Investing in Nanotechnology

Bridging the ‘Valley of Death’

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Bridging the Valley of Death

- Industry Track Record
- Barriers to Commercialization
  - The Scientist’s View
  - The CEO’s View
- Copenhagen
- Washington, DC
Industry Track Record

- Return on Capital - unacceptable
  - Industry Structure
    - Operating Leverage
    - Returns to scale
    - Globalization
  - Investment in Technology - “C” students

- Investment in Pre-competitive Research
  - PAPRICAN
  - FERIC
  - IPST
Projects with potential to renew the enterprise are left to wither and die. Is the Valley that bad?

- Carboxylated Fiber; nano-coatings; acetylated wood
- Impulse drying; chitosan additive
- “Simple” engineering problems shutdown viable projects
- Management is oblivious to the risk of the deteriorating base case
Barriers to Commercialization
The CEO’s View of the Valley

- Operational, Customer Driven, & Innovative-
  It is almost impossible to have it all
- Early adopters almost inevitably underestimate the challenges
  - Materials of construction; bearings; seals; NPE
  - Energy balances; marginal costs; business expenses
- The first mover’s advantage is overwhelmed by the disruption of the business
The United Nations Framework Convention on Climate Change (UNFCCC-1992)

- In force in 1994
  - Promote and cooperate in the development, application and diffusion, including transfer, of technologies
  - Support international and intergovernmental efforts to strengthen systematic observation and national scientific and technical research capacities and capabilities

COP 15

- Energy and Materials Revolution
- Intellectual Property regime revision
American Recovery and Reinvestment Act of 2009
- High-risk, High-payoff transformational R&D funding
- The US will work actively to make your R&D succeed

Advanced Research Projects Agency-Energy (ARPA-E) is being created to disrupt the status quo
- Bayh-Dole Act class waiver
- Nine levels of technological readiness
Guarded Optimism

- Explicit learning curves
- Option Values
- Global players
  - Risk tolerance
  - Focus
  - Scale
Thank you

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