

BARRIERS IN CLEAN ENERGY PROJECTS

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Finance Symposium**

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Investing in Clean Energy in Asia

❖ Co-authored by:

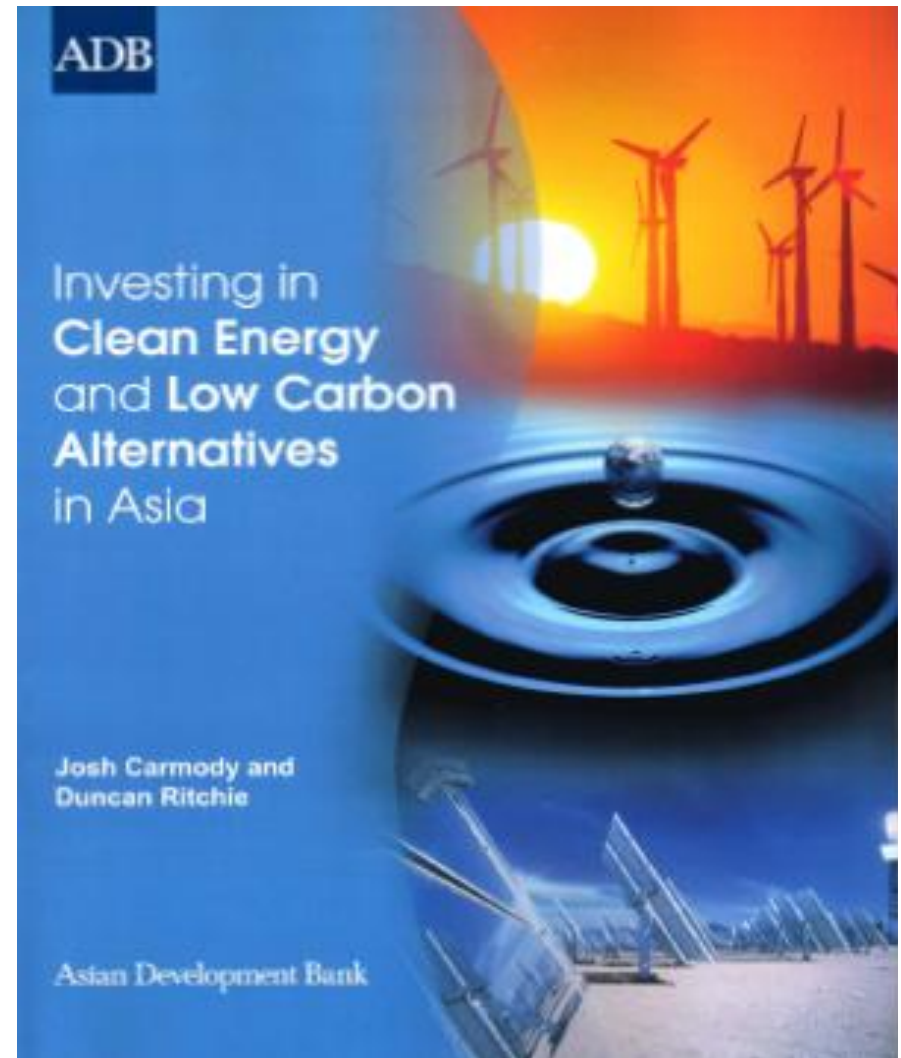
- ⇒ Josh Carmody, ADB, Manager of Asia-Pacific Carbon Fund
- ⇒ Duncan Ritchie, AeQUERO

❖ Premise:

- ⇒ How to achieve order of magnitude increase in clean energy investment in Asia

❖ Perspectives:

- ⇒ Private sector
- ⇒ Governments
- ⇒ Development Finance Institutions



Available as PDF download from the AeQUERO website at www.aequero.com/media

Presumptions

- 🔺 **Need to:**
 - ⇒ Address climate change
 - ⇒ Act quickly to avoid dangerous impact
- 🔺 **Other compelling reasons for promoting clean energy**
 - ⇒ Energy security
 - ⇒ Social benefits
- 🔺 **Move to a sustainable energy pathway**



Image Source: www.flickr.com/photos/sorby/258577150/
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Characteristics of Energy Sector

- ⚠ **Long asset lives – typically 20-30 years**
- ⚠ **Highly capital intensive**
- ⚠ **Resources and markets usually far apart**
- ⚠ **High degree of interconnectivity**
 - ⇒ Requires careful, long term planning
 - ⇒ Results in significant project-on-project dependency... and risk
- ⚠ **Heavy reliance on contractual arrangements... and regulation**
- ⚠ **Relatively stable (low volatility) earnings**
- ⚠ **Traditionally provided by public sector...**
 - ⇒ ...but increasing reliance on private sector due to public sector capital constraints

Lessons, Challenges and Opportunities

- 🔥 Principles of investing in clean energy are fundamentally the same as for conventional energy sector investment
- 🔥 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
 - ⇒ 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

Identified Barriers

- ❖ **Project return profiles not commensurate with risk**
- ❖ **Need for well-designed, supportive policy and regulatory frameworks**
- ❖ **Absence of robust carbon price signal over appropriate timeframes**
 - ⇒ “Black hole” after 2012
- ❖ **Typical transaction size creates financing challenges**
- ❖ **New / prototypical technologies difficult to insure / finance**
- ❖ **“Market gap” at early stage of project development cycle**
 - ⇒ **Absence of experienced skill sets**
 - ⇒ **...and “intelligent” risk capital**

Case Study

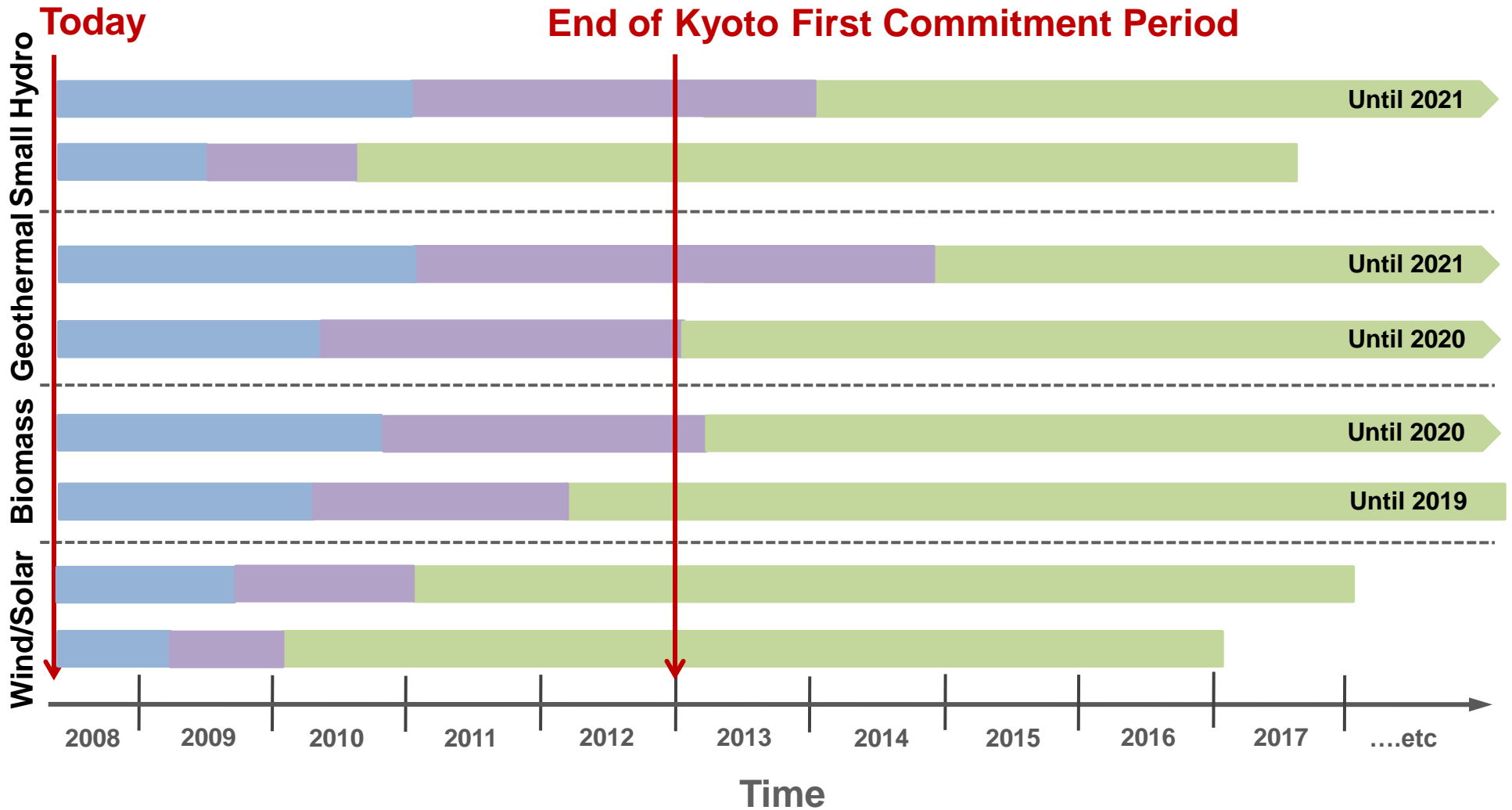
- ❏ **Biomass project with associated reforestation project**
- ❏ **Benefits include:**
 - ⇒ Clean energy and reduction of GHG emissions
 - ⇒ Reforestation of degraded land
 - ⇒ Strong social component – including employment
- ❏ **Policy framework assumes all biomass projects use agricultural waste streams**
 - ⇒ Result in insufficient income for forestry farmers
...or insufficient return to investors
 - ⇒ Working with government to revise energy tariff to suit needs of project...time consuming
- ❏ **Uncertainty of carbon price means carbon income largely discounted by investors / lenders**
 - ⇒ Country presently does not recognise forestry as CDM activity

Case Study

- ✦ Uses proven technology for biomass combustion ...and borrows pulp & paper economic forest model
- ✦ Relatively large for biomass project but below “utility” scale
 - ⇒ Led by local indigenous developer - lacks capital / skills
 - ⇒ Aequero providing advisory services
 - ⇒ Lack of capital at early stage of lifecycle stifling development



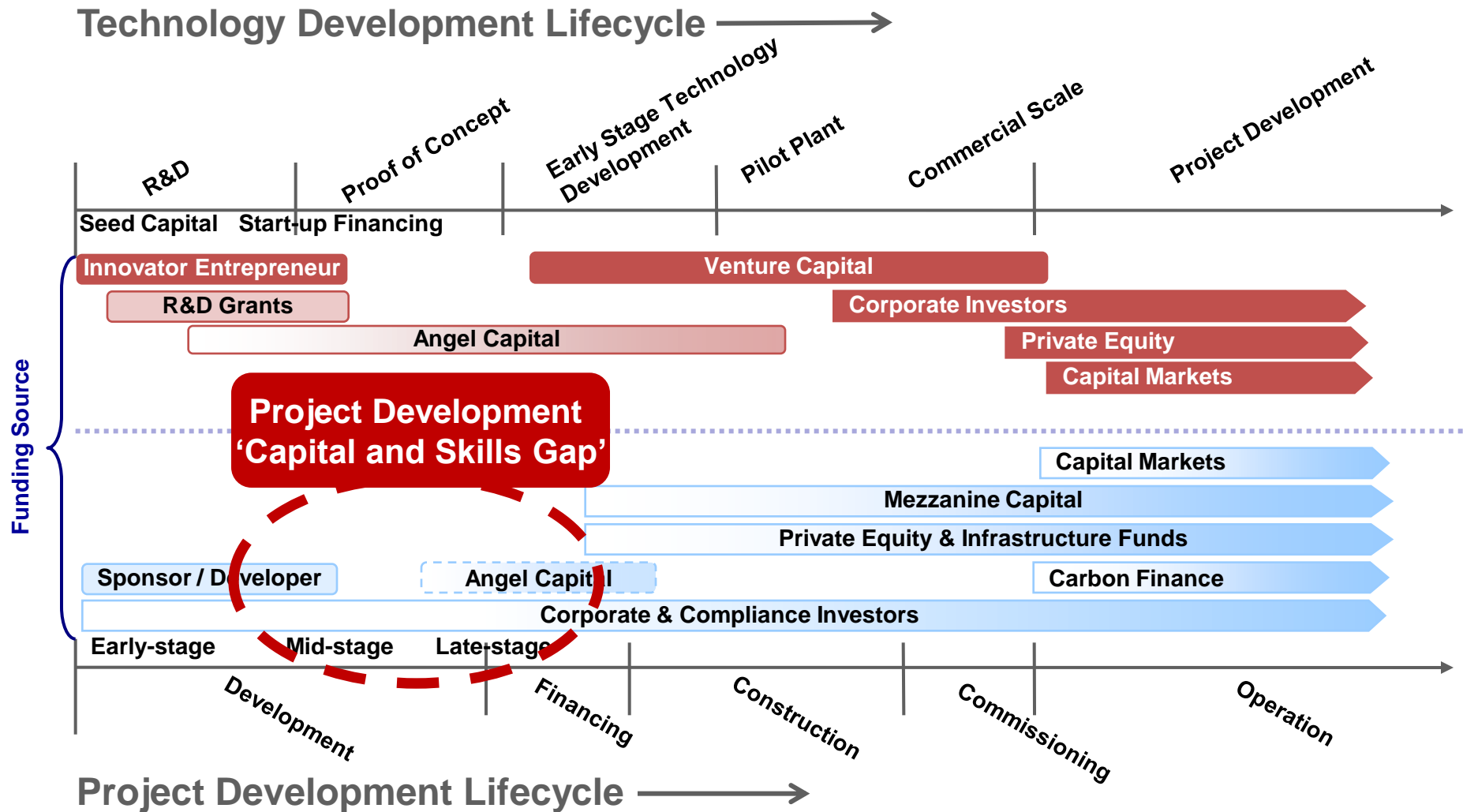
Project Development Timelines and CDM



Development Period
 Construction Period
 CDM Certification Period (7 years)

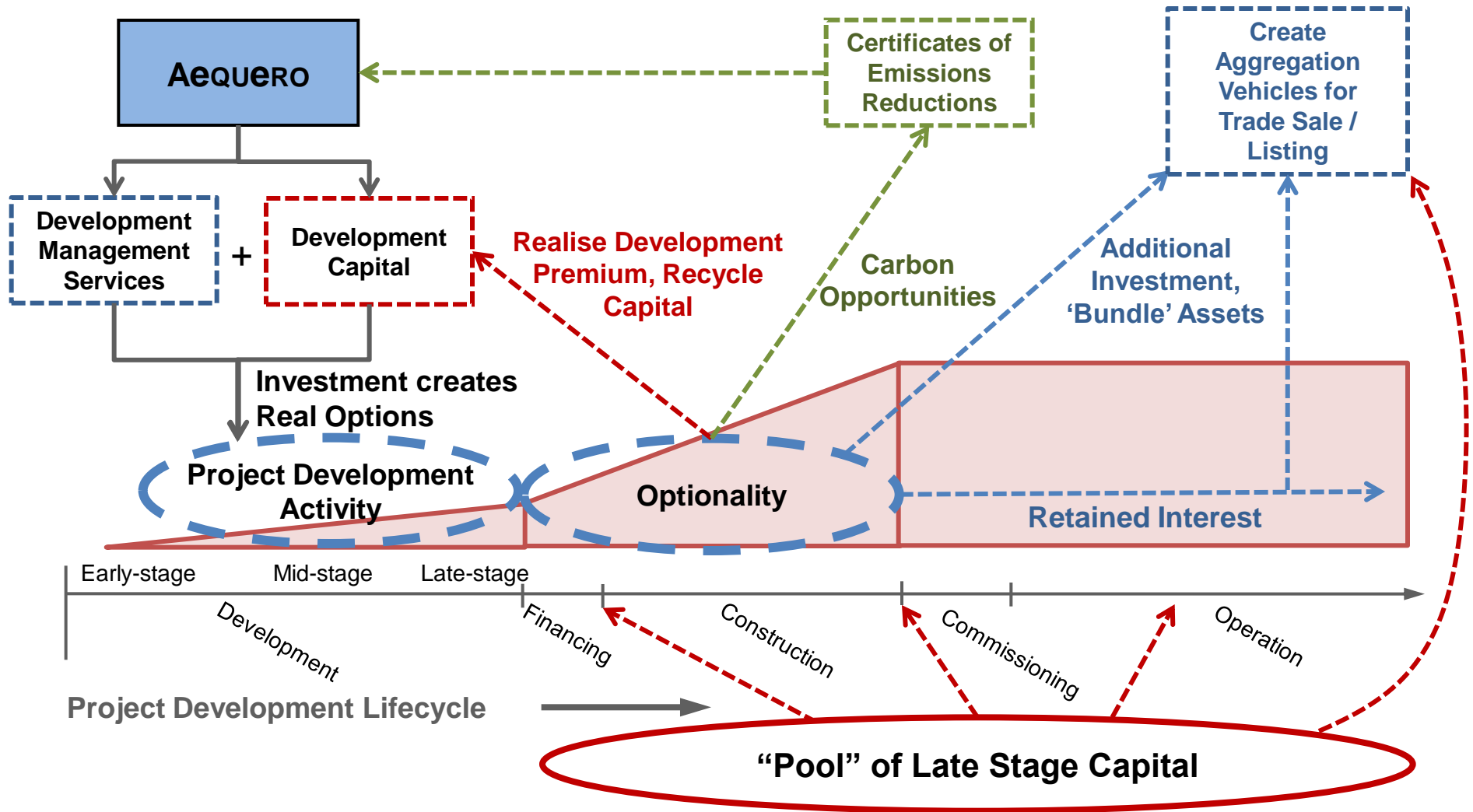


Asian Clean Energy 'Capital and Skills Gap'



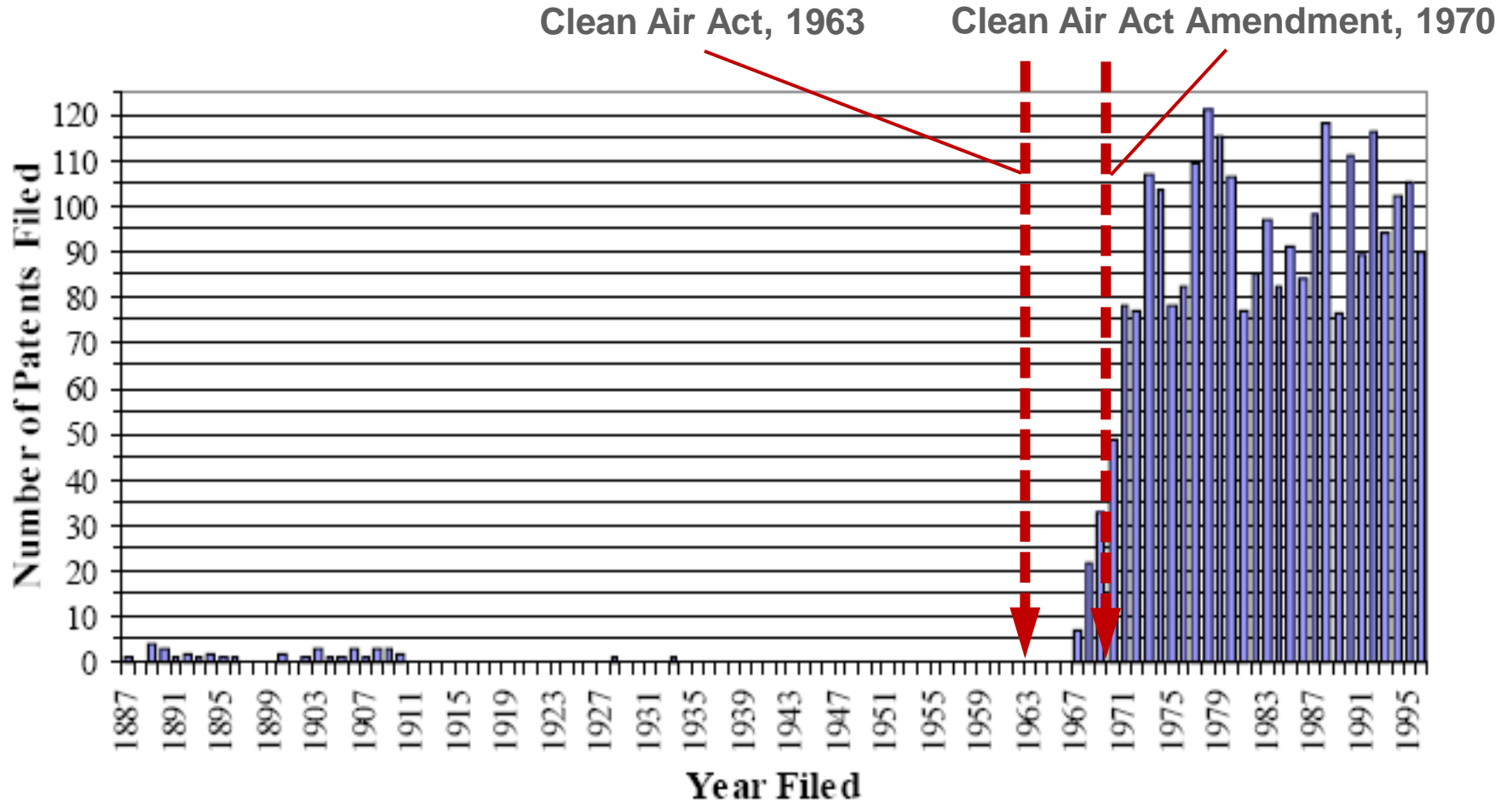
Source: Josh Carmody and Duncan Ritchie, "Investing in Clean Energy and Low Carbon Alternatives in Asia". Published by ADB, November 2007.

Project Development: A 'Real Option'



Regulation “Forces” Technology

US patents relevant to SO₂ control technology



Source: The effect of Government Action on Technological Innovation for SO₂ Control (Taylor, M. R., Rubin, E. S., Hounshell, D. A.). August 2001. Thanks also to Marsh McLennan.

Conclusions

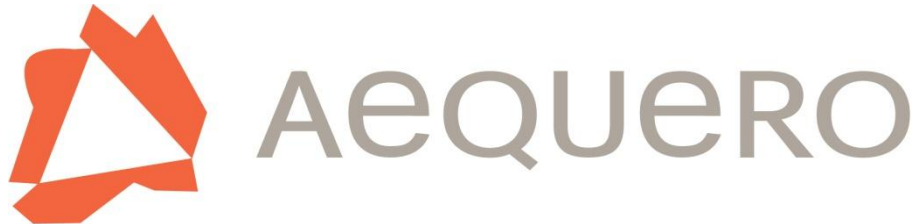
“Private capital will flow to markets (and sectors) where policies and related regulatory frameworks that govern investment are well considered, clearly set out and consistently applied in a manner that gives investors confidence over a time scale appropriate to their investment life cycle.”†

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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