

GHG Reduction Summit Financial Capital Primer¹

Financial capital is an essential part of innovation without which risks cannot be taken and breakthrough solutions cannot be achieved. GHG reduction will require multiple solutions and multiple sources of financial capital – from research funding to pilot projects to product manufacturing. Governments have allocated significant amounts of money to find solutions that will contribute to meeting GHG reduction goals. However, the total dollars needed to implement these solutions is far greater than the funding currently available..

Current literature suggests that there are a number of financial barriers to the development and deployment of clean energy technologies. These include:

- Clean energy technologies are not cost competitive with fossil fuel energy sources – while progress has been made in bringing down the cost of some “clean” technologies (e.g., solar, onshore wind) virtually all of the technologies are more costly than conventional sources.
- The Venture Capital mismatch – investment horizons for venture capital firms do not match the development timeframes for complex clean technology developments (up to 10 years for new device concepts); in most cases, VC’s investments have a timeframe on the order of only three years before exiting.
- Substantial Capital Requirements – The capital requirements to advance the clean technology industry are huge. Given the current level of technology risk and the challenges associated with private finance noted above, governments will have to play a role in catalyzing the market, including providing significant funds.

While government research dollars and venture capital available for early-stage technology development, and project finance is available for large projects when the processes and technologies are already well established (such as new gas fired power plants or many wind projects), there is a gap in the middle – referred to by some as a “valley of death.” Many technologies facing this financing challenge show great promise in addressing climate change, but unless they can traverse this commercialization valley of death, the benefits will never be realized.

Although the commercialization financing gap is only one among a number of constraints, it is a critical one and has implications across the whole clean energy innovation and adoption value chain. In particular, entrepreneurs and early-stage funders will regard a gap in commercialization funding as a potentially fatal barrier to profitably developing their technologies and will hence be less likely to invest in the first place. This impact on innovation is particularly concerning since achievement of GHG reduction targets is likely to require significant technical innovation, not just incremental change.

The commercialization valley of death will not be overcome with one or even a small number of specific actions. No matter what steps are taken by governments and industry participants, it is likely to remain a challenging undertaking to finance first and early commercial-scale projects using new clean energy technologies.

¹ Summarized from CalCEF Innovations, *From Innovation to Infrastructure: Financing First Commercial Clean Energy Projects*, June 2010, http://www.calcef.org/innovations/activities/FirstProjFin_0610.pdf

The aim of those interested in achieving GHG reduction and clean energy goals should be to develop an array of options that improve the prospects for promising new technologies by increasing access to finance and lowering the cost of capital. The challenge will be to do this without excessively distorting valid commercial judgments about risk and viability, and over time, focusing scarce dollars on the most promising technologies. Public sector funds and guarantees are limited and valuable and must be used efficiently if the desired outcome is to be reached in an environment of budget scarcity.

Additional Reading Material

In addition to the article upon which this primer is based, please review the following material:

- Bloomberg New Energy Finance:
 - *Crossing the Valley of Death: Solutions to the next generation clean energy project financing gap*, June 2010,
http://www.cleangroup.org/Reports/CEG_BNEF-2010-06-21_valleyofdeath.pdf