

ENERGY ALL-STARS: “WHAT’S OUR ENERGY FUTURE”

WASHINGTON DC

19 JANUARY 2013

Michael Liebreich, Chief Executive

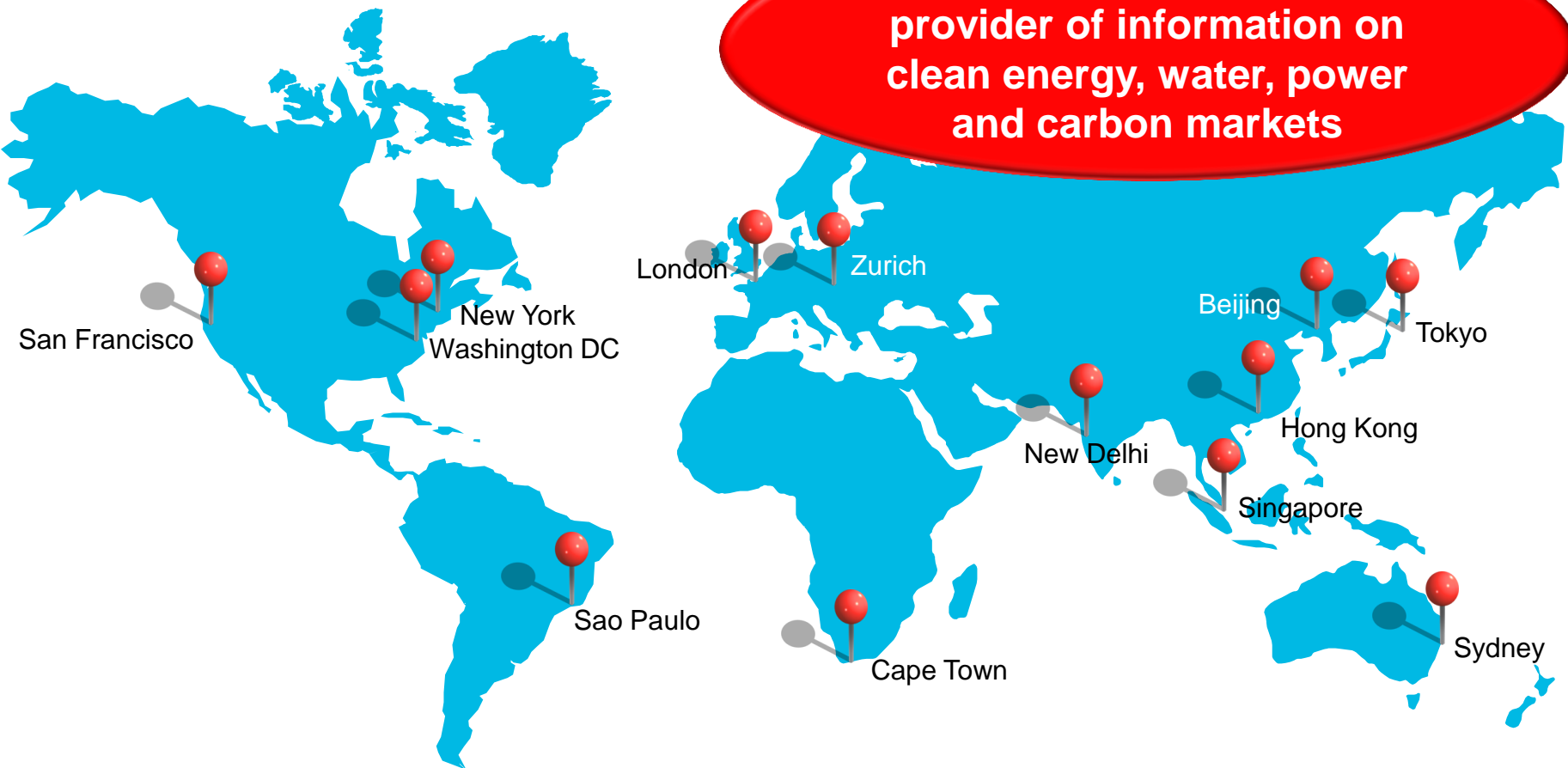
Bloomberg New Energy Finance

Twitter: @MLiebreich



ABOUT BLOOMBERG NEW ENERGY FINANCE

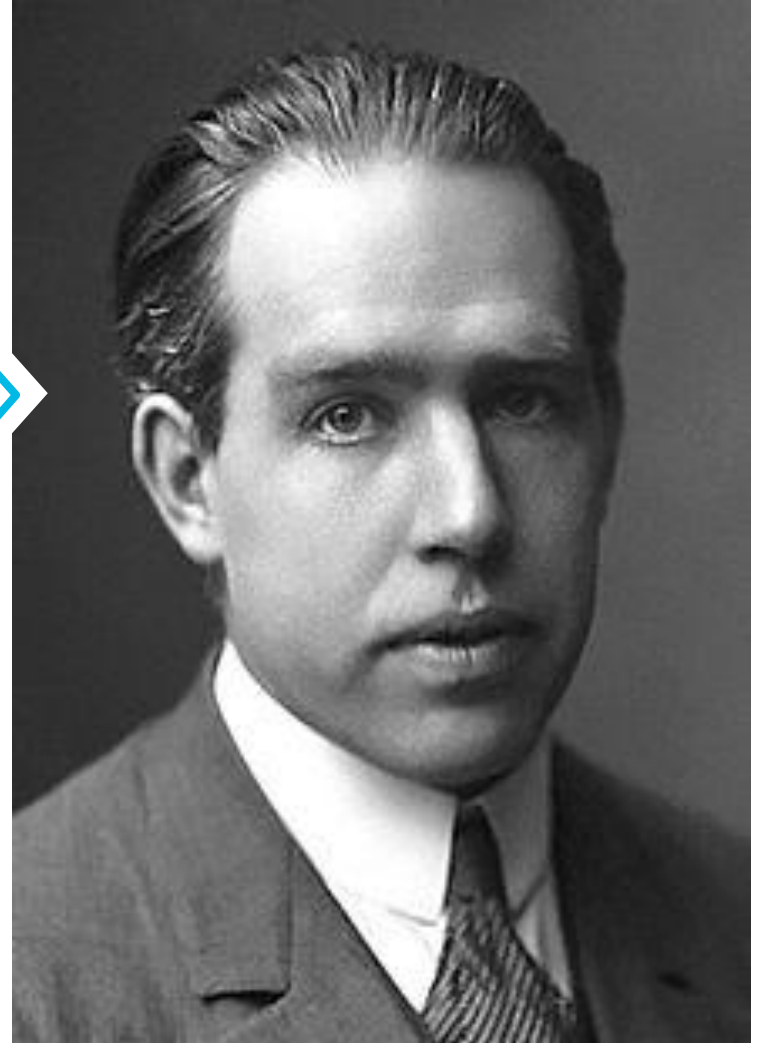
200 people: world's leading provider of information on clean energy, water, power and carbon markets



THE FUTURE

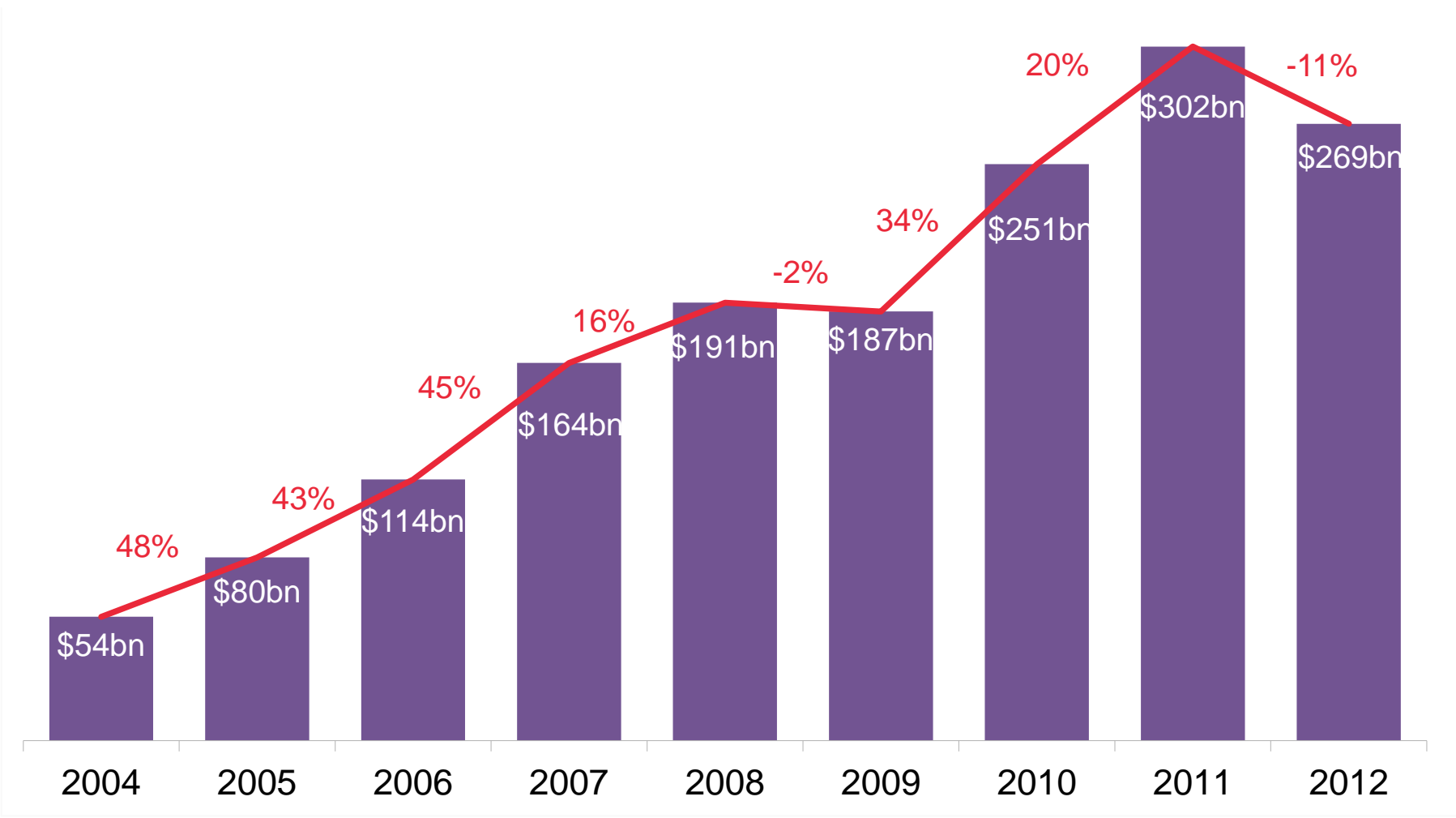
“ Prediction is very difficult, especially about the future. ”

Nils Bohr
Physicist



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

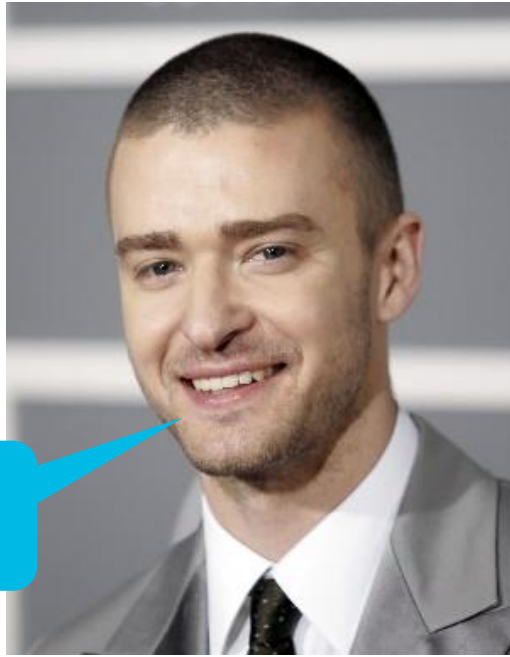
Source: Bloomberg New Energy Finance

TOTAL INVESTMENT IN CLEAN ENERGY

In clean energy, a **billion** dollars isn't cool. You know what's cool?

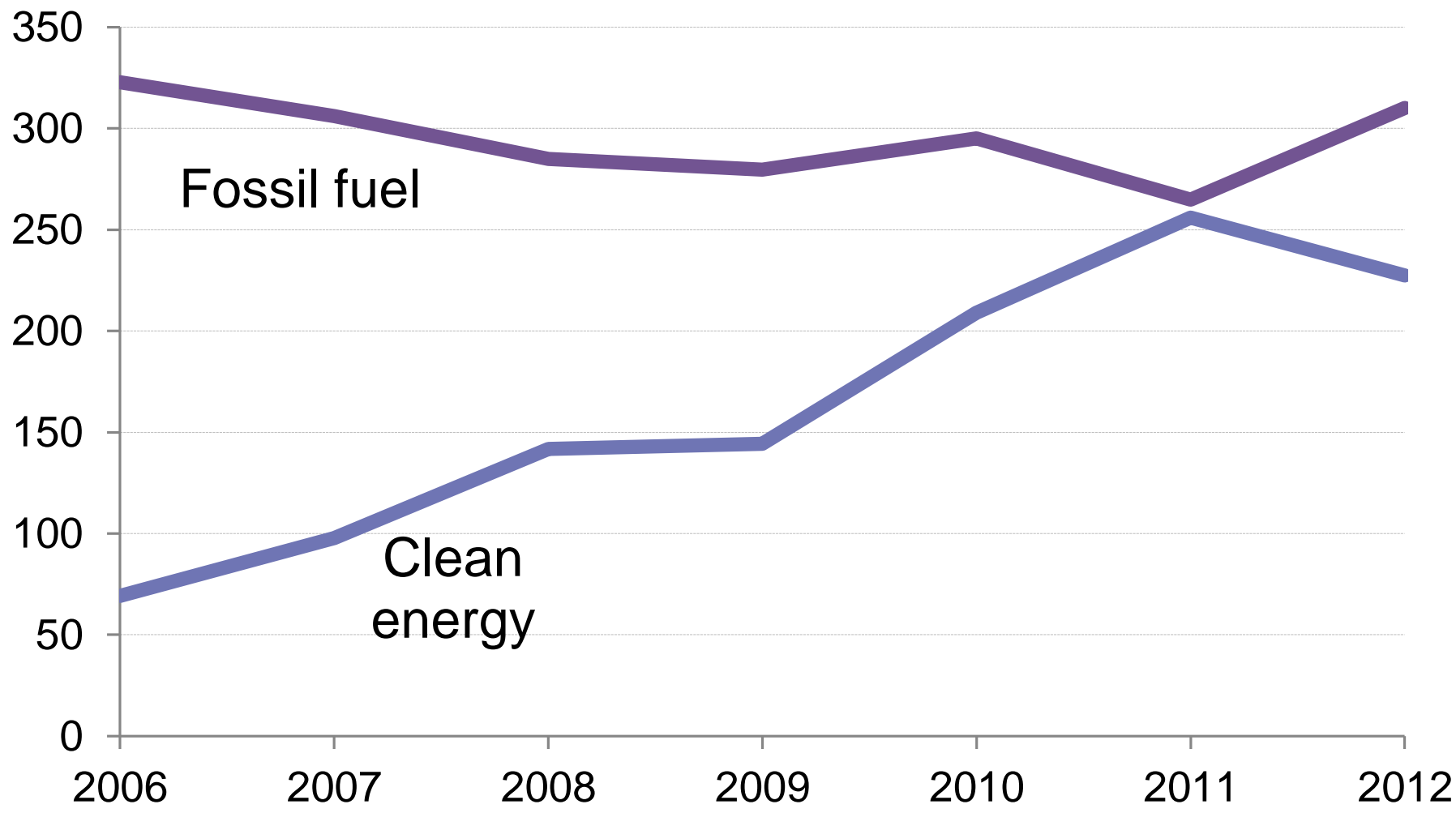
A **trillion** dollars.

That's cool



Source: Bloomberg New Energy Finance, Columbia Pictures

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

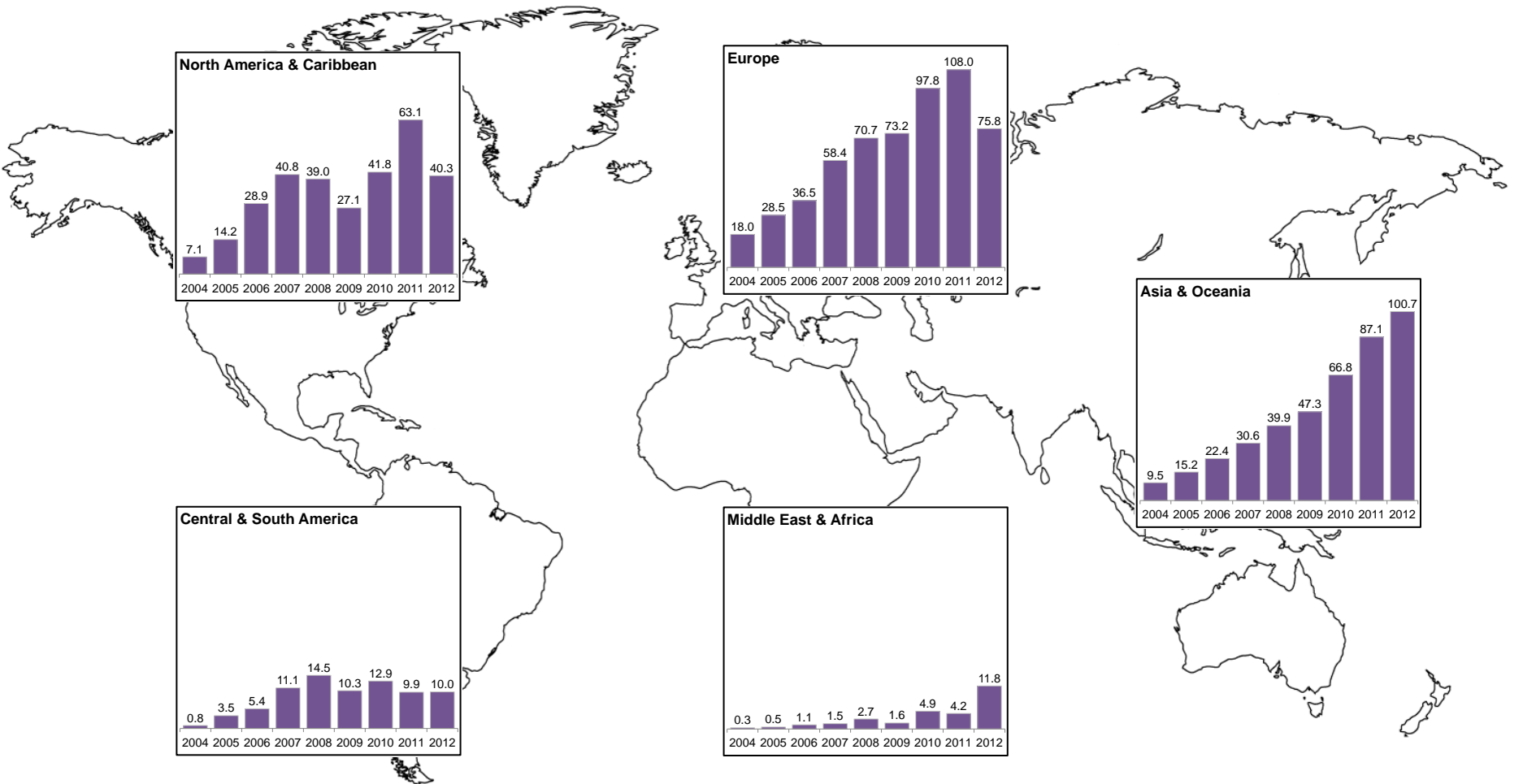


Note: Clean energy total excludes large hydro. Fossil fuel is investment on coal and gas capacity. We assume capacity retirement of 3.3%/yr for coal and 4%/yr for gas.

Source: Bloomberg New Energy Finance, EIA

NEW INVESTMENT IN CLEAN ENERGY BY REGION

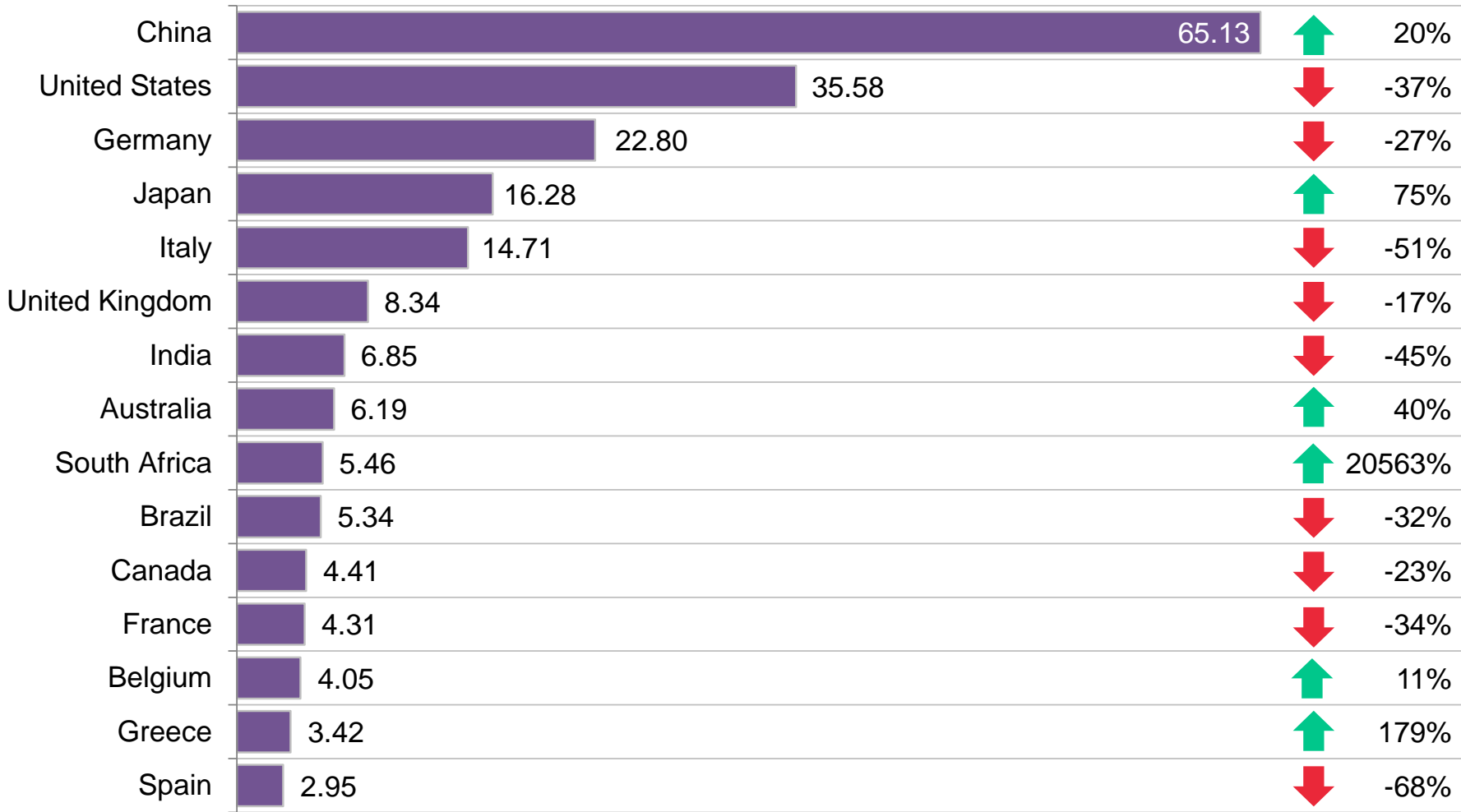
2004–12 (\$BN)



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

CHINA'S AIR QUALITY PROBLEM

(PM2.5 microgrammes per cubic meter)



993

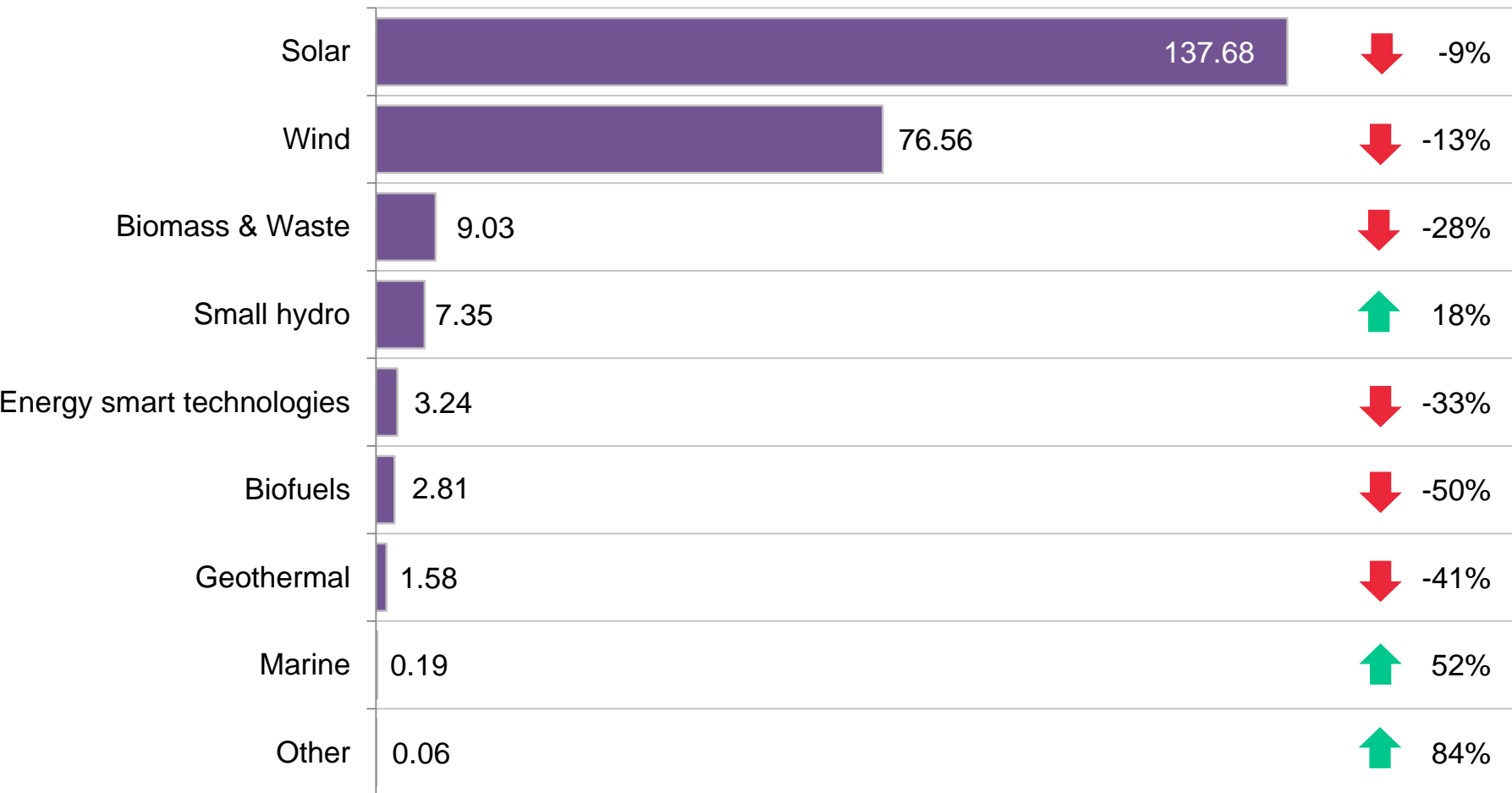
Beijing
12 Jan 2013

World Health
Organisation
Guideline

25

Picture credit: Feng Li/Getty Images

NEW INVESTMENT IN CLEAN ENERGY BY SECTOR IN 2012 AND % CHANGE ON 2011 (\$BN)

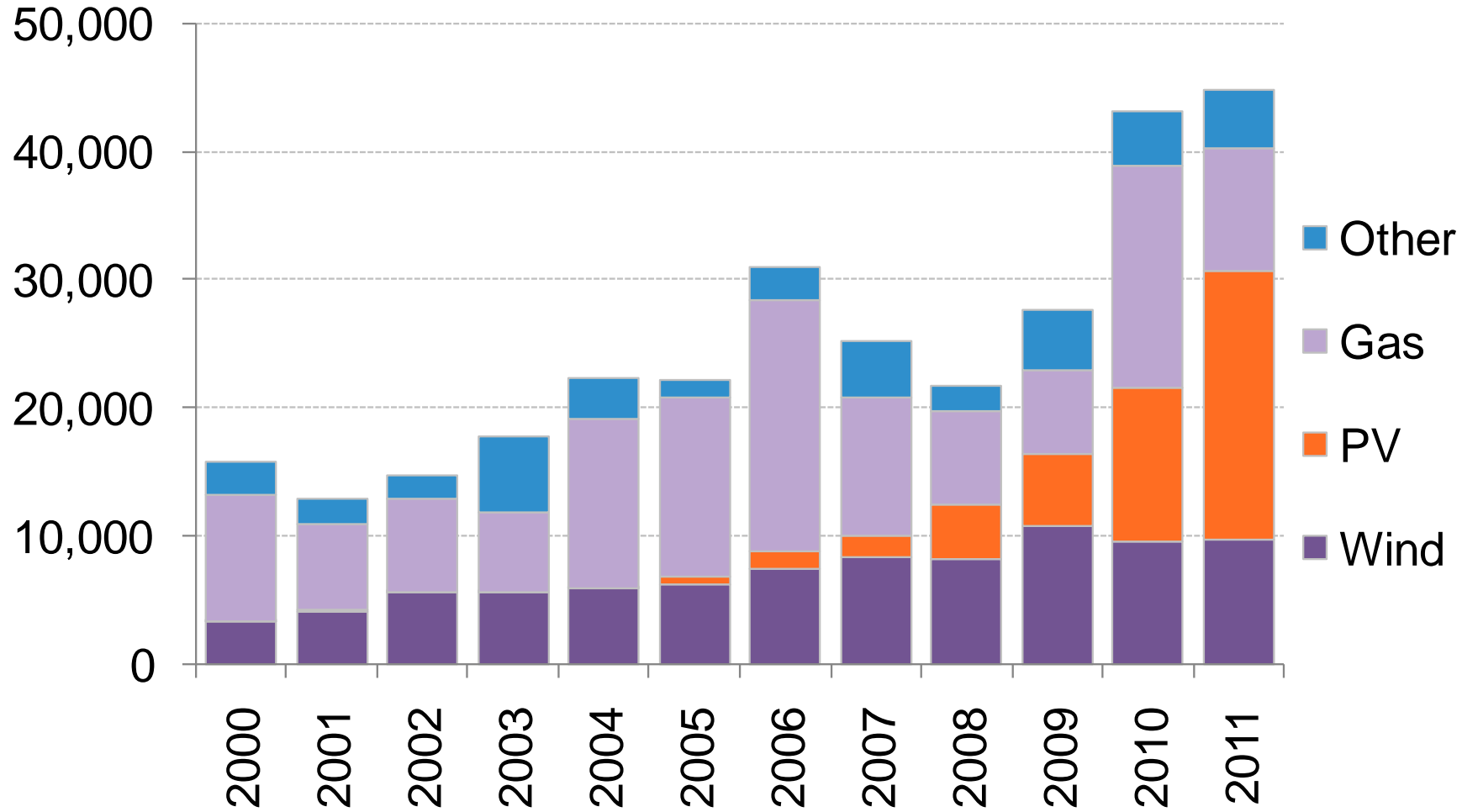


Note: Excludes corporate and government R&D

Source: Bloomberg New Energy Finance

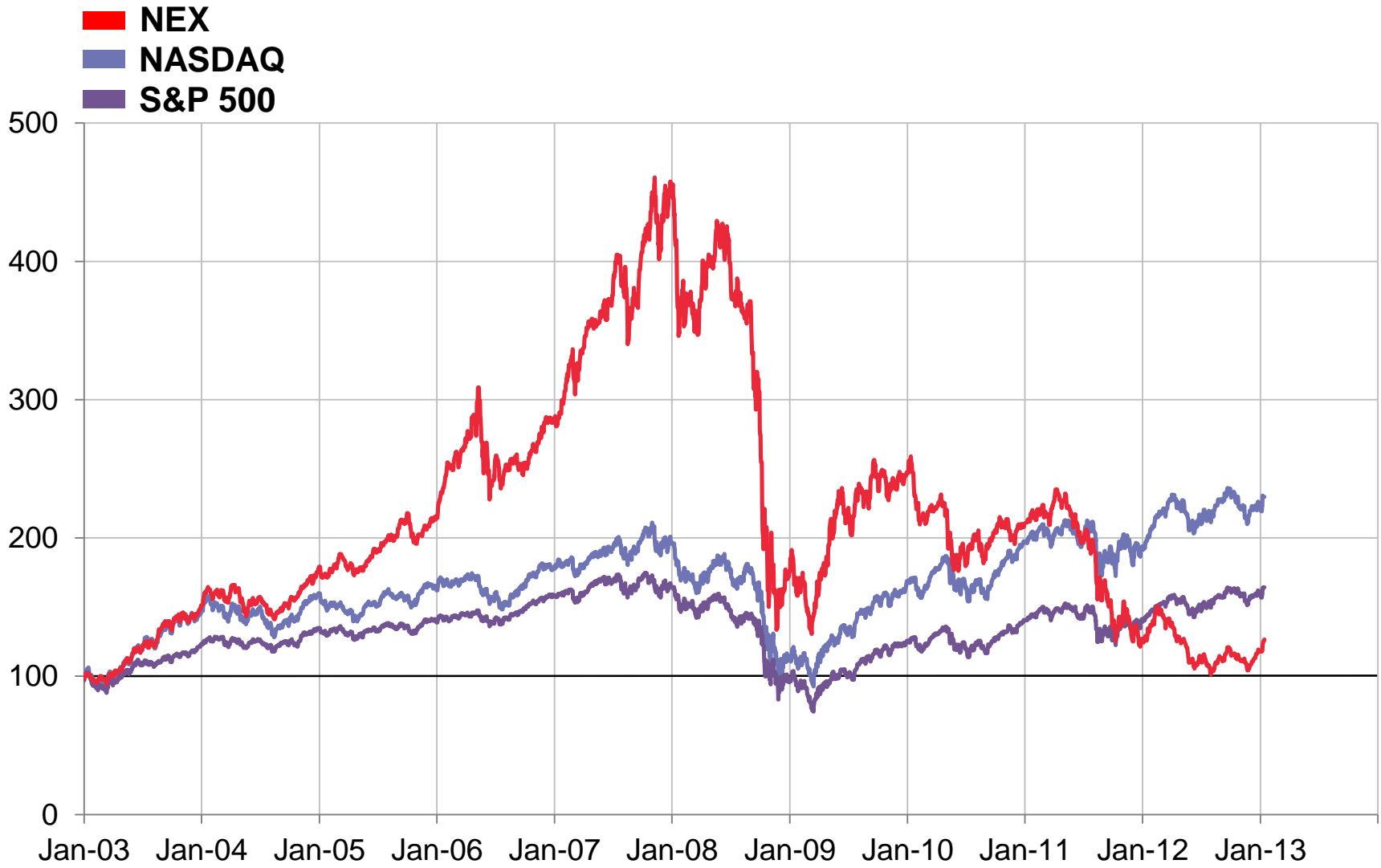
EU NET CAPACITY ADDITIONS

(GW)



Source: EWEA, Bloomberg New Energy Finance,

NEX CLEAN ENERGY INDEX 2003 – 2013 YTD

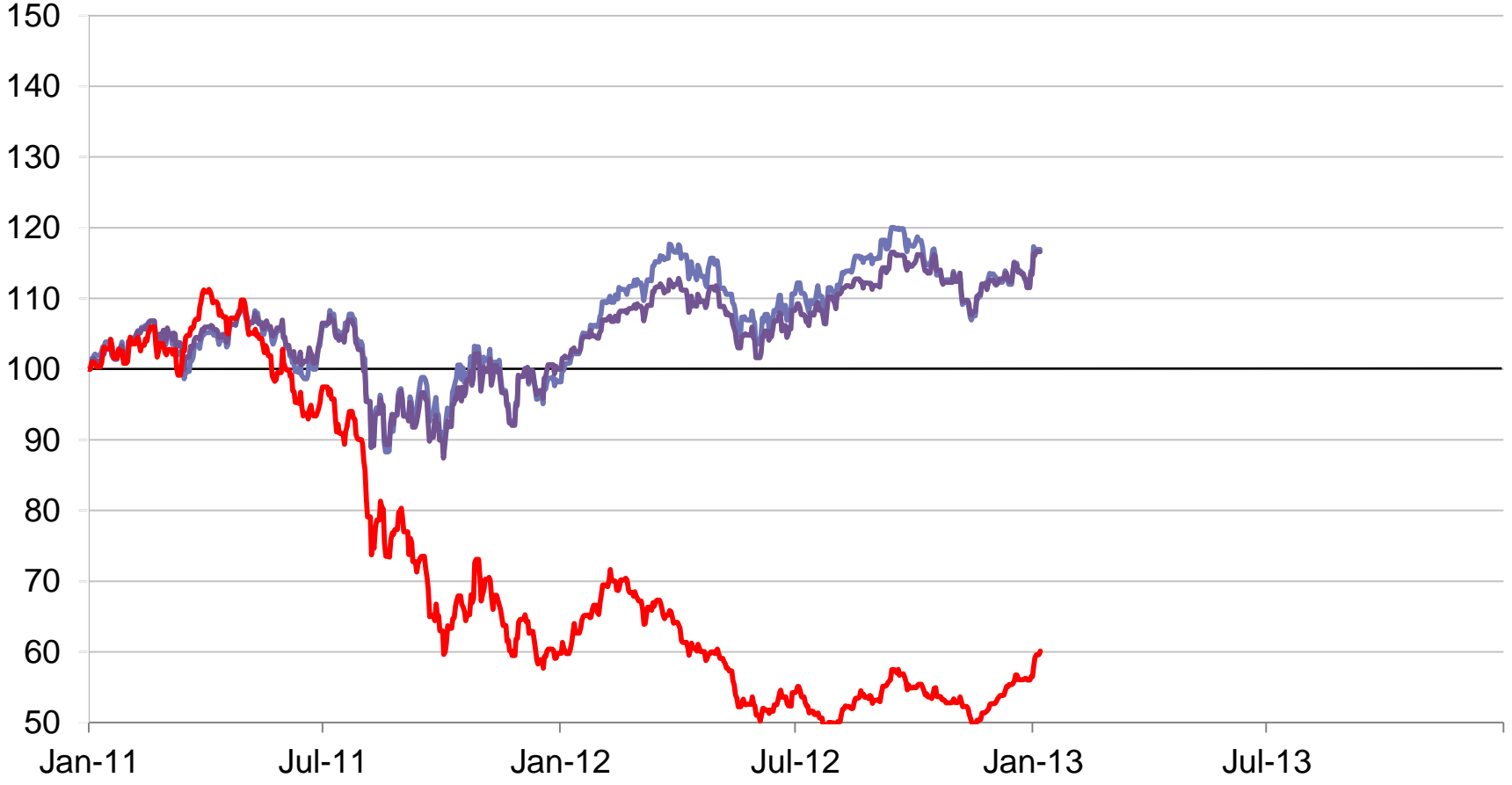


Note: Values as of 07 January 2013; NASDAQ and S&P 500 rebased to 100 on 01 Jan 2003

Source: Bloomberg New Energy Finance

NEX CLEAN ENERGY INDEX 2011 – 2013 YTD

■ NEX
■ NASDAQ
■ S&P 500



Note: Values as of 07 January 2013; NASDAQ and S&P 500 rebased to 100 on 01 Jan 2011.

Source: Bloomberg New Energy Finance

EUROPE – FINANCIAL CRISIS



Photo: Bloomberg

US ELECTION

~~ndra! Solyn~~

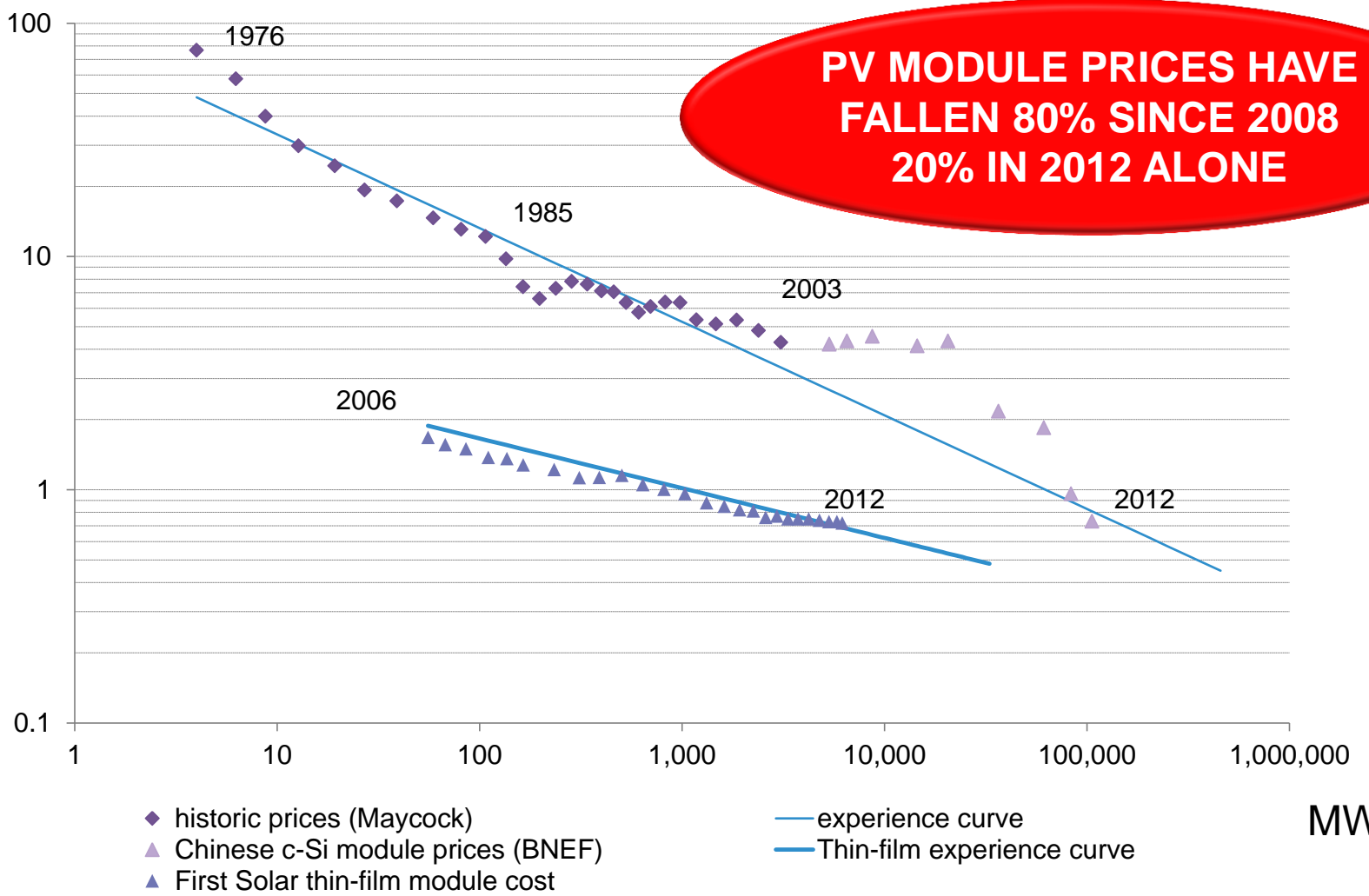
All of the above! Starting with the Wind Production Tax Credit!



Picture Credits: Bloomberg

PV EXPERIENCE CURVE, 1976-2012

2012 \$/W



Note: Prices inflation indexed to US PPI.

Source: Paul Maycock, Bloomberg New Energy Finance

CLEAN ENERGY COST COMPETITIVENESS – AFRICA



Kerosene
\$4 per week



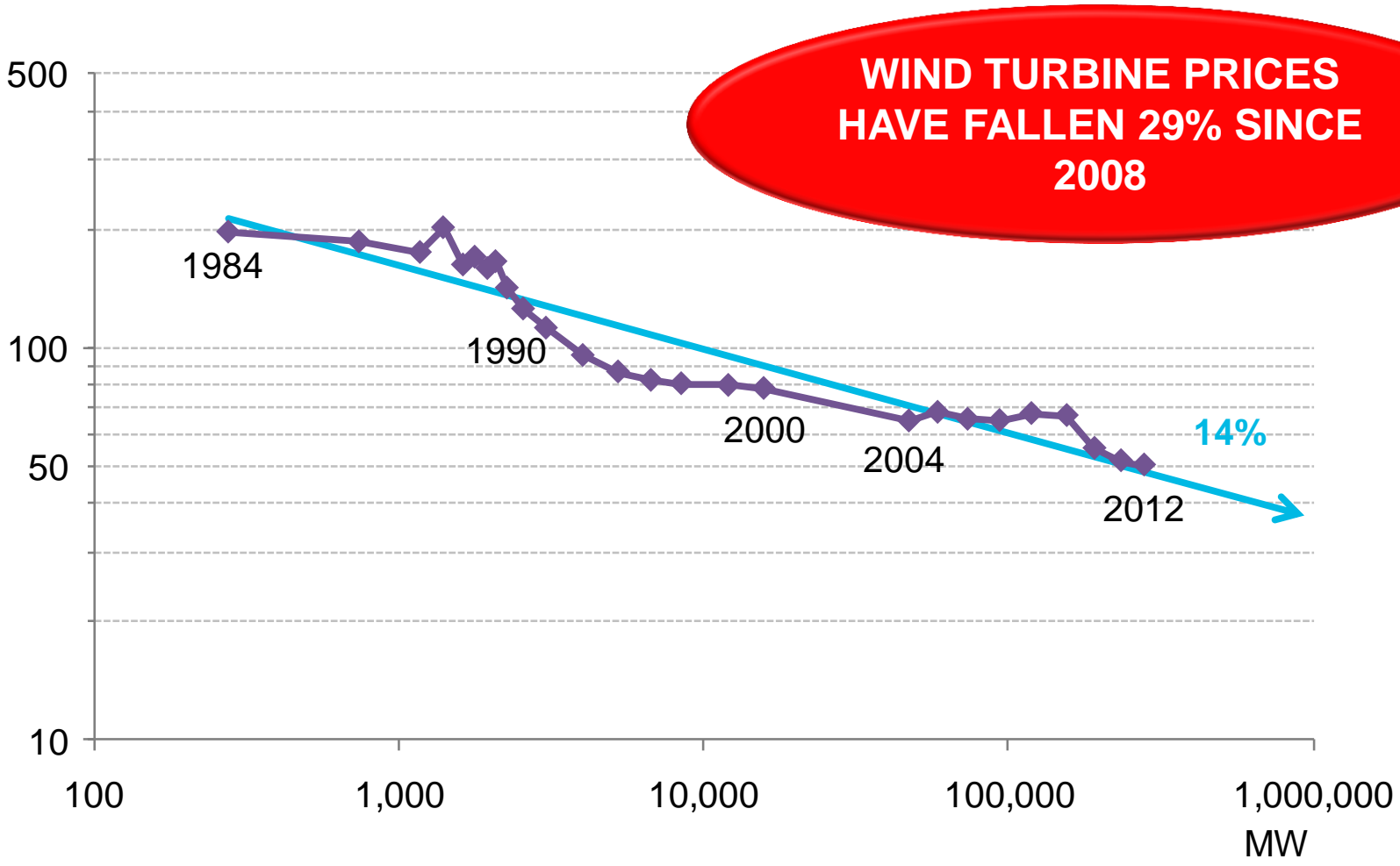
Solar PV
\$1 per week



Note: Illustrative figures for cost of 2 lamps plus mobile phone charging, Kenya, 2012

Picture Credit: SolarSister

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

EVOLUTION OF WIND POWER

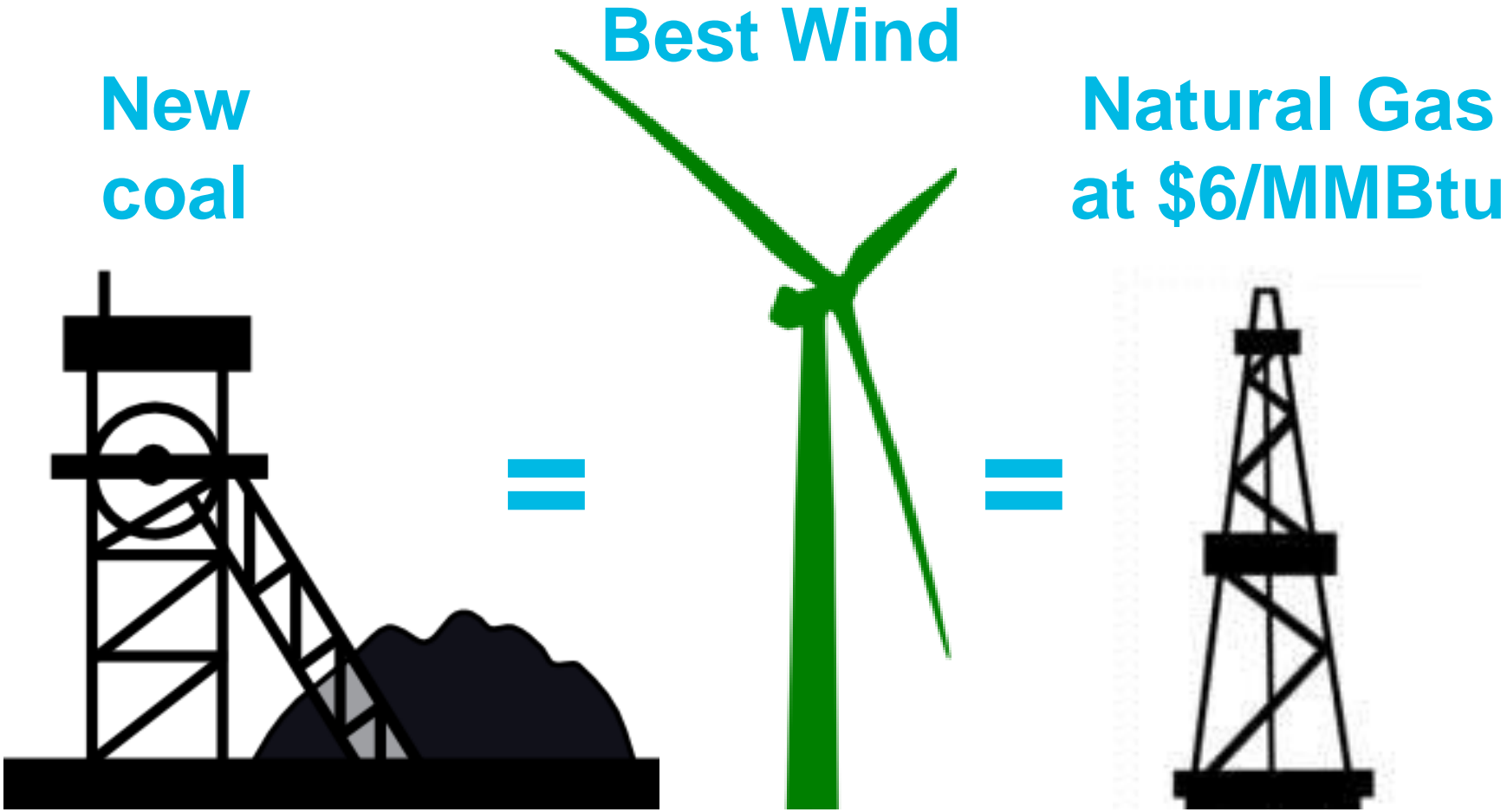


1984



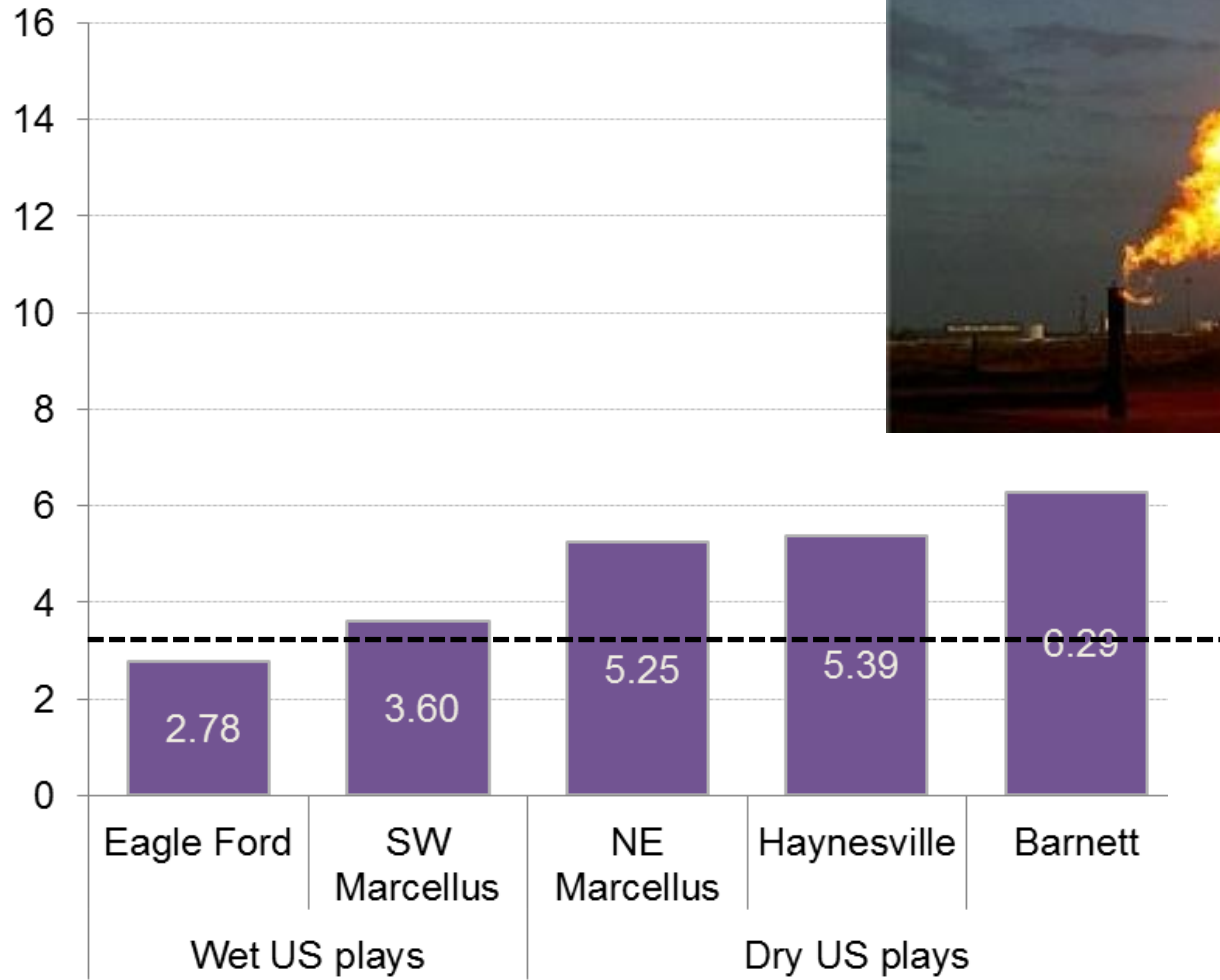
2011

GRID-COMPETITIVE CLEAN ENERGY



Source: Bloomberg New Energy Finance

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



19 Jan 2013
Henry Hub
\$3.57/MMBTU

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

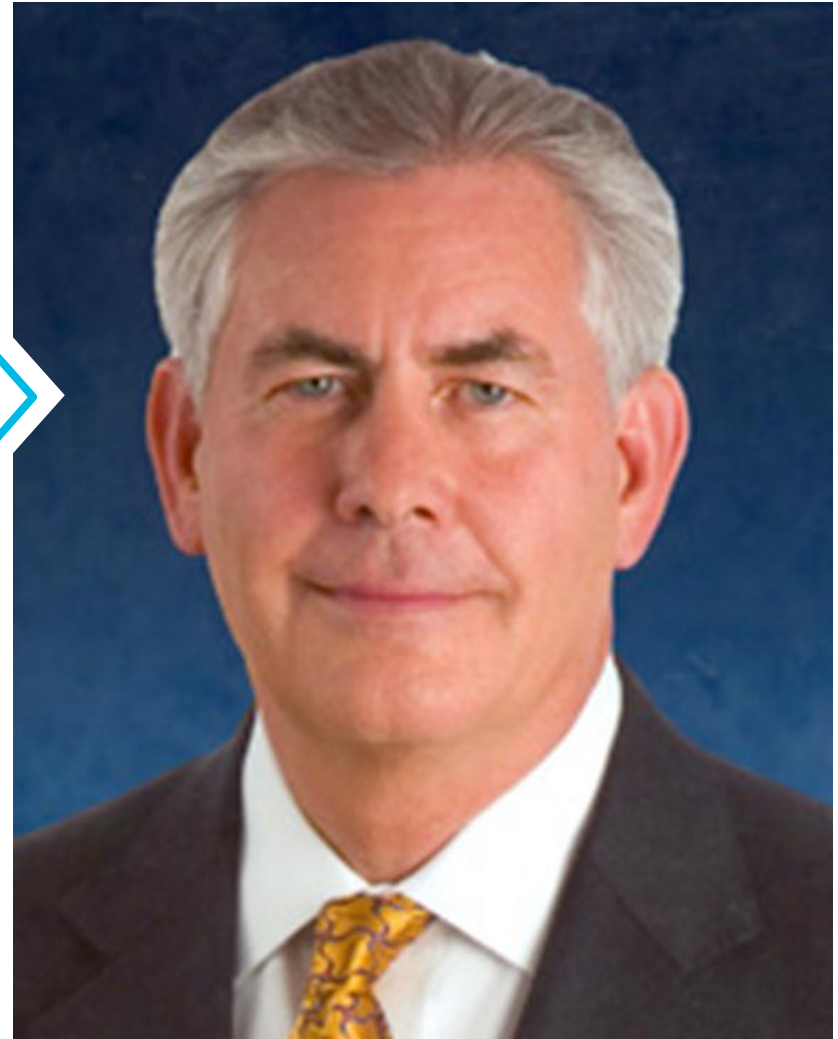
Source: Bloomberg New Energy Finance; Various

“

You know,
we're making
no money.
It's all in the
red.”

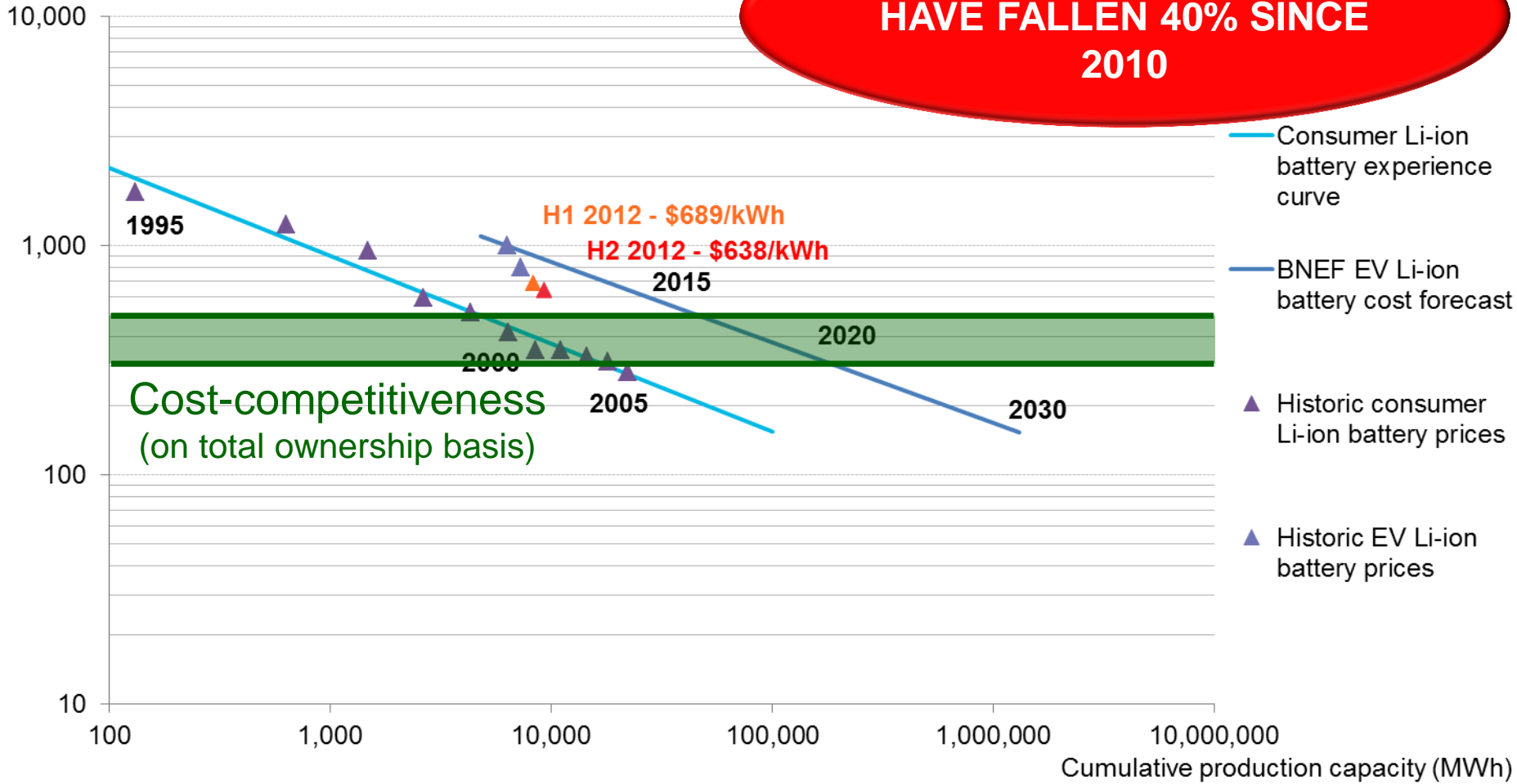
”

Rex Tillerson
CEO, Exxon



LITHIUM-ION BATTERY EXPERIENCE CURVE

Battery pack cost (\$/kWh)



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

FUTURE OF ENERGY

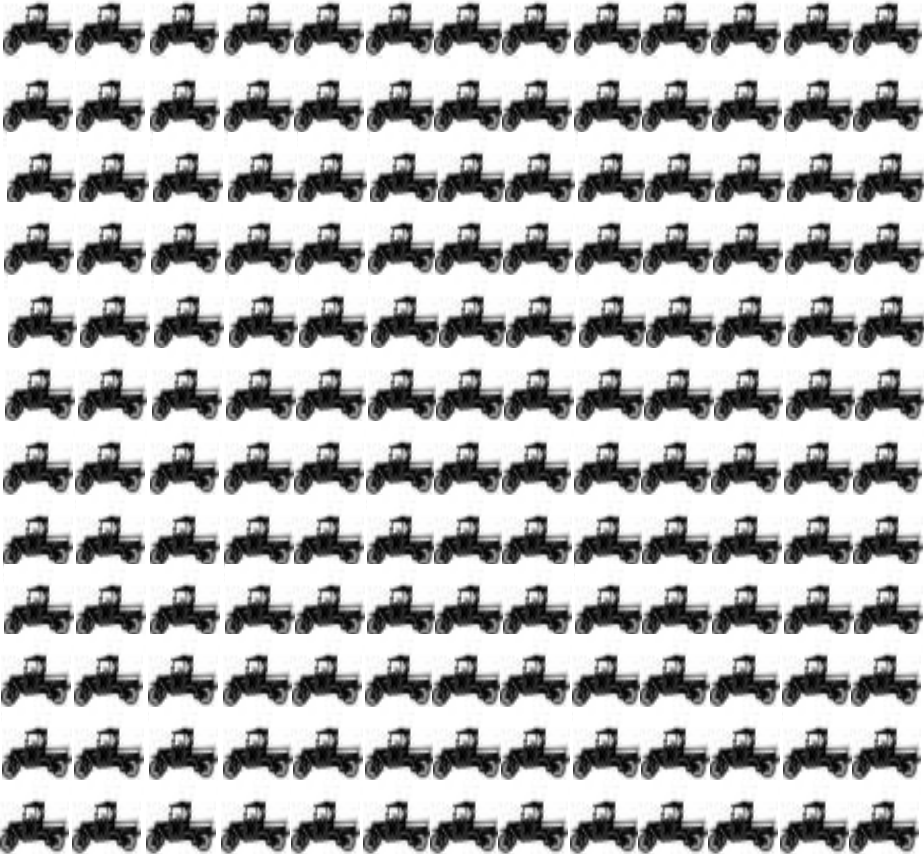
Fundamental re-engineering of the world's energy sector around a more distributed, lower carbon, more secure architecture

- Will cost trillions of dollars
- Will take decades
- Will be supported by government actions
- Will be funded largely by capital markets

Source: New Energy Finance

INDUSTRY CONSOLIDATION EXAMPLE - US CAR MANUFACTURERS

1903



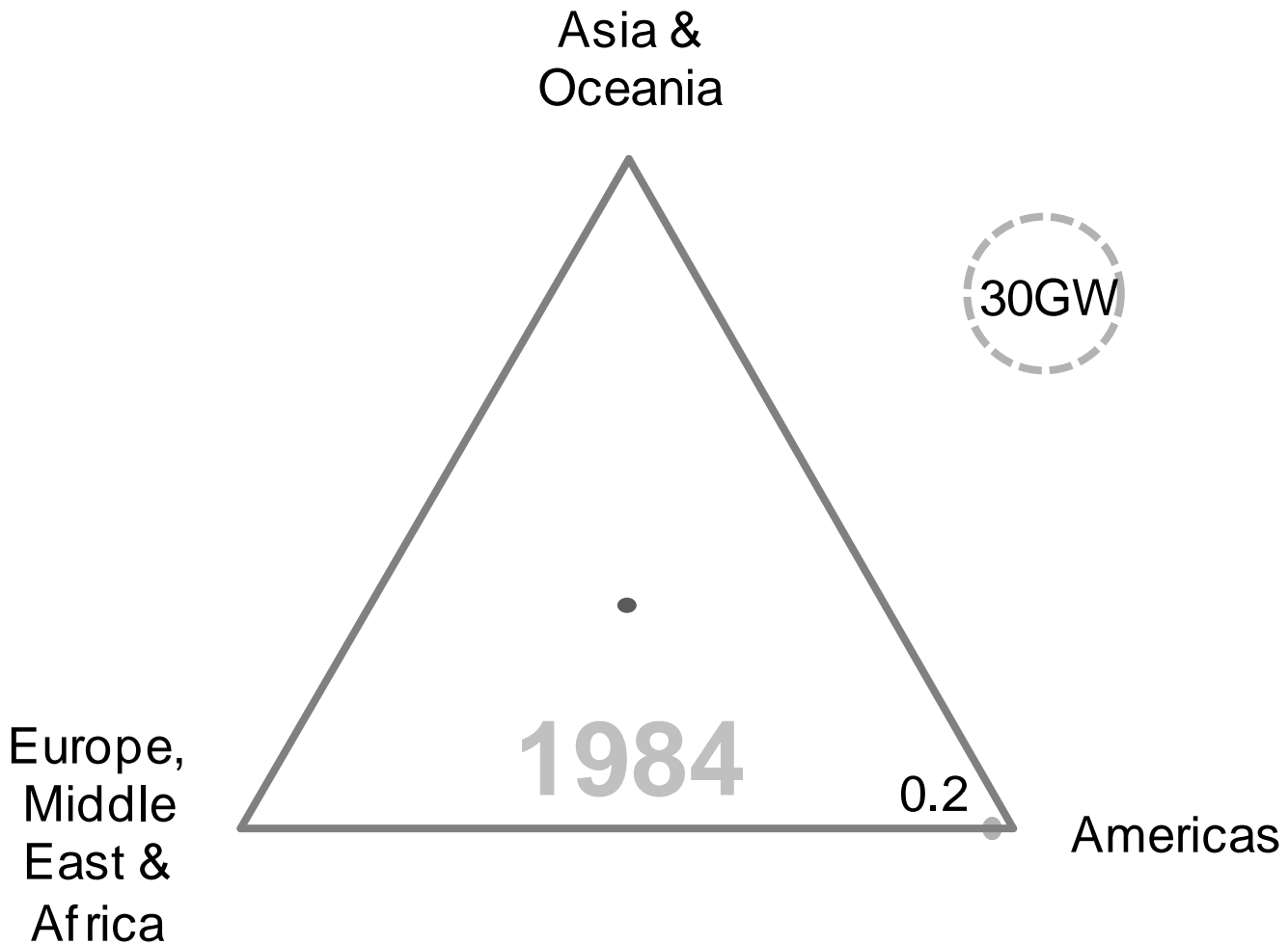
2012 Major Manufacturers

CHRYSLER



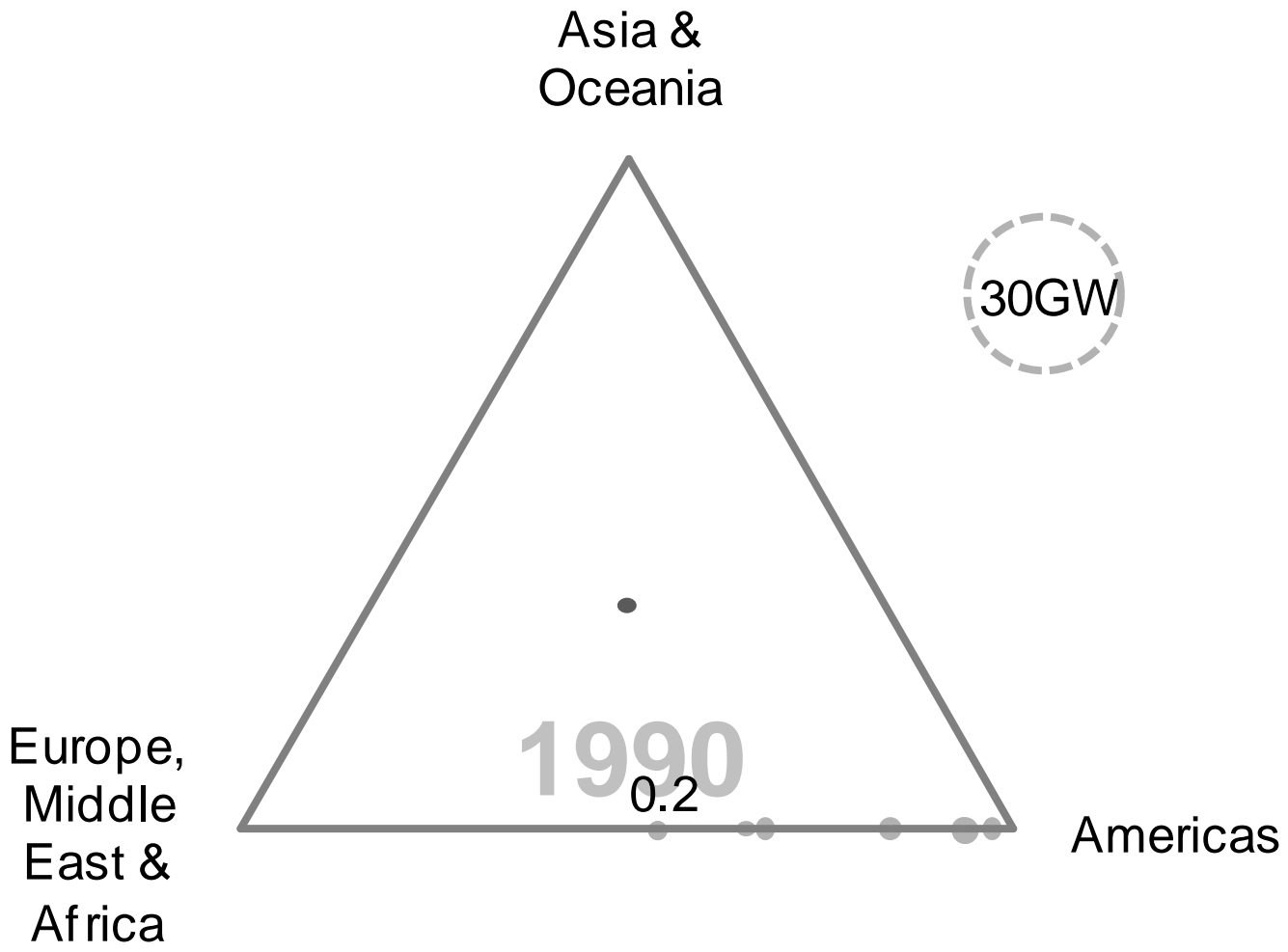
Source: Age of the Moguls; Bloomberg New Energy Finance

WIND GENERATION ADDITIONS (GW)



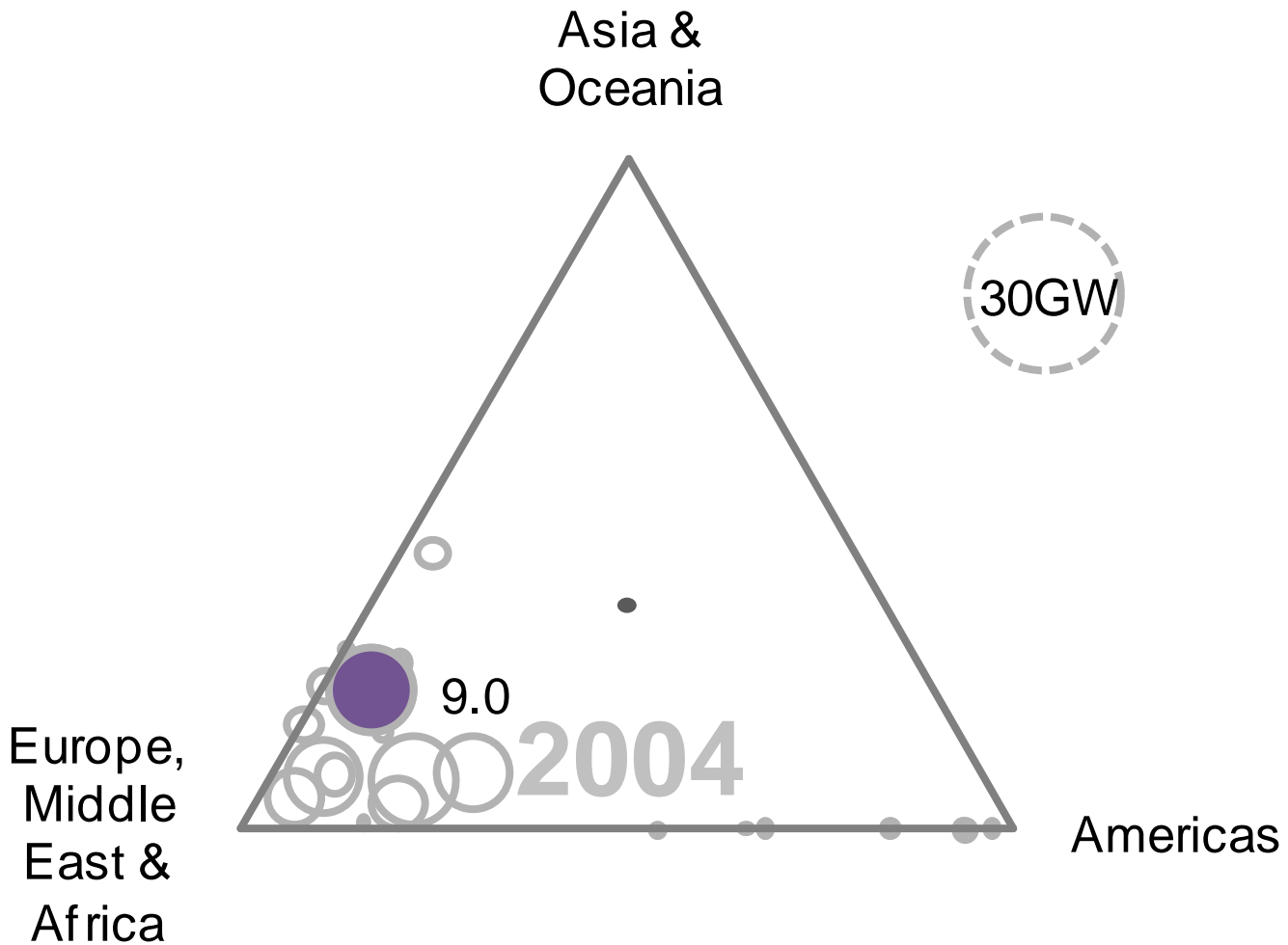
Source: Bloomberg New Energy Finance

WIND GENERATION ADDITIONS (GW)



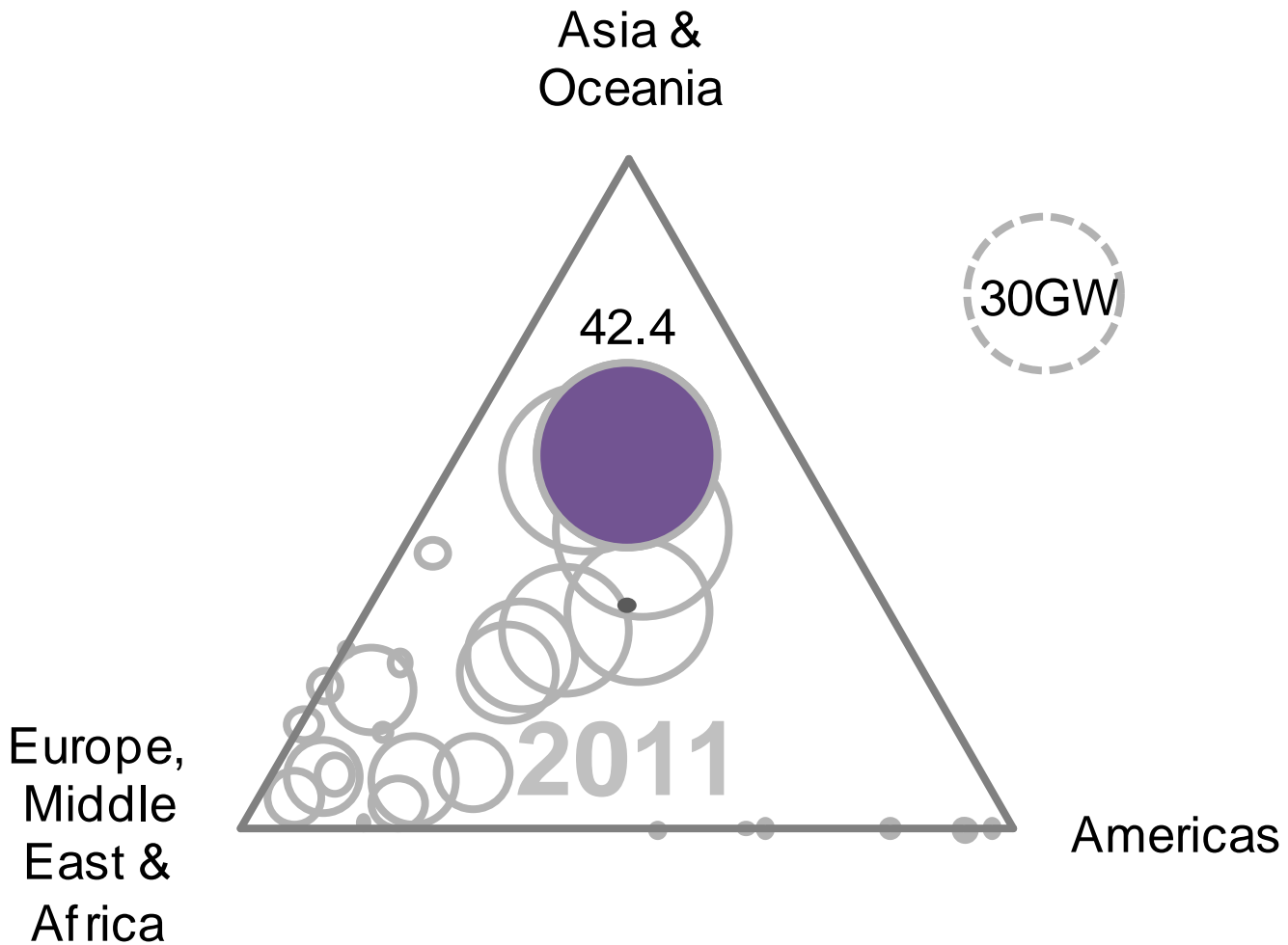
Source: Bloomberg New Energy Finance

WIND GENERATION ADDITIONS (GW)



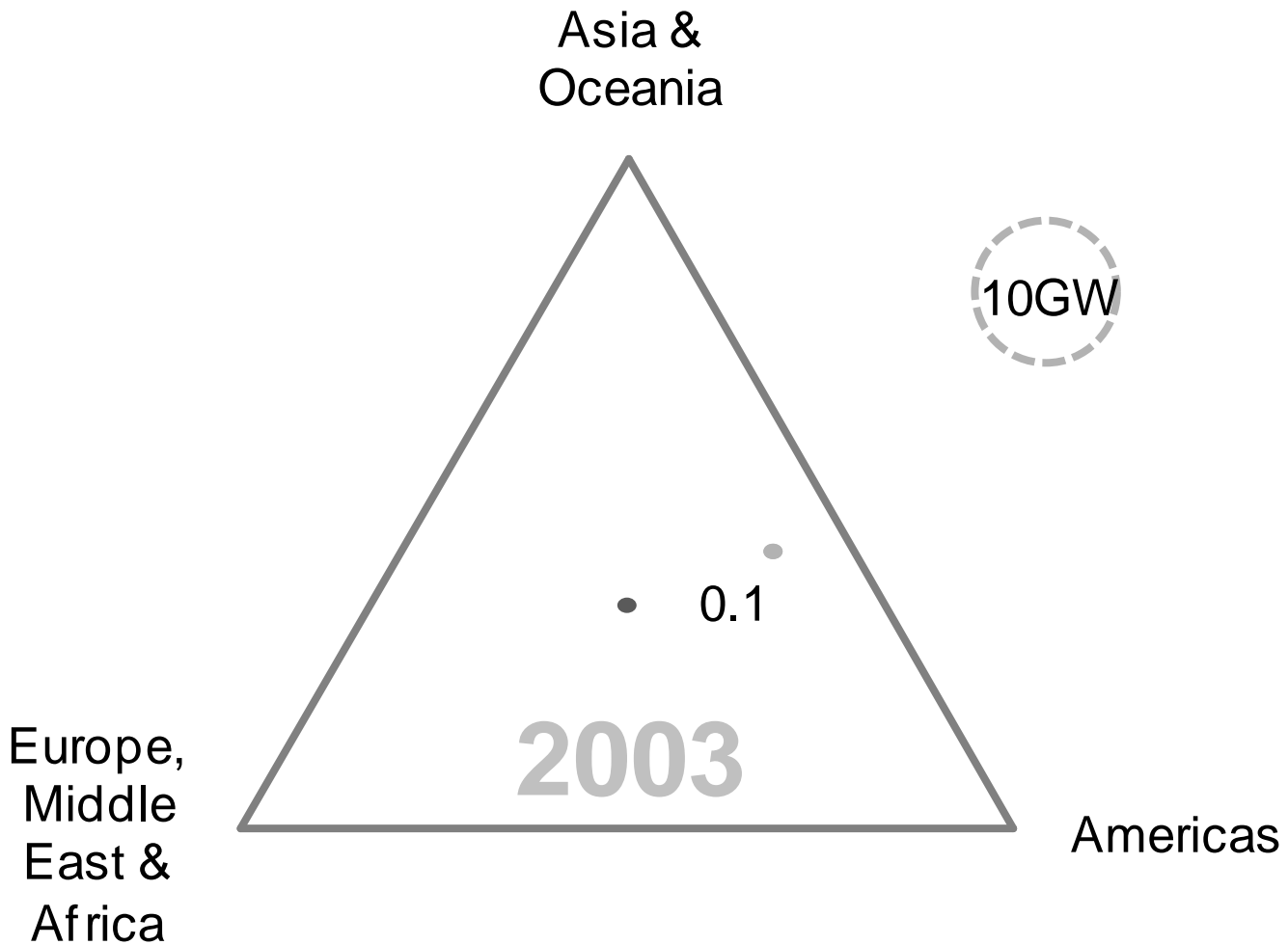
Source: Bloomberg New Energy Finance

WIND GENERATION ADDITIONS (GW)



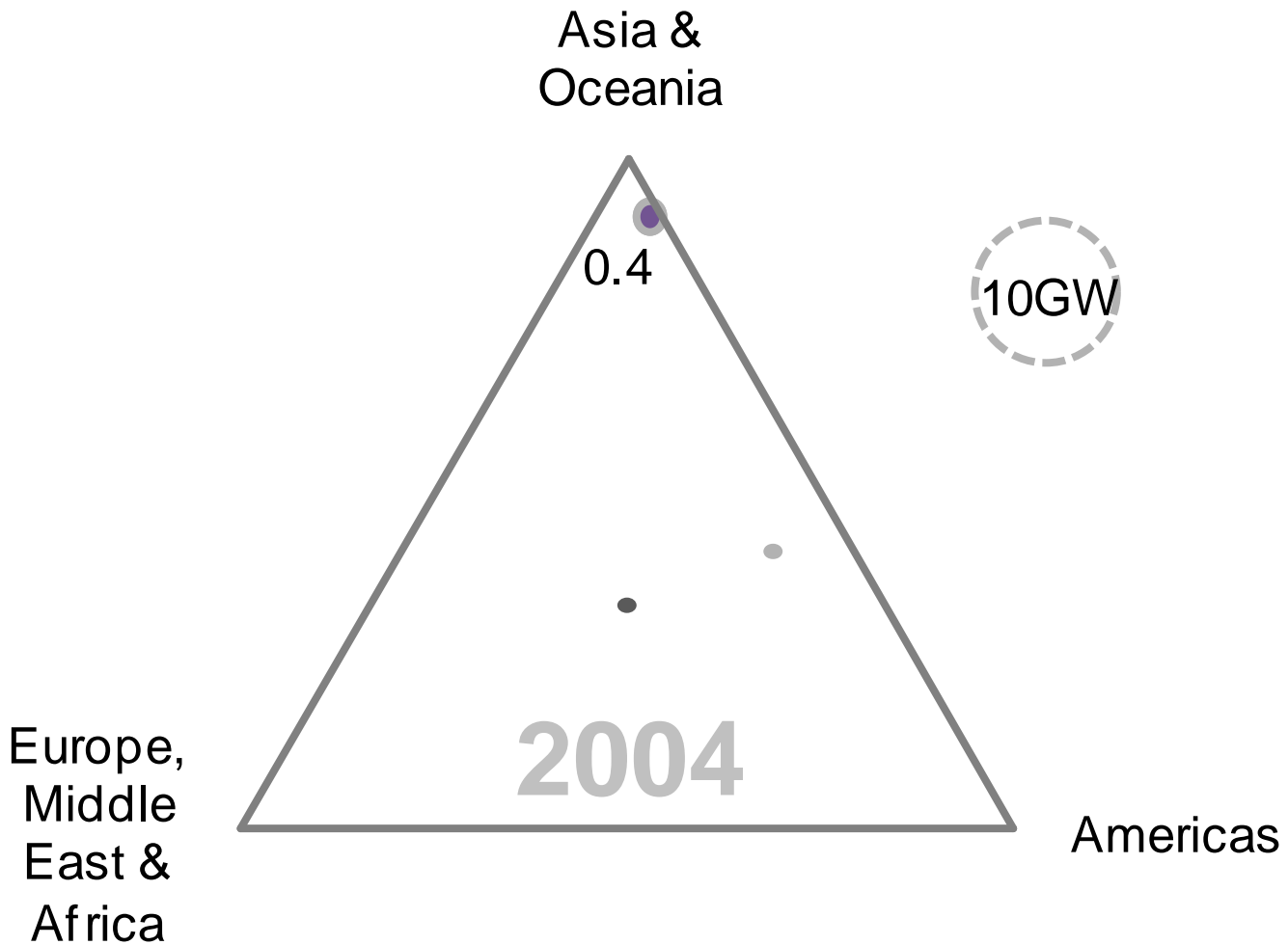
Source: Bloomberg New Energy Finance

SOLAR MANUFACTURING CAPACITY ADDITIONS (GW)



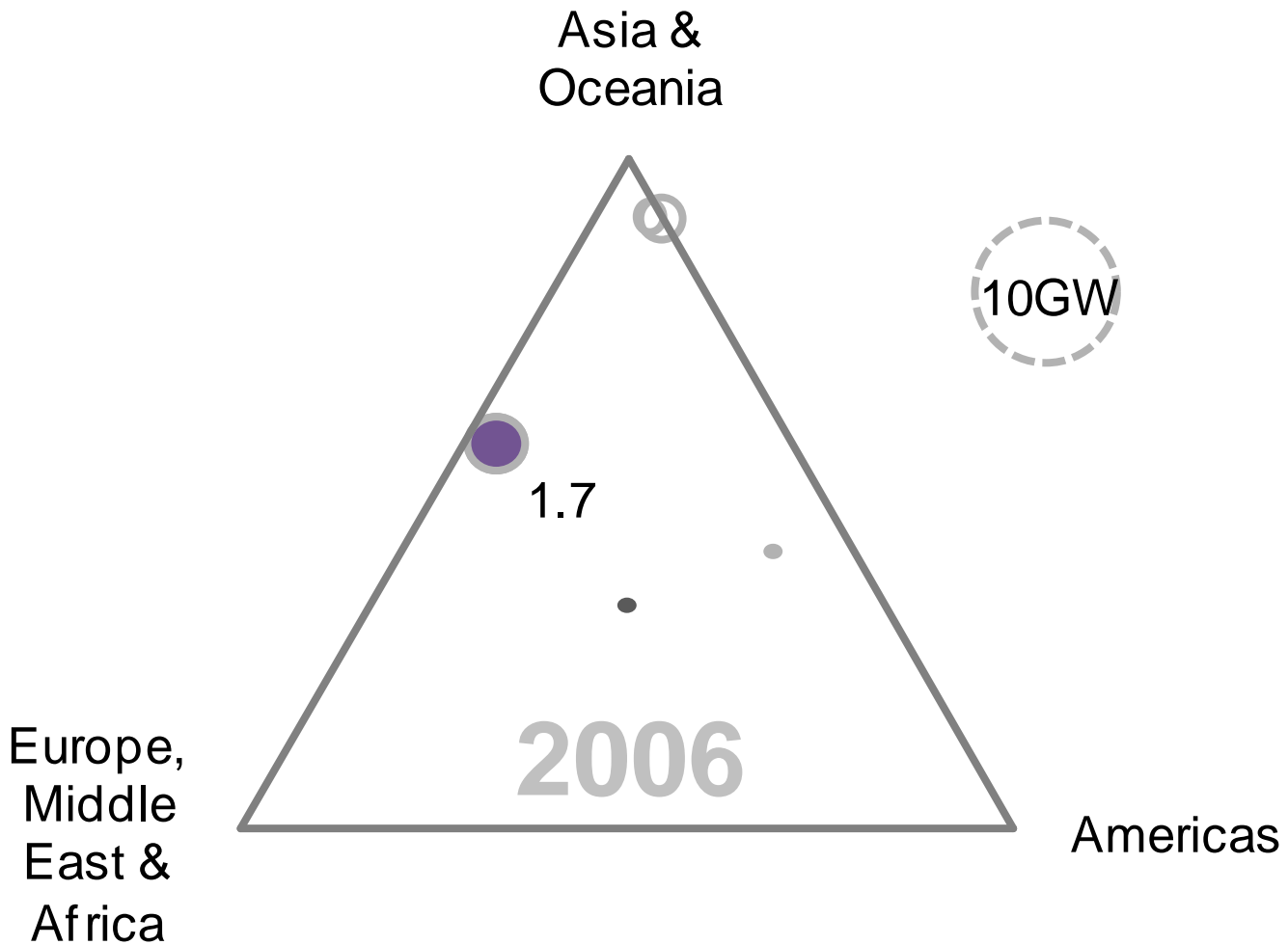
Source: Bloomberg New Energy Finance

SOLAR MANUFACTURING CAPACITY ADDITIONS (GW)



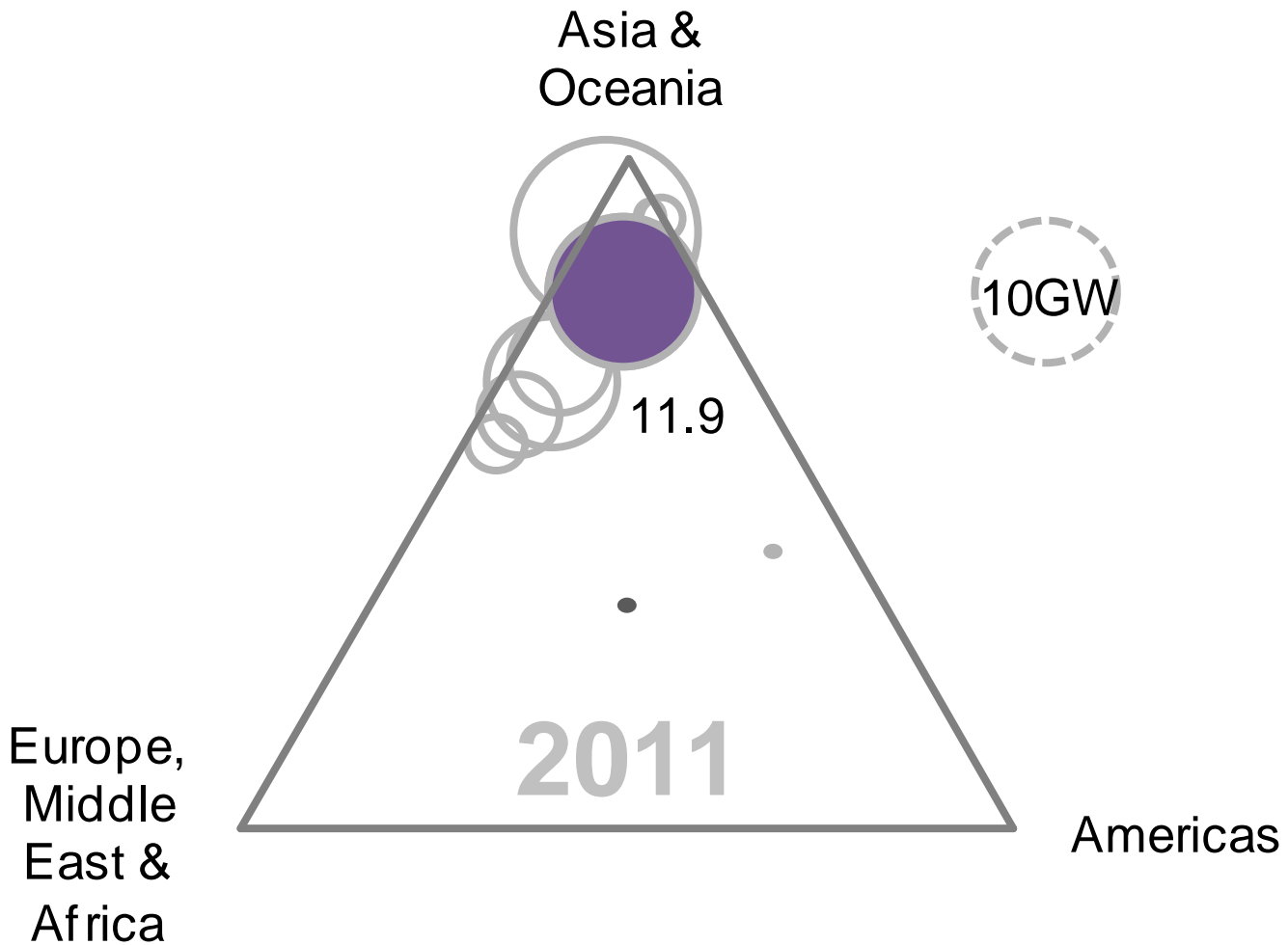
Source: Bloomberg New Energy Finance

SOLAR MANUFACTURING CAPACITY ADDITIONS (GW)



Source: Bloomberg New Energy Finance

SOLAR MANUFACTURING CAPACITY ADDITIONS (GW)



Source: Bloomberg New Energy Finance

What can you do?

1. HUG A CLIMATE SCEPTIC... ...AND GIVE THEM A BEAUTIFUL LED LIGHT BULB



Picture Credit: Philips

2. BOOK A TEST DRIVE IN AN ELECTRIC VEHICLE... ...BECAUSE YOU'RE WORTH IT!



Picture Credit: Tesla, Renault/Nissan; BMW, Volkswagen, GM, Ford, Mercedes

3. LEND SOMEONE THE MONEY TO GO SOLAR... ...ALL THE FEEL-GOOD, NONE OF THE HASSLE



MOSAIC
Solar Mosaic
<https://joinmosaic.com/>



SunFunder
Sunfunder
www.sunfunder.com



abundance
Abundance NRG
www.abundancegeneration.com

Note: Do your own research. Neither Michael Liebreich nor Bloomberg New Energy Finance endorses any of the organisations mentioned here.

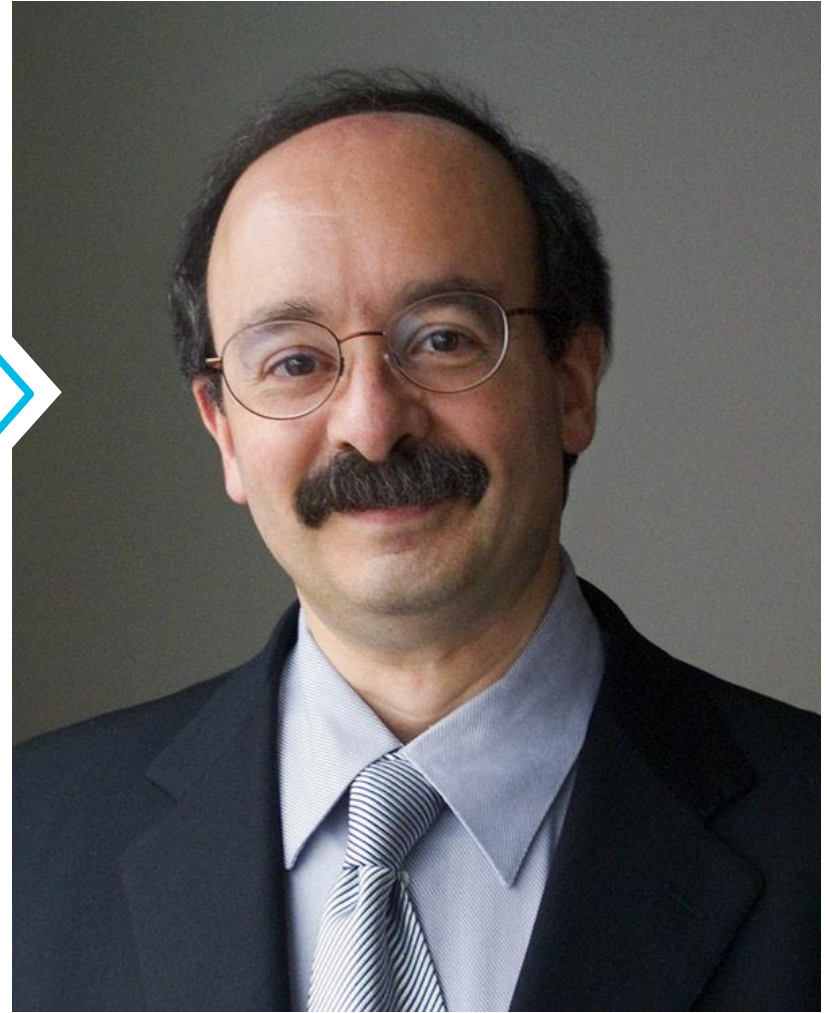
THE FUTURE – TAKE 3

“

Our energy
future is not
fate, but choice

”

Amory Lovins
Founder & CEO
Rocky Mountain Institute



THANK YOU!

MICHAEL LIEBREICH

TWITTER: @MLiebreich

MARKETS

Renewable Energy

Carbon Markets

Energy Smart Technologies

Renewable Energy Certificates

Carbon Capture & Storage

Power

Water

Nuclear

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