1. The next 15 years is critical for the clean energy transition
Climate performance off track: next 15 years critical

Source: IPCC
Fossil fuel reserves exceed the carbon budget

Source: ODI analysis of data from Shearer, Ghio, Myllyvirta & Nace. 2015. Tracking the Global Coal Plant Pipeline. Sierra Club.

NOTE: The figure shows the implied CO2 emissions of conventional and likely unconventional fossil fuel reserves vs. the remaining CO2 budget for given probabilities of staying below 2°C above pre-industrial levels. Budgets are adjusted for likely non-CO2 emissions. Resource estimates are much greater, particularly for coal (30,000-40,000 Gt for coal, 2,000-5,000 Gt for gas, and 1,000-1,500 Gt for oil). Estimates for unconventional gas are highly uncertain, with little agreement on what resources are appropriately classified as reserves.

SOURCES: Sources: For carbon budgets: IPCC, 2013; fossil fuel reserves shown are ranges for mid-point estimates of a range of different sources, including BGR, 2013; BP, 2014; IEA, 2013; World Energy Council, 2013.
OECD coal still consumes most of the CO2 budget, and addition of China and India’s coal bursts it

Requires rapid decommissioning, regardless of clean energy targets

Requires re-steering pipeline of new build

Source: The Overseas Development Institute analysis of data from Shearer, Gho, Myllyvirta & Nace. 2015. Tracking the Global Coal Plant Pipeline. Sierra Club.
The costs of solar and wind energy have plumeted

Solar power costs over time
USD/MWh

Wind power costs over time
USD/MWh

Note: Assuming coal price of 70 USD/tonne and gas price of 10 USD/Mmbtu. Assuming a 35% capacity factor for wind power i.e. 35% utilisation, and a 15% capacity factor for solar power

Sources: Citi Research 2012; G. F Nemet, “Beyond the learning curve”, Energy Policy 34, 3218-3232 (2006); Bloomberg NEF (Turner 2013); IEA World Energy Outlook 2013, WEO 2012; Lazards 2015
In each of last three years, more low-carbon electricity capacity was added than fossil fuel capacity (GW)

Investments in low-carbon energy have increased, but 2/3 still goes to fossil fuels

Investment in global energy supply by fossil fuel, non-fossil fuel (renewable energy, nuclear, biofuels) and transmission & distribution in the power sector.

2. There is no capital shortage for clean energy
Capital pools for clean energy and infrastructure

Annual projections for 2015-2030, in US $trillion

- Fixed capital investment: 26.70
- Green infrastructure need: 6.30
- BAU infrastructure need: 6.0
- Current infrastructure spend: 1.70
- Current development finance: 0.14
- Climate finance target: 0.10 (from 2020)

Source: Granoff, I et al. The nested barriers to green infrastructure development (forthcoming)
Private Finance: The allure of institutional capital

- Institutional investors control over US$71 trillion of assets
- OECD estimates that less than 1% of their assets are currently allocated to direct infrastructure investment, of which clean energy infrastructure is a small fraction
- New financing vehicles like green bonds and YieldCos are growing rapidly, and can reduce liquidity risk and transaction costs, opening clean energy to a wider range of investors.

**Good fit**
- High upfront cost
- Long stable cash flow
- Social Mandate

**Poor fit**
- Liquidity risk
- Unfamiliar asset

**Capital markets solution**
- Bundle assets, sell:
  - Debt: green bonds
  - Equity: yieldcos
- More liquid
- Easier due diligence

Source: Overseas Development Institute
3. Technology is already competitive, but power sector private financing is designed around fossil fuels.
Private Finance: New models better fit to renewables could reduce capital costs by 20%

<table>
<thead>
<tr>
<th>Wind power financing options</th>
<th>Typical wind project today costs ~$80/MWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Finance</td>
<td>Impact of financial crisis: shorter term increases costs by 15-24%</td>
</tr>
<tr>
<td>Project Finance with 7-Year Debt</td>
<td>Selling projects to other investors only lowers prices by 1-3%</td>
</tr>
<tr>
<td>Sell Down</td>
<td>Utilities financing on balance sheet could reduce cost by 2-5%</td>
</tr>
<tr>
<td>Corporate Finance</td>
<td>YieldCos and Muni finance could reduce costs by ~20%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Levelized Cost of Energy ($/MWh)</th>
<th>Change in Cost from Current Industry Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>!$0$, $20$, $40$, $60$, $80$, $100$!</td>
<td>!$-20%$, $-10%$, $0%$, $10%$, $20%$!</td>
</tr>
</tbody>
</table>

Private Finance: Using capital markets to close the clean energy gap

Portion of large pension funds assets allocated to unlisted infrastructure

Average asset allocation of large pension funds, 2013

52% fixed income and cash
32% listed equity
15% Other

Green bonds
Pool of pension fund capital that green debt and equity securities could target

Yieldcos

Source: Granoff, I et al. The nested barriers to green infrastructure development (forthcoming)
4. Public finance also still favors fossil fuels, but DFIs can leverage shift, redesigning the sector around the benefits of clean energy.
Public finance: MDBs and DFIs have a significant role to play in scaling up five forms of international cooperation

Convening initiatives
- These allow public and private institutions to share best practices. Many problems and solutions are common across countries (e.g. Global Innovation Lab for Climate Finance)

Risk mitigation initiatives
- Allow investors to assemble portfolios that meet their risk-return and liquidity requirements.

Standardisation
- Standardize data, methods of measurement, project documentation and processes and qualifications to reduce transaction costs and enable large-scale financing.

Technical assistance for project development
- to create a pipeline of projects, which reduces market risk to developers and manufacturers.

Supportive national policy frameworks
- Improve the investment environment for clean energy.
Public finance: reshape current power sector policies and institutions that unfairly favor incumbent technologies

Public financing: Public resources should go where capital markets don’t

Research & Development
- Grants
- Innovation prizes
- Intellectual property laws
- Scholarships
- Technical research institutes
- Science parks
- Technology transfer offices
- National innovation agencies

Pre-Commercialisation
- Demonstration projects
- Soft loans
- Contingent grants
- Subordinated debt
- Public venture capital
- Performance-based grants
- Business incubators and accelerators
- loan guarantees

Commercialisation
- Carbon pricing
- Feed-in tariffs
- Renewable portfolio standards
- Deal standardization
- Public procurement
- Reverse auctions
- Emission reduction underwriting mechanisms
- Loan guarantees
- Product standards and certification

Higher risk/return
Lower risk/return

Source: The Overseas Development Institute