

12 May 2014

CLEAN ENERGY TRENDS

Clean Energy Ministerial
Seoul, Republic of South Korea

Nathaniel Bullard

Bloomberg
NEW ENERGY FINANCE

Investment

1. Historical clean energy investment since 2004
2. 2013 and 2014 return to growth trends
3. Leading indicators point to new investment classes

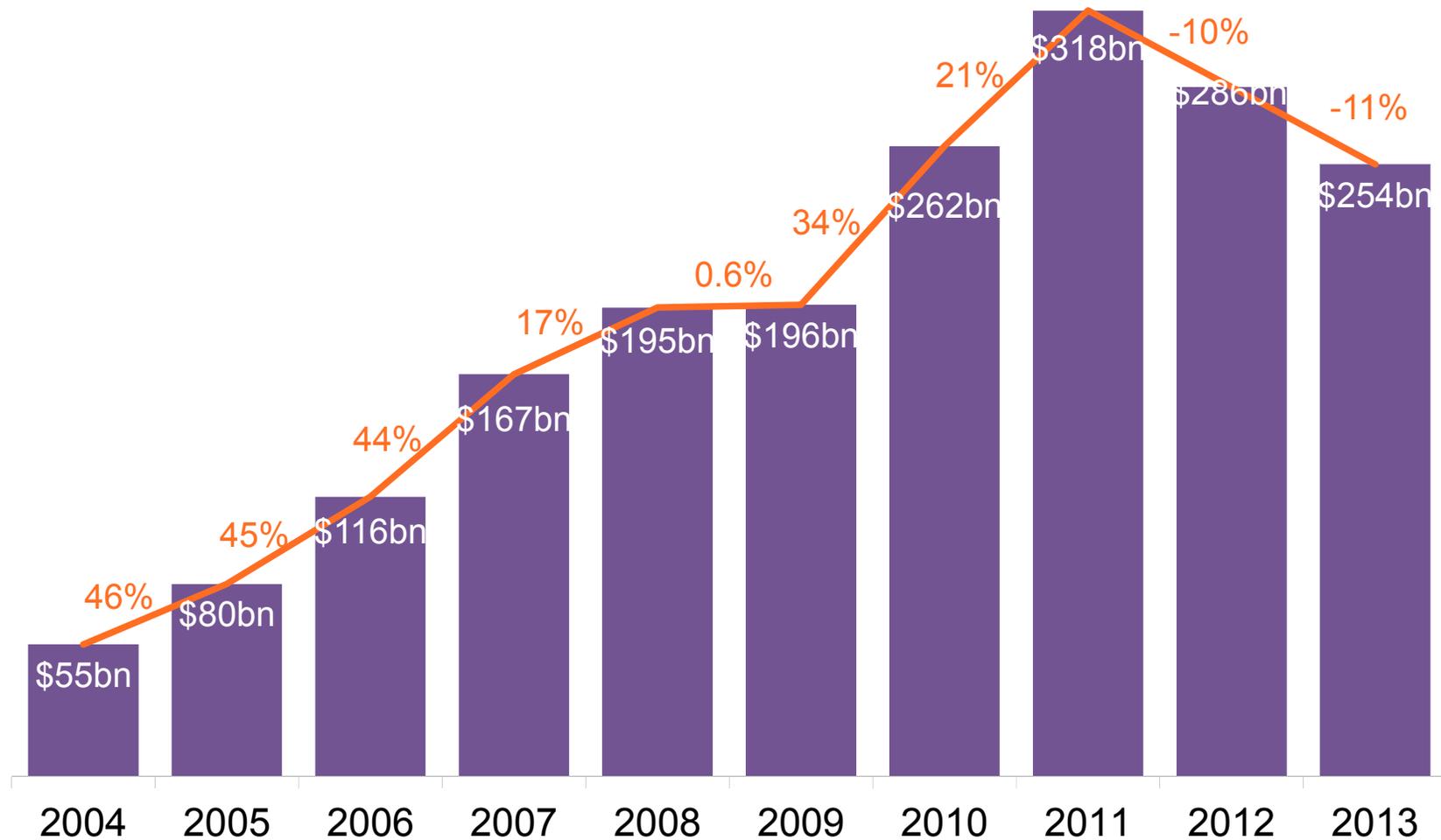
Phase Change

1. Clean energy is a major share of major energy economies
2. Shale fracking and LNG change global gas dynamics
3. China wages war on pollution
4. Energy efficiency reverses utility growth projections
5. Software is eating the energy world
6. Fossil fuel divestment movements show momentum

NEW INVESTMENT IN CLEAN ENERGY

2004–13 (\$BN)

Clean energy investment has declined more than 20% since its 2011 peak



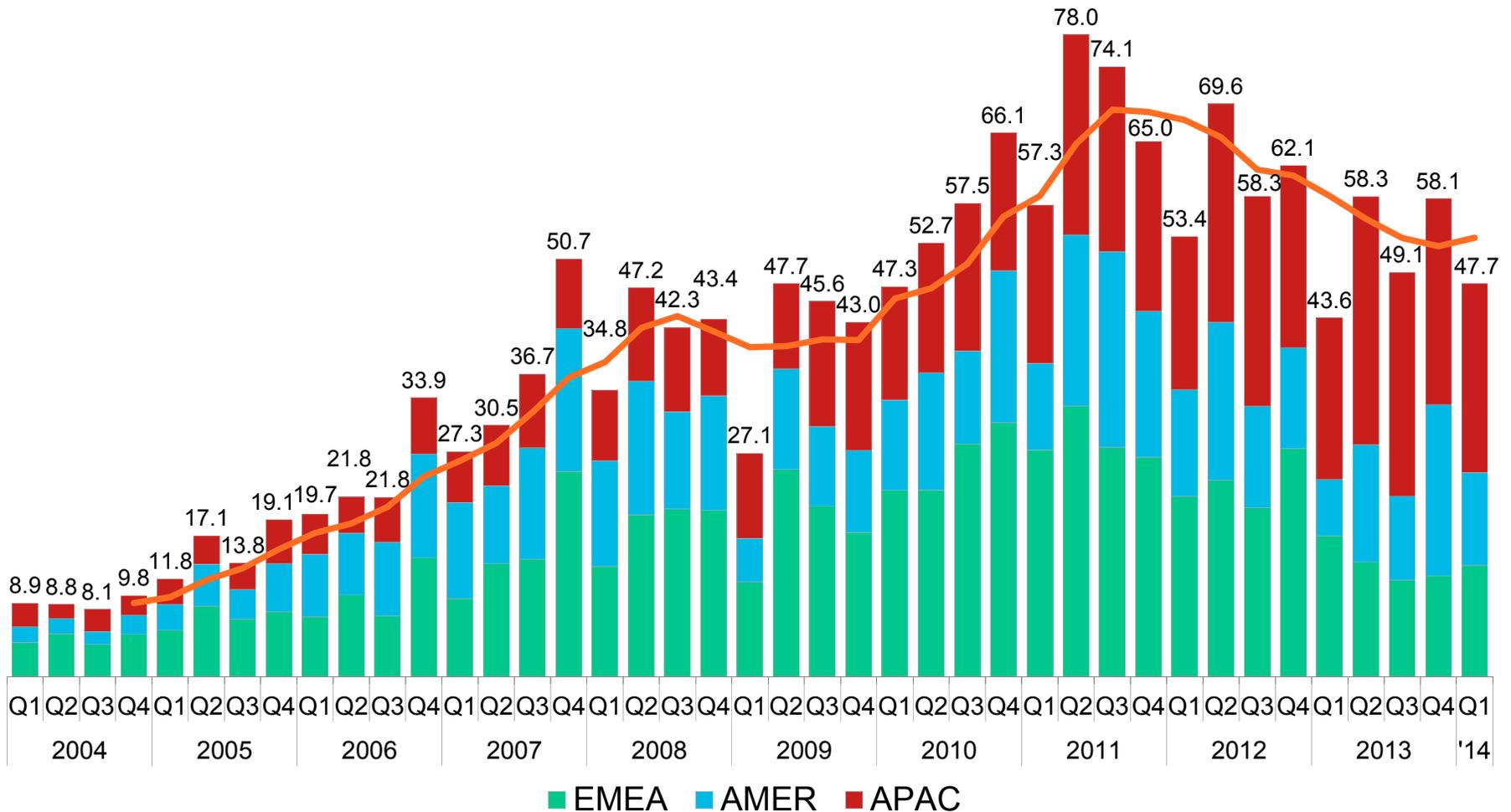
Note: Total values include estimates for undisclosed deals. Includes corporate and government R&D, and spending for digital energy and energy storage projects (not reported in quarterly statistics)

Source: Bloomberg New Energy Finance

NEW INVESTMENT IN CLEAN ENERGY BY REGION

2004 – Q1 2014 (\$BN)

Asia-Pacific is the only growing region with continuous investment growth



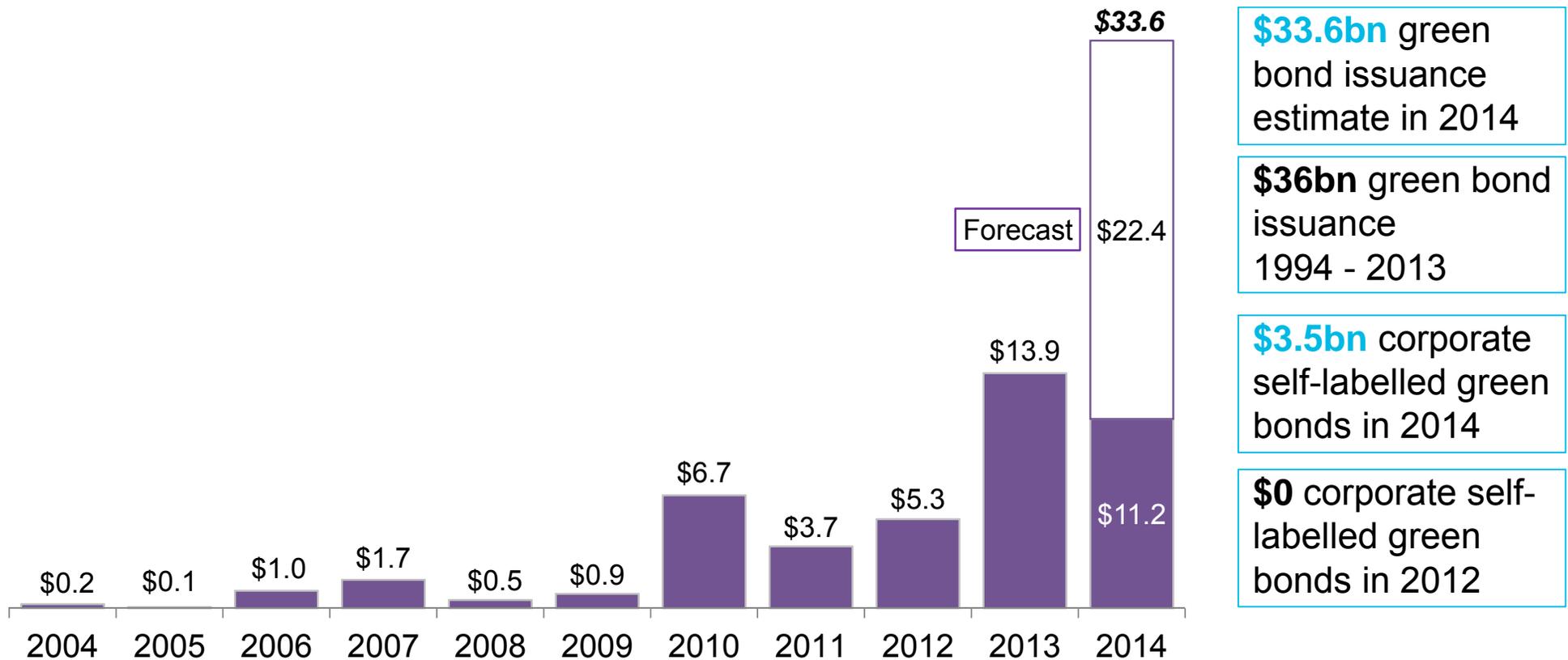
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Source: Bloomberg New Energy Finance

GREEN BOND ISSUANCE

2007 – 2014 (\$BN)

Green bond issuance will reach all-time highs in 2014



Source: Bloomberg New Energy Finance

Investment

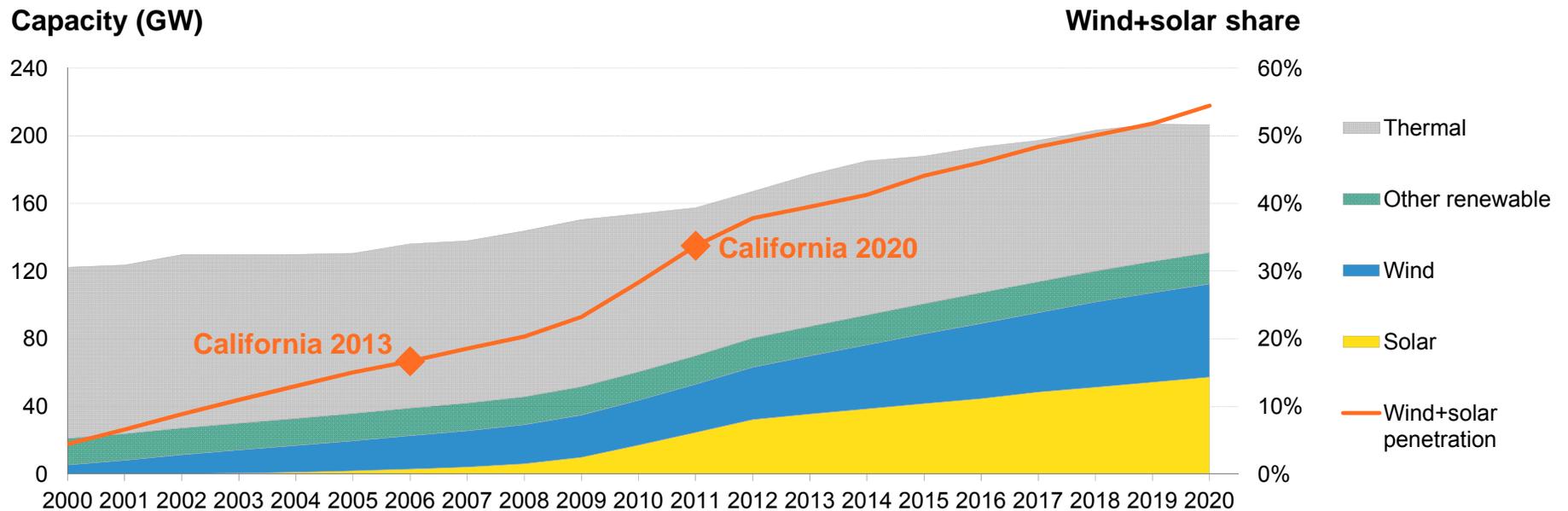
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1. MAJOR ENERGY ECONOMIES WILL SOON HAVE MORE THAN 50% RENEWABLE ENERGY CAPACITY

Clean energy as a percentage of Germany's total power generation

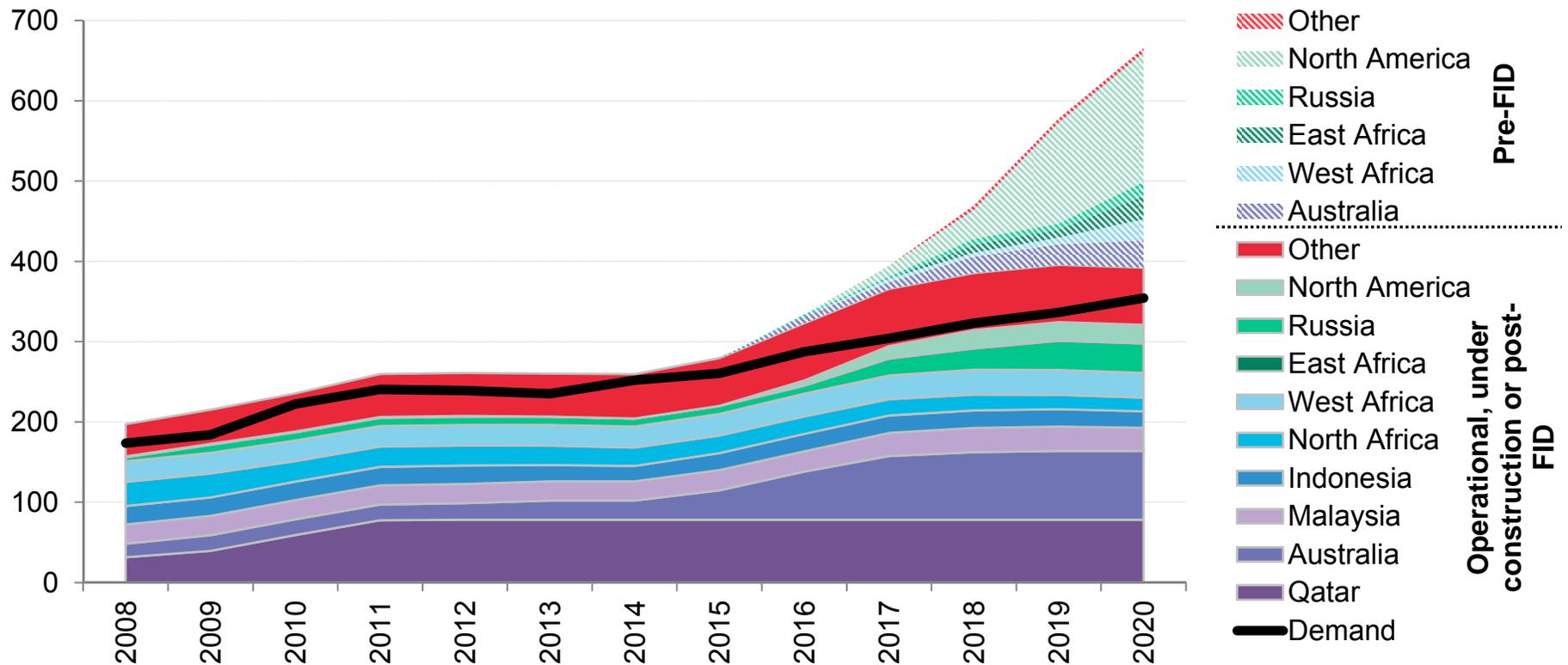


California will follow Germany's lead, though with 7-10 years of lag time

Other major economies can reach similar renewable energy penetration

2. GLOBAL LIQUIFIED NATURAL GAS SUPPLY WILL DOUBLE BY THE END OF THE DECADE

Global LNG demand/supply balance 2008-20 (MMtpa)



LNG supply will remain tight in 2014, though it will ease in 2015

LNG demand will grow at a 6% compounded rate through 2020

Source: Bloomberg New Energy Finance, Poten & Partners

3. CHINA DECLARES WAR ON POLLUTION

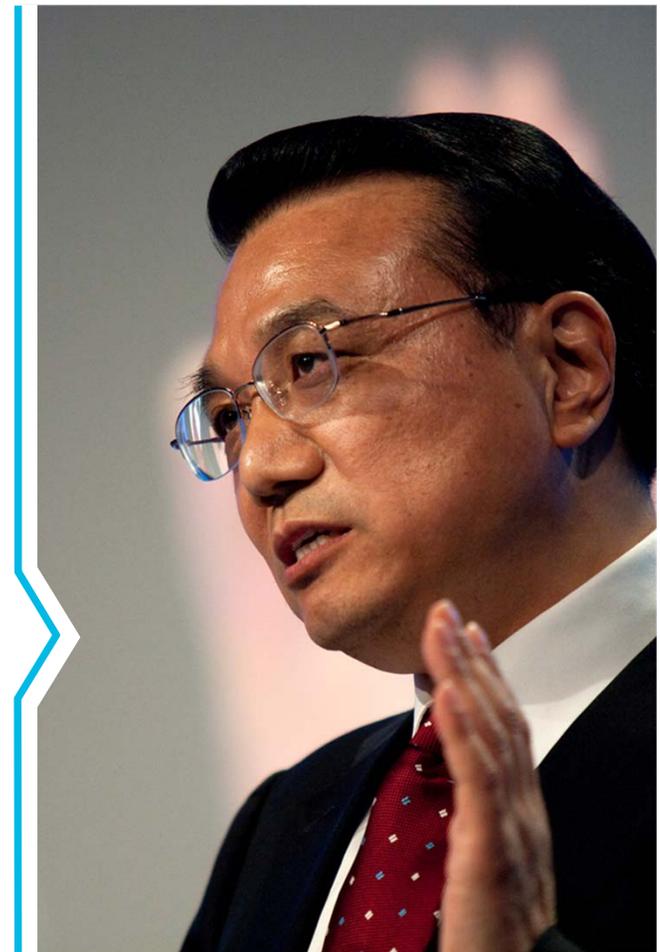
March 2014

Li Keqiang, Premier of the People's Republic of China

“

We will declare war on pollution as we declared war against poverty.

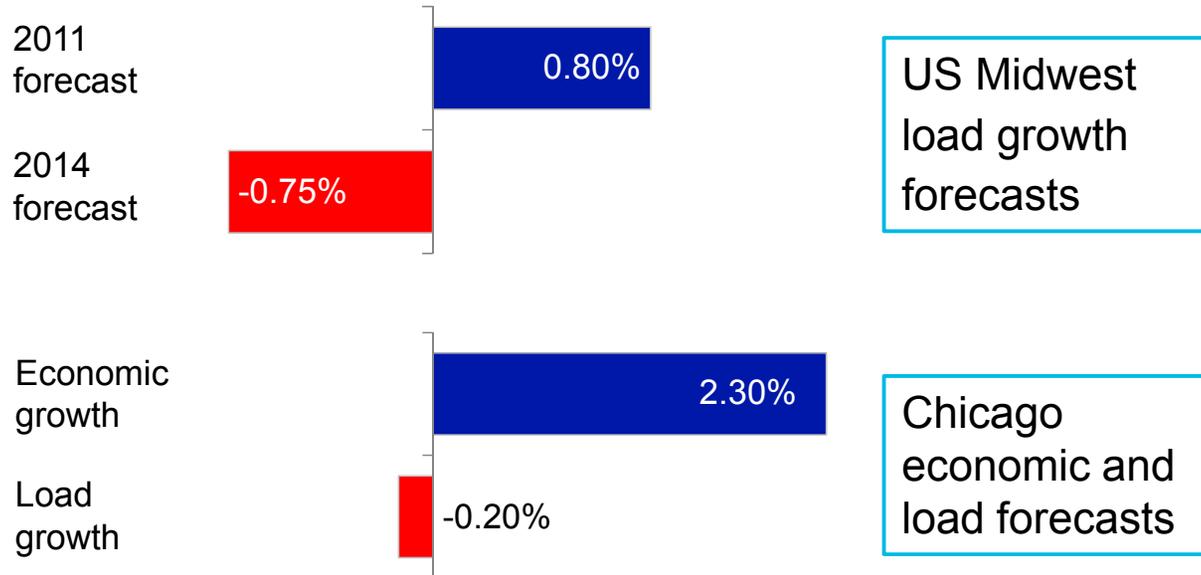
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Source: Bloomberg

4. ENERGY EFFICIENCY IS CHANGING POWER UTILITY GROWTH PROJECTIONS

Energy efficiency impacts on utility load growth in Midwest US markets



Quotes from Midwest US market executives, February 2014

“We’re dealing with a structural change that fundamentally affects the decisions of owners of power plants, state utility commissions, and the Federal Energy Regulatory Commission”

“Energy efficiency is not a sideshow anymore...It’s part of the way utilities are meeting demand”

5. SOFTWARE IS EATING THE ENERGY WORLD

TOYOTA RECALLS 1.9M PRIUSES...

Toyota recalls over 50% of its total Prius fleet for software updates

The screenshot shows the Bloomberg News website header. On the left is the Bloomberg News logo. In the center, it displays 'EARNINGS TODAY' for 'TJX Cos Inc/The' with a green box indicating a '+0.99%' change. To the right, it shows 'TIME: BEF-MKT'. Below this is a navigation menu with links for Home, News, Quick, Markets, Personal Finance, Tech, Politics, Sustainability, Luxury, Opinion, Video, and Radio.

Toyota to Recall 1.9 Million Priuses to Update Software

By Craig Trudell and Yuki Hagiwara | Feb 12, 2014 1:31 PM GMT+0800 | [9 Comments](#) [Email](#) [Print](#)

1.9m vehicles x **10km** per recall = **19m** kilometers driven
= **474** times around earth
= **25** roundtrips to moon

5. SOFTWARE IS EATING THE ENERGY WORLD ...WHILE TESLA UPDATES OVER THE AIR

Tesla pushes vehicle firmware updates for all aspects of vehicle performance



Over-the-air updates include:	Ride height (suspension) Door handle opening protocol Charging plug update
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6. UNIVERSITY FOSSIL FUEL DIVESTMENT CAMPAIGNS DOMINATE DISCUSSION OF ENDOWMENT PRIORITIES

Fossil Free Campaign



“

If it is wrong to wreck the climate, then it is wrong to profit from that wreckage. We believe that educational and religious institutions, city and state governments, and other institutions that serve the public good should divest from fossil fuels.

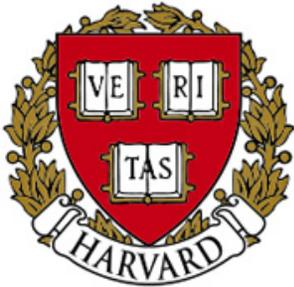
”

Source: [Fossil Free Campaign](#)

6. UNIVERSITY FOSSIL FUEL DIVESTMENT CAMPAIGNS DOMINATE DISCUSSION OF ENDOWMENT PRIORITIES

October 2013

Ivy League president statements on fossil fuel divestment



\$32.3bn

“

While I share their belief in the importance of addressing climate change, I do not believe, nor do my colleagues on the Corporation, that university divestment from the fossil fuel industry is warranted or wise.

”



BROWN

\$2.5bn

“

The serious, thoughtful and robust discussion in the Corporation covered the full range of perspectives. The conclusion of this discussion is that Brown will not divest from coal. I agree with this decision and I am writing to explain why.

”

6. UNIVERSITY FOSSIL FUEL DIVESTMENT CAMPAIGNS DOMINATE DISCUSSION OF ENDOWMENT PRIORITIES

May 2014

Stanford will divest from coal companies

Journalist Resources Stanford News Stanford Experts Contact Us

Stanford | News Service

May 6, 2014

Stanford to divest from coal companies

Acting on a recommendation of Stanford's Advisory Panel on Investment Responsibility and Licensing, the Board of Trustees announced that Stanford will not make direct investments in coal mining companies. The move reflects the availability of alternate energy sources with lower greenhouse gas emissions than coal.

Stanford University will not make direct investments of endowment funds in publicly traded companies whose principal business is the mining of coal for use in energy generation, the Stanford Board of Trustees decided today.

In taking the action, the trustees endorsed the recommendation of the university's Advisory Panel on Investment Responsibility and Licensing (APIRL). This panel, which includes representatives of students, faculty, staff and alumni, conducted an extensive review over the last several months of the social and environmental implications of investment in fossil fuel companies.

Stanford's [Statement on Investment Responsibility](#),



The Stanford University Board of Trustees has decided to not make direct investments of endowment funds in coal-mining companies. (David J. Phillip / AP)

\$18.7bn
endowment

9.7%
2013 return

Source: [Stanford](#)

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Advanced Transport
Gas
Carbon and RECs

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Asia Pacific Service
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Applied Research
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carbon markets

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