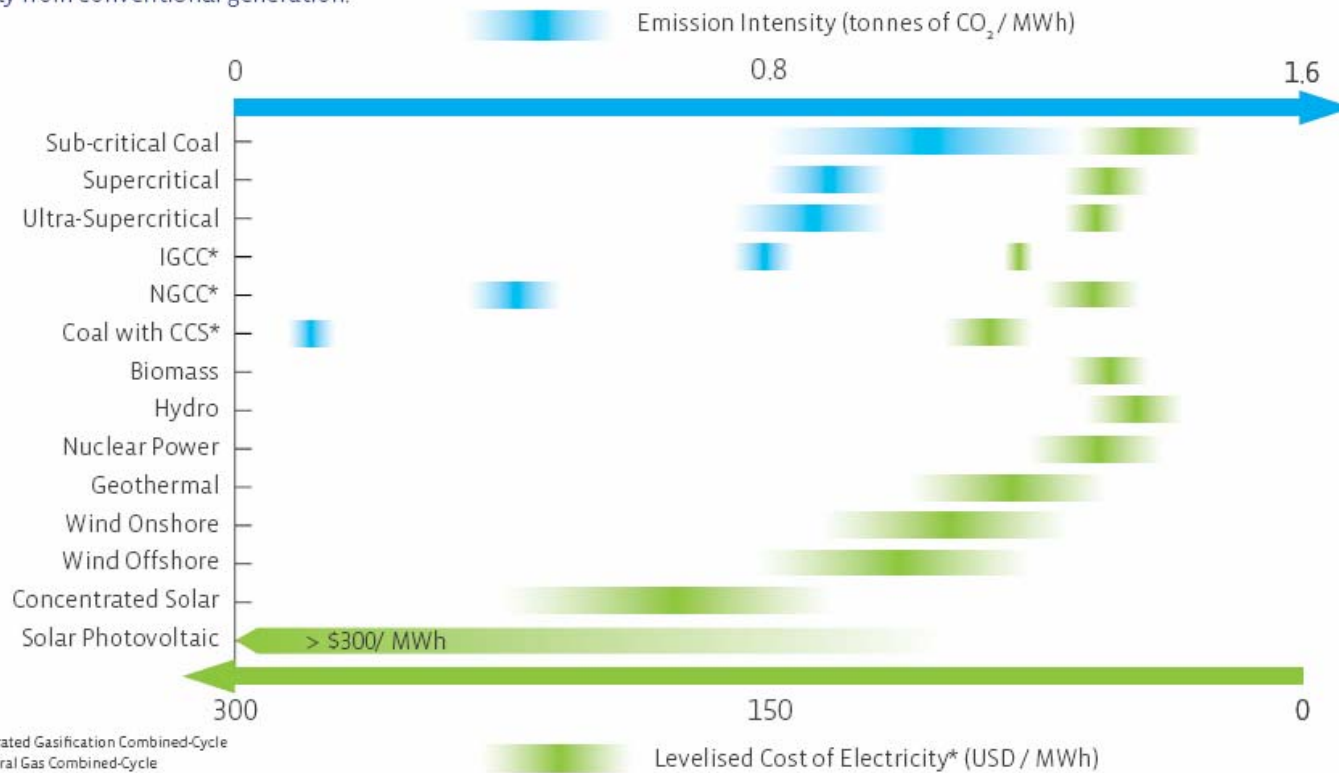
Financing for Climate Change

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Emissions Intensity and Levelised Cost of Power Generation Technologies

Electricity generated by low-carbon technologies, which have low or zero CO₂ emissions intensity, usually have higher levelised cost than electricity from conventional generation.



*Notes:
 IGCC = Integrated Gasification Combined-Cycle
 NGCC = Natural Gas Combined-Cycle
 CCS = Carbon Capture and Storage
 Levelised costs do not include backup power costs of variable output systems, such as wind energy.

Clean Energy is seriously out of the money – and seriously out of the market

- CLP has 1,065 E/MW of RE in operation or under development
- Represents 8.4% of our generating fleet – investment of c. HK\$4 billion
- The project cost of a 49.5MW windfarm in China is c. US\$75 million
- The utilisation of an RE project is 20-25% (conventional coal – 65-70%) i.e. one MW of conventional capacity = 3MW of renewables
- An IGCC/CCS project may cost US\$5 million per MW (greenfield conventional coal is c. US\$1 million per MW)
- It's a long-term business – asset lives of +20 years and financing periods of 10 years

Clean Energy is an expensive game – there are no cheap tickets

The problems of securing financing

India

- High cost of debt
- Limited market for non-recourse financing (Indian lenders are comfortable with balance sheet financing)

China

- Difficulty in securing pure project financing (wind projects mostly limited recourse with completion guarantee and cashflow pledge)
- Widely differing internal policies amongst banks (e.g. one major bank will not lend to hydro projects <50MW, many cautious on biomass etc.)
- Preferential rates not available for small projects (large projects have 10% discount to PBOC rate)
- Restrictions on maximum gearing (40% equity for <US\$30m, 33% for >US\$30 m – lowest 25% with State level approval)

It's tough to raise finance

What do governments do?

India

- State-based mandatory RE targets
- Some tariff concessions

But

- Regulatory regime is short-sighted (limited policy periods provide windows of opportunity – not long-term approach)
- Implementation at offtaker level is problematic (utilities' focus is on reducing power tariffs – RE viewed as high-priced power)

What do governments do? (cont'd)

China

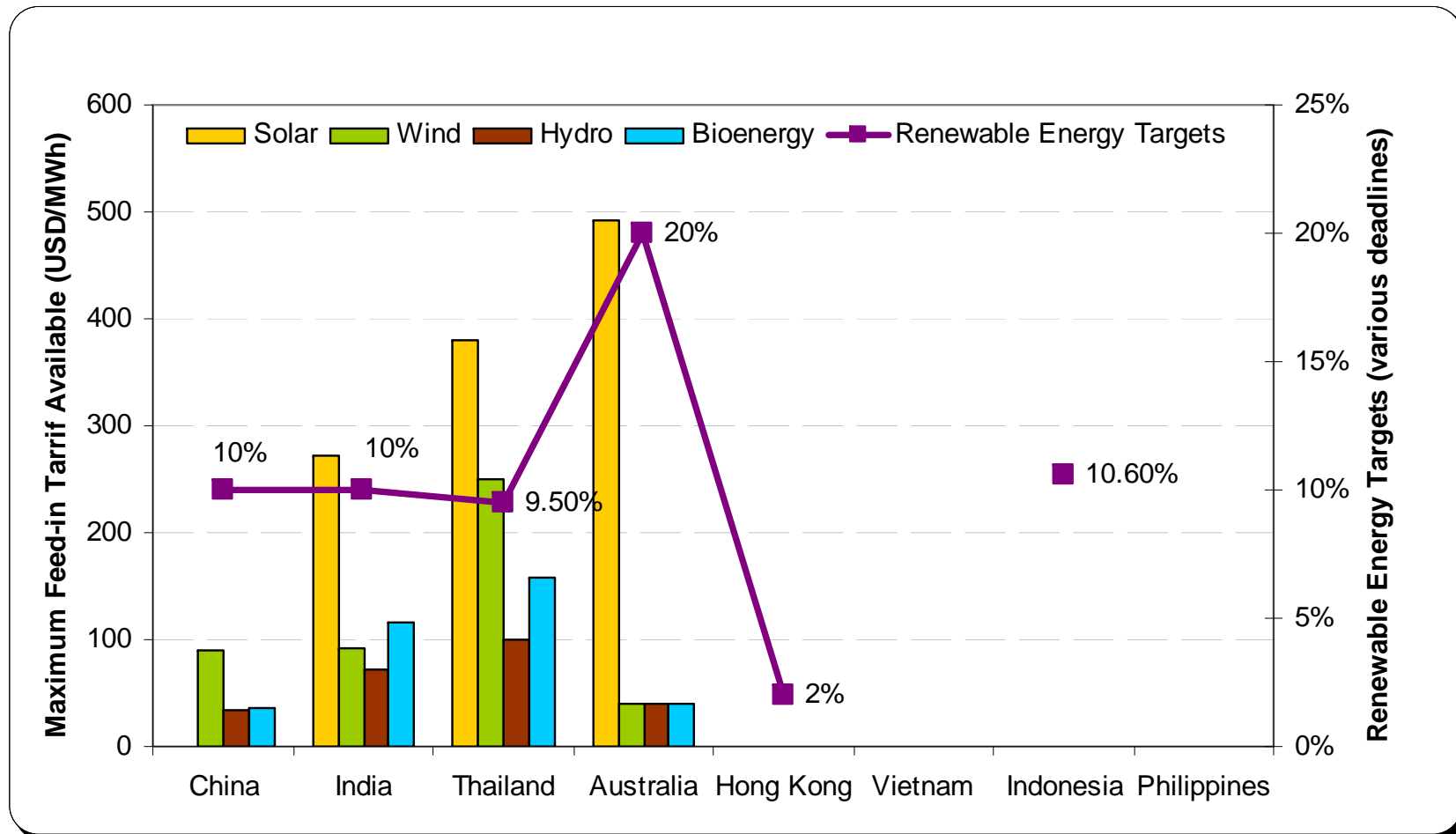
- RE Act
 - RE 11th 5-Year Plan
- } set out economic incentives and moral support
- PPA incentives to take all RE generated electricity
 - Tariff incentives (feed-in tariffs – additional 25 cents to benchmark tariffs)
 - Tax incentives (VAT refunds, 3 year income tax exemptions)
 - Fiscal incentives to wind turbine manufacturers

But

- Benchmark tariffs can change at any time (and in any magnitude)
- Full RE offtake not practical in certain provinces

Regulation/Incentives in Asia are highly market-specific

Renewable Energy Policy Snapshot in Asia



- NB:
- There are no feed-in tariffs for Solar in China at present
 - Indonesia, Vietnam, Philippines and Hong Kong do not offer feed-in tariffs for renewable generation at present

What government support would make RE financing easier?

India

- Enact RE Law – nationwide view of industry with long-term targets for Renewable Purchase Obligations, Tariff-Fixing mechanisms, inter-state trading
- Easier accessibility to Government-owned land
- Regulations for use of agricultural waste for power generation (encourage bio-mass projects)

China

- Firmer determination of benchmark tariffs
- More preferential tax policies (lower VAT, longer income tax exemptions)
- Real implementation of S.25 RE Act (banks may provide preferential loans with fiscal subsidies to qualifying RE projects) – today's RE financing is largely commercial

Specific improvements needed in individual markets

CDMs

Secondary CER Prices (€)



- Forward contracts trading commenced in 2006 – prices between €5 and €20 per tonne CO₂ equivalent
- CERs started spot trading May 2007

Source: Point Carbon website, *Secondary CER OTC Assessment*, 9-Feb-2009

What value would you attribute to CDMs on a projected investment?

The relevance of CDMs

India

- “UNFCCC is as volatile in its approach as perhaps the Indian Government is static” (proving additionality in volatile financial markets is a challenge)
- Increased levels of certainty on registration could be provided through standard guidelines (rather than “subjectivities”) – this would allow CDM revenues to enhance financeability
- But India is open for business on CDM

China

- RE projects are marginally profitable (if at all) so CDM revenues can support cashflows and financeability
- CERs can improve IRR’s by 1.5%, 3-4% and 7-9% for wind, hydro and biomass projects respectively
- But sponsors’ and lenders’ views on CDM revenues vary widely
- Foreign majority-owned projects do not qualify for CERs

Here's a real-life example of an India wind project

Capacity :	82MW
Commissioning :	June 2009
Project Cost :	US\$111m (US\$1.32m per MW)
Funding :	20% equity / 80% loan (with recourse). 18 year loan repayment, 11% p.a.
Utilisation Factor :	26%
Tariff :	Rs3.40/kWh (~US\$8c) for 10 years, Rs2.75/kWh (~US\$7c) 11 to 20th year (“recommendatory” 10% RPO)
CDMs :	€13.63 per tonne CO₂ to 2012, beyond at €5 per tonne CO₂
Project IRR :	11.3%

This is what it takes to get over the line in India

..... and a real-life example of a China wind project

Capacity :	49.5MW
Commissioning :	July 2009
Project Cost :	US\$73m – US\$1.47m per MW (low)
Funding :	33.3% equity / 66.6% loan (PBOC rate + 0.27%, 13 year tenor)
Utilisation hours :	2,672 (not bad)
Tariff :	RMB0.61 (US\$90c) for first 30,000 hours, then standard rates)
CDMs :	€12.5 per tonne to 2012 (assumed €5 from 2013)
Dividend IRR :	12.4% (quite good – it's often lower)

This is what it takes to get over the line in China

We didn't have time to discuss financing mechanisms for

- Adaptation
- Energy efficiency (demand-side management)
- Education
- Carbon abatement of existing facilities
- Nuclear energy
- New technology development
- Differing RE technologies (new and old)
- Improved transmission infrastructure

but.... thanks for listening