Clean Energy Investment Center

“Addressing Challenges in Clean Energy Investment”
Clean Energy Solutions Center Webinar

Dr. Sanjiv Malhotra, Director
Key Observations

- Massive need for new capital for deployment to achieve the 2 degree Celsius warming limit

- Growth of solar and other emerging clean energy technologies

- Demand for new energy will be driven by the emerging economies, especially China, India, and sub-Saharan Africa

- Importance of Innovation
Revolution Now Report: Exciting Future from Economies of Scale

Solar PV

Wind

Lithium-Ion Batteries

LED Lighting
NEW SOLAR AND WIND CAPACITY ADDED 2014-15

**Solar**

<table>
<thead>
<tr>
<th>Year</th>
<th>Investment</th>
<th>New capacity</th>
</tr>
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<tbody>
<tr>
<td>2014</td>
<td>$144bn</td>
<td>46GW</td>
</tr>
<tr>
<td>2015</td>
<td>$162bn</td>
<td>57GW</td>
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**Wind**

<table>
<thead>
<tr>
<th>Year</th>
<th>Investment</th>
<th>New capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>$106bn</td>
<td>49GW</td>
</tr>
<tr>
<td>2015</td>
<td>$110bn</td>
<td>64GW</td>
</tr>
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Source: Bloomberg New Energy Finance
NEW INVESTMENT IN CLEAN ENERGY AND Brent CRUDE SPOT PRICE 2004-15 ($BN)

Source: Bloomberg New Energy Finance
Early- and late-stage VC funding rounds as well as funds raised privately for the purposes of expansion by companies that are primarily involved in the clean energy industry according to BNEF exposure ratings.

Note: Total values include estimates for undisclosed deals.
The need for additional sources of clean energy technology investment

Global Early-Stage Cleantech VC Investment: 2005-2014 ($ millions)

Note: This data includes Seed, Series A, and Tech/Early-spinoff deals.
The Cleantech Valley(s) of Death

1st Valley of Death

2nd Valley of Death
DOE Programs Support the Full Arc of Commercialization

**R&D:**
- DOE Labs
- ARPA-E ($300 MM/yr)

**Demonstration:**
DOE Applied Science Programs
- Energy Efficiency & Renewable Energy (EERE) ($2 B/yr)
- Others
  - Fossil Energy (FE) ($800 MM/yr)
  - Nuclear Energy (NE)

**Initial Commercial Deployment:**
DOE Loan Programs Office (LPO)
($32 B Portfolio)

**Commercial Financing:**
Private Sector Financing (Banks & Bond Market)

**Technology Maturity**
- Most
- Least

**Technology Risk**
- Most
- Least

**Commercial Maturity**
- Most
- Least

**Financing Models:**
- Debt: US Gov’t Equity: Private
- Debt: Private Equity: Private
- Private Sector Financing (Banks & Bond Market)

**Grants**
- DOE Labs
- ARPA-E ($300 MM/yr)
Mission Innovation at COP 21

November 30, 2015 Announcement at Paris COP

Commitments:
- **Mission Innovation**
  - 20 Country Commitments to Expand Clean Energy R&D
  - Counties cover more than 80% of global carbon emissions

- **Breakthrough Energy Coalition**
  - Private Sector Investment Commitments
  - 27 investors
  - Led by Bill Gates
Clean Energy Investment Center

**Laboratory Partnering Service**
- Connection Platform for Investors and SMEs at National Labs

**Laboratory – Investor Knowledge Seminars (LINKS)**
- Meetings between DOE National Laboratories and Investors
- Discussions of Partnership Opportunities

**Innovation Interface (I2)**
- Sessions at DOE HQ with Investors and DOE Technical Experts/Program Managers

**Project Data Initiative**
- Provide access to DOE portfolio of investable clean energy opportunities

**Technical Assistance**
- Share research and analysis produced by DOE and its National Laboratories on relevant developments in clean energy technology.
For more information:

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