# Investing in Clean Energy in Asia


## Asia Clean Energy Forum 2008

June 2008

# Potential Tectonic Shifts in the Energy Sector

# Fossil Fuel Depletion

- The World has a finite resource of fossil fuels
  - ⇨ Essentially stored “ancient sunlight”
- IEA estimates that the World will run out of oil and gas around 2050 based on the present Reserves-to-Production ratio
- …But the picture is significantly worse than this:
  - ⇨ The World is approaching a “Hubbert’s Peak” – a terminal decline in oil production – expected to occur 2015–2020†
  - ⇨ Gas is expected to follow soon thereafter (C. 2025)
- This creates the “perfect storm” for sustained increases in global fossil fuel prices

† Over 60 countries are already in terminal decline of oil production.



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# Implications and Solutions

- There is no present viable alternative energy solution to meet global demand (for both generation and, especially, transportation)
  - ⇨ …let alone the aspiring energy demand growth of developing countries
- The best we can hope for is to stretch out present fossil fuel resources…
  - ⇨ To buy time to develop alternative energy systems and technologies for tomorrow's energy needs
  - ⇨ And reduce greenhouse gas emissions to stave off the impact of climate change
- There is no "silver bullet":
  - ⇨ The World needs an urgent, aggressive acceleration of investment in Clean Energy systems and technologies
  - ⇨ This is especially true in Asia where growth in energy demand and the carbon intensity of energy use is highest



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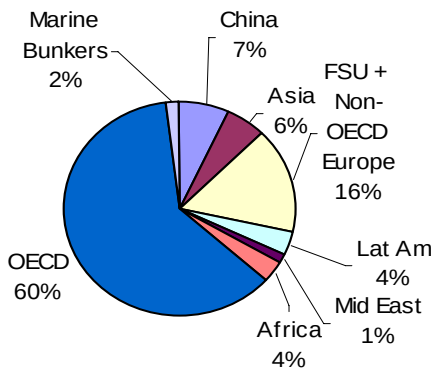
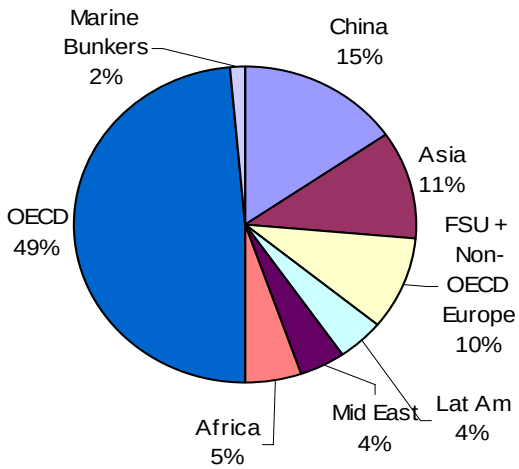
# Asia: An Increasing Share of Energy Use

## Asia responsible for significant share of growth in energy demand… and carbon emissions

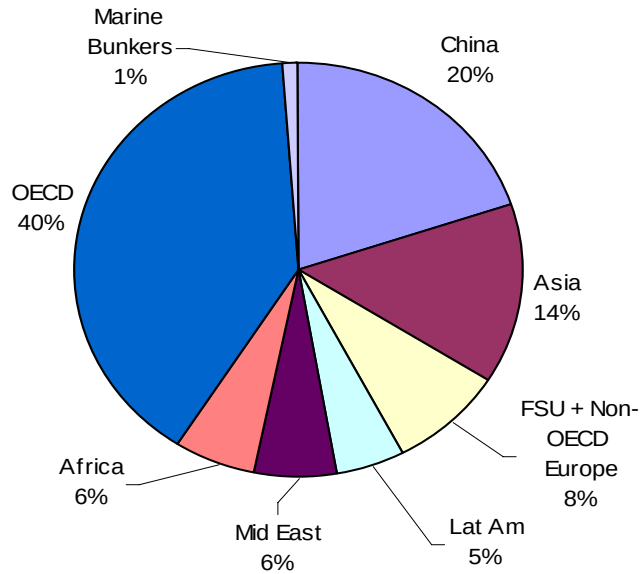
**1973**
**6,128 Mtoe**

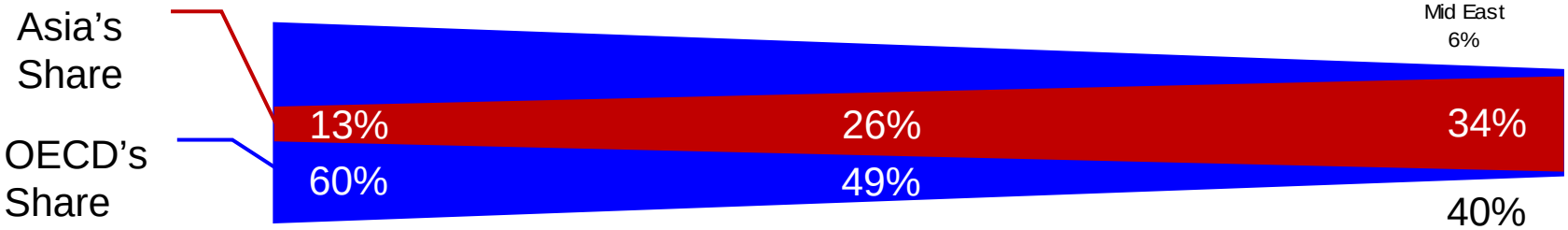



**2005**
**11,435 Mtoe**




**2030**
**17,100 Mtoe (RS)**




Source: IEA Key Energy Statistics 2007. Reference Scenario refers to the business as usual scenario.



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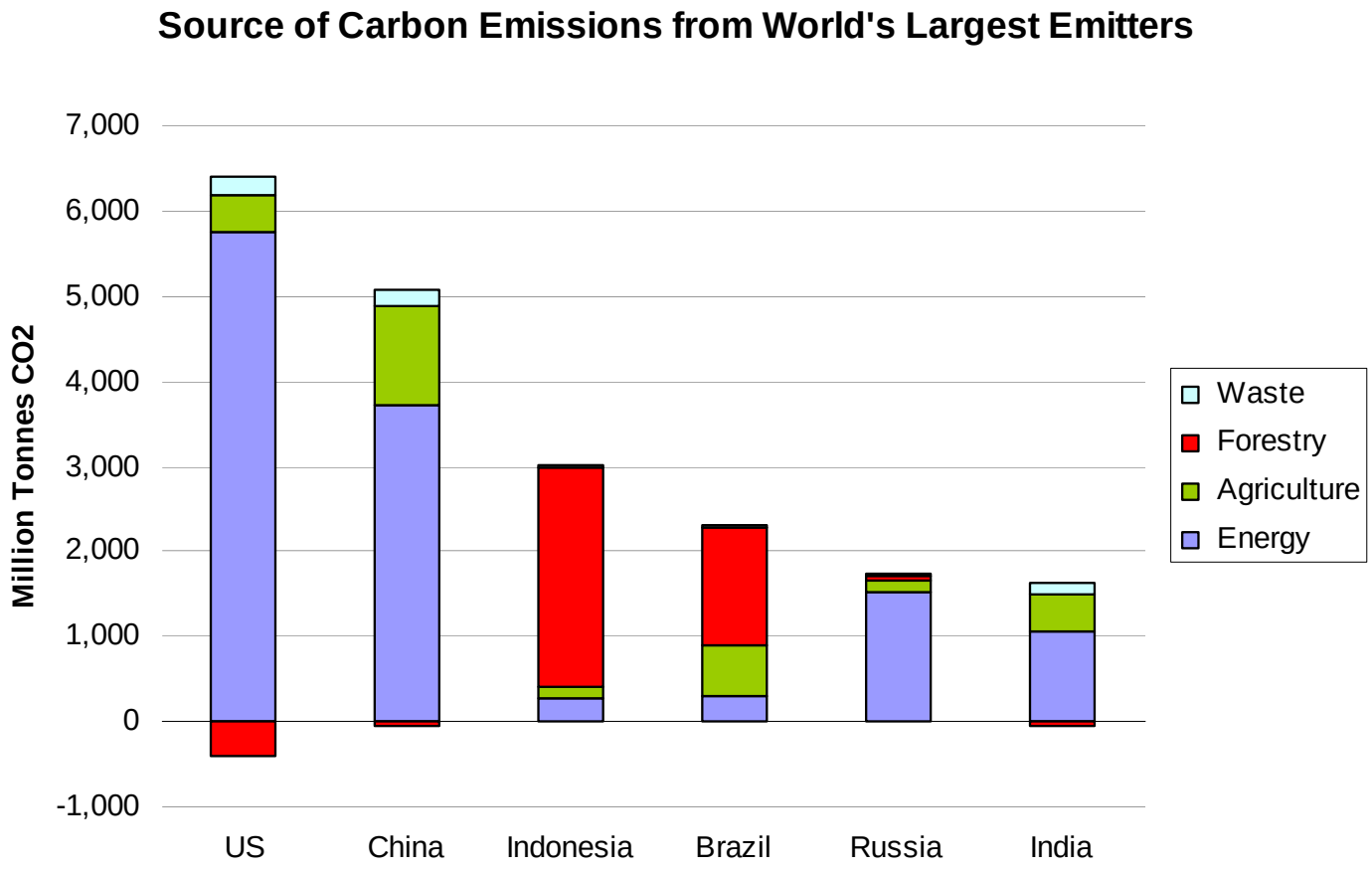
# Climate Change Impacts

## Developing nations have ascended to the ranks of the world's top greenhouse gas emitters




Source: World Bank, DFID, March 2007, "Indonesia and Climate Change".
Note, the European Union would comprise the third largest polluter behind US and China.

# Risks and Opportunities

- Tectonic shifts in the energy sector will require redesign of energy systems and will have broad implications for every economic sector
  - ⇨ Deployment of Clean Energy infrastructure and technology becomes an imperative, not just a “nice to have” mitigation against Climate Change
  - ⇨ Energy efficiency – doing more with less – similarly becomes of paramount importance
  - ⇨ Redesign of urban structures and infrastructure will be required – urban centres will be more dense, with a greater role for public transport
  - ⇨ Develop sustainable land use and improve yields to meet food and biofuel production
  - ⇨ Countries most reliant on energy (e.g. for transport) will be the most vulnerable – e.g. US, Australia and Canada
- Massive investment will be required across every sector – a potential redesign of human activity and our relationship with the environment
- Potential risk of global economic downturn if economic systems are not prepared



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# Scaling Up Clean Energy Investment

# Some observations…

- Principles of investing in clean energy are fundamentally the same as for energy sector investments generally
- Five key areas of difference:
  - ⇨ Reliance on policy and regulatory support
  - ⇨ Carbon assets create supplementary revenue streams
  - ⇨ Transaction size is smaller than for conventional energy
  - ⇨ …attracting non-traditional project developers who lack expertise and capital – particularly in Asia
  - ⇨ Technology (for certain investments – although most projects driven by proven technology)
- Increasing 'wall of capital' focused on sector…
  - ⇨ …but predominantly focused on more mature transactions
- A "market gap" at early stage of project development cycle
  - ⇨ Absence of experienced skill sets
  - ⇨ …and "intelligent" risk capital



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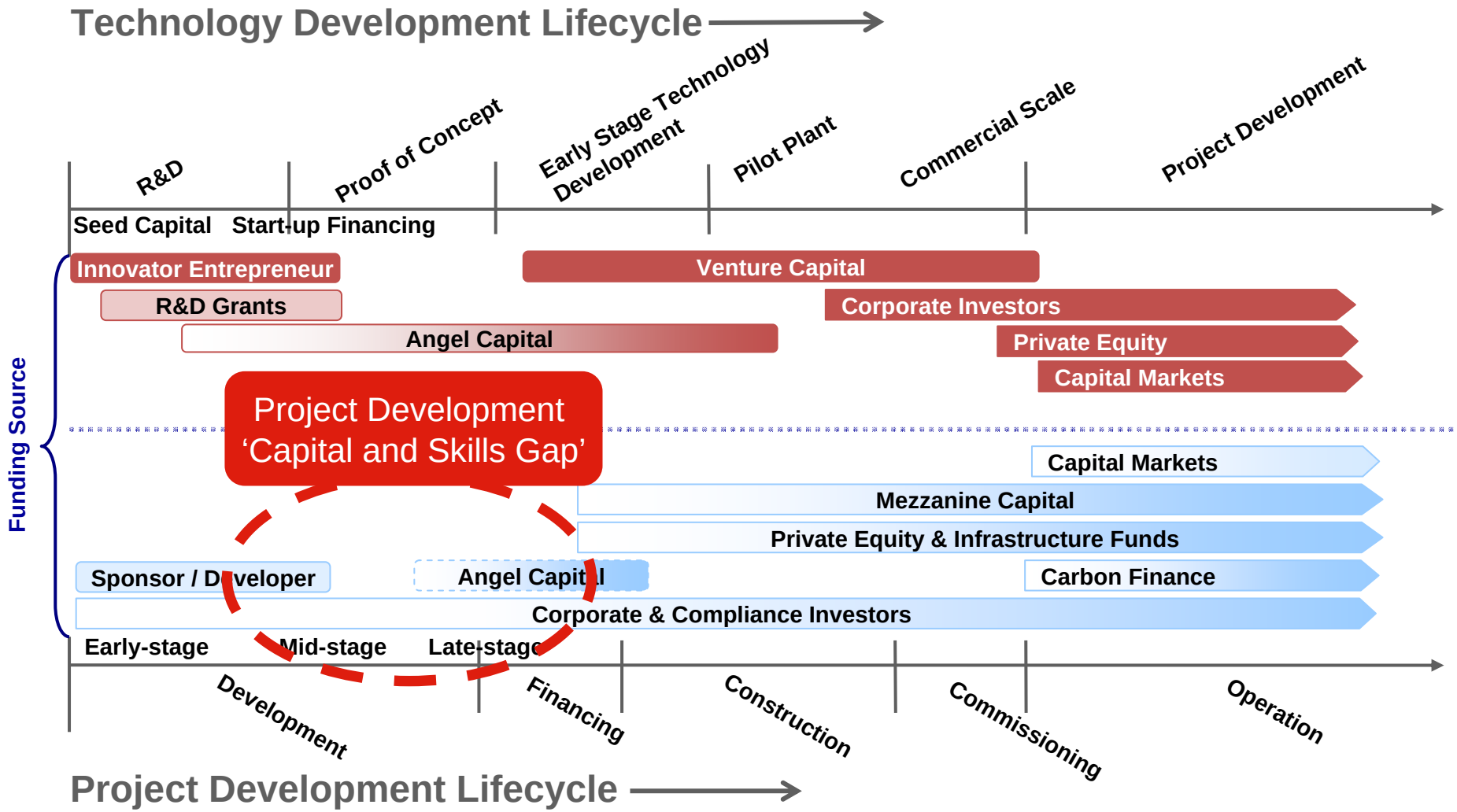
# Asian Clean Energy ‘Capital and Skills Gap’




Source: Josh Carmody and Duncan Ritchie, “Investing in Clean Energy and Low Carbon Alternatives in Asia”. Published by ADB, November 2007.



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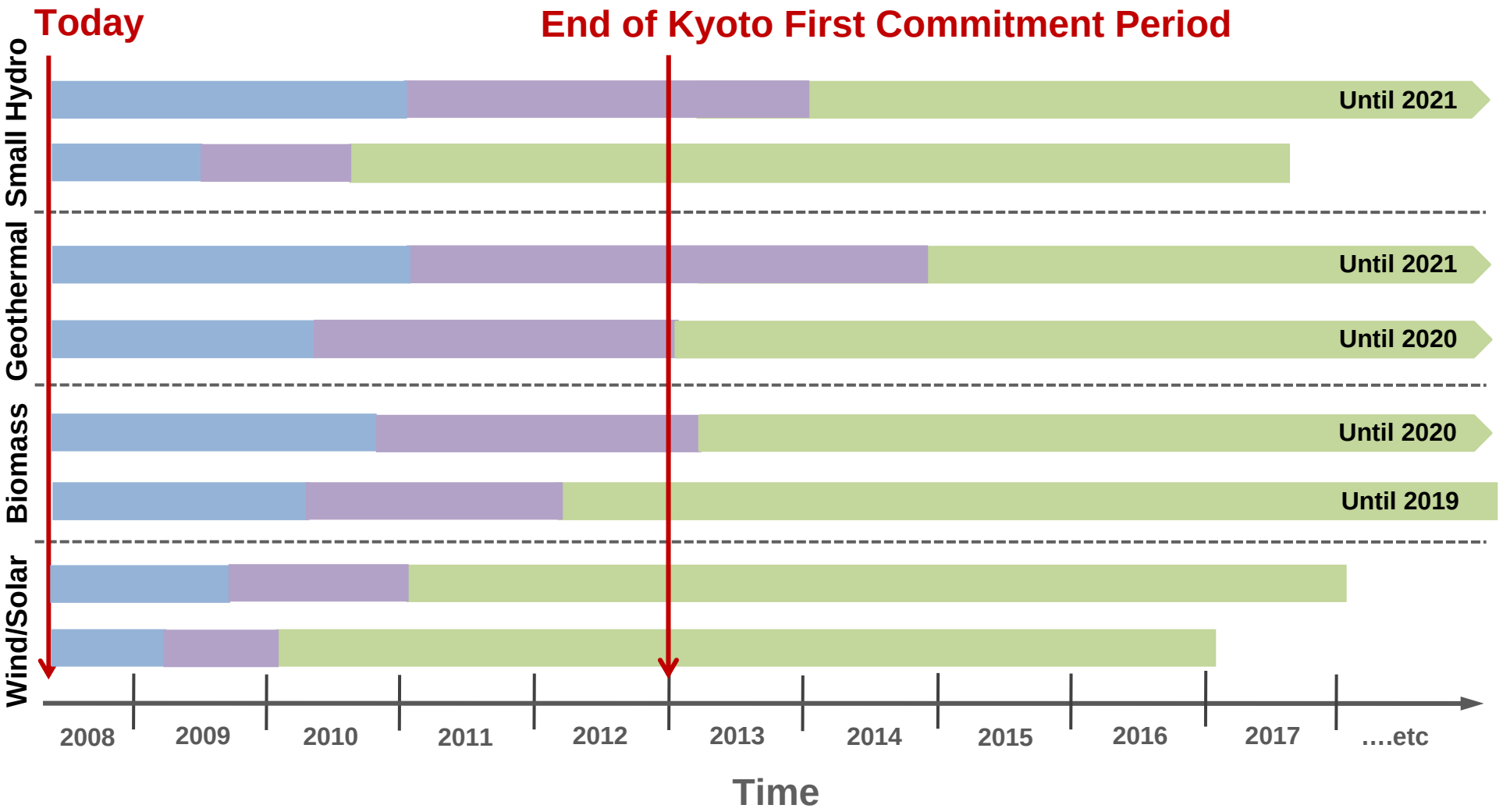
# Project Development Timelines and CDM



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# Conclusions

**“Private capital will flow to markets (and sectors) where policies and related regulatory frameworks that govern investment are well considered, clearly set out and consistently applied in a manner that gives investors confidence over a time scale appropriate to their investment life cycle."†**

**Policy Support + Carbon Price = Investment + Invention**

- **Need to accelerate agreement on Kyoto II**
- **Lack of access to early stage risk capital continues to impair project realization**

† Source: Josh Carmody and Duncan Ritchie, Investing in Clean Energy and Low Carbon Alternatives in Asia. ADB 2007.



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