Catalysing Investment in Low-Carbon, Climate Resilient Growth

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1. Investment activity

2. Clean energy sectoral trends

3. Near-term issues

4. Thoughts on solutions
GLOBAL TOTAL NEW INVESTMENT IN CLEAN ENERGY 2004–10 ($BN)

Note: Includes corporate and government R&D, and small distributed capacity. Adjusted for re-invested equity. Does not include proceeds from acquisition transactions.

Source: Bloomberg New Energy Finance
CLEAN VS FOSSIL-BASED GENERATING CAPACITY INVESTMENT, 2004–10 ($BN)

Source: IEA, EIA, Bloomberg New Energy Finance

Note: Investment for new build – fossil fuel calculated from EIA & IEA numbers, clean energy taken from Bloomberg New Energy Finance totals. Clean energy capacity includes small distributed capacity.
DRIVERS OF INVESTMENT GROWTH, 2009–10 ($BN)

**EUROPEAN ROOFTOP SOLAR**

- 2009: 21.0
- 2010: 46.2

+120%

**CHINA**

- 2009: 39.2
- 2010: 51.1

+30%

Source: Bloomberg New Energy Finance
GLOBAL CLEAN ENERGY STIMULUS SPENDING BY YEAR, 2011–2013 ($BN)

Global total = $193.9bn

Note: 2011–13 according to Bloomberg New Energy Finance expectations

Source: Bloomberg New Energy Finance
NEW FINANCIAL INVESTMENT IN CLEAN ENERGY
Q1 2004–Q3 2011 ($BN)

Four quarter running average

Note: Excludes corporate and government R&D, and small distributed capacity. Not adjusted for re-invested equity

Source: Bloomberg New Energy Finance
New financial investment in clean energy in Amer Q1 2004–Q3 2011 ($BN)

Four quarter running average

Note: Excludes corporate and government R&D, and small distributed capacity. Not adjusted for re-invested equity.

Source: Bloomberg New Energy Finance
NEW FINANCIAL INVESTMENT IN CLEAN ENERGY IN EMEA
Q1 2004–Q3 2011 ($BN)

Note: Excludes corporate and government R&D, and small distributed capacity. Not adjusted for re-invested equity

Source: Bloomberg New Energy Finance
NEW FINANCIAL INVESTMENT IN CLEAN ENERGY IN ASOC
Q1 2004–Q3 2011 ($BN)

Note: Excludes corporate and government R&D, and small distributed capacity. Not adjusted for re-invested equity

Source: Bloomberg New Energy Finance
ASSET FINANCE FOR NEW BUILD CLEAN ENERGY – TOP 15 COUNTRIES, 2010 ($BN)

- China: 47.3
- United States: 20.7
- Brazil: 6.9
- Germany: 6.2
- Italy: 4.8
- Spain: 4.6
- Canada: 4.4
- India: 3.2
- Belgium: 2.4
- Mexico: 2.3
- United Kingdom: 2.2
- Australia: 2.2
- Portugal: 1.8
- Pakistan: 1.5
- Poland: 1.4

Note: Total values include estimates for undisclosed deals

Source: Bloomberg New Energy Finance
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Source: Bloomberg New Energy Finance
THE PV MODULE EXPERIENCE CURVE, 1976–2011 ($/W)

Source: Paul Maycock, Bloomberg New Energy Finance, FSLR filings

Notes: Inflation adjustment using US PPI, R2 of c-Si regression = 0.94, R2 of FSLR regression = 0.98

Bloomberg New Energy Finance, FSLR filings
RESIDENTIAL PV PRICE PARITY

$/kWh average residential power price

Note: LCOE based on 6% weighted average cost of capital, 0.7%/year module degradation, 1% capex as O&M annually. $3.5/W capex assumed for 2011, $2/W for 2015.

Source: Bloomberg New Energy Finance
'CHINA' AND 'INTERNATIONAL' SPOT PRICE OF SOLAR-GRADE SILICON, MAY 2009 – 24 OCTOBER 2011 ($/KG)

Note: For longer-term spot prices, see Appendix. Starting 11 July 2011 the Index is conducted weekly and the dates in chart represent first day of the week.

Source: Bloomberg New Energy Finance Solar Spot Price Index
SPOT PRICES OF WAFERS AND CELLS, MAY 2009-17 OCTOBER 2011 ($/W)

Note: See methodology about conversion. Starting 11 July 2011 the Index is conducted weekly. The dates in chart represent first day of the week for which the price applies.

Source: Bloomberg New Energy Finance Solar Spot Price Index
UTILITY-SCALE PV SYSTEM PRICE FORECAST, 2010-2020 (2010 $/W)

Source: Bloomberg New Energy Finance
ASSET FINANCE FOR LARGE-SCALE SOLAR PROJECTS, 2007-Q3 2011

Note: Based on individual deals tracked, with a 'buffer'; subject to change, usually upwards, as more deals are discovered. Source: Bloomberg New Energy Finance
Note: Plotted against cumulative global installed capacity. All prices are real EUR. Each marker represents one year for the corresponding series. ExTool data is for Denmark and Germany. BNEF Rest of World (RoW) is BNEF Wind Turbine Price Index, excluding Asian turbine contracts. BNEF China is domestic turbine contracts.

Source: Bloomberg New Energy Finance, ExTool
LEVELIZED COSTS: BEST NEW WIND VS NEW COAL ($/MWh)

Perception:

Wind 120
Coal  30

- New coal must cover cost of capital
- New coal requires advanced pollution control
- Wind turbines back to 2005 prices, but now perform much better
- Wind bankability has driven down cost of capital
- Coal suffers from carbon price risk

Reality:

Wind  65
Coal  68

Source: Bloomberg New Energy Finance
Electric vehicles - past
ELECTRIC VEHICLES - PRESENT
LITHIUM-ION BATTERY PACK COST, TRACTION BATTERY PRODUCTION, 2010–30

Note: Total pack cost includes the battery management system.

Source: Bloomberg New Energy Finance
GLOBAL EV CAPACITY, 2011 (‘000 VEHICLES)

73,714

Global auto & light commercial vehicle production*

* Figures from 2010

Source: OICA, L'Argus, Bloomberg New Energy Finance
500+ SMART GRID PROJECTS WORLDWIDE

CANADA
Smart meters and automation in Ontario and BC

USA
Over 200 projects; $4.5bn stimulus for smart grids

UK
100% smart metering by 2019; GBP 500m for Low Carbon Networks

EU
80% smart metering by 2020; Over 100 projects

CHINA
High voltage “Strong Smart Grid”; 48m smart meters by 2010.

JAPAN
Multiple pilots

SOUTH KOREA
Jeju Island pilot; Nationwide smart grid by 2030

SINGAPORE
Smart metering pilot 2011–12

BRAZIL
Proposed smart metering mandate; large-scale pilots

AUSTRALIA
Smart metering in Victoria; Newcastle Smart Grid, Smart City project

NEW ENERGY FINANCE
Worldwide computer and storage power, 1980 - 2010

Source: Seagate; PhysOrg.com; Computer Industry Almanac; Bloomberg New Energy Finance
Case study: mobile telephony

US telecoms revenue split ($bn)

US fixed line vs mobile prices ($/min)

Source: Federal Communications Commission; Bloomberg New Energy Finance
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EUROPE – FINANCIAL CRISIS

Source: AP
GREECE SENIOR 5-YEAR USD DENOMINATED CDS
CDS SPREADS - PORTUGAL
SPAIN SENIOR 5-YEAR USD DENOMINATED CDS
ITALY SENIOR 5-YEAR USD DENOMINATED CDS

Bloomberg Terminal
FRANCE SENIOR 5-YEAR USD DENOMINATED CDS
US – CLIMATE SCEPTICISM
GLOBAL CLEAN ENERGY STIMULUS SPENDING BY YEAR, 2011–2013 ($BN)

Global total = $193.9bn

Spent = $94.8bn, 49%
Unspent = $31.1bn, 16%

Note: 2011–13 according to Bloomberg New Energy Finance expectations

Source: Bloomberg New Energy Finance
MARGINAL COST OF GAS-LEVERED PRODUCERS AND HENRY HUB PRICE FORECAST ($/MMBTU)

Source: Bloomberg New Energy Finance   Note: Basket comprises 17 E&P companies with an average 85% gas/liquids production ratio and combined 2010 output of 4,250Bcf. ‘DD&A’ is depletion, depreciation and amortisation; ‘G&A’ is general and administrative expenses.
NET COSTS OF FEED-IN TARIFFS (EUR BN)

Source: Bloomberg New Energy Finance
NEX CLEAN ENERGY INDEX 2003 – 30 SEPTEMBER 2011

Note: Values as of 30 Sep 2011; AMEX Oil, NASDAQ and S&P 500 rebased to 100 on 01 Jan 2003

Source: Bloomberg New Energy Finance
CHINA POWER CAPACITY ADDITIONS BY TECHNOLOGY, 2001-11E (GW)

Source: China Electricity Council, Bloomberg New Energy Finance
WORLD’S LARGEST BANKS BY TOTAL BALANCE SHEET ($ BN)

Note: as at 16 September 2011

Source: Bloomberg
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Accelerating the shift to clean energy

1. Level playing field
   - Remove subsidies
   - Neutralise externalities
   - Improve risk transparency
   - Remove barriers to innovation
     - **Accelerated retirement**
     - **Utility regulation**
   - Trade barriers
   - Standards
   - Financial regulation (risk, solvency vs liquidity)

2. Smart support
   - Importance of price discovery
   - TLC = transparent, limited, carefully applied
   - Focus on R&D or cost reduction
   - Avoid “green jobs” fallacy
   - Education & Skills
   - Public procurement
   - Climate finance
   - APPROPRIATE use of PPP
   - Communications / Leadership
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Carbon Capture & Storage  
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Water  
Nuclear

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