



مركز الملك عبدالله للدراسات والبحوث البترولية  
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# Long Run Climate Change Analysis – Policy Implications

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# Summary of Policy Implications

- Incorporating all costs is crucial to efficient outcomes.
- Research and development of low-carbon technology must be a priority.
- Government support for low-carbon technology in the marketplace can bring challenges.
- Crucial uncertainties demand flexible and adaptable policy responses.

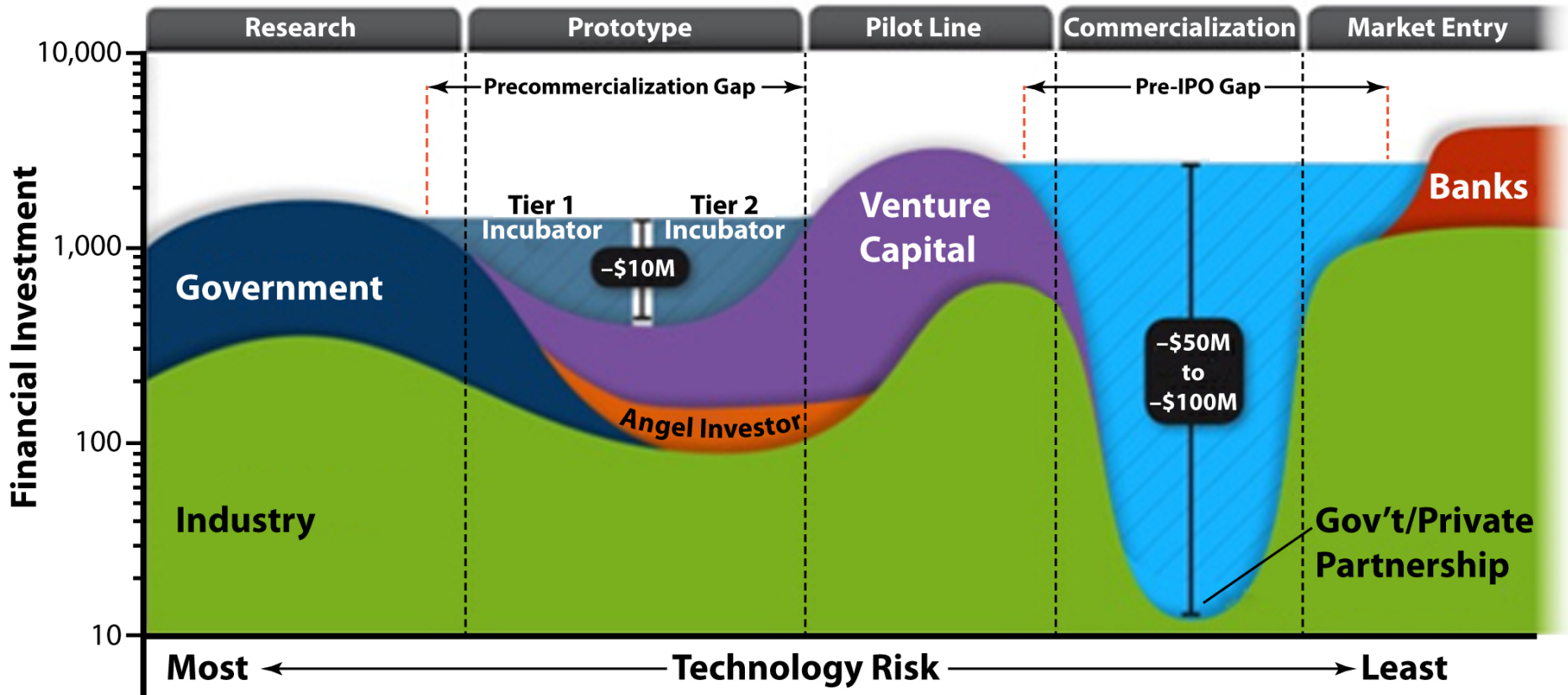
# Incorporating all costs is crucial to efficient outcomes.

- Total cost of climate change to society = mitigation + adaptation + damage
  - At high levels of mitigation, adapting to temperature change or living with the damage are less costly than mitigation.
- The scenario with 50% reductions by 2050 is very difficult to justify from an economic point of view.
- On the other hand, the NDCs from the Paris Accord are not sufficient to reach our optimal emissions pathways.
- Don't let perfect become the enemy of good. The Paris Accord recognizes this with its bottom-up strategy and flexibility.

# Research and development of low-carbon technology must be a priority.

- 21<sup>st</sup> Century economies depend on electricity – we must get this transition right.
- Low-carbon technologies must be cost-effective (including CO<sub>2</sub> externality).
- Focus government money where it is needed the most, on research and development to promote efficient invention and innovation.
  - Private industry will underinvest in basic R&D because the commercial payoff is not yet clear.
  - Moving from pilot phase to full commercialization requires a great deal of capital: the “commercialization valley of death”.

# New Technology Path Toward Commercialization



Source: Sandia National Lab

# Government support for low-carbon technology in the marketplace can bring challenges.

- Deployment of still-maturing energy technologies in the marketplace should be undertaken as a means to increase knowledge and spur further invention, not as an end in itself.
- Technology-agnostic policy tools are best – accounting for externalities on a whole-economy basis and setting the playing field for low-carbon technologies to succeed.
- A strong push to bring technologies into the marketplace before they are ready can lock in less efficient and more expensive technology and squeeze out cost-effective innovations.
- Climate change policies will need intergenerational public support. If government spends too much and gets too little, it will lose public support, jeopardizing policy implementation.

# Crucial uncertainties demand flexible and adaptable policy responses.

- We will never reach a stage where we fully understand the climate system. Policy must be adaptable and responsive as science produces new information.
- The Paris Accord anticipates revisions and refinements every five years and allows countries to take into account their changing economic and social conditions.
- A practical approach involves making the best decisions possible using today's science, without locking in overly expensive technologies to reduce emissions or ignoring the risks and waiting for better information.
- The transition to a low-carbon energy system will take generations.
  - We need a revolution in low- and zero-carbon energy technologies,
  - But we will see an evolution of the energy system over time. The world's vast energy system cannot change in an instant.