

# GLOBAL TRENDS IN CLEAN ENERGY INVESTMENT

**CLEAN ENERGY MINISTERIAL**

**DELHI, 17 APRIL 2013**

Michael Liebreich, Chief Executive

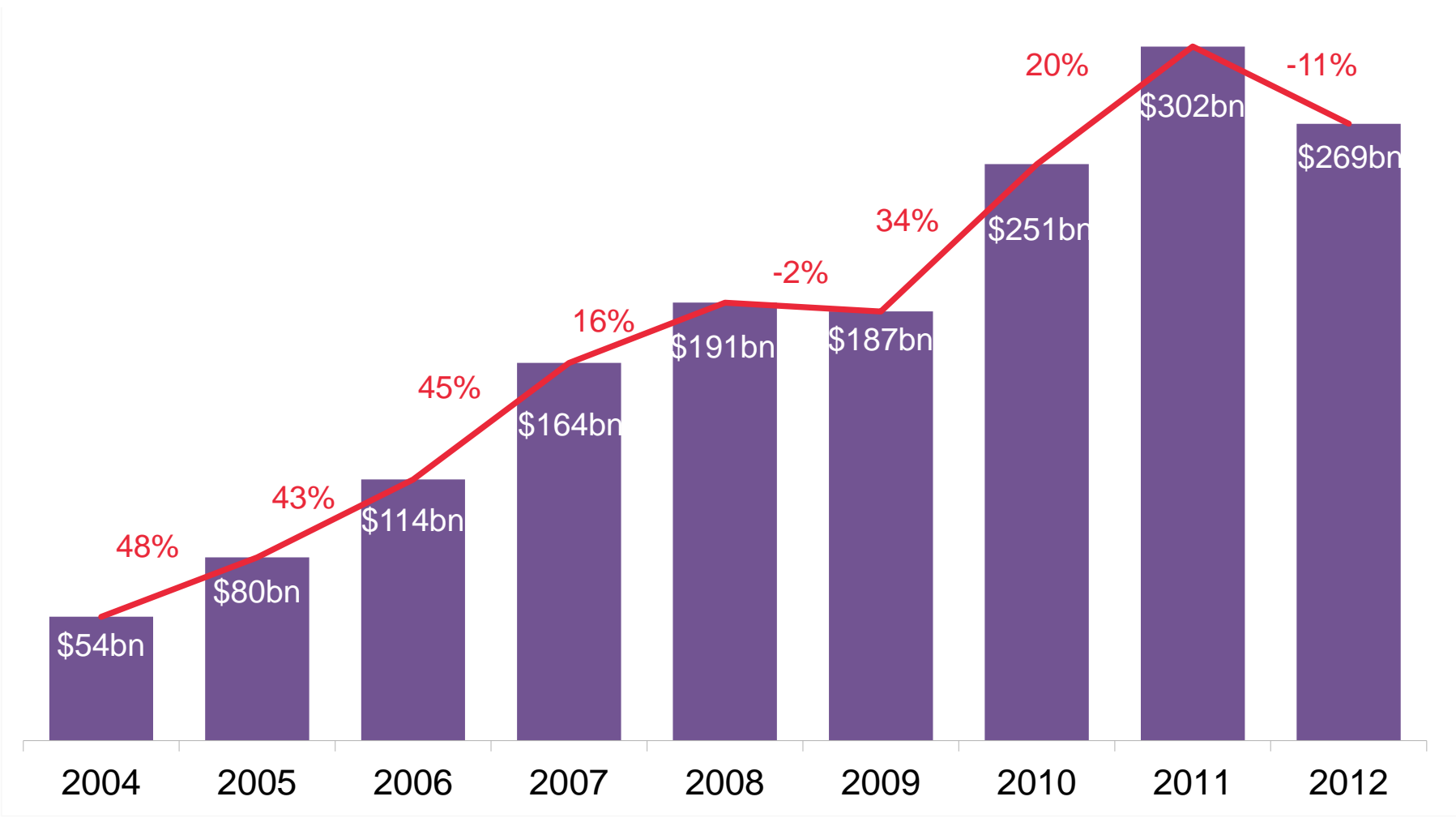
Bloomberg New Energy Finance

Twitter: @MLiebreich



# GLOBAL TOTAL NEW INVESTMENT IN CLEAN ENERGY

2004–12 (\$BN)

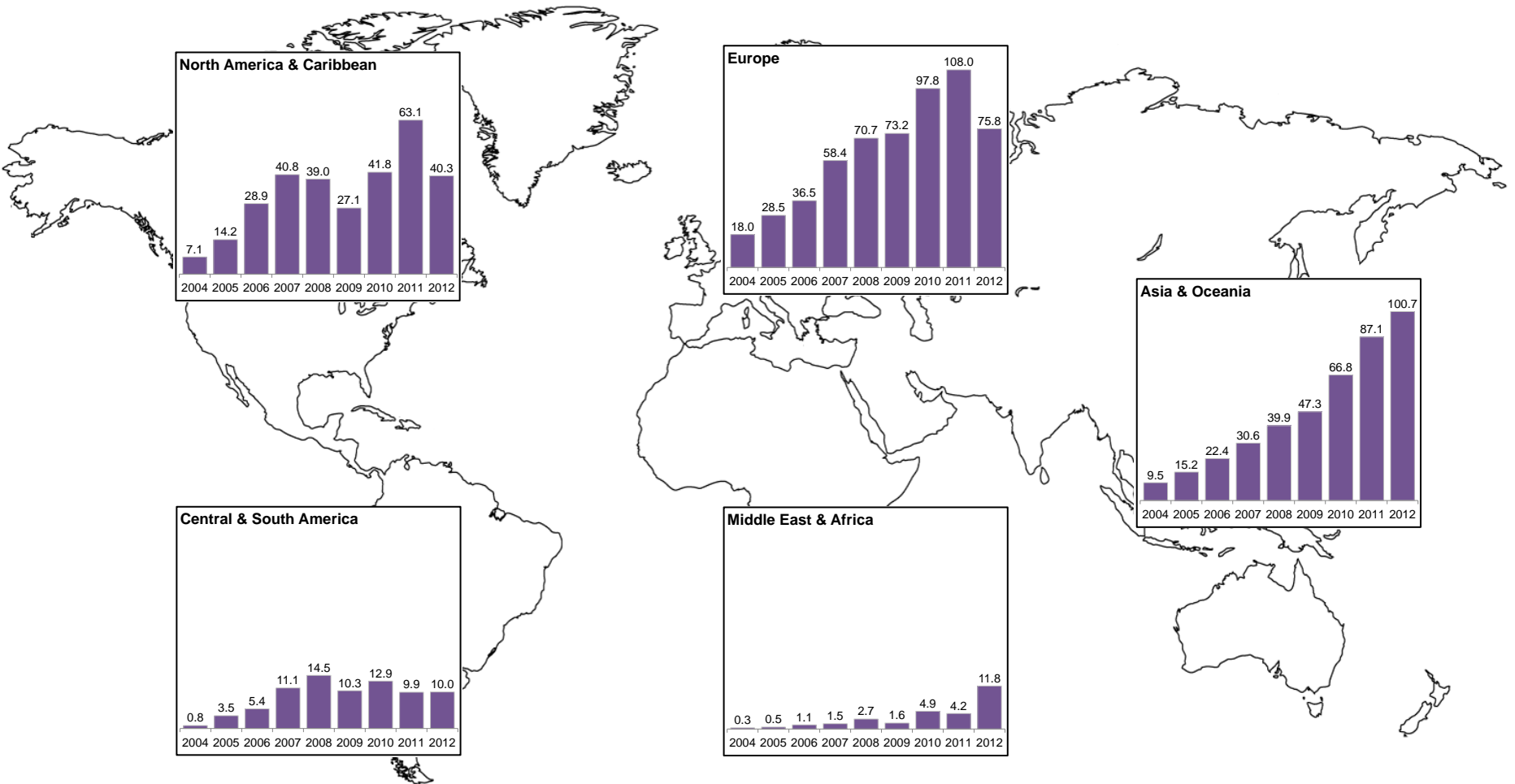


Note: Includes corporate and government R&D, and small distributed capacity. Adjusted for re-invested equity. Does not include proceeds from acquisition transactions

Source: Bloomberg New Energy Finance

# NEW INVESTMENT IN CLEAN ENERGY BY REGION

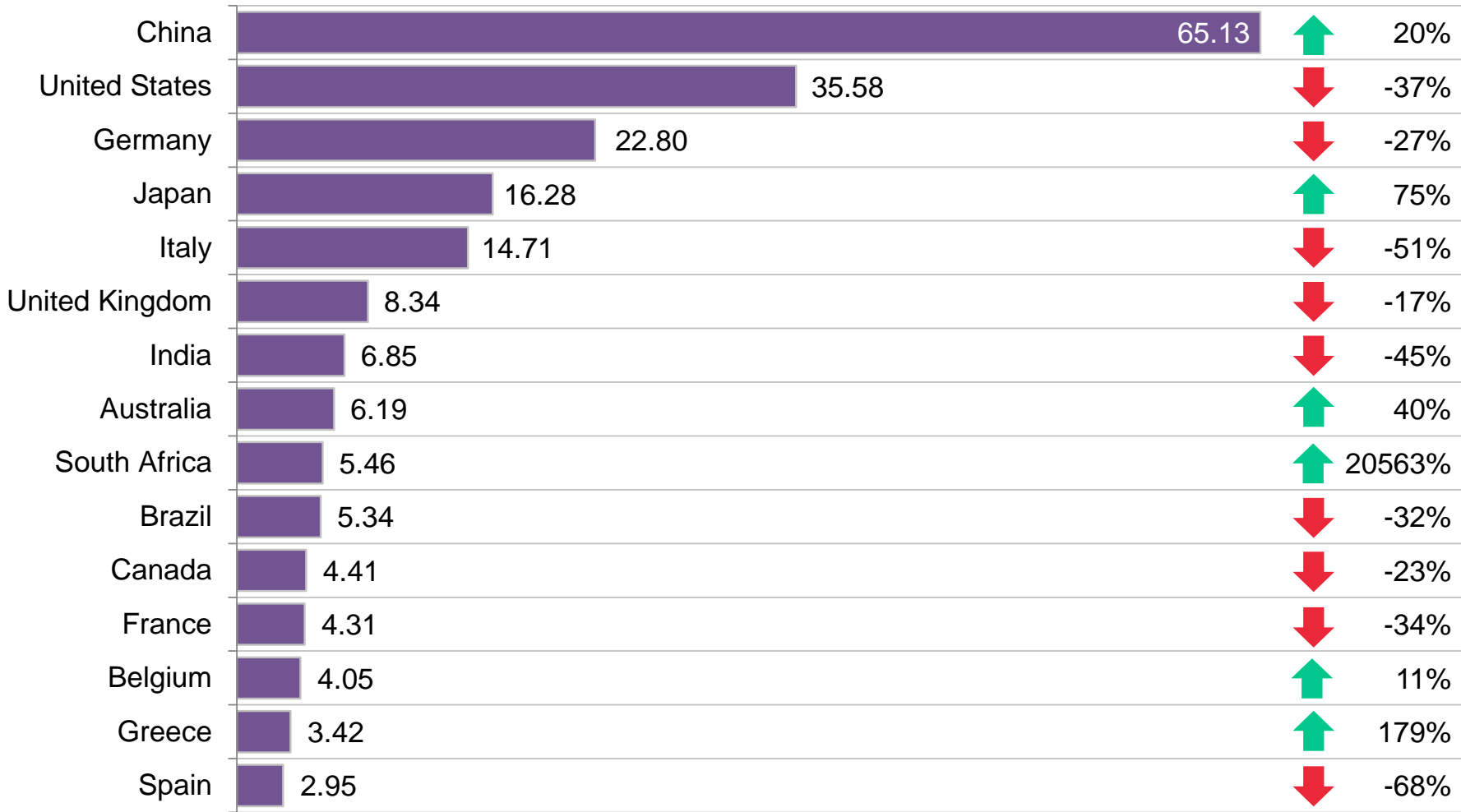
2004–12 (\$BN)



Note: Excludes corporate and government R&D

Source: Bloomberg New Energy Finance

# TOP 15 COUNTRIES FOR NEW INVESTMENT IN CLEAN ENERGY IN 2012 AND % CHANGE ON 2011 (\$BN)

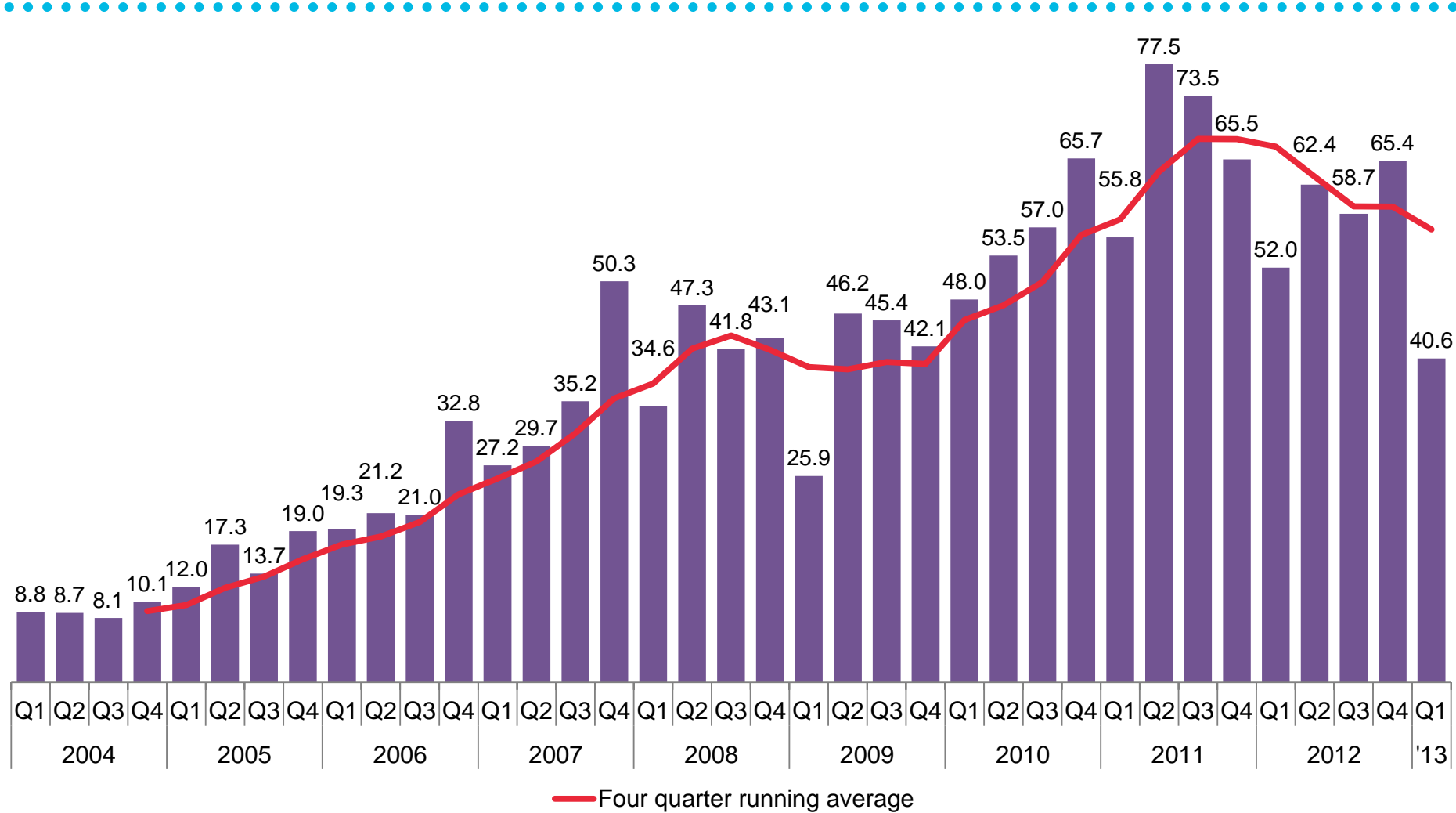


Note: Excludes corporate and government R&D

Source: Bloomberg New Energy Finance

# NEW INVESTMENT IN CLEAN ENERGY

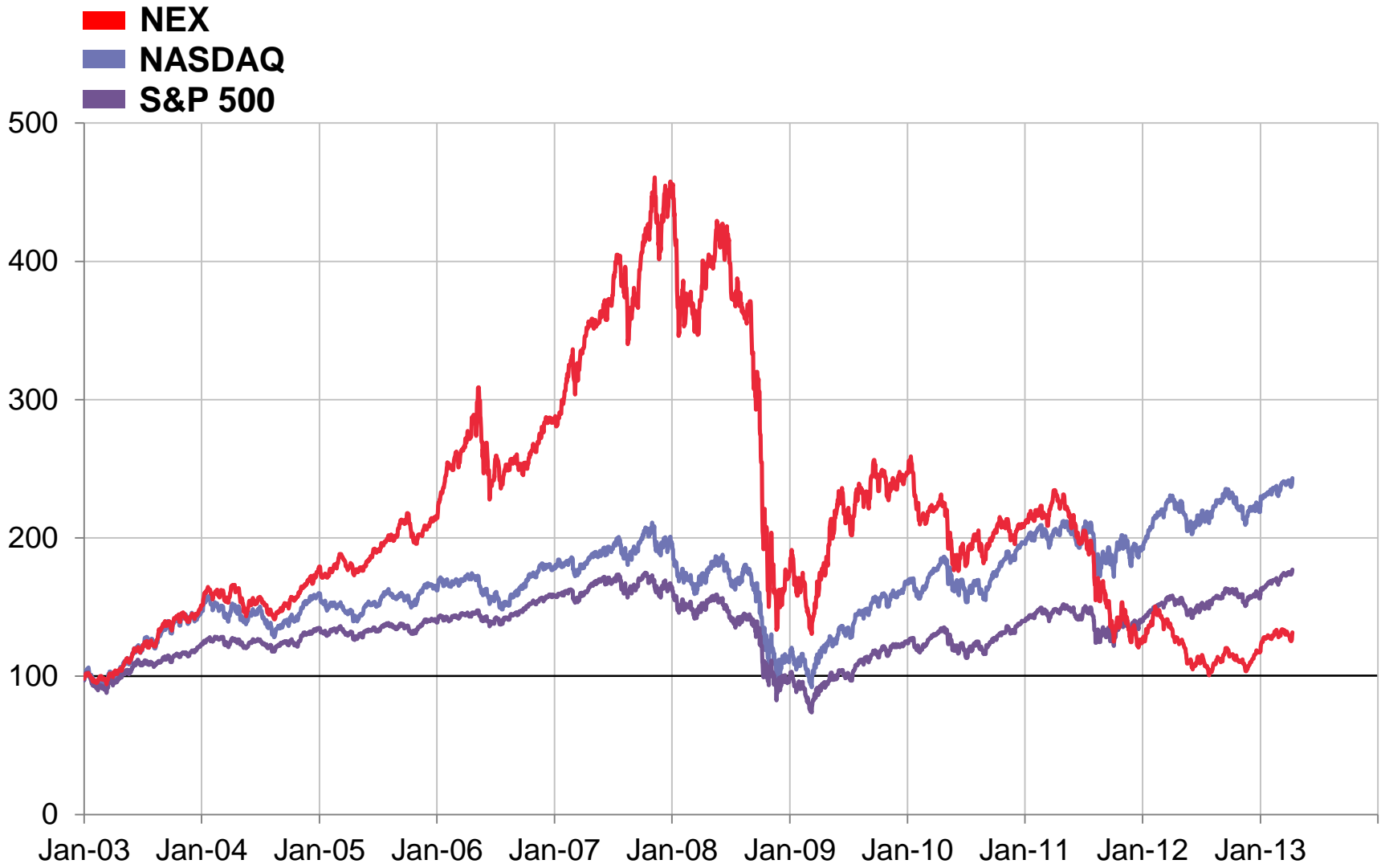
Q1 2004–Q1 2013 (\$BN)



Note: Total values include estimates for undisclosed deals. Excludes corporate and government R&D. Includes small distributed capacity & adjustment for re-invested equity.

Source: Bloomberg New Energy Finance

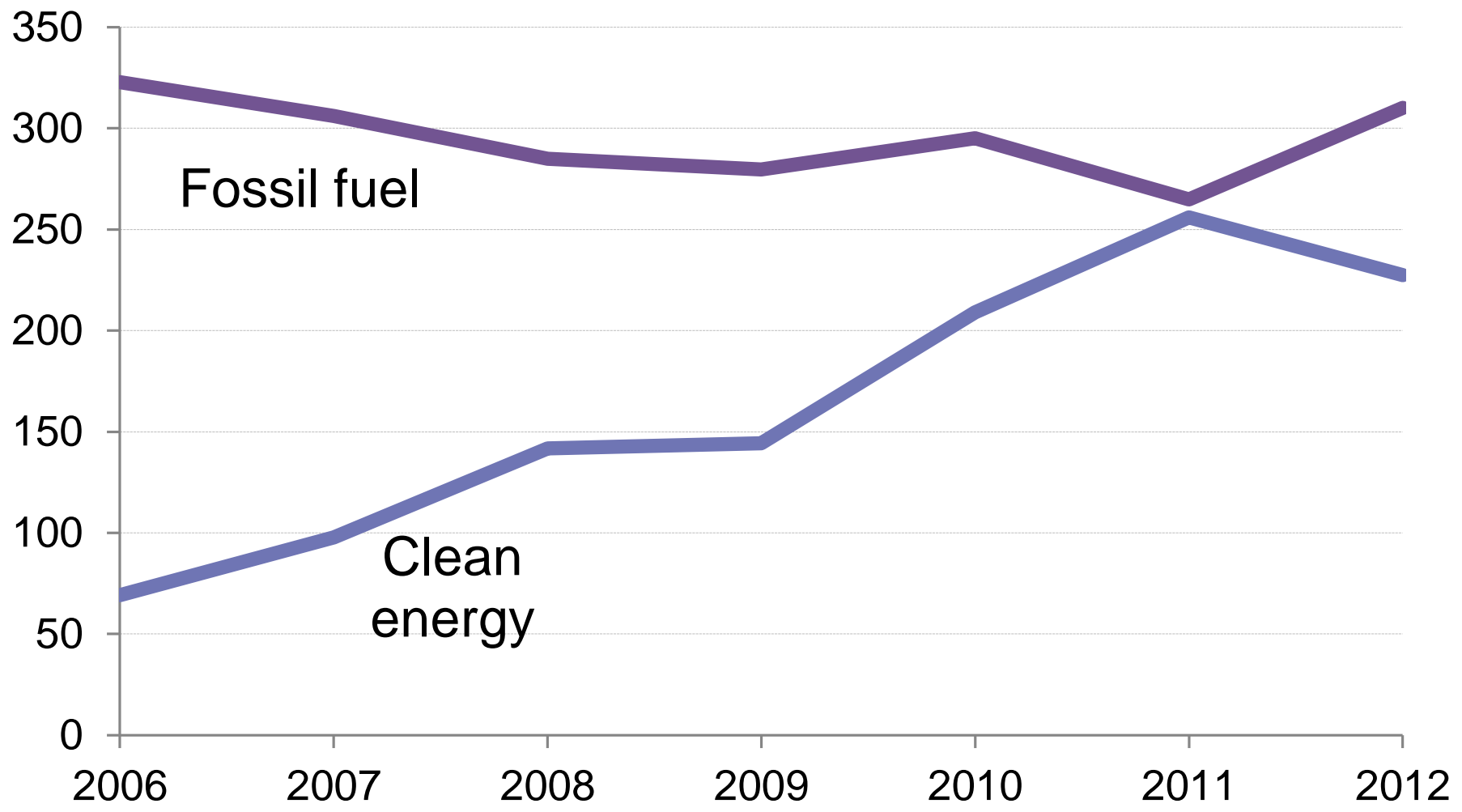
# NEX CLEAN ENERGY INDEX 2003 – 2013 YTD



Note: Values as of 10 April 2013; NASDAQ and S&P 500 rebased to 100 on 01 Jan 2003

Source: Bloomberg New Energy Finance

# CLEAN VS FOSSIL-BASED GENERATING CAPACITY INVESTMENT, 2006–12 (\$BN)

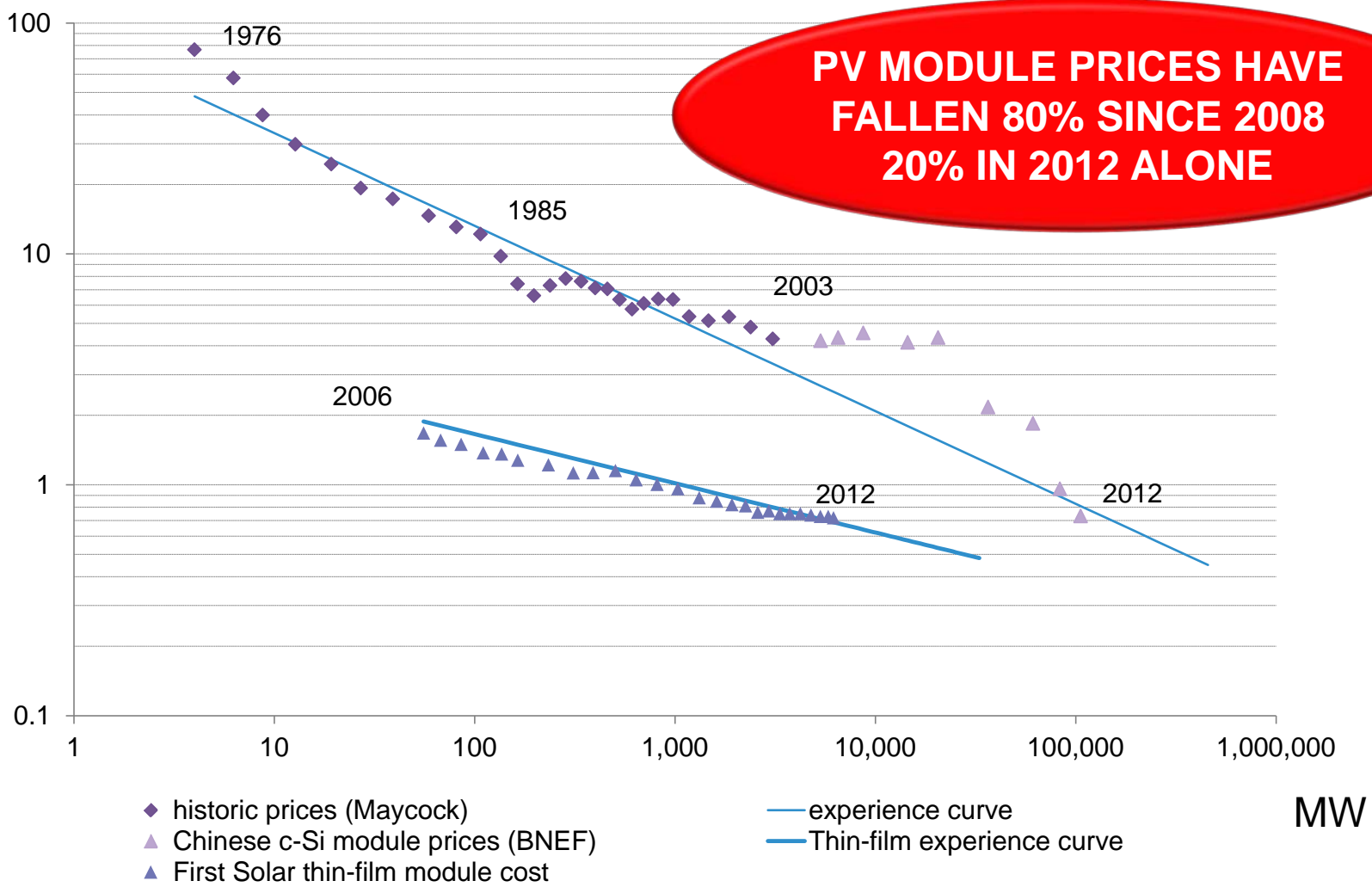


Note: Clean energy total excludes large hydro. Fossil fuel is investment on coal and gas capacity. We assume capacity retirement of 3.3%/yr for coal and 4%/yr for gas.

Source: Bloomberg New Energy Finance, EIA

# PV EXPERIENCE CURVE, 1976-2012

## 2012 \$/W

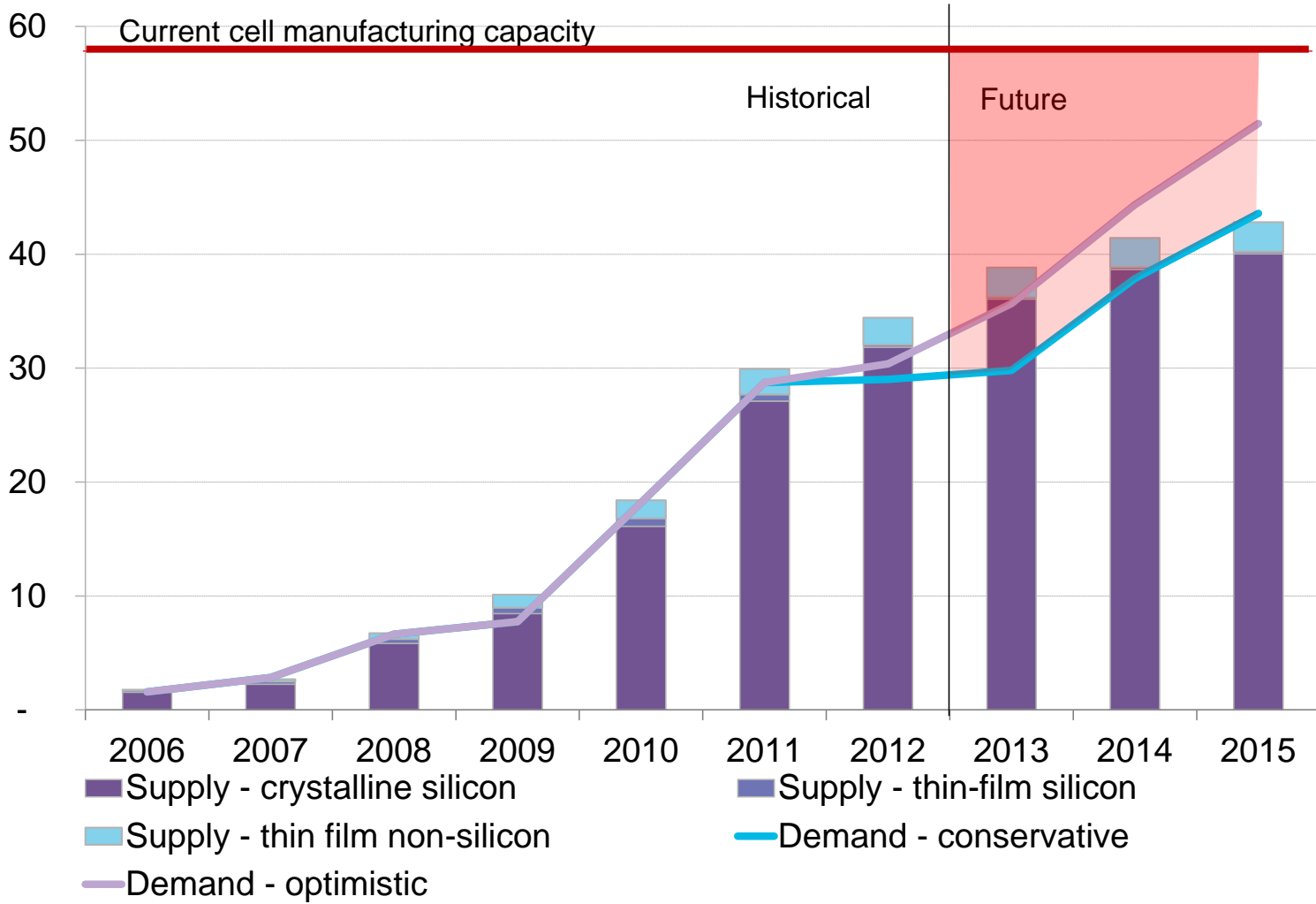


Note: Prices inflation indexed to US PPI.

Source: Paul Maycock, Bloomberg New Energy Finance



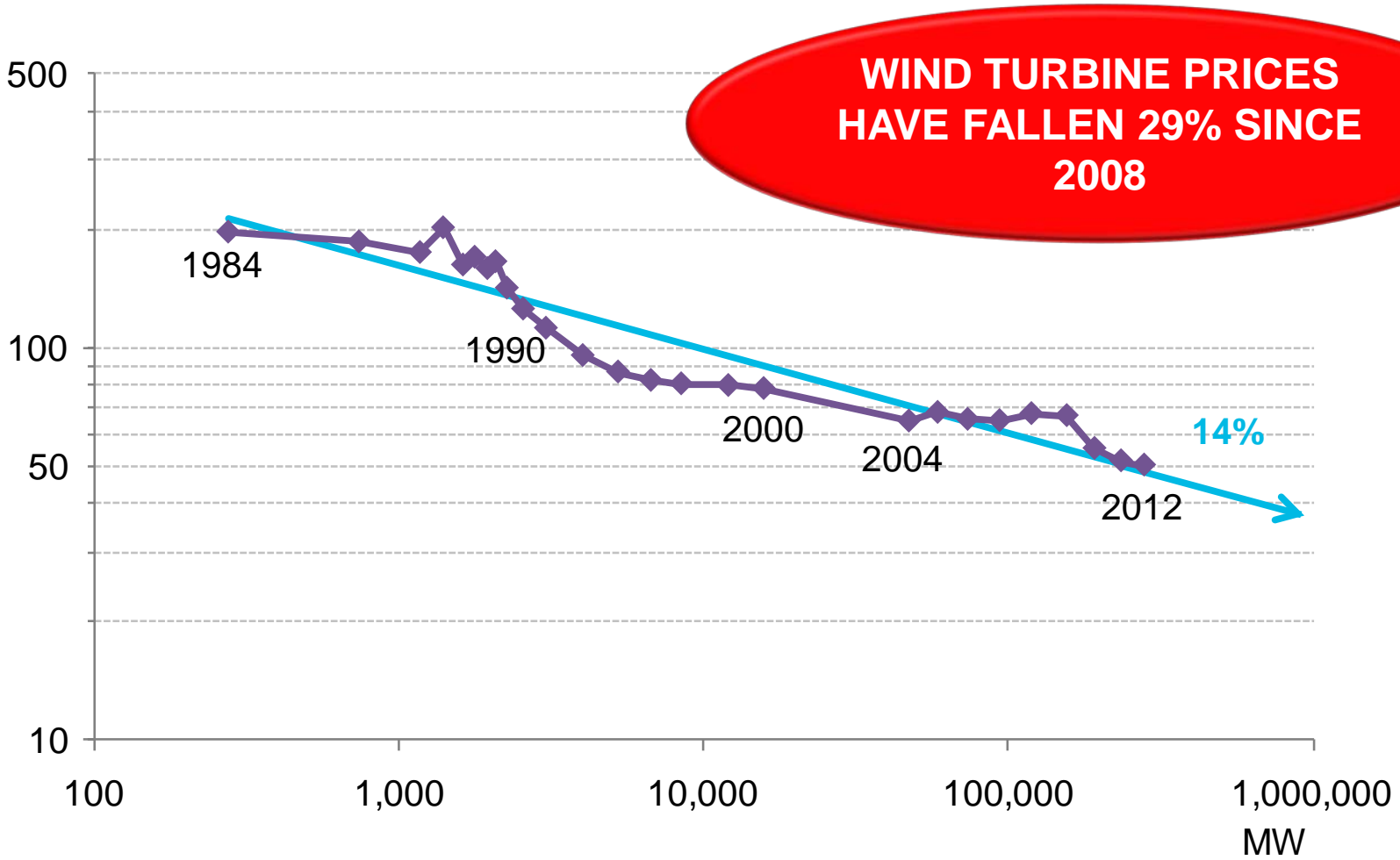
# DEMAND VERSUS HISTORICAL AND PROJECTED MODULE PRODUCTION (GW)



Note: Supply scenarios based on continued 2012 utilisation rates.

Source: Bloomberg New Energy Finance

# AVERAGE LEVELISED COST OF ONSHORE WIND, 1984-2012 (€/MWH)

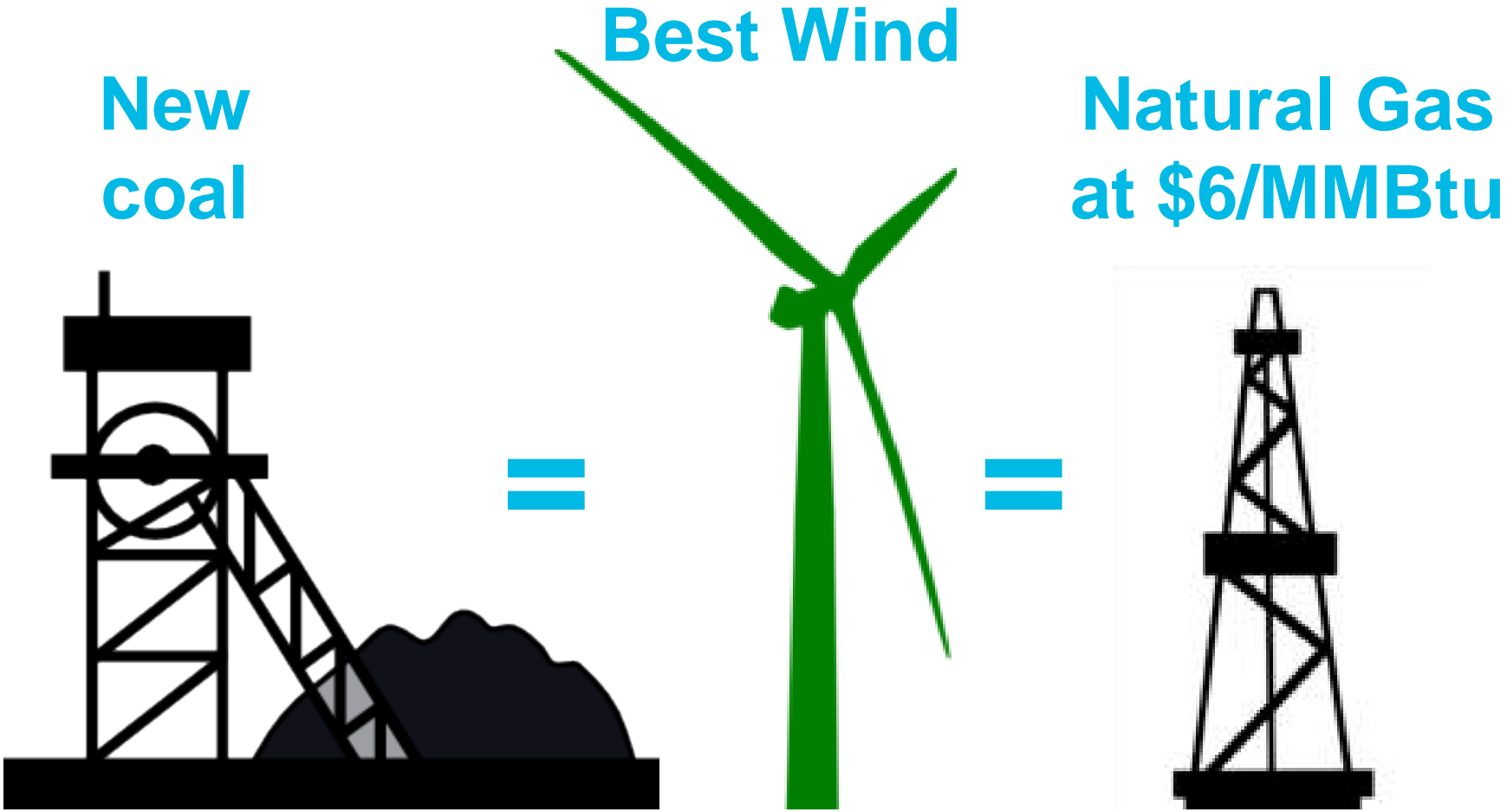


Note: Learning curve (blue line) is least square regression:  $R^2 = 0.88$  and 14% learning rate.

Source: Bloomberg New Energy Finance, ExTool

# GRID-COMPETITIVE CLEAN ENERGY

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Source: Bloomberg New Energy Finance

# \$4.16 NATURAL GAS, USA, 16 APRIL 2013

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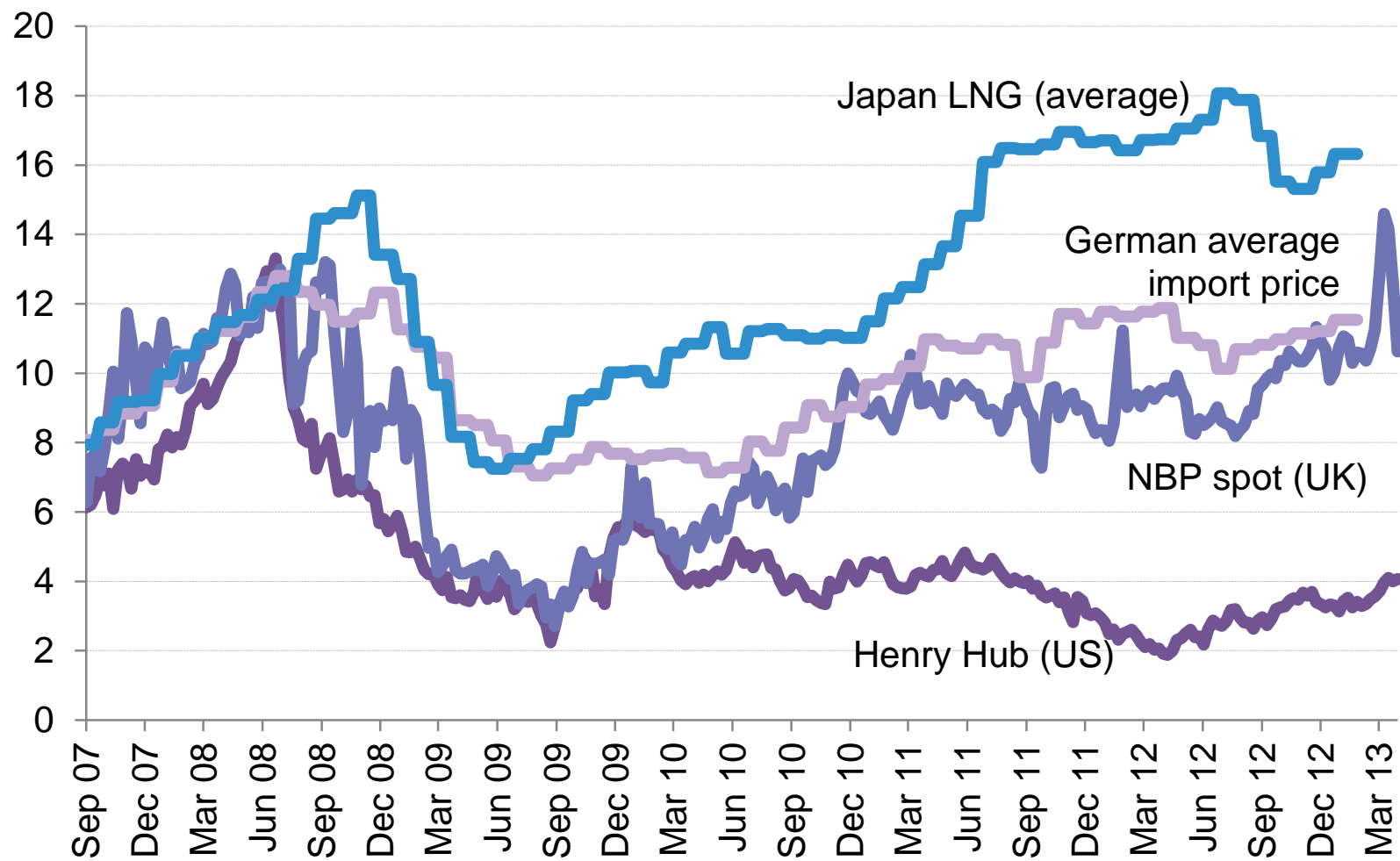


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Picture credits: Tod Baker via Creative Commons; NASA, NOAA, CERES

# GLOBAL GAS PRICES

(\$/MMBTU)

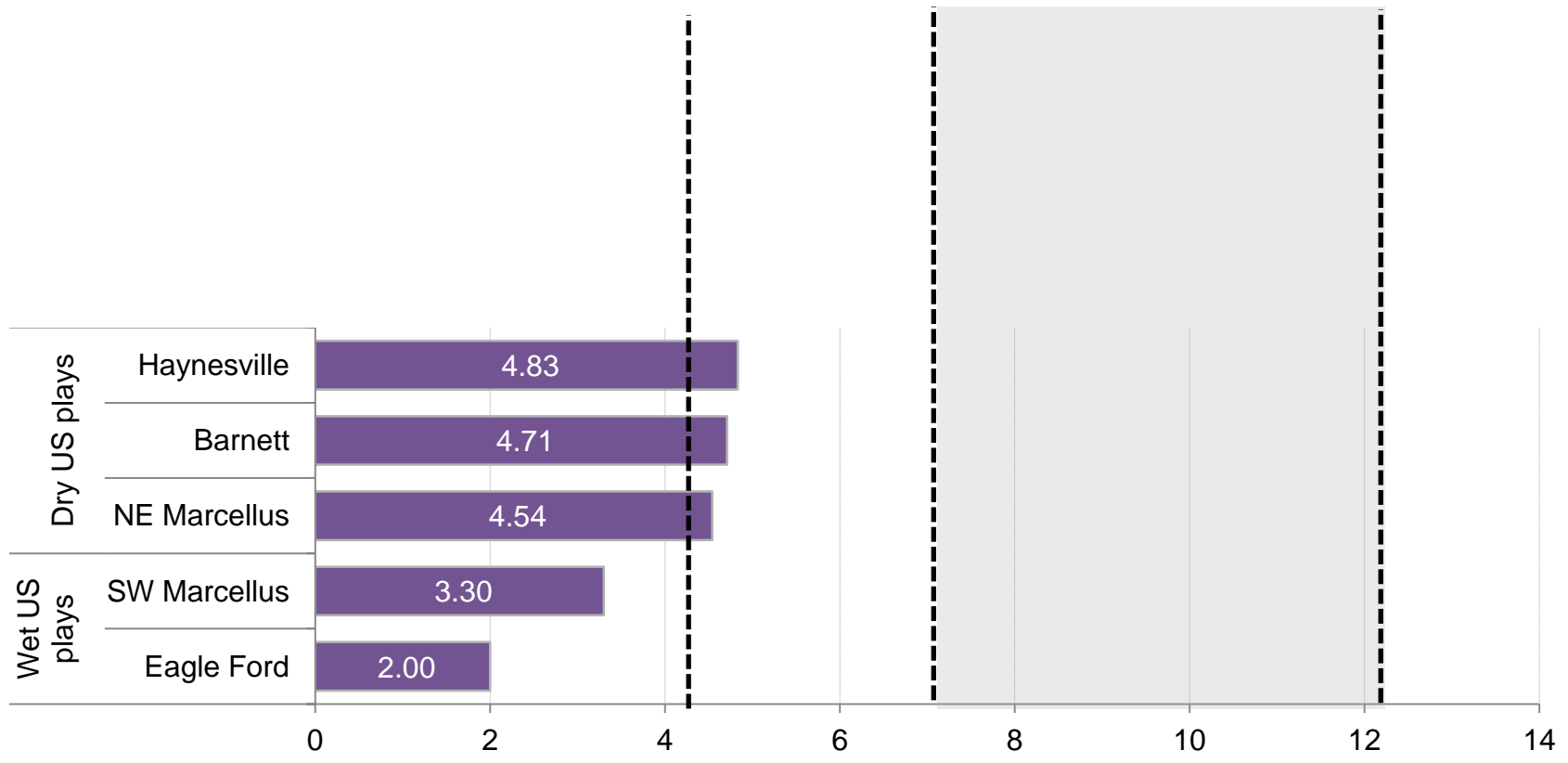


Source: Bloomberg New Energy Finance, Japan LNG Corp, German Federal Office of Economics and Export Control

# SHALE GAS 'FRACKING' BREAK-EVEN PRICE (\$/MMBTU)

16 April 2013  
Henry Hub  
\$4.16/MMBTU

UK likely shale gas price range

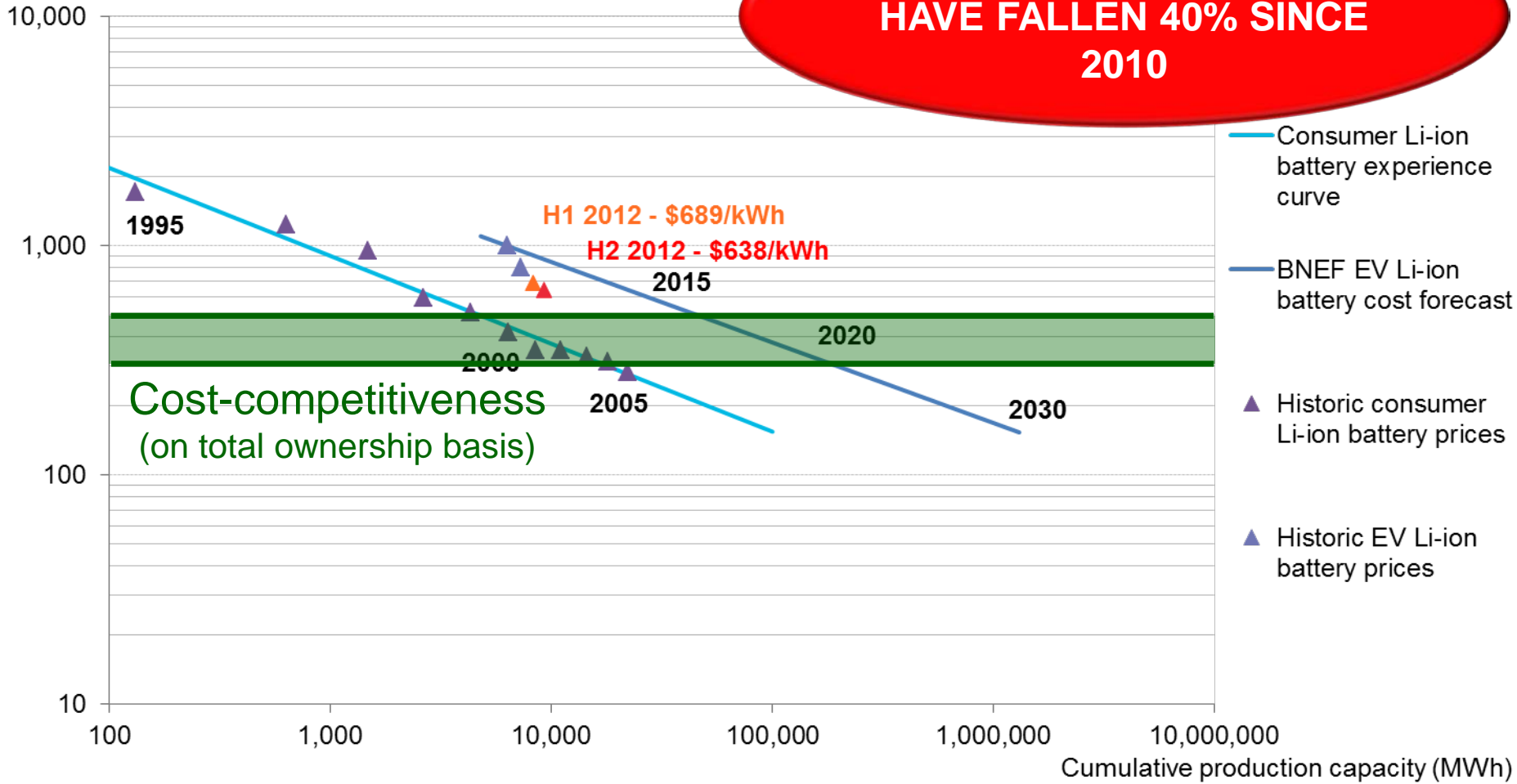


Note: Assumes 15% equity IRR. UK assumes \$8m Drilling & Completion cost; 2000-4250 mcf/d dry production (per Marcellus and Eagle Ford); 20% royalty rate; usual tax treatment

Source: Bloomberg New Energy Finance; Various

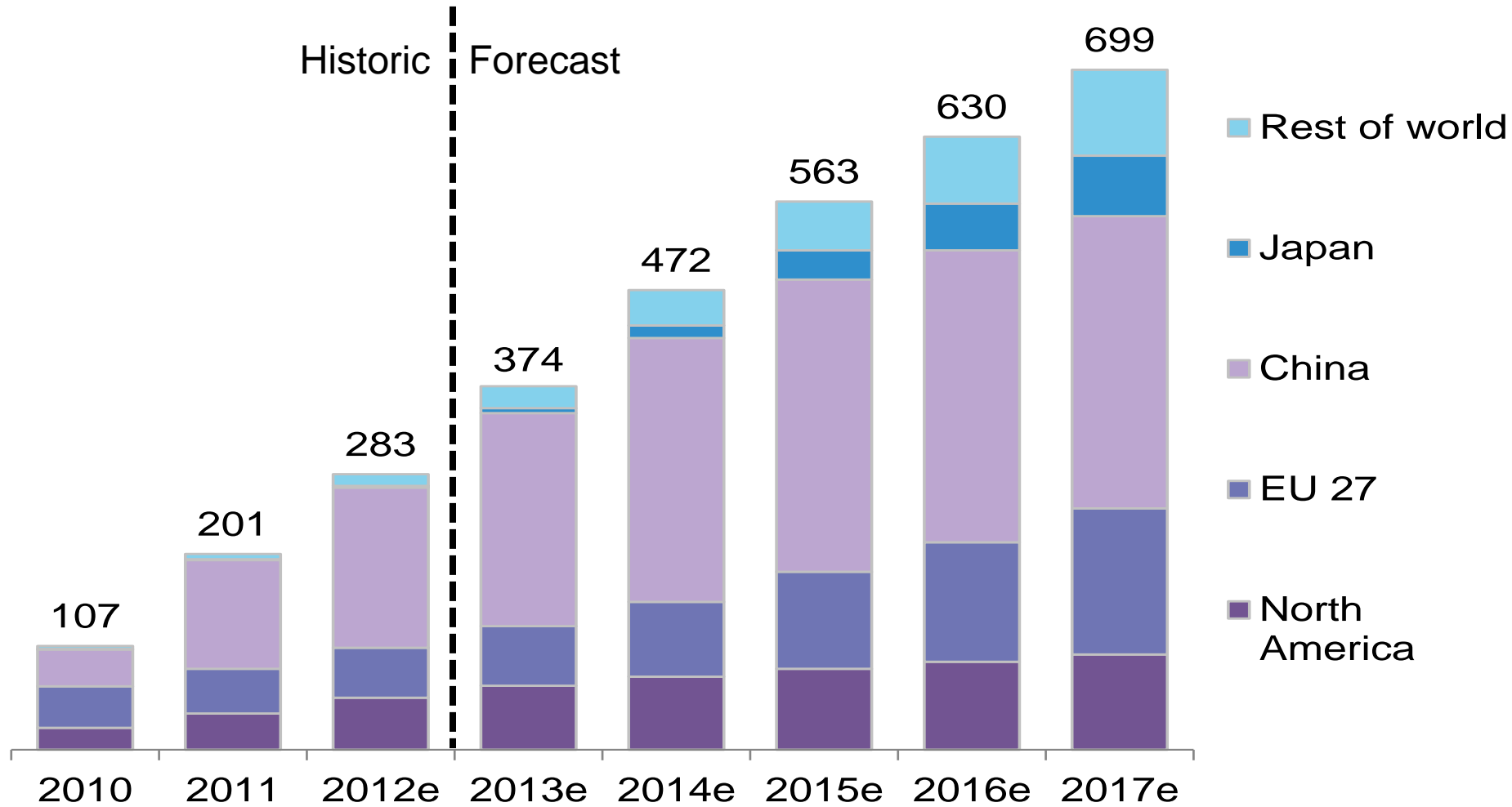
# LITHIUM-ION BATTERY EXPERIENCE CURVE

Battery pack cost (\$/kWh)



Source: Battery University, MIT, IIT, Bloomberg New Energy Finance

# NUMBERS OF SMART METERS WORLDWIDE (MILLIONS)

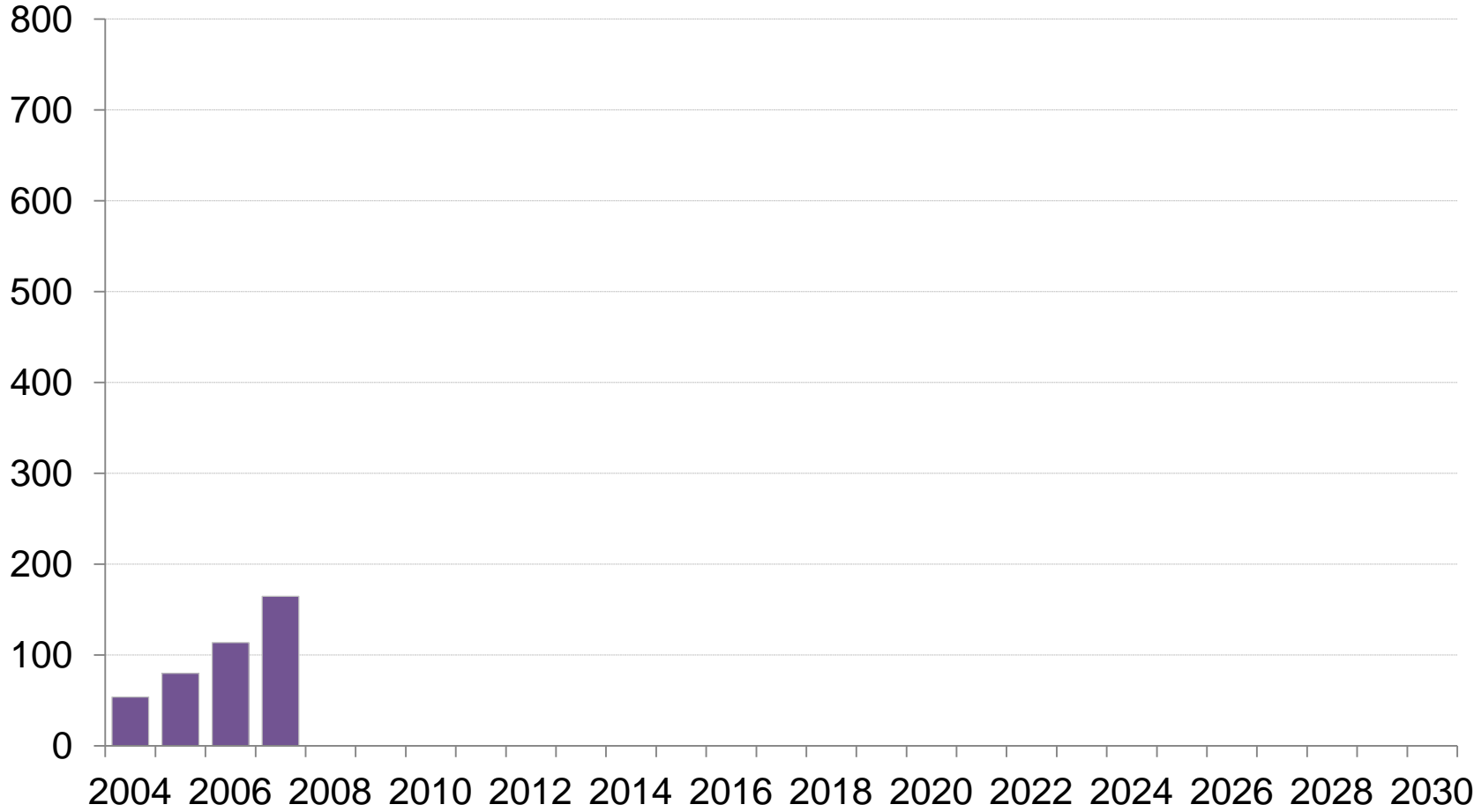


Source: Bloomberg New Energy Finance



# CAPITAL REQUIREMENT TO 2030

(\$BN)

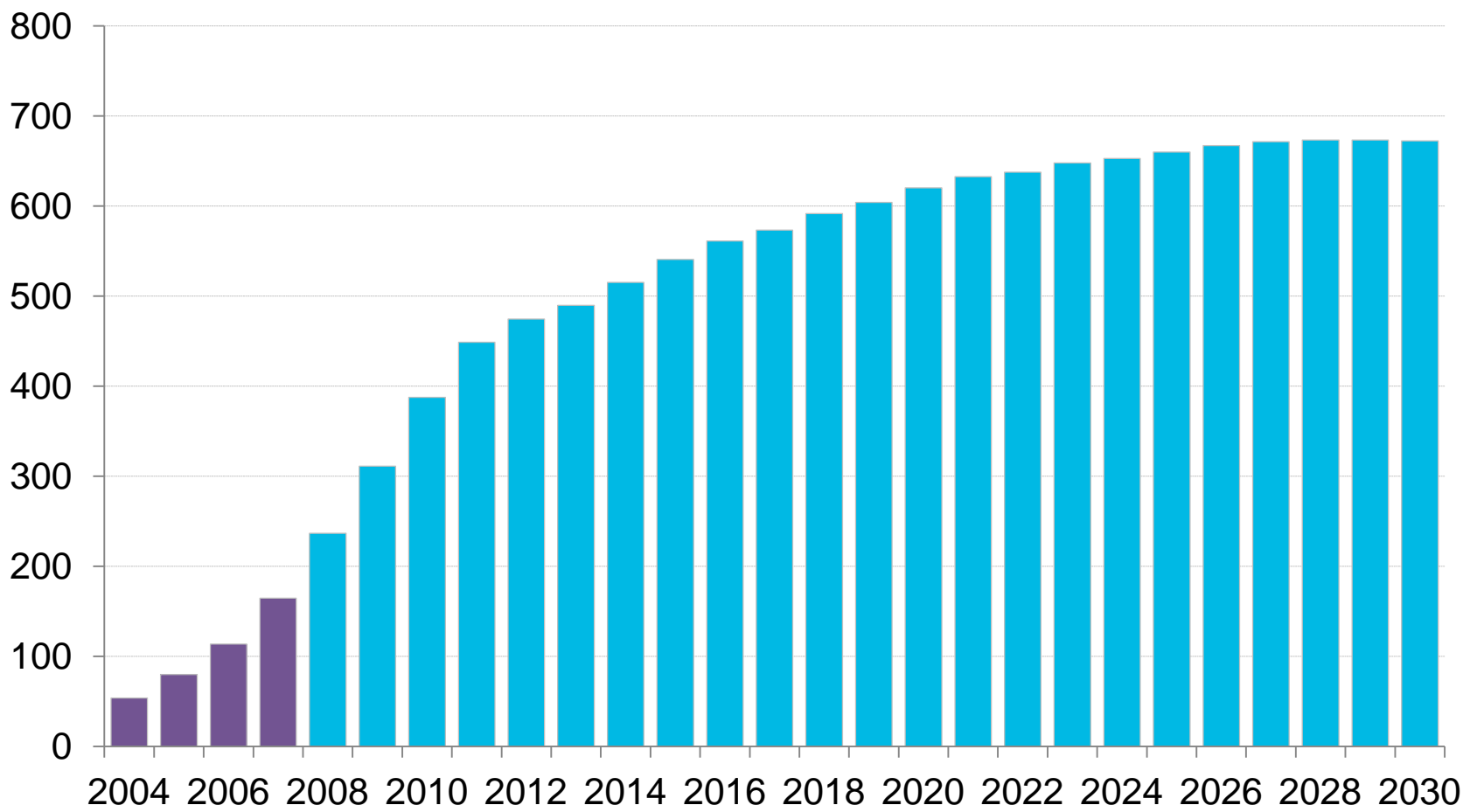


Note: Global Futures figures from 2008 restated to reflect current investment calculation methodology

Source: New Energy Finance Global Futures 2008, Bloomberg New Energy Finance

# CAPITAL REQUIREMENT TO 2030

(\$BN)

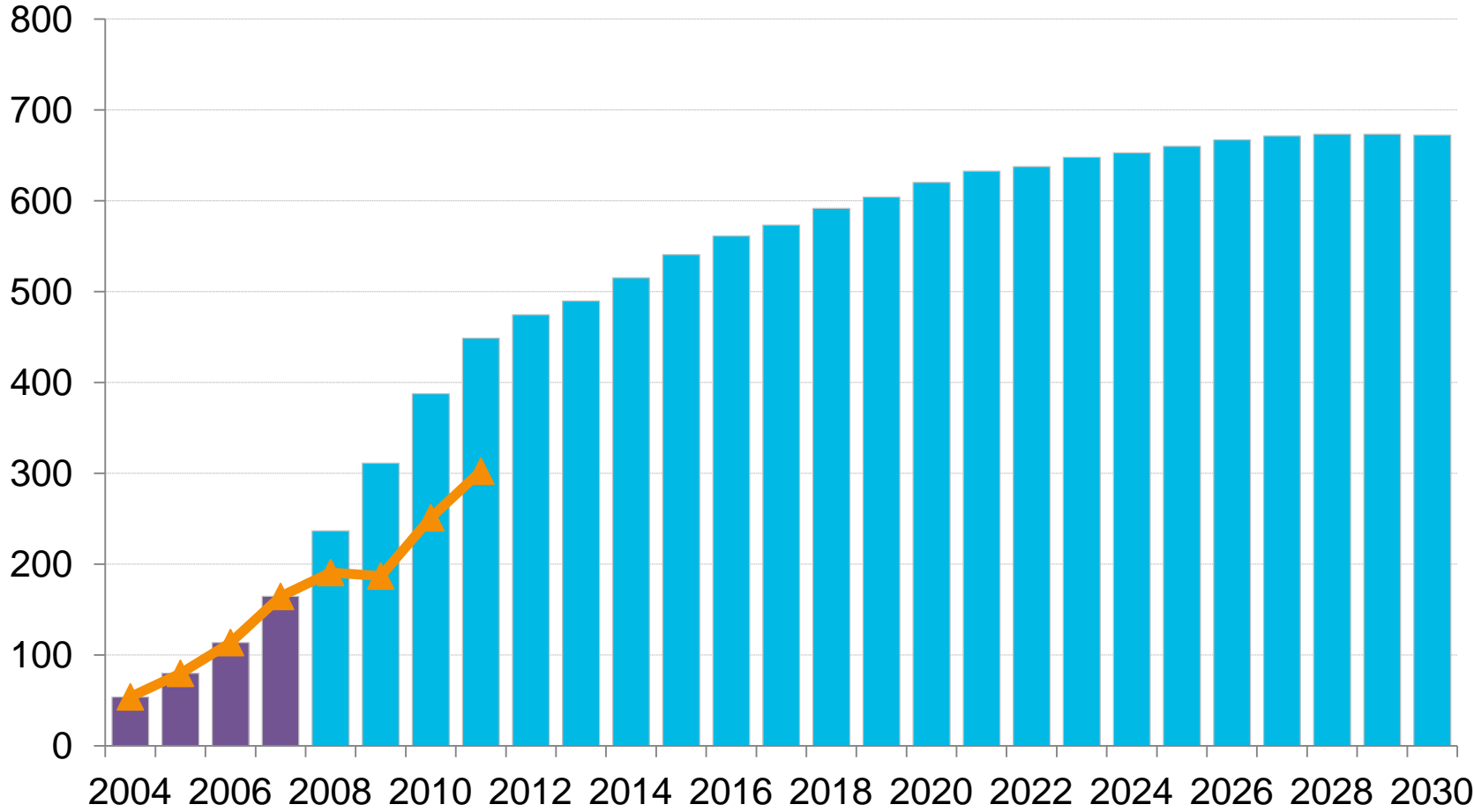


Note: Global Futures figures from 2008 restated to reflect current investment calculation methodology

Source: New Energy Finance Global Futures 2008, Bloomberg New Energy Finance

# CAPITAL REQUIREMENT TO 2030

(\$BN)

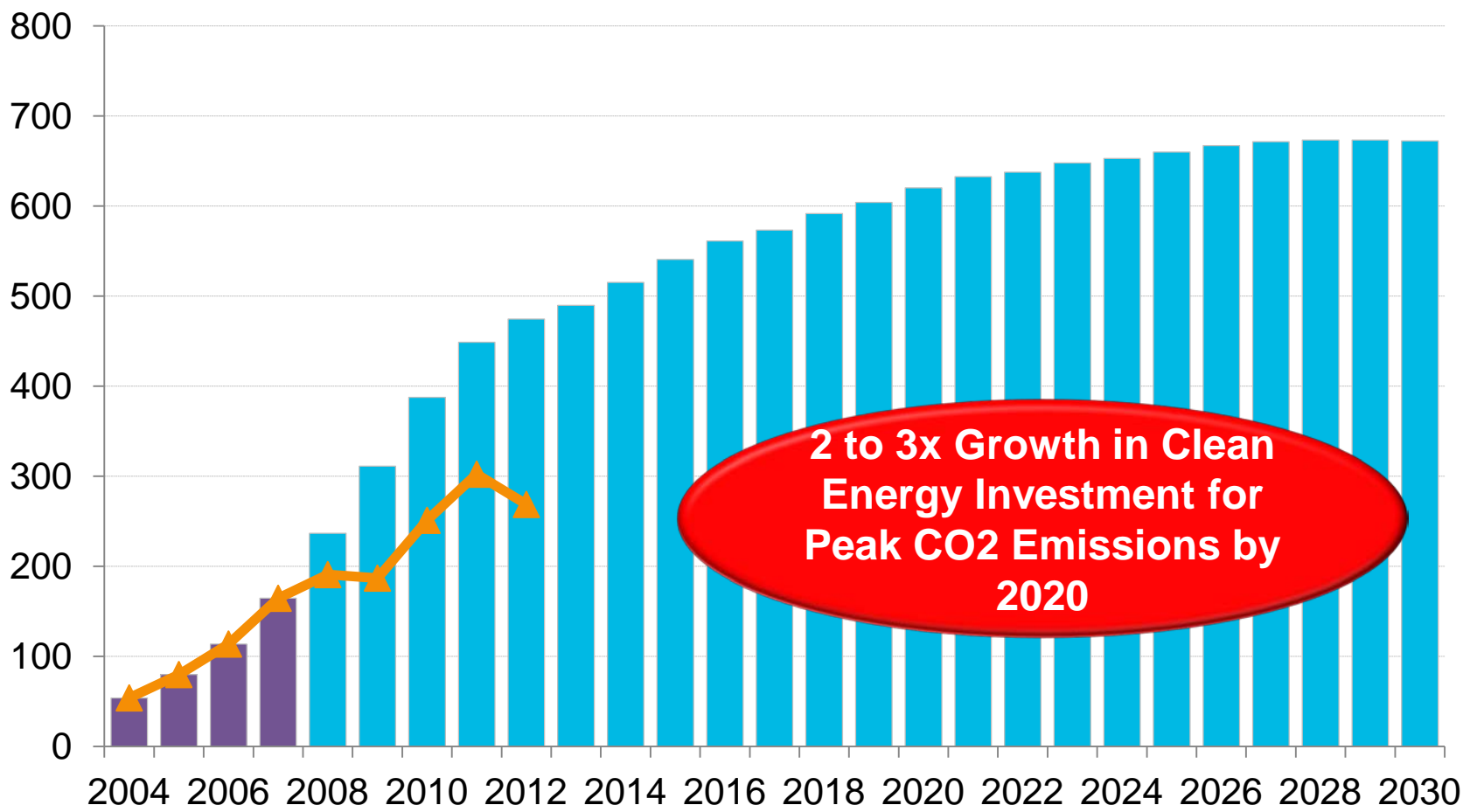


Note: Global Futures figures from 2008 restated to reflect current investment calculation methodology

Source: New Energy Finance Global Futures 2008, Bloomberg New Energy Finance

# CAPITAL REQUIREMENT TO 2030

(\$BN)



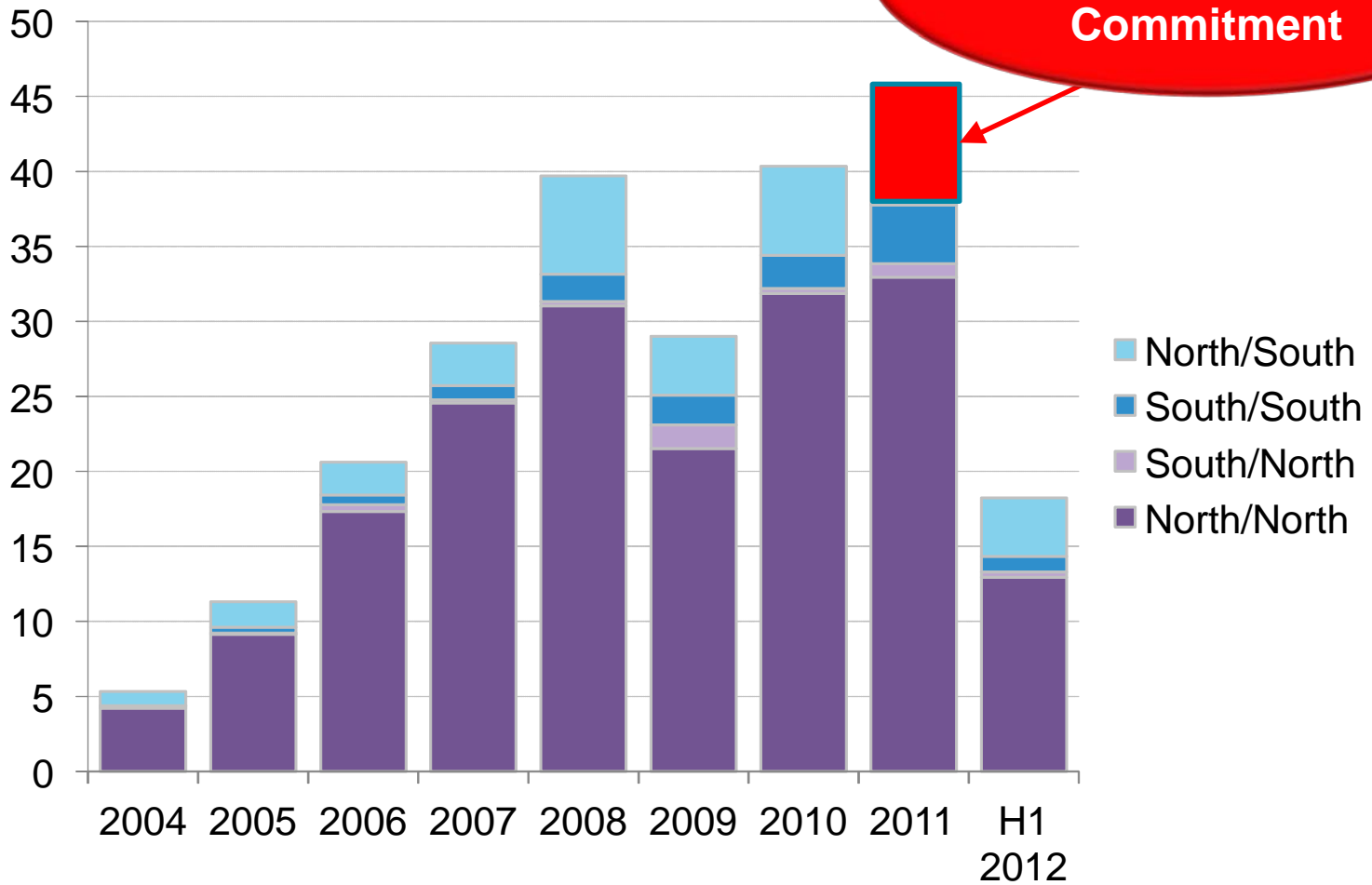
**2 to 3x Growth in Clean Energy Investment for Peak CO2 Emissions by 2020**

Note: Global Futures figures from 2008 restated to reflect current investment calculation methodology

Source: New Energy Finance Global Futures 2008, Bloomberg New Energy Finance

# CROSS-BORDER INVESTMENT VOLUMES BY REGIONAL FLOW, 2004 – H1 2012 (\$BN)

**10x Growth to meet \$100bn Copenhagen Commitment**



Note: new build asset finance for renewable energy projects only. Investment volumes show cross-border (or foreign) investments only. Domestic investments are excluded here.

Source: Bloomberg New Energy Finance

# THANK YOU!

**MICHAEL LIEBREICH**

**TWITTER: @MLiebreich**

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