

GLOBAL TRENDS IN CLEAN ENERGY (ABRIDGED VERSION)

NORTH CAROLINA SUSTAINABLE ENERGY ASSOCIATION:
MAKING ENERGY WORK

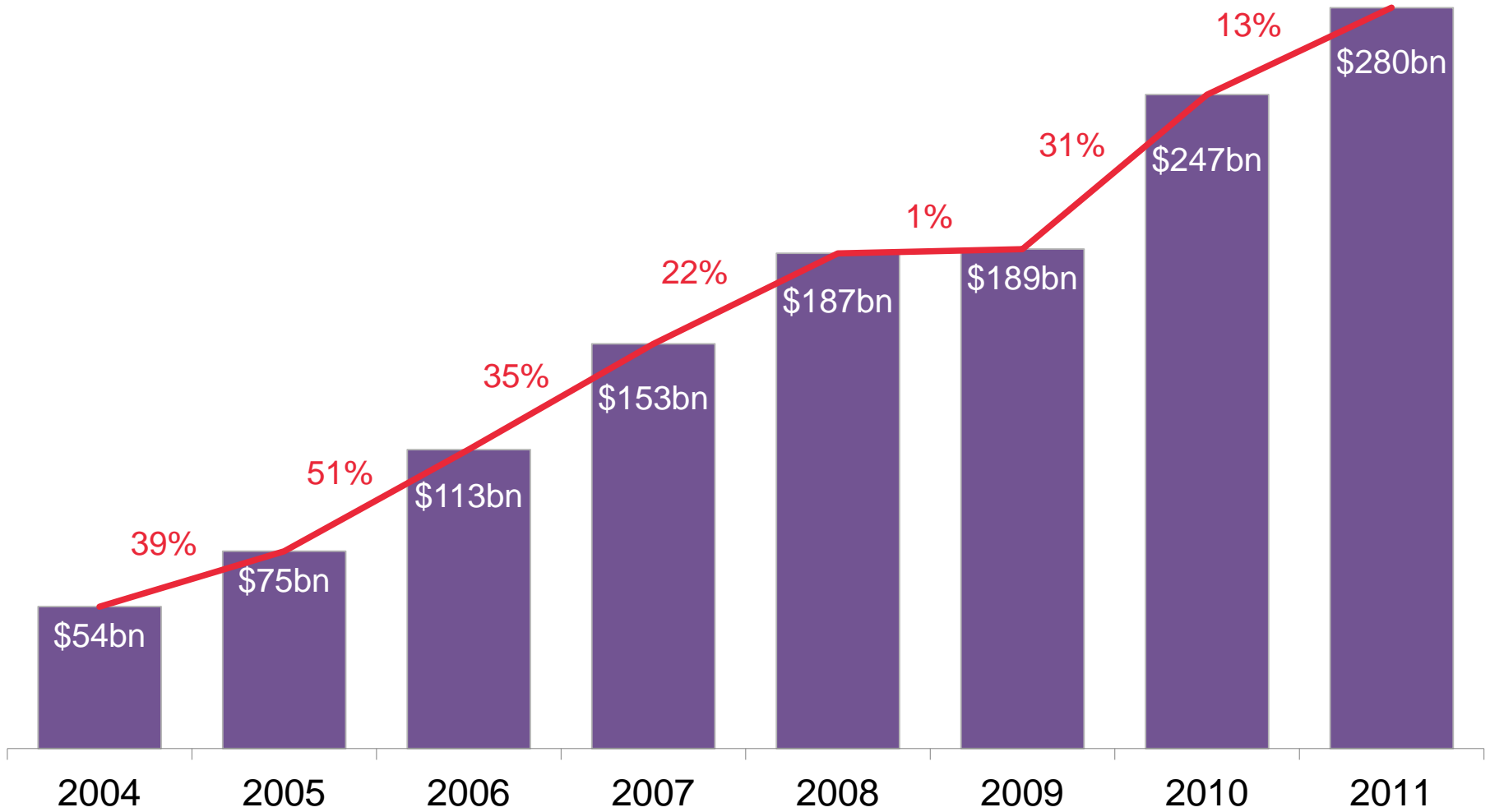
MICHEL DI CAPUA

OCTOBER 2012



GLOBAL NEW INVESTMENT IN CLEAN ENERGY

2004–11 (\$BN)

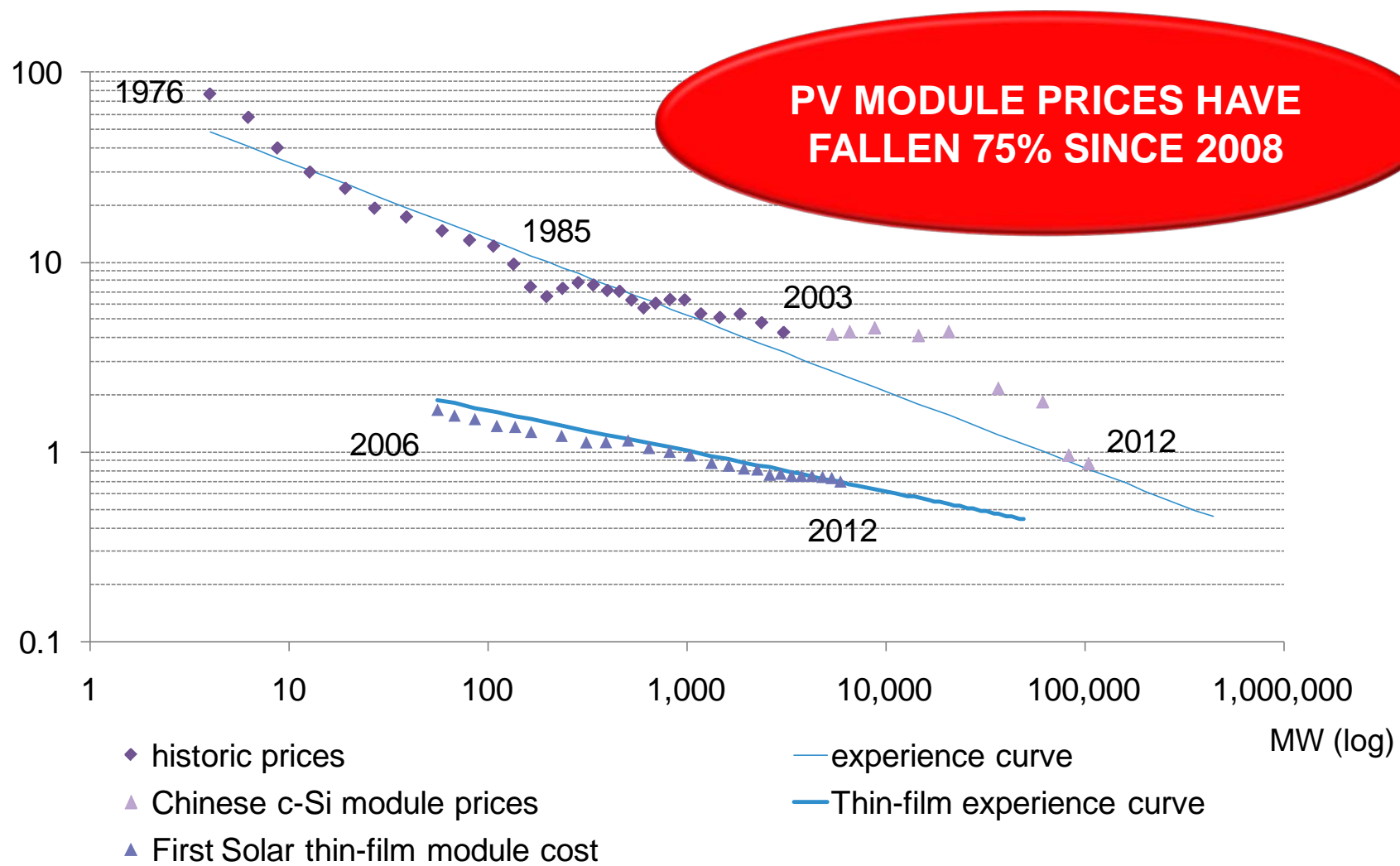


Note: Includes corporate and government R&D, and small distributed capacity. Adjusted for re-invested equity. Does not include proceeds from acquisition transactions.

Source: Bloomberg New Energy Finance

PV MODULE PRICES, 1976–2012

(\$/W)



Notes: Inflation adjustment using US PPI, R2 of c-Si regression = 0.94, R2 of FSLR regression = 0.98; Source: Paul Maycock, Bloomberg New Energy Finance, FSLR filings
 data since 2007 based on Bloomberg New Energy Finance Solar Spot Market Price Index

EUROPE – FINANCIAL CRISIS

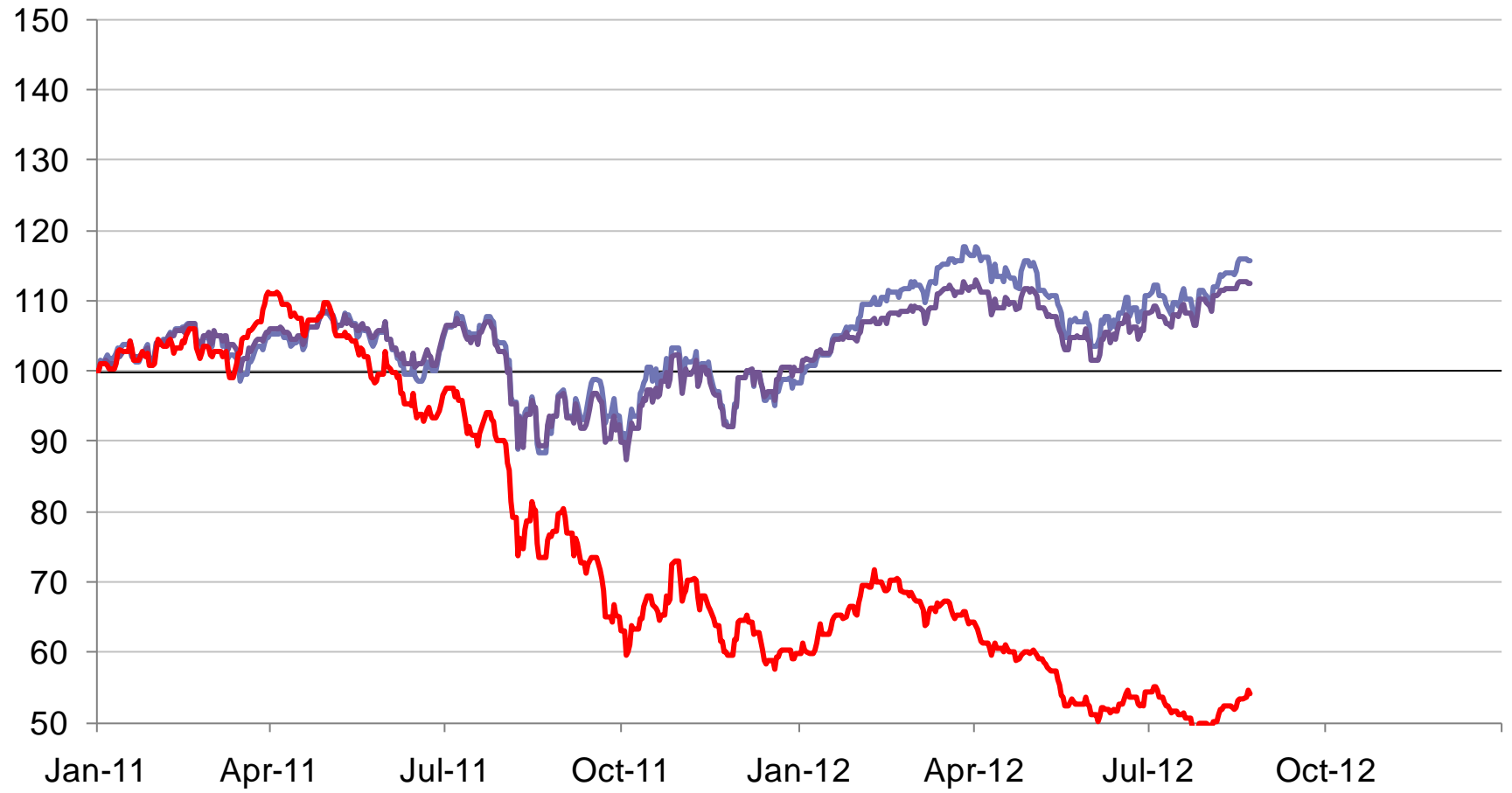


Photo: Bloomberg

NEX CLEAN ENERGY INDEX (VERSUS BENCHMARKS)

2011 – 2012 YTD

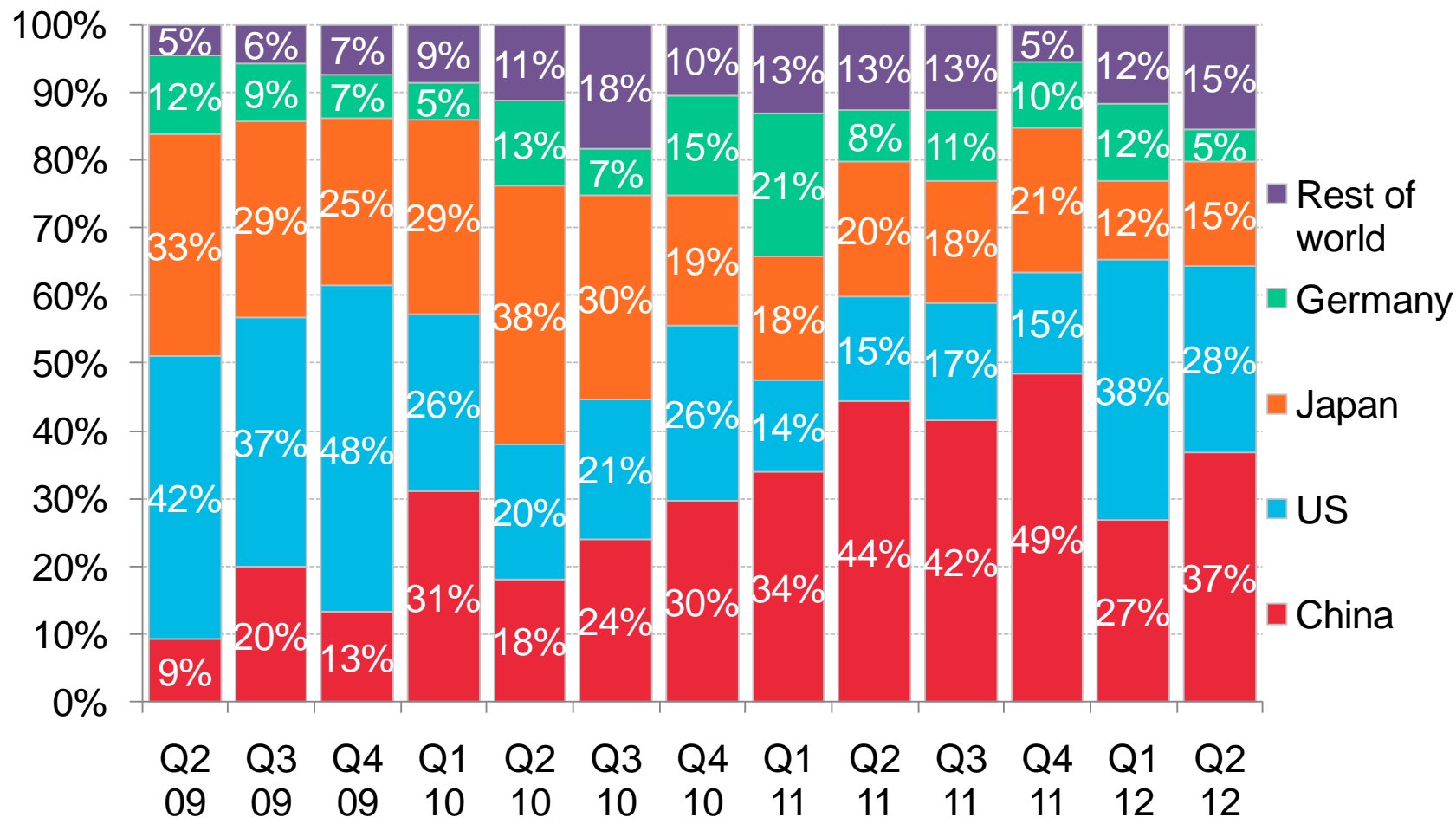
- NEX
- NASDAQ
- S&P 500



Note: Values as of 22 August 2012; NASDAQ and S&P 500 rebased to 100 on 01 Jan 2011.

Source: Bloomberg New Energy Finance

CALIFORNIA PV MODULE SUPPLIERS BY PERCENTAGE OF TOTAL MW, COUNTRY, AND QUARTER, Q2 2009 – Q2 2012



Note: 'Country' tracks country of corporate headquarters, not country of manufacture. Market share based on installations for Q1 2009 – Q2 2011, and applications for Q3 2011 – Q2 2012, to enable accurate comparisons.

Source: Bloomberg New Energy Finance, California Solar Initiative

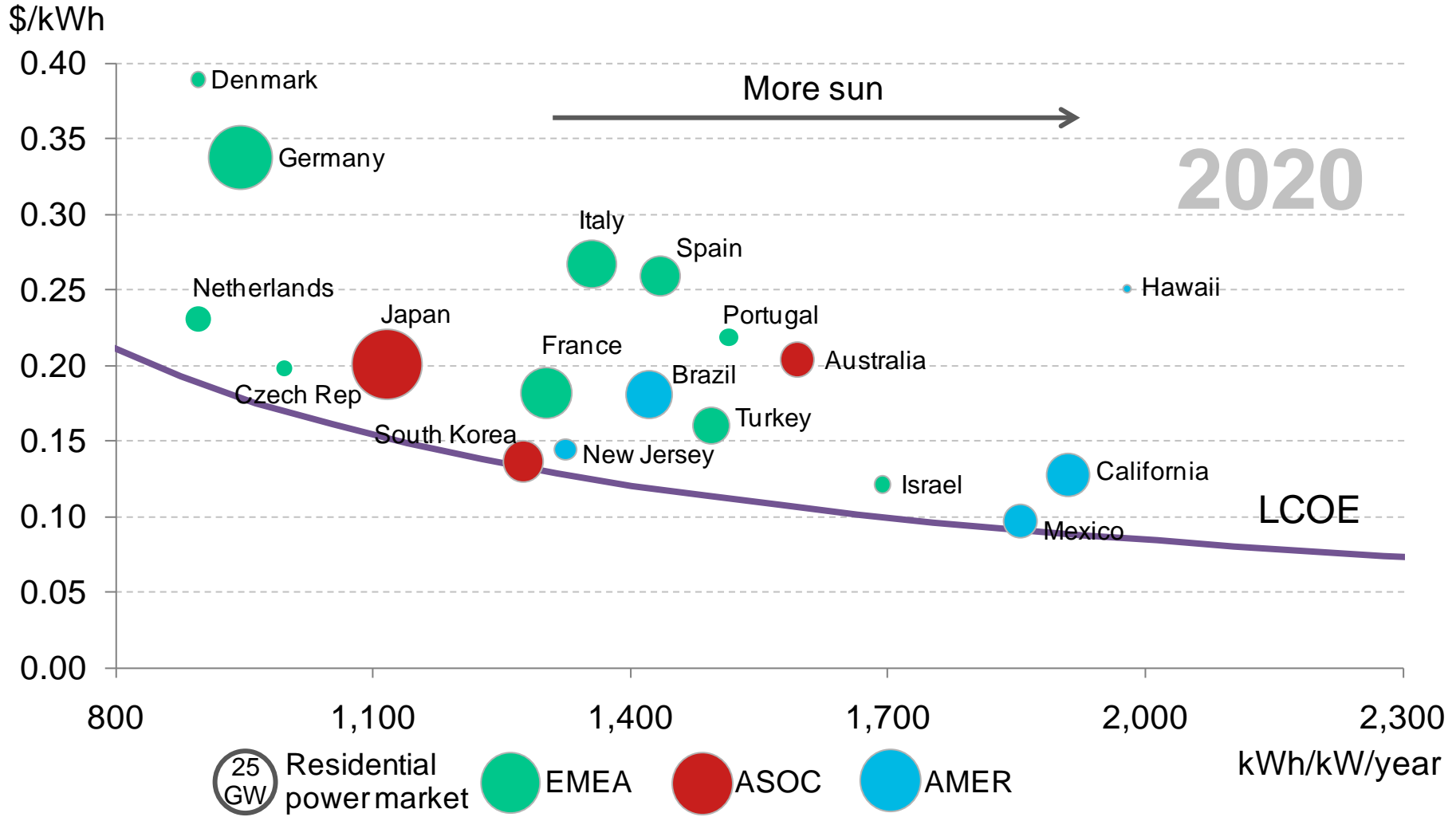
LEVELISED COST OF ENERGY Q4 2012 (\$/MWH)



Note: Carbon forecasts from the Bloomberg New Energy Finance European Carbon Model with an average price to 2030 of \$38/mt. Coal and natural gas prices from the US EIA and BNEF. Percentage change represents change from Q3 2012

Source: Bloomberg New Energy Finance

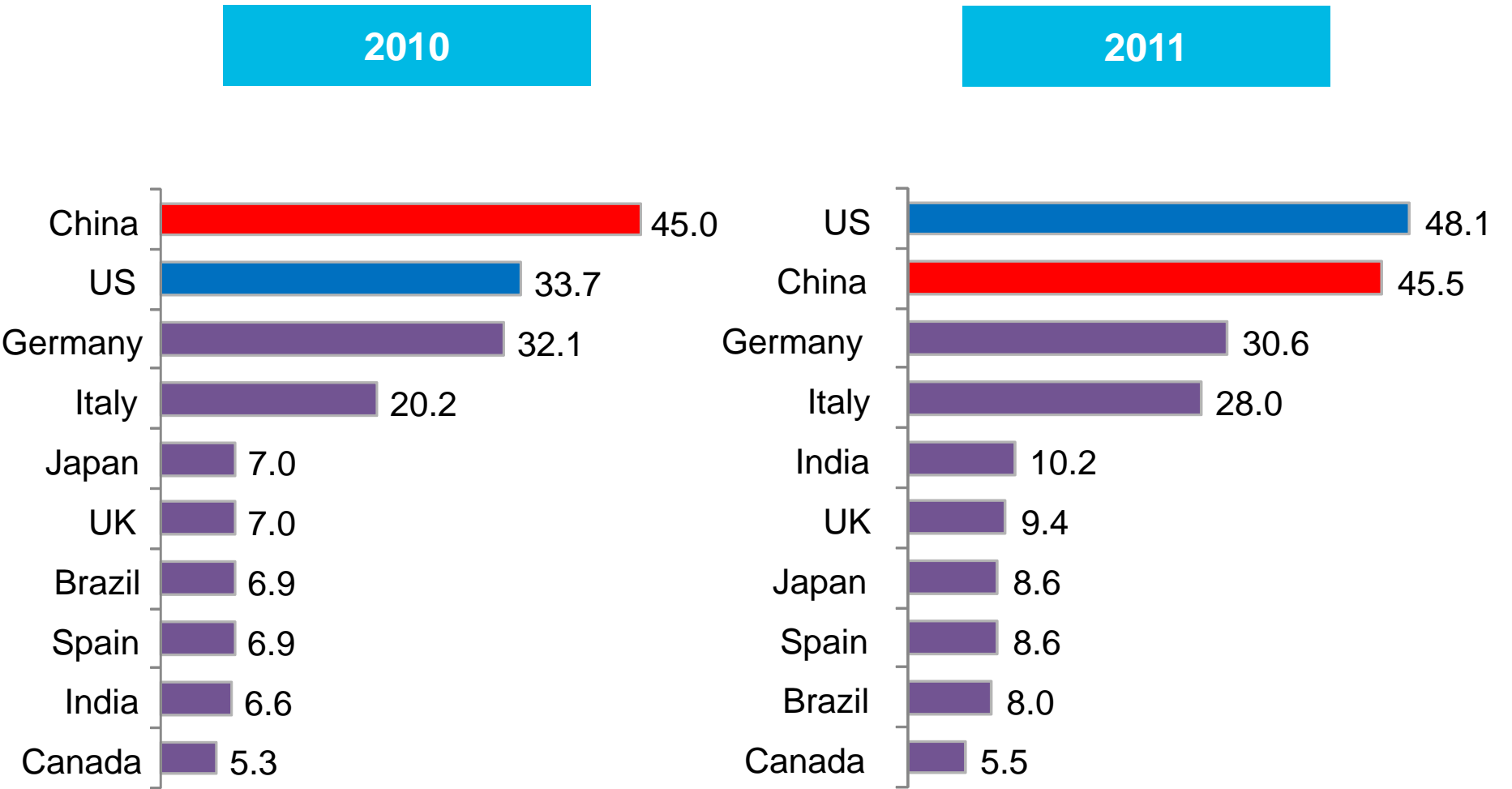
RESIDENTIAL PV PRICE PARITY



Note: LCOE based on 6% weighted average cost of capital, 0.7%/year module degradation, 1% capex as O&M annually.

Source: Eurostat, grid operators, Bloomberg New Energy Finance

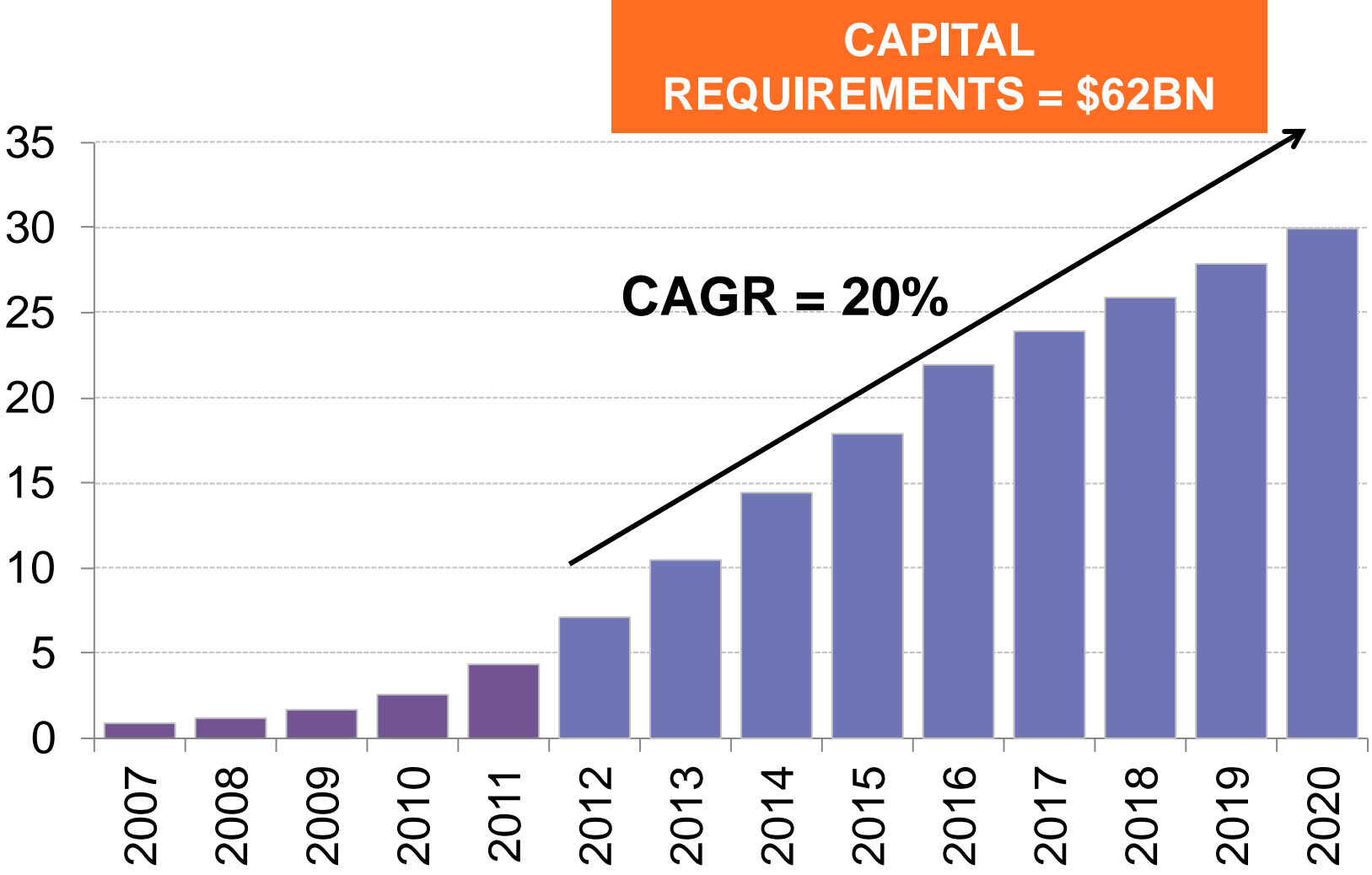
TOTAL NEW CLEAN ENERGY FINANCIAL INVESTMENT, 2010-11 (\$BN)



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

Source: Bloomberg New Energy Finance

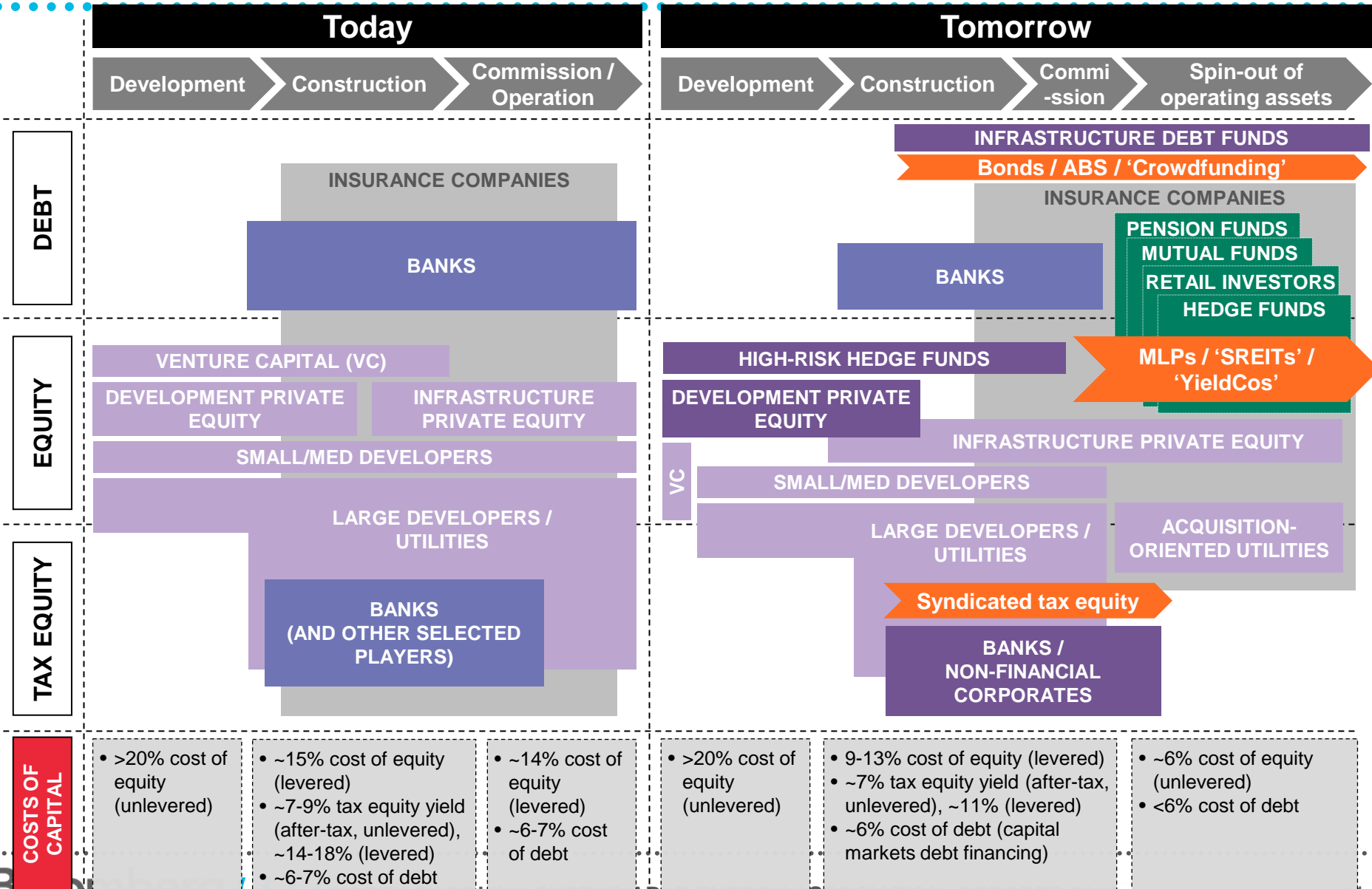
HISTORICAL AND PROJECTED CUMULATIVE US PV CAPACITY INSTALLED (GW)



Source: Bloomberg New Energy Finance

EVOLUTION IN US SOLAR PROJECT FINANCING

High-liquidity investment vehicles



THIRD-PARTY TAX EQUITY PROVIDERS FOR US RENEWABLES

Pre-financial crisis



Post-financial crisis



Today



Source: Bloomberg New Energy Finance, US PREF

SOUTHERN COMPANY'S PARTICIPATION



30MW Cimarron I solar project
(northern New Mexico)

- Second-largest utility in the US
- Service area covers four Deep South states, no RPS
- Opponent of renewables legislation at federal level

- Acquired ~100MW of PV assets since March 2010, via JVs with Ted Turner
- Georgia Power (Southern subsidiary) filed initiative to conduct largest *voluntary* solar solicitation in the US

• Trend 1: Solar will become a cost-competitive option

• Trend 2: RPS policies will decline in importance

• Trend 3: Utilities will eye solar for defensive reasons

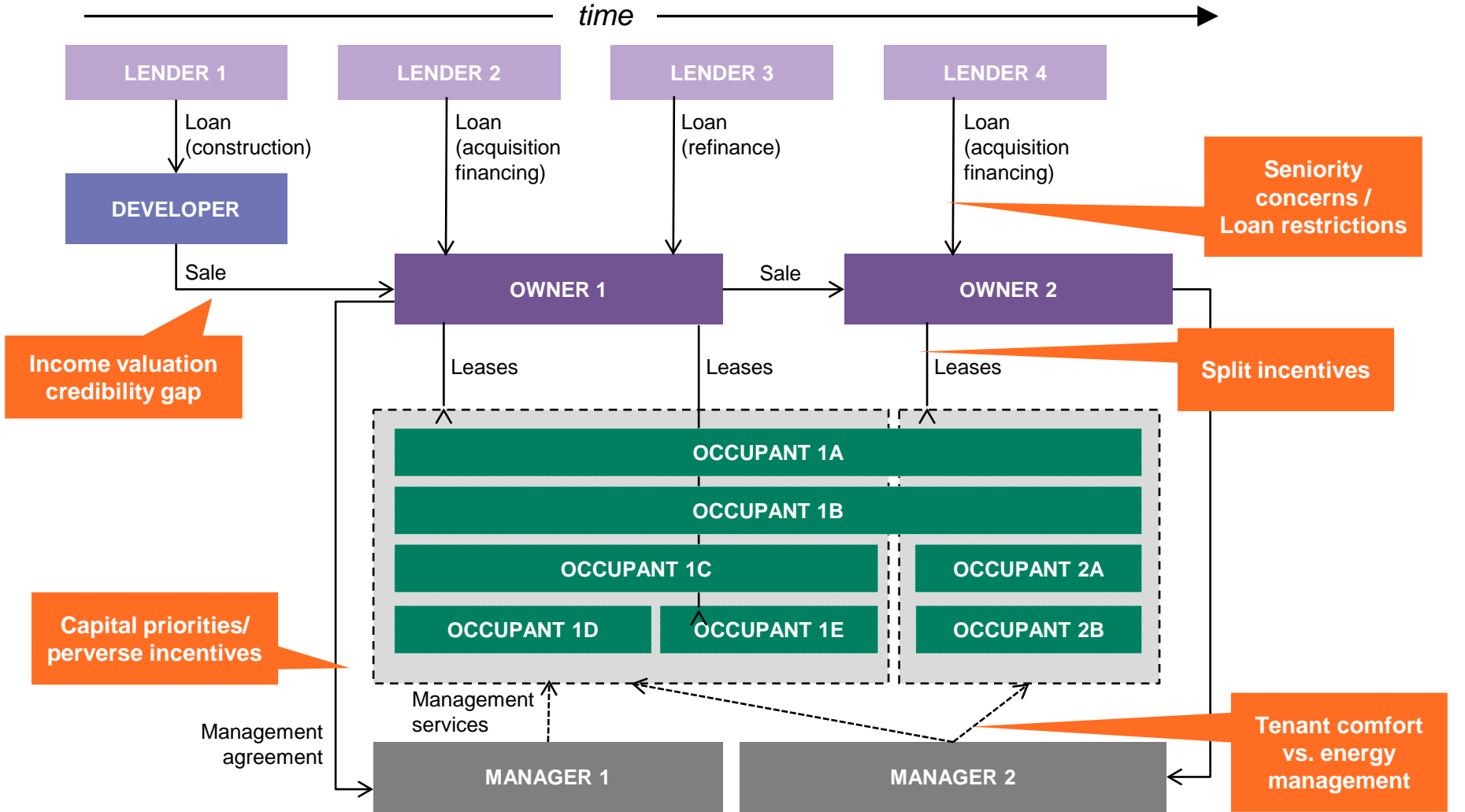
• Trend 4: Utilities (low WACC) will become asset owners

• Trend 5: Utilities will become a source of tax equity

Source: Bloomberg New Energy Finance, Solar Daily, Southern Company

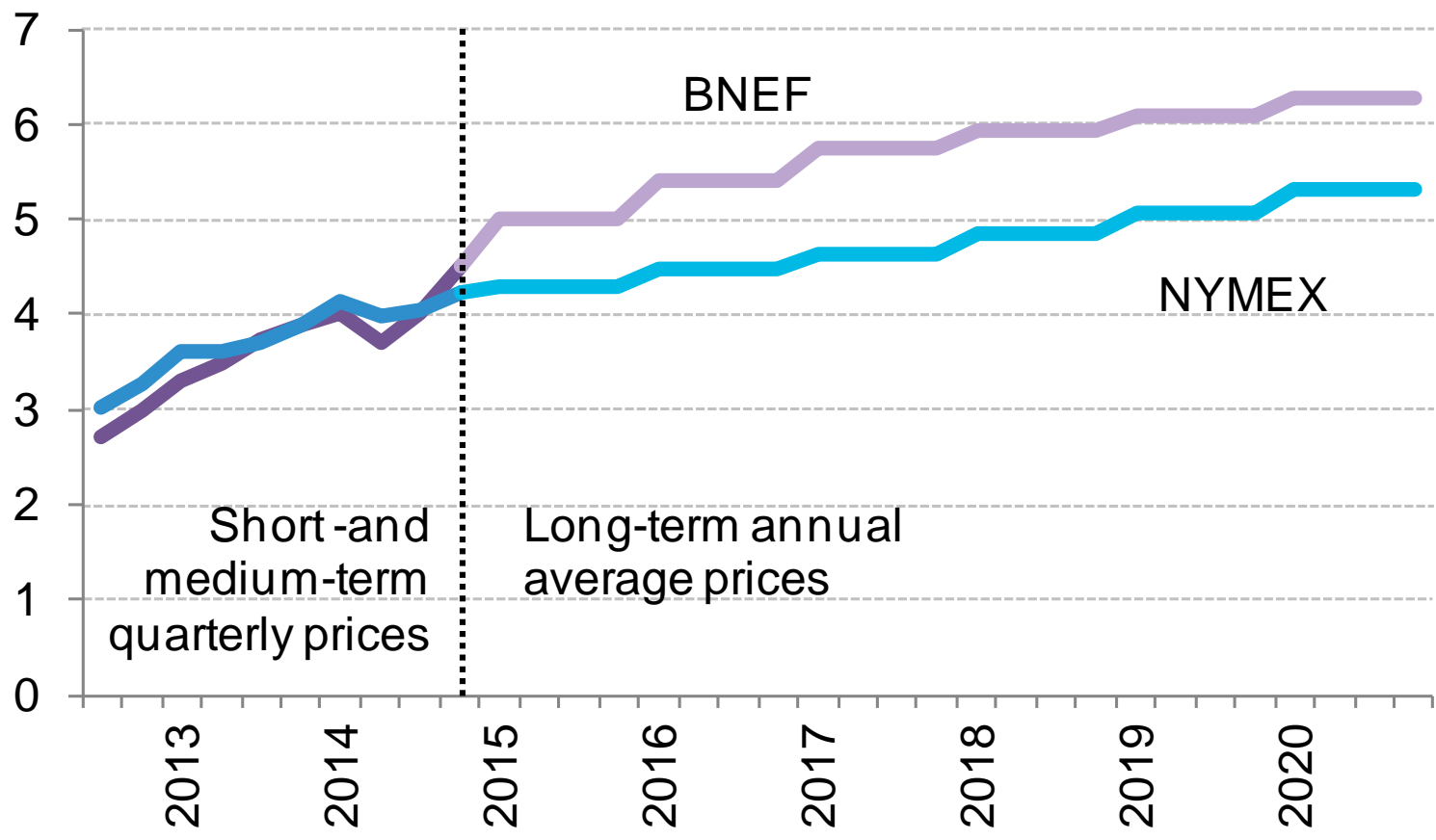
REAL ESTATE INTERFACES AND TRANSITIONS

Points of potential friction when implementing energy efficiency



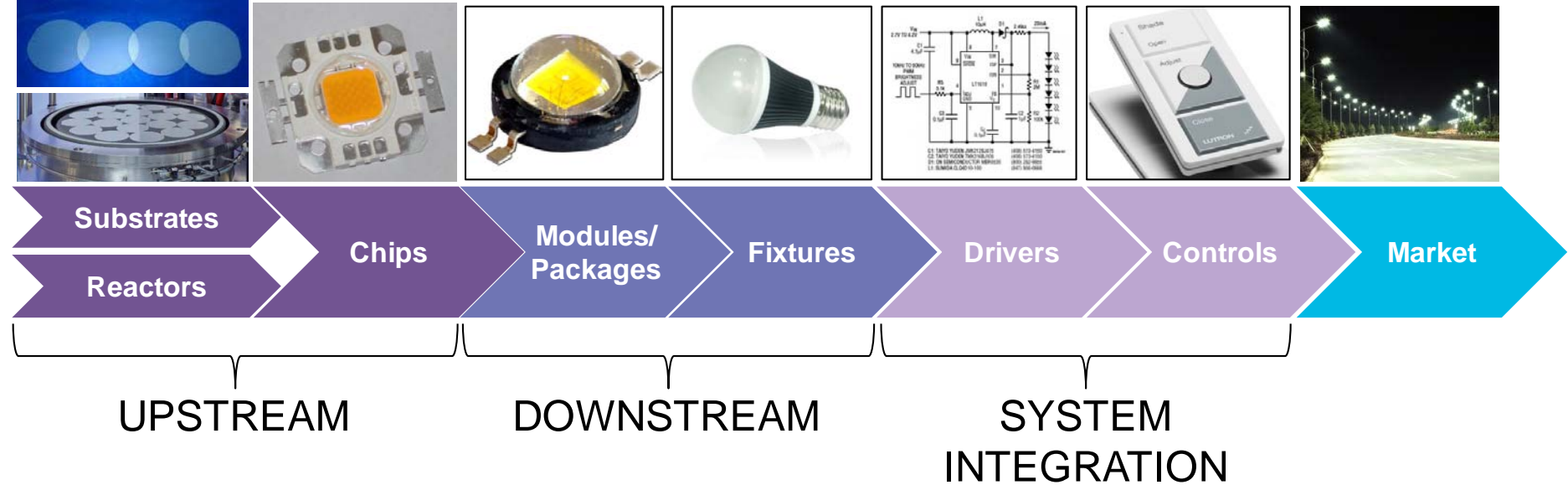
Source: Bloomberg New Energy Finance

BLOOMBERG NEW ENERGY FINANCE GAS PRICE FORECASTS VS. NYMEX STRIP (\$/MMBTU)



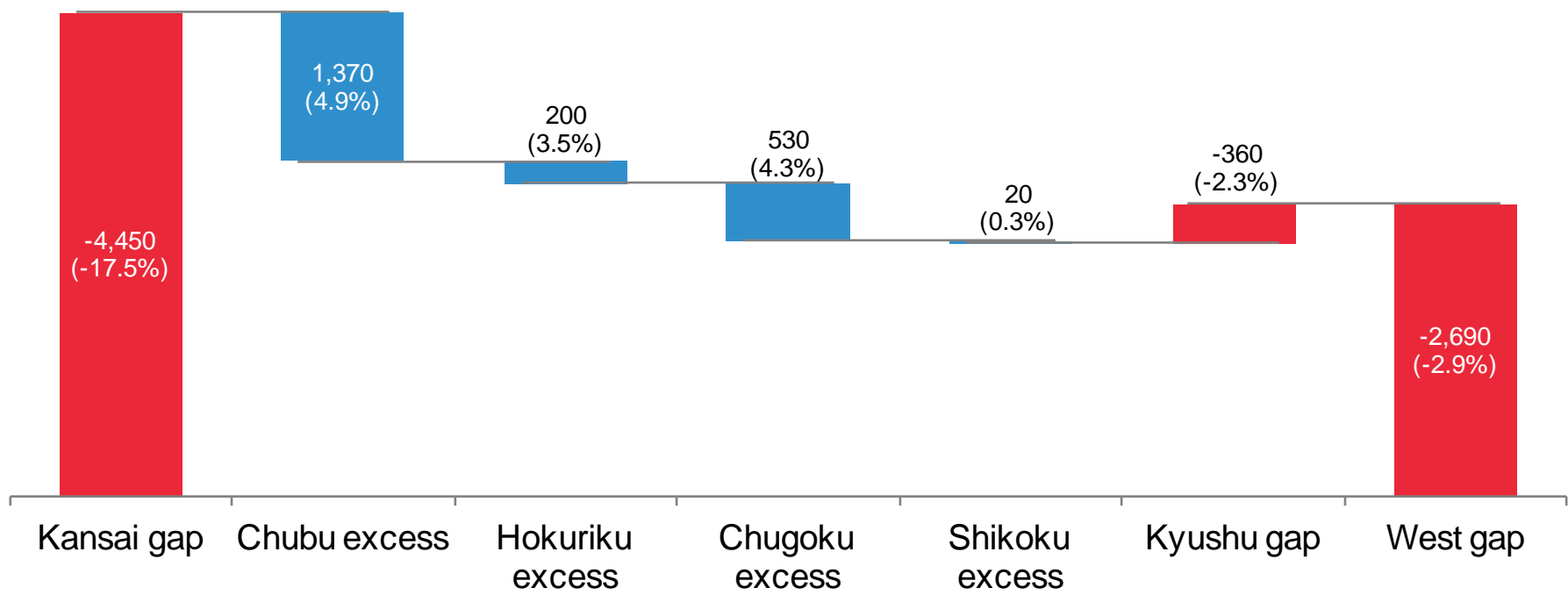
Source: Bloomberg New Energy Finance

LED LIGHTING VALUE CHAIN



Source: Bloomberg New Energy Finance

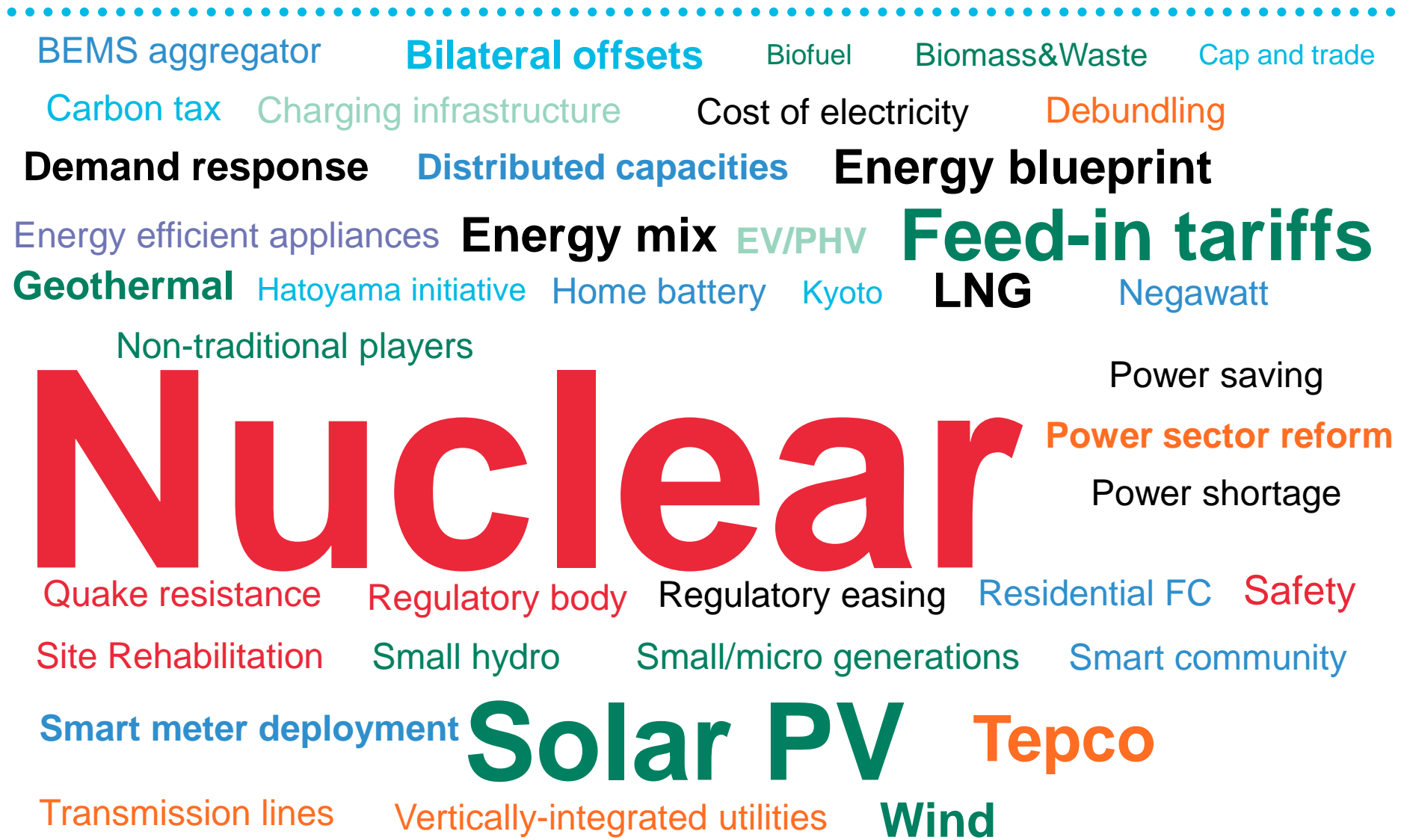
JAPAN ELECTRICITY MARKET: 2012 SUMMER SUPPLY-DEMAND FORECAST FOR WESTERN REGION (MW)



Note: The value in parentheses shows the excess/gap as a percentage of supply. The demand forecast does not take into account demand response programmes.

Source: National Policy Unit, Government of Japan

SNAPSHOT OF JAPANESE POLICYMAKER'S MIND



Source: Bloomberg New Energy Finance

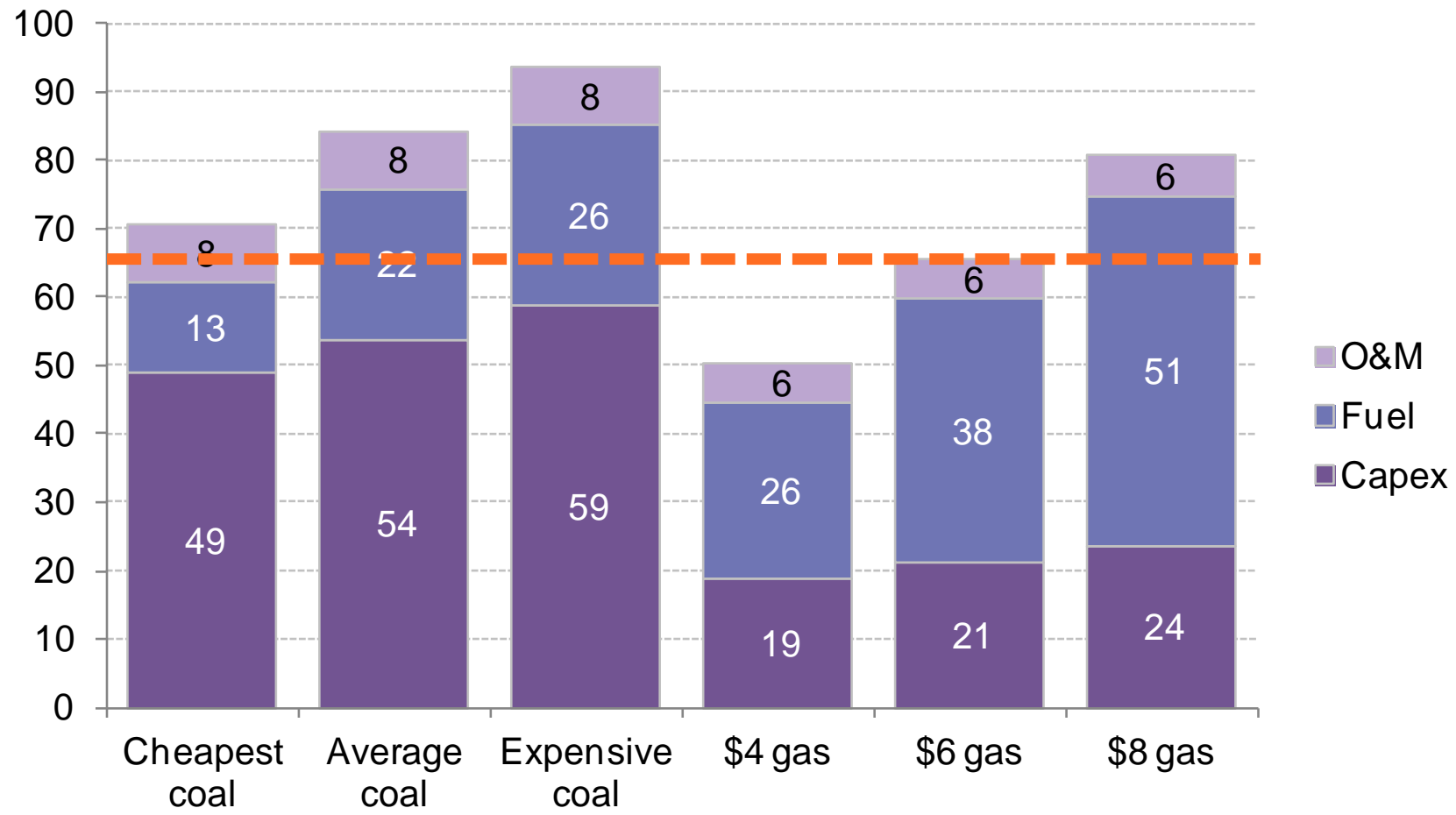
ROMNEY ON COAL



“If [Obama] was elected president, the cost of energy would skyrocket... We have 250 years of coal. Why in the heck wouldn't we use it?”

Source: Herald Star Online, Bloomberg New Energy Finance

LEVELISED COST OF ENERGY COMPARISON: COAL VS. COMBINED CYCLE GAS (\$/MWH)



Note: 'Cheapest coal' assumes \$1.50/MMBtu delivered fuel costs and capex of \$2,500/kW; 'Average coal' assumes \$2.50/MMBtu and \$2,750/kW; 'Expensive coal' assumes \$3/MMBtu and \$3,000/kW. '\$4 gas' assumes capex of \$800/kW; '\$6 gas' assumes \$900/kW, '\$8 gas' assumes \$1,000/kW. All prices in real 2012 dollars.

Source: Bloomberg New Energy Finance

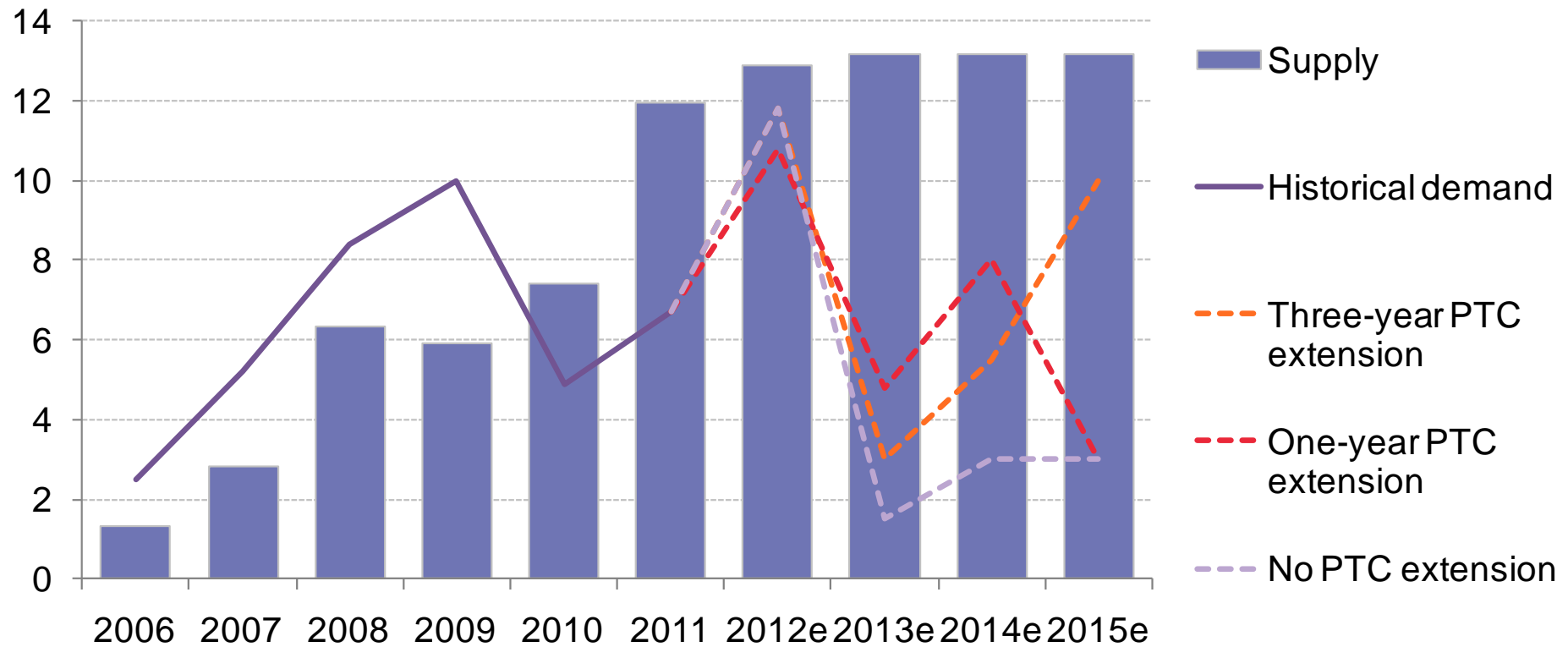
OBAMA ON WIND



“Today we have nearly 500 facilities in 43 states employing tens of thousands of American workers...If [wind manufacturers] are not confident that the industry’s going to be moving at a fast clip and they start reducing orders here, that affects you...”

Source: Politico, US News, Bloomberg New Energy Finance

SUPPLY AND DEMAND BALANCE FOR US TURBINE PRODUCTION CAPACITY, 2006-14E (GW)

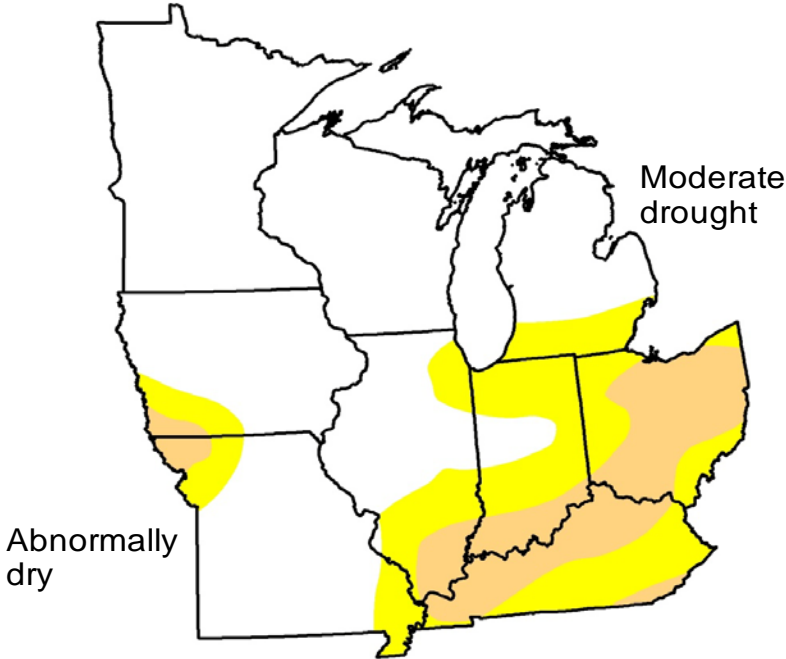


Note: Lines show demand corresponding to Bloomberg New Energy Finance projections for wind build under different scenarios for PTC extension

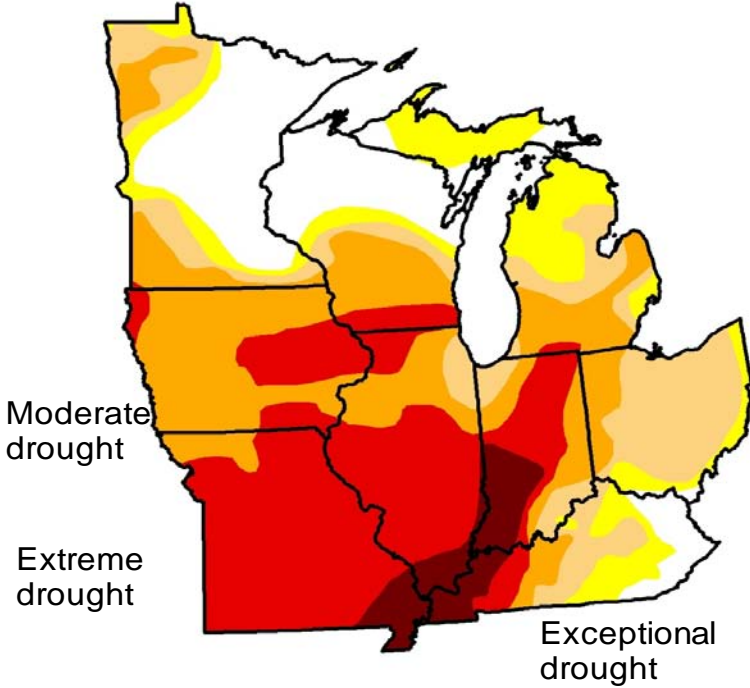
Source: Bloomberg New Energy Finance

MIDWEST DROUGHT MONITOR

August 2002



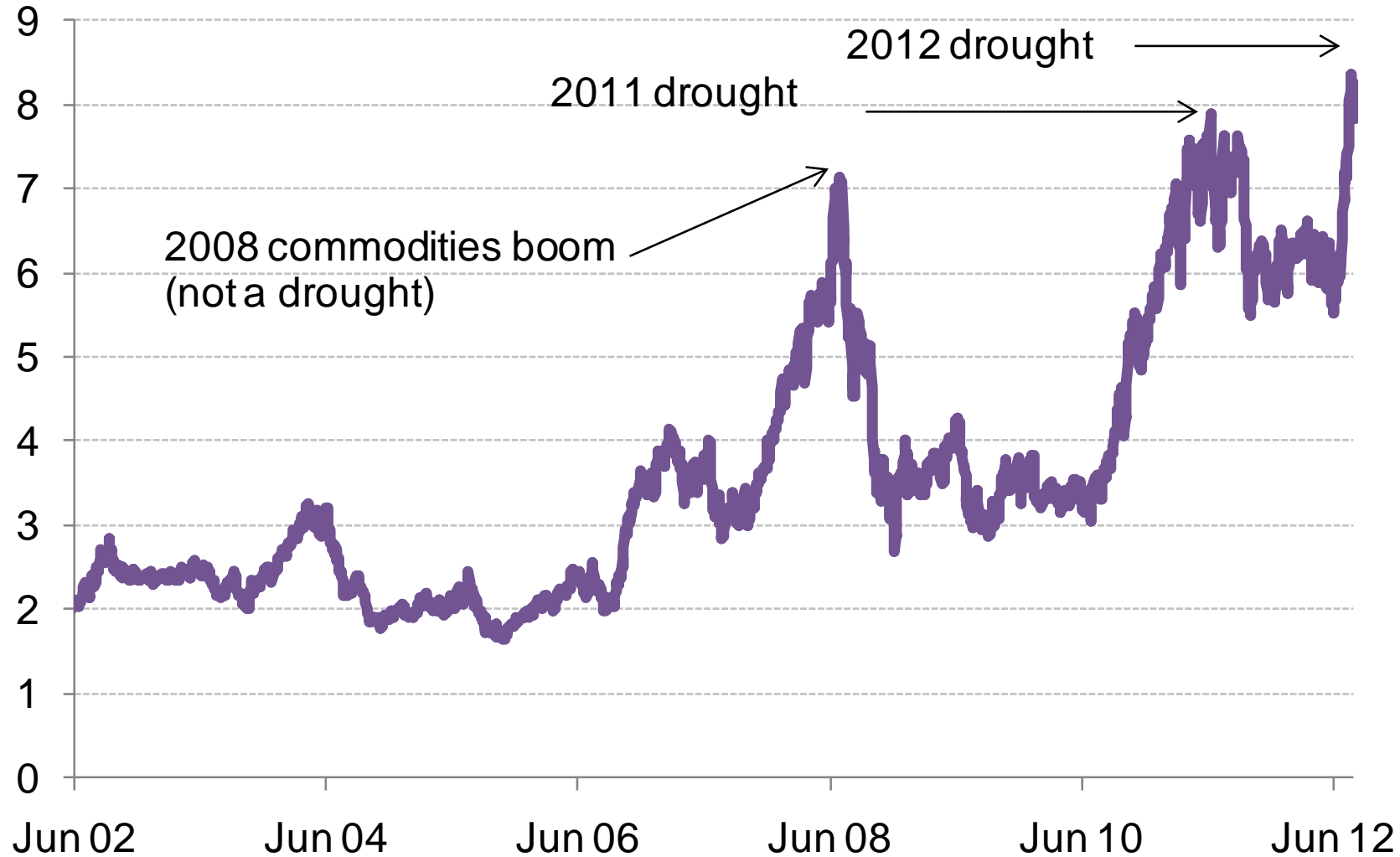
July 2012



Source: University of Nebraska (Lincoln), Mark Svoboda, National Drought Mitigation Centre (<http://droughtmonitor.unl.edu>)

Note: Shading reflects level of drought severity (brown is more severe, yellow less severe)

US CORN PRICE (\$ PER BUSHEL)



Source: Bloomberg New Energy Finance

COMPREHENSIVE GLOBAL COVERAGE – CLEAN ENERGY AND CARBON MARKETS

	RENEWABLE ENERGY	CARBON MARKETS	ENERGY SMART TECHNOLOGIES											
INSIGHT <ul style="list-style-type: none"> RESEARCH NOTES ANALYST REACTIONS QUARTERLY OUTLOOKS CONFERENCE CALLS SECTOR-SPECIFIC DATA 	Wind	Solar	Geothermal	Bioenergy	Hydro & marine	Renewable energy credits	North America	EU-ETS	Global / Kyoto	Australia	Energy efficiency	Digital energy (smart grid)	Power storage	Advanced transportation
	Cross-sector research (eg, policy analyses, levelised cost of energy updates, regional market outlooks)													
INDUSTRY INTELLIGENCE	Organisations, projects and deal database, daily news per region													
NEWS & BRIEFING	Daily news & monthly briefing													
EVENTS & CONSULTING	BNEF Summit / Food for Thought events / Leadership Forum events Applied research / Data mining / White papers													

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MARKETS

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Carbon Markets

Energy Smart Technologies

Renewable Energy Certificates

Carbon Capture & Storage

Power

Water

Nuclear

SERVICES

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Industry Intelligence: data & analytics

News & Briefing: daily, weekly & monthly

Applied Research: custom research & data mining

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