

SUSTAINABLE ENERGY IN AMERICA: 2013 FACTBOOK

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Bloomberg
NEW ENERGY FINANCE

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BCSE Mission Statement

BCSE advocates policies that promote clean, efficient, and sustainable energy products, technologies and services

SUSTAINABLE ENERGY IN AMERICA 2013 FACTBOOK



The Business Council for
**Sustainable
Energy**

The *Sustainable Energy in America 2013 Factbook* provides the leading independent analysis and market intelligence for clean energy sectors in the U.S.

Today's energy mix in the United States is undergoing radical change. Traditional energy sources are declining, while natural gas, renewable energy and energy efficiency are on the rise. Highlights from the Factbook include:

- **Renewable energy** installations hit an all-time record with at least 17 GW of new nameplate capacity added in 2012.
- In April 2012, electricity generation from **natural gas** equaled that from coal for the first time in US history.
- Policies and approaches for financing **energy efficiency** continued to make market headway; energy intensity for US commercial buildings has now dropped by more than 40% since 1980 and investments in smart grid topped \$4 billion.
- Carbon dioxide (CO₂) **emissions** from the energy sector were on pace to sink to their lowest level since 1994.

The 2013 Factbook researched and produced by [Bloomberg New Energy Finance](#) and commissioned by the [Business Council on Sustainable Energy](#), offers a fresh look at the state of US energy along with the roles these new technologies and innovations now play.



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A revolution is transforming how Americans produce, consume and even think about energy

**THE CLEAR PICTURE ON
Sustainable Energy**

We are in the midst of remarkable change in how we generate energy.

Natural gas and renewable energy sources are both gaining market share. Energy efficiency gains have reduced energy demand dramatically.

View this Infographic to learn more!

Use these resources to get an inside look at today's cleaner, more diverse energy mix:

- Executive Summary
- Factbook Highlights
- Slideshow
- Video: Stakeholder Briefing, Washington, DC - Part I
- Video: Stakeholder Briefing, Washington, DC - Part II



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GET THE FACTS: <http://www.bcse.org/sustainableenergyfactbook.html>

THE FACTBOOK...

- Aims to augment existing, reputable sources of information on US energy
- Focuses specifically on renewables, efficiency, natural gas, and advanced transportation
- Fills important data gaps on the contribution of small, distributed generation and other areas
- Is current through 2012 wherever possible
- Employs Bloomberg New Energy Finance data in most cases, augmented by EIA, FERC, AGA, ACEEE, and other sources where necessary
- Contains the very latest information on new energy technology costs

HOW THE US *PRODUCES* ENERGY IS UNDERGOING DRAMATIC CHANGE

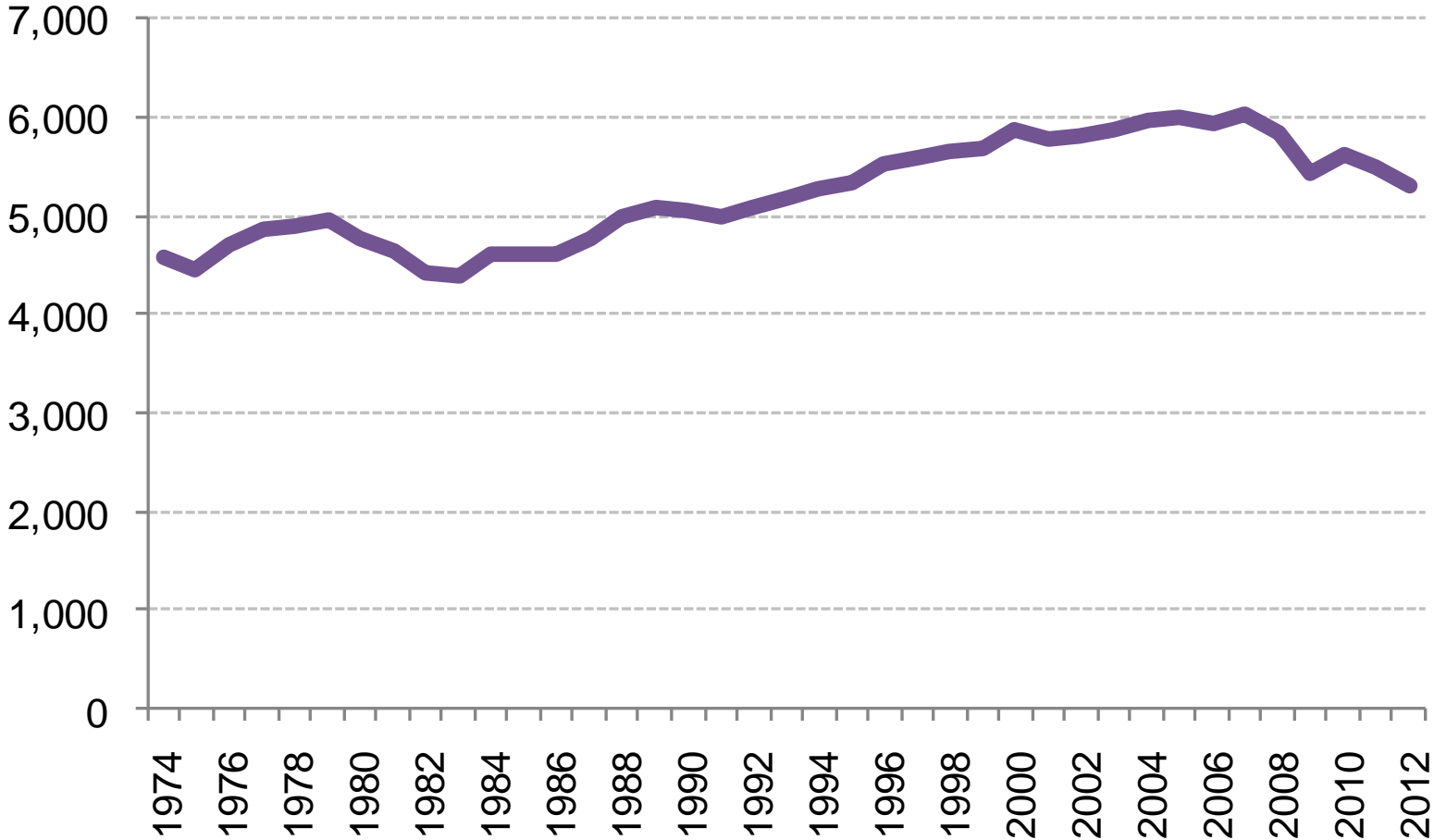
- Renewables capacity virtually doubled 2009-2012 to 86.1GW*. Wind set an all-time high with 13.7GW installed in 2012.
- Natural gas-fired generation met 31% of US electricity needs in 2012 compared with 22% in 2007
- Gas + renewables** = 658GW capacity, 57% of the US total
- Costs have plummeted.
 - 2009-2012 levelized cost drop for large-scale solar: \$0.31->\$0.14/kWh
 - 2009-2012 levelized cost drop for large-scale wind: \$0.09->\$0.08/kWh

* Not including large hydro **Including large hydro

HOW THE US CONSUMES ENERGY IS UNDERGOING DRAMATIC CHANGE

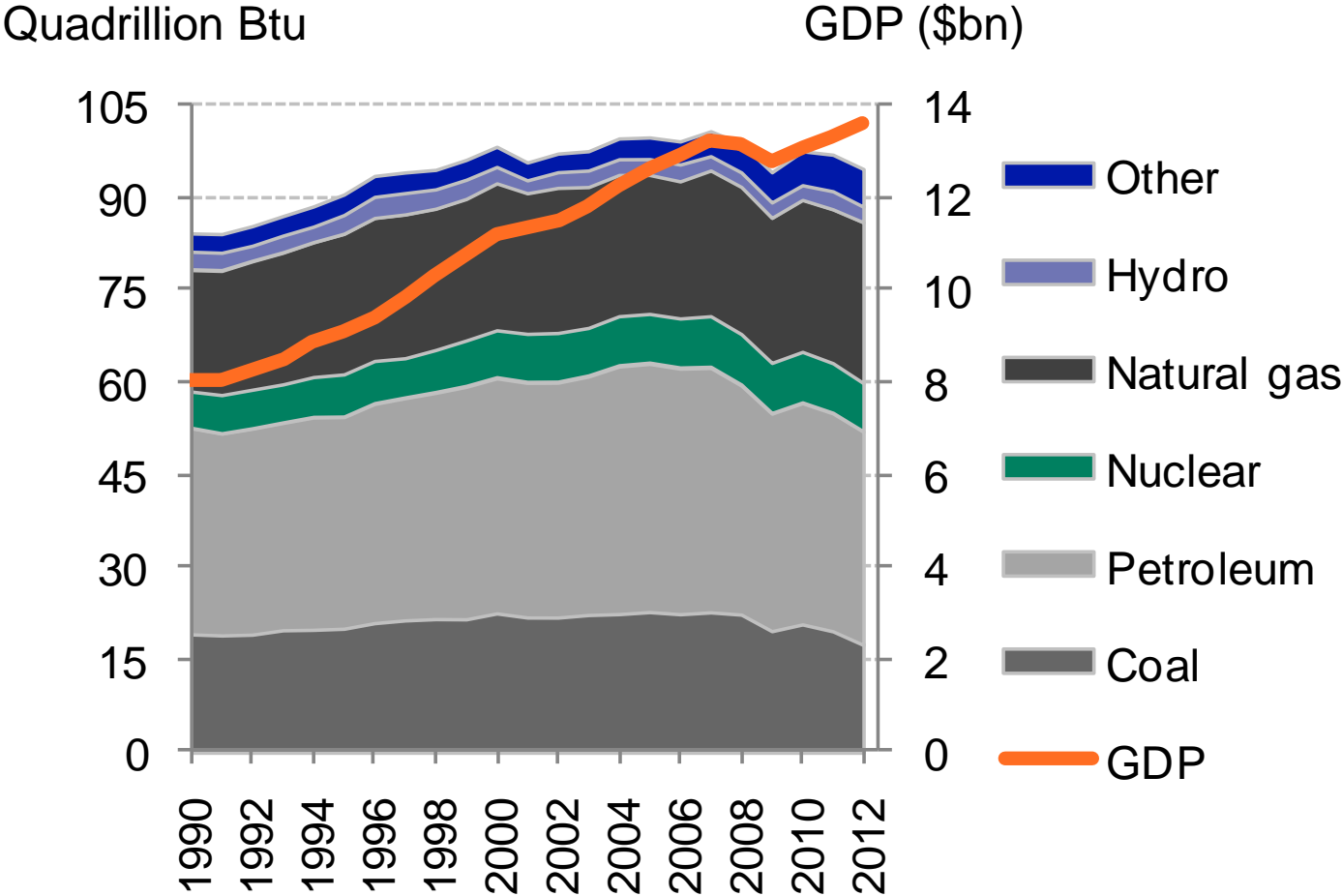
- 2007-2012: Total annual energy use fell 6.1% while GDP grew by 3%
- Commercial building energy intensity has dropped 20% since 1980
- Allocated energy efficiency budgets by utilities for 2011: \$7bn
- Smart meter spend in 2012: \$4.3bn; 46m smart meters deployed to date
- Hybrid and plug-in electric vehicle sales in the US totalled 488,000 in 2012 (3.25% of US passenger vehicle sales)
- Natural gas use in transport rose 26% 2008-2011
- Market trends increasingly will value flexible generation and distributed generation, strong opportunities for CHP and waste heat recovery

THE NET RESULT: US ENERGY-RELATED CO2 EMISSIONS (MTCO2E) HAVE DROPPED TO 1994 LEVELS



Source: Bloomberg New Energy Finance, EIA

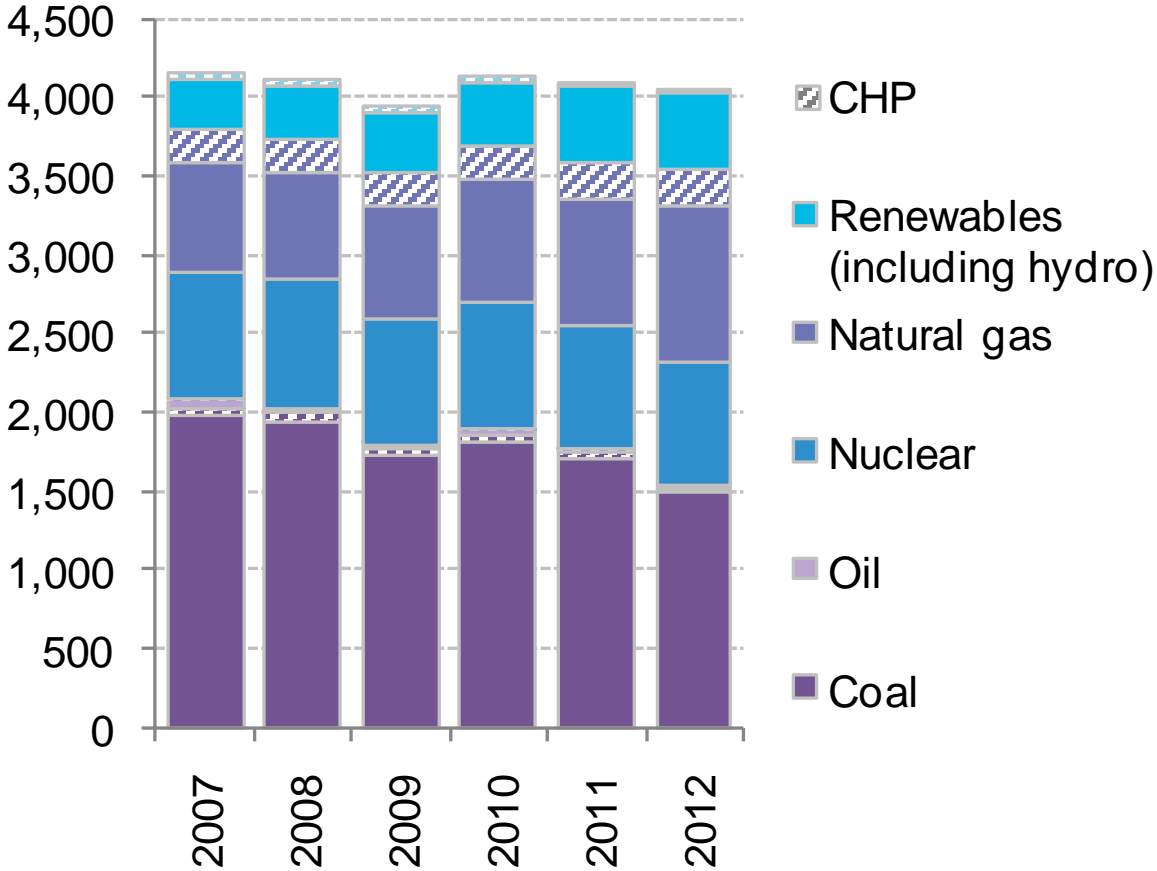
PRIMARY ENERGY CONSUMPTION VS GDP, 1990-2012



Note: GDP is real and chained; 2012 value is based on economic forecasts from Bloomberg Terminal.

Source: Bloomberg New Energy Finance, Bureau of Economic Analysis, US EIA

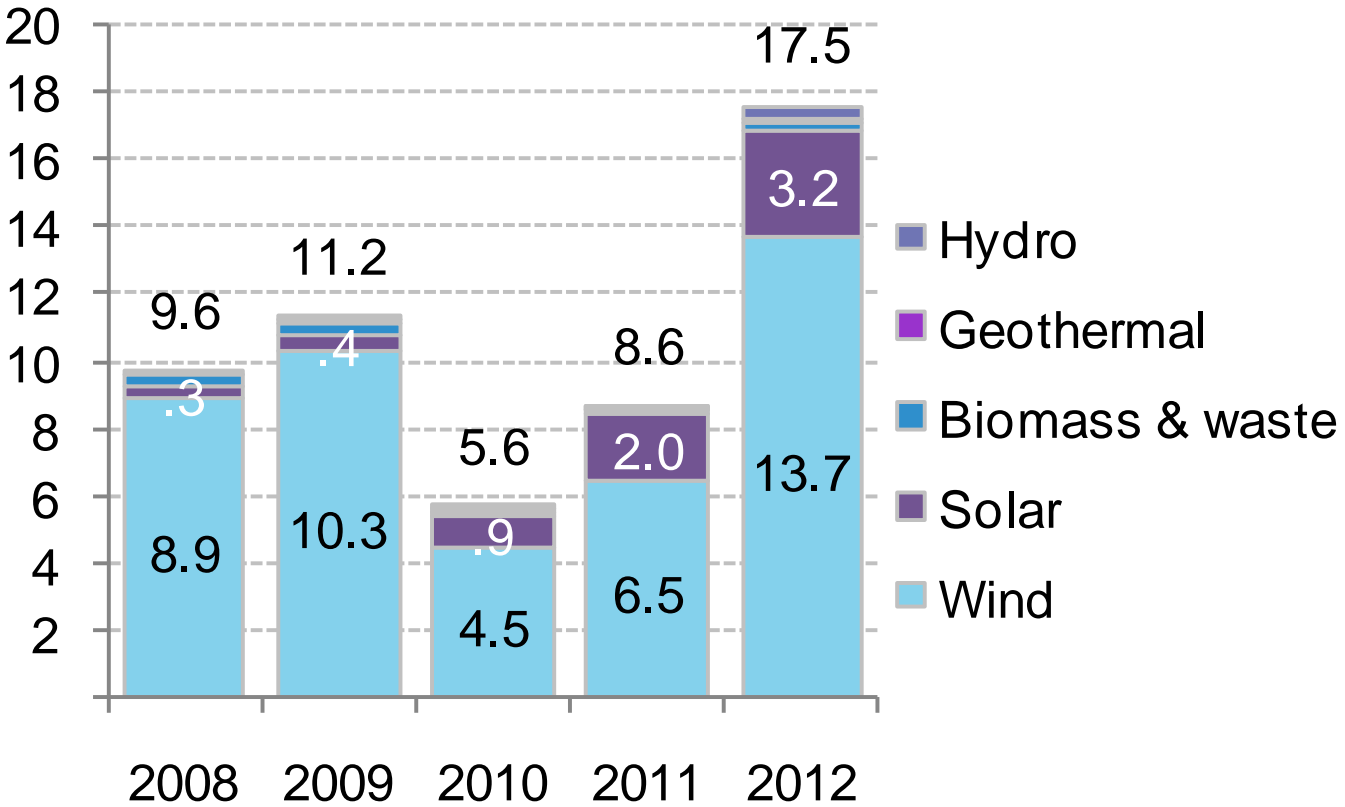
US ELECTRICITY GENERATION BY FUEL TYPE (TWH)



Note: Contribution from CHP is indicated by a 'shaded' bar in the columns

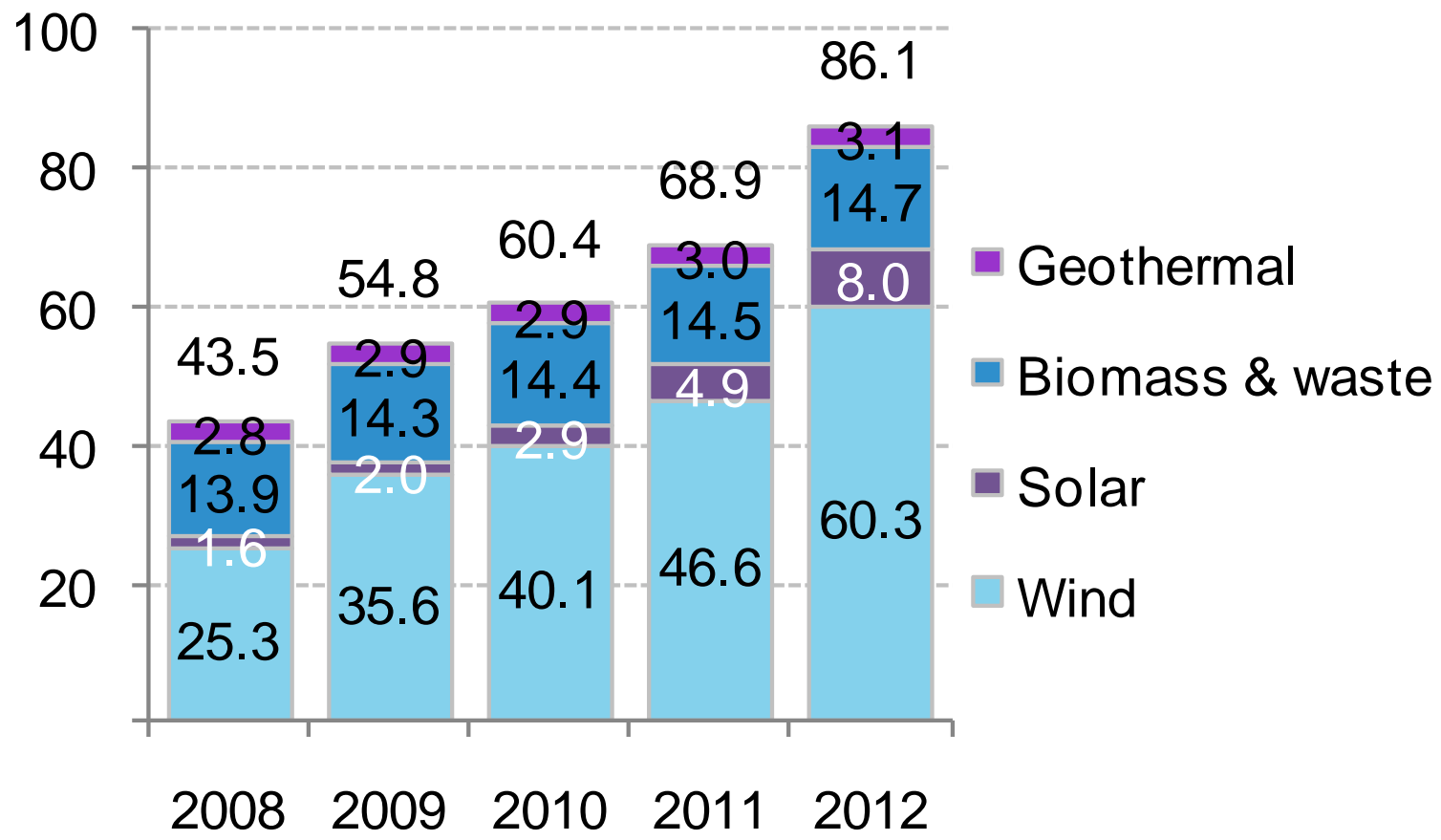
Source: Bloomberg New Energy Finance, EIA

US RENEWABLE CAPACITY BUILD BY TECHNOLOGY, 2008-2012 (GW)



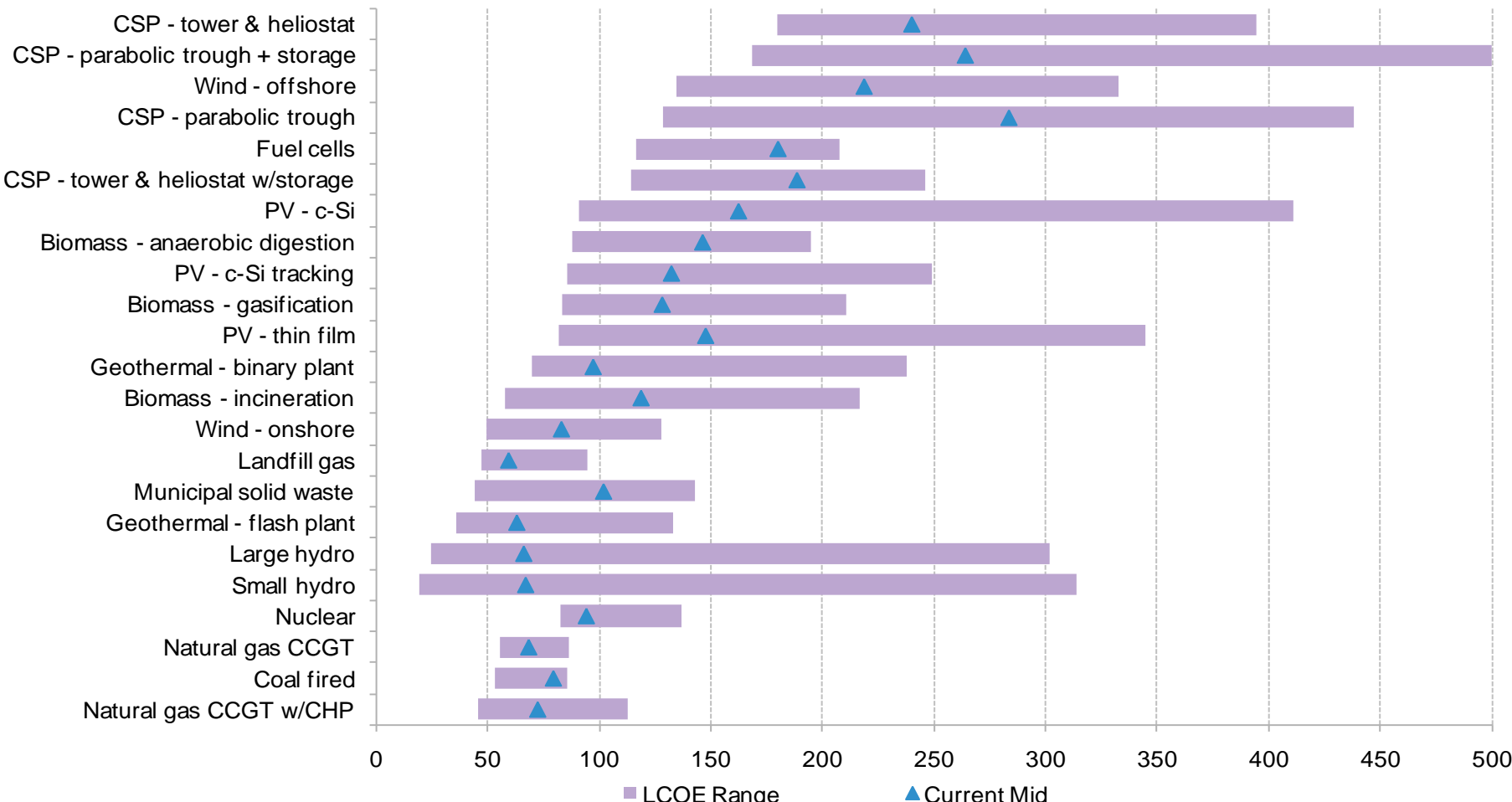
Source: Bloomberg New Energy Finance

US CUMULATIVE NON-HYDRO RENEWABLE CAPACITY (GW)



Source: Bloomberg New Energy Finance, EIA

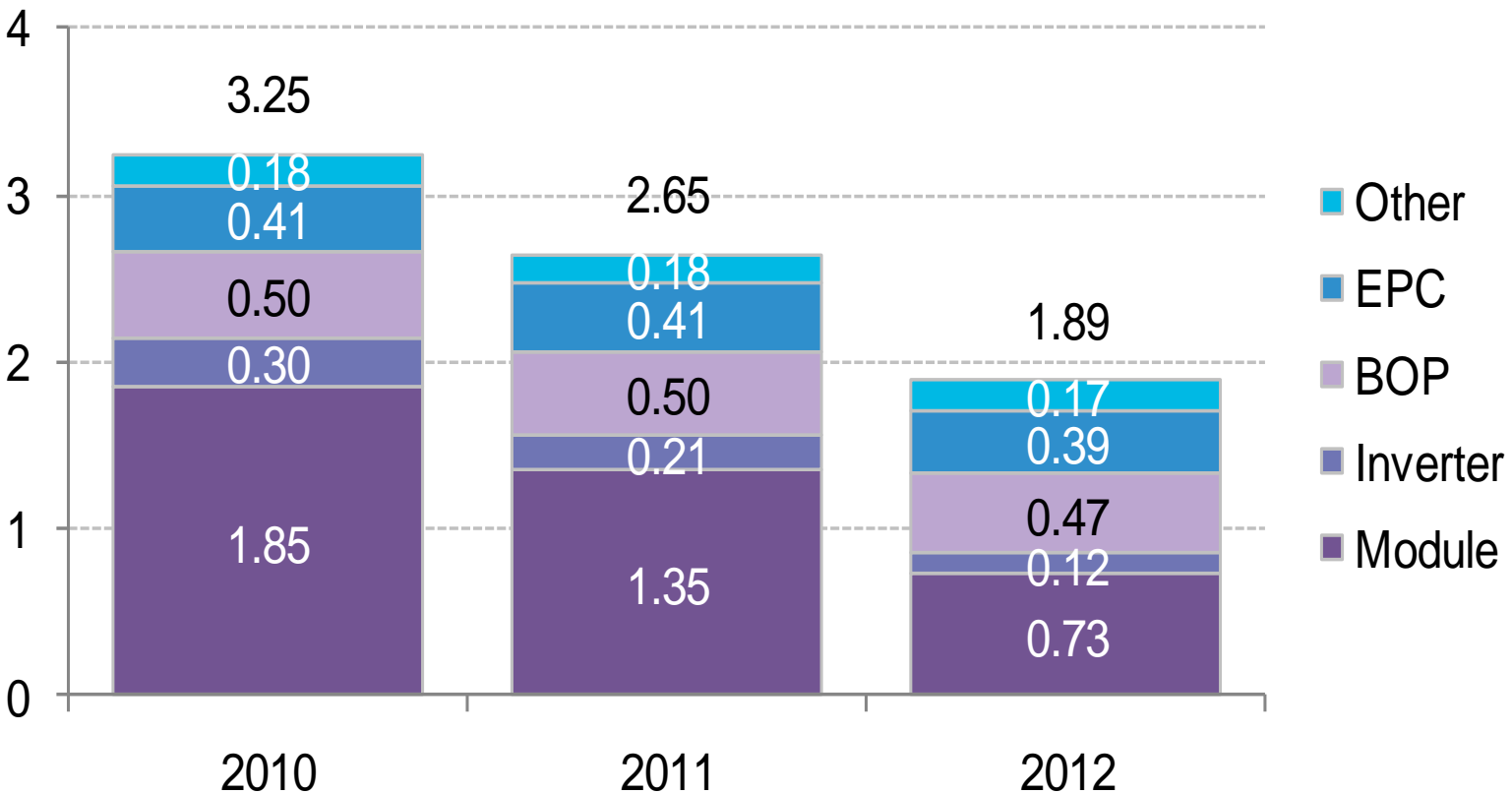
Q4 2012 LEVELIZED COST OF ENERGY FOR SELECT TECHNOLOGIES



Note: LCOE is the per-MWh inflation-adjusted lifecycle cost of producing electricity from a technology assuming a target equity internal rate of return (IRR) of 10%. All figures are derived from Bloomberg New Energy Finance analysis. Analysis is based on numbers derived from actual deals (for inputs pertaining to capital costs per MW) and from interviews with industry participants (for inputs such as debt/equity mix, cost of debt, operating costs, and typical project performance). Capital costs are based on evidence from actual deals, which may or may not have yielded a margin to the sellers of the equipment; the only 'margin' that is assumed for this analysis is 10% equity IRR for project sponsor.

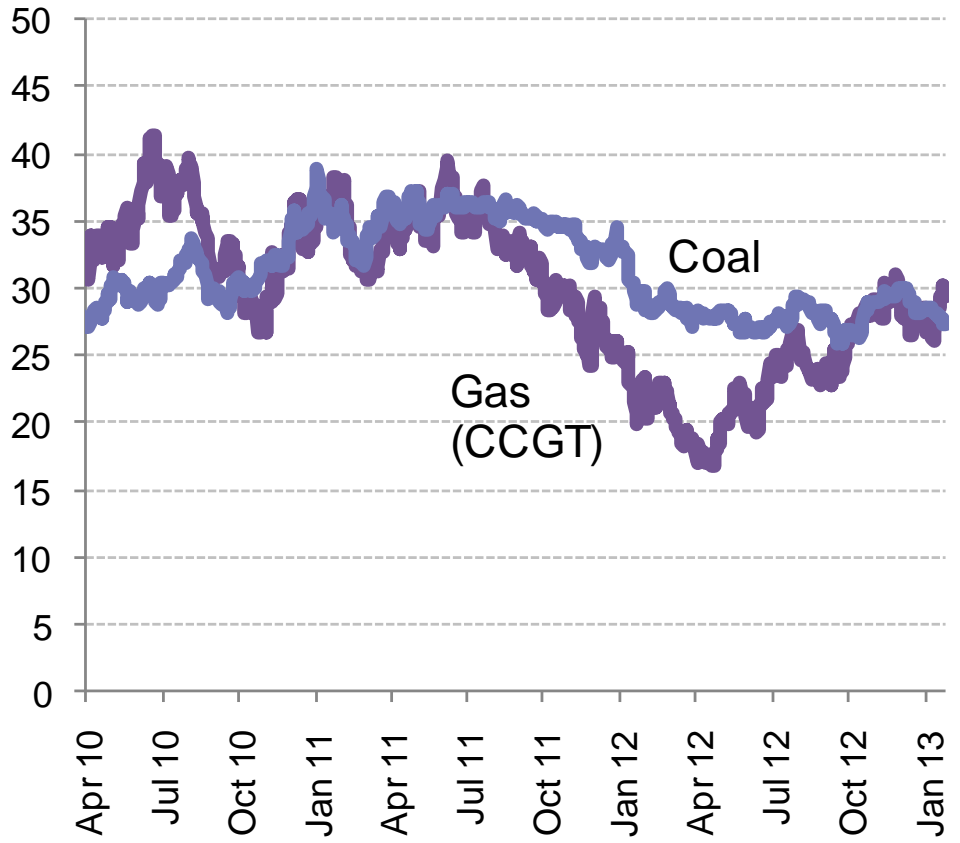
Source: Bloomberg New Energy Finance, EIA

CAPEX – BEST-IN-CLASS COST OF GLOBAL UTILITY-SCALE PV, 2010-12, (\$/W)



Source: Bloomberg New Energy Finance

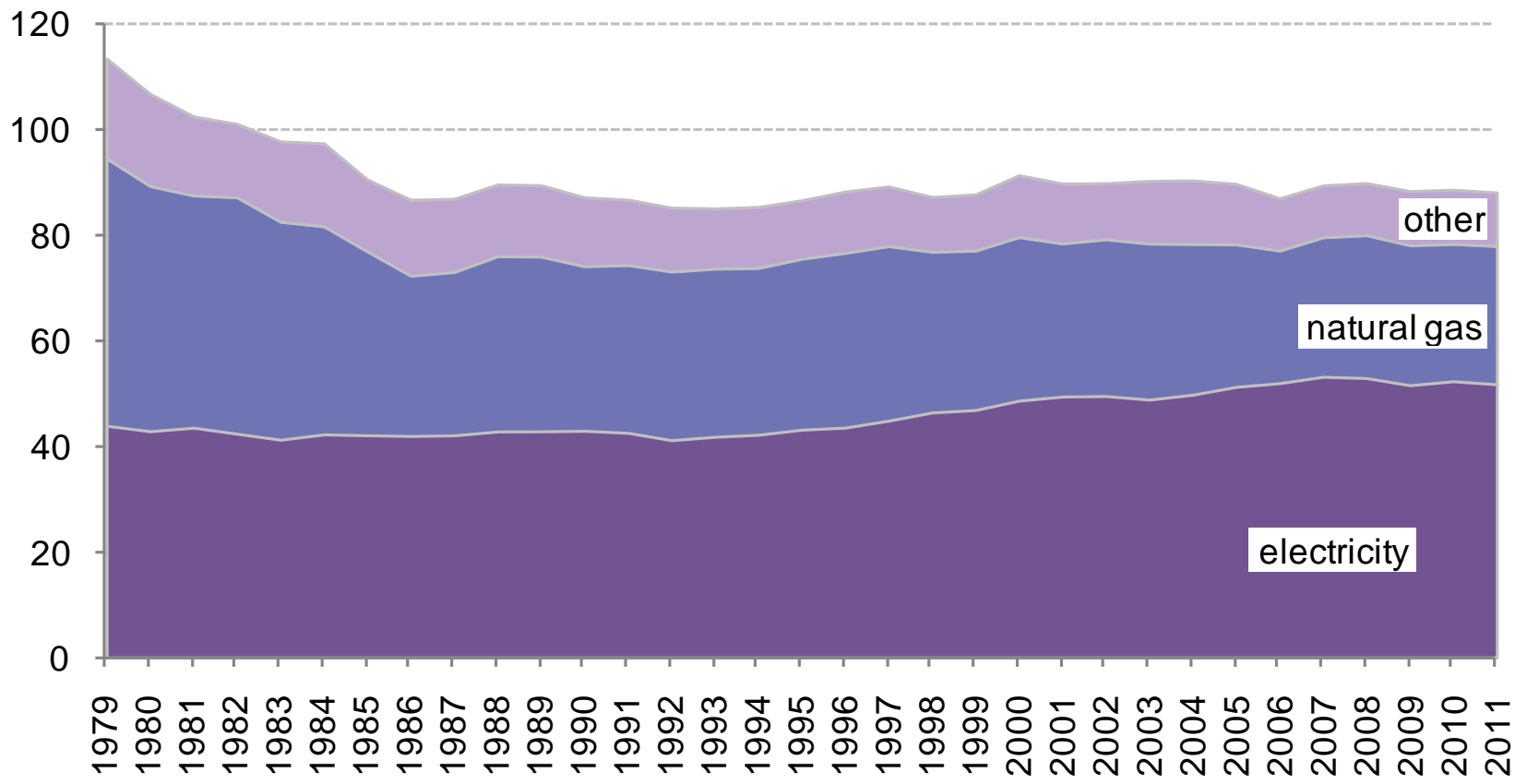
COST OF GENERATING ELECTRICITY IN THE US FROM NATURAL GAS VS. COAL, 2010-12 (\$/MWH)



Note: Assumes heat rates of 7,410Btu/kWh for CCGT and 10,360Btu/kWh for coal (both are fleet-wide generation-weighted medians); variable O&M of \$3.15/MWh for CCGT and \$4.25/MWh for coal.

Source: Bloomberg New Energy Finance

US COMMERCIAL BUILDING ENERGY INTENSITY, 1980-2011 (KBTU/SQ-FOOT)

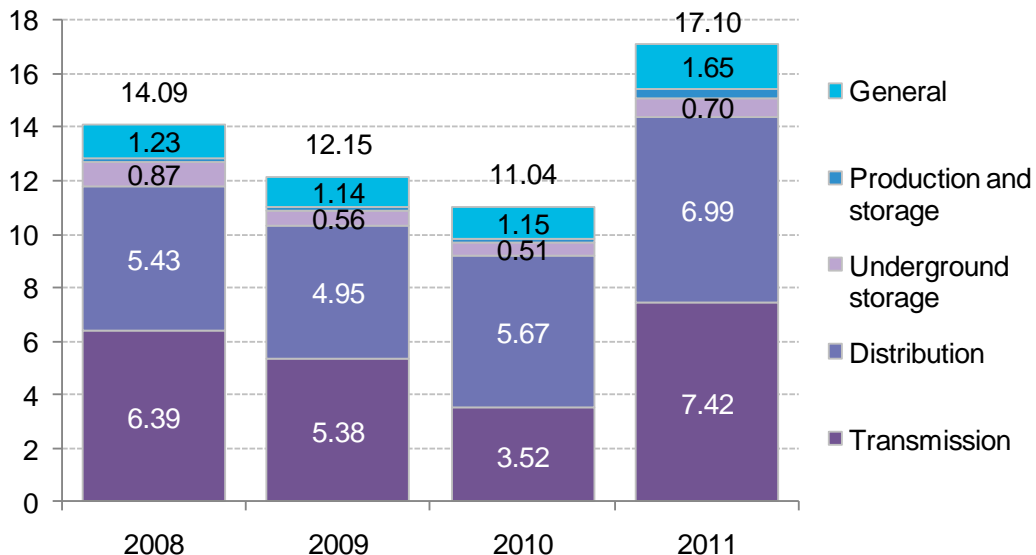


Note: This analysis is based on (i) EIA data on US commercial building energy consumption and floorspace for the years 1979, 1983, 1986, 1989, 1992, 1995, 1999, 2003 and (ii) EIA data for total US commercial sector energy consumption for every year between 1979-2011.

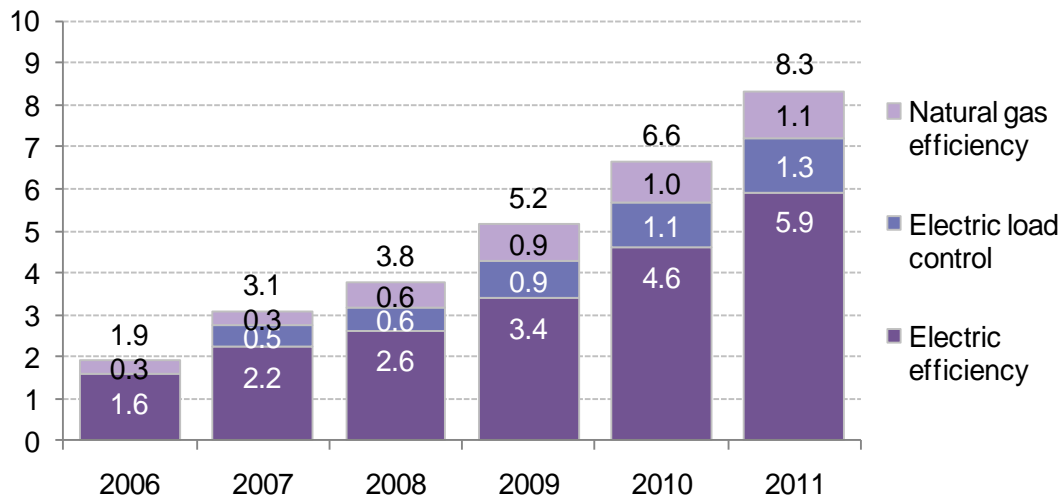
Source: EIA, Bloomberg New Energy Finance

US UTILITIES' FINANCING FOR NATURAL GAS AND EFFICIENCY (\$BN)

**NATURAL GAS
INFRASTRUCTURE
EXPENDITURES**

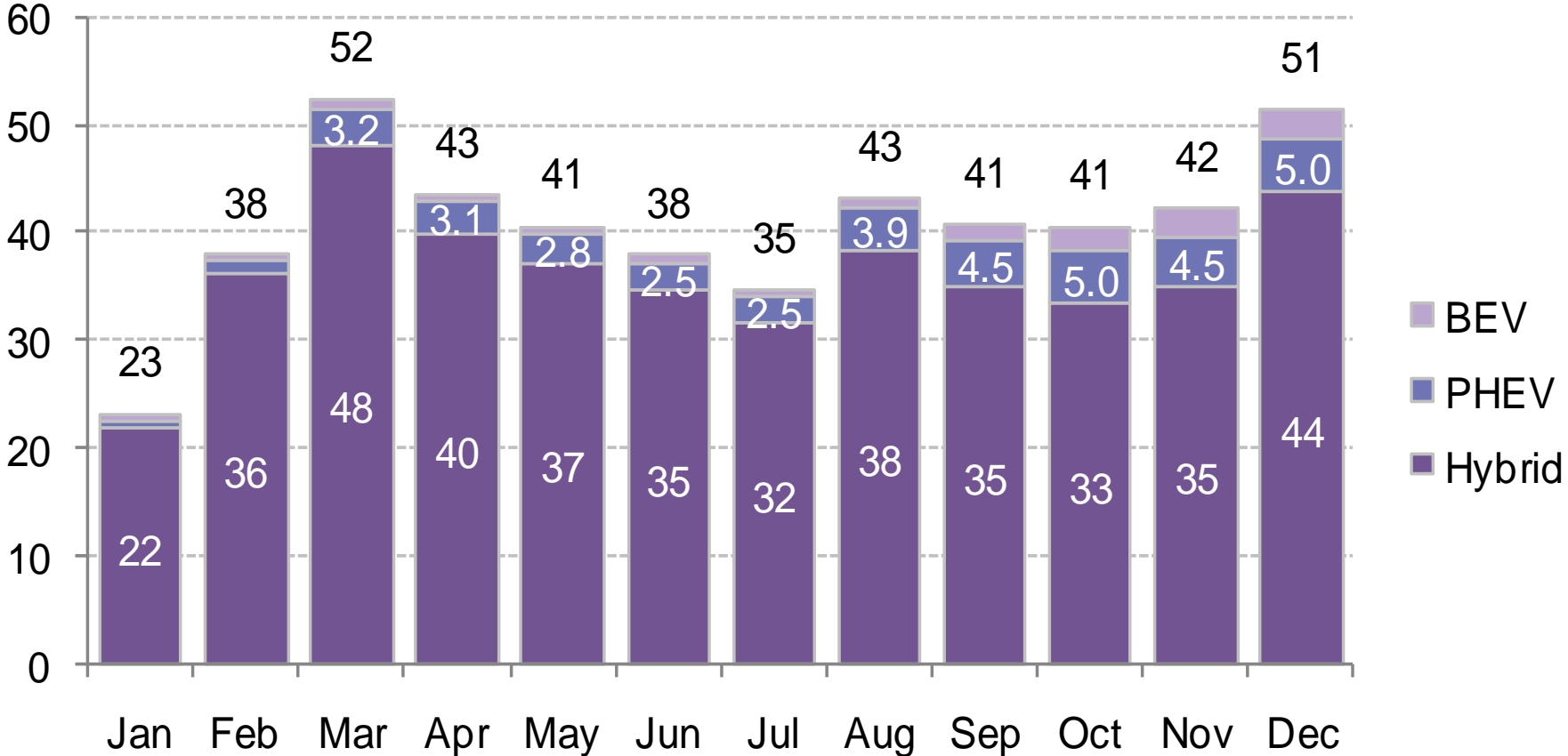


**ENERGY
EFFICIENCY
BUDGETS**



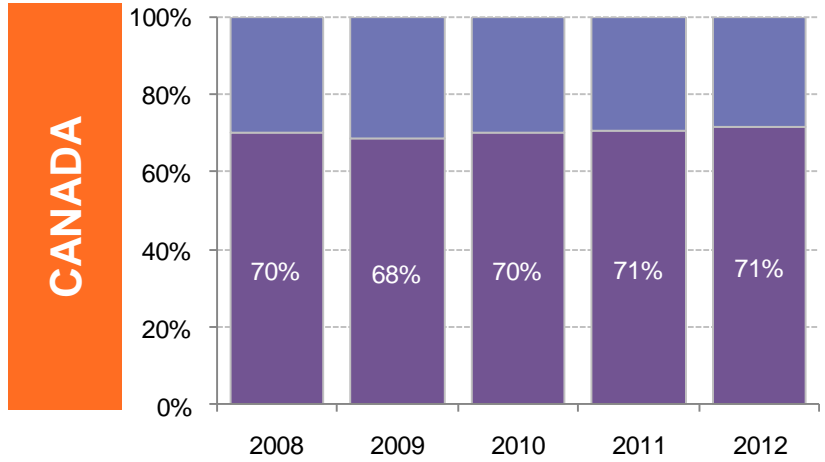
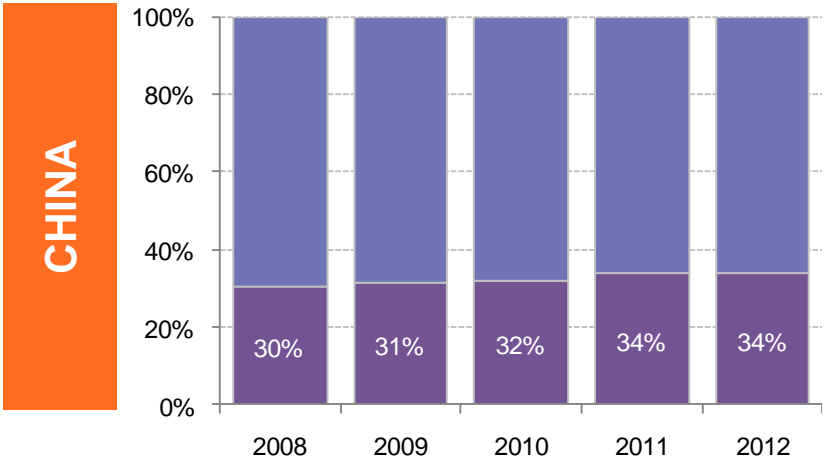
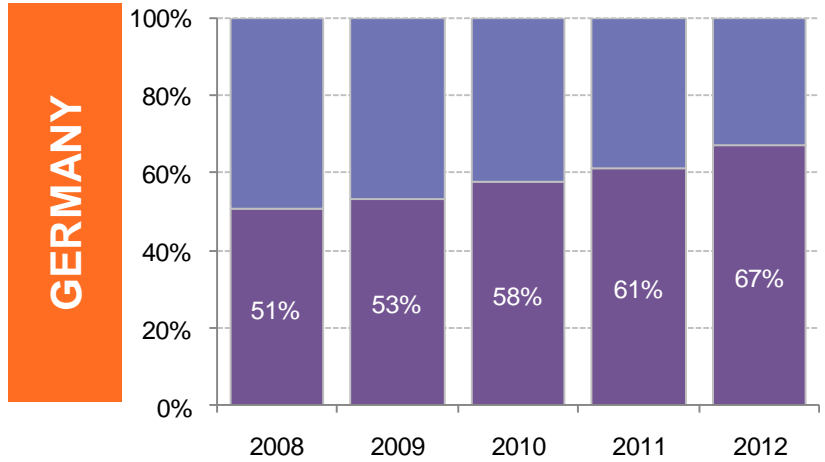
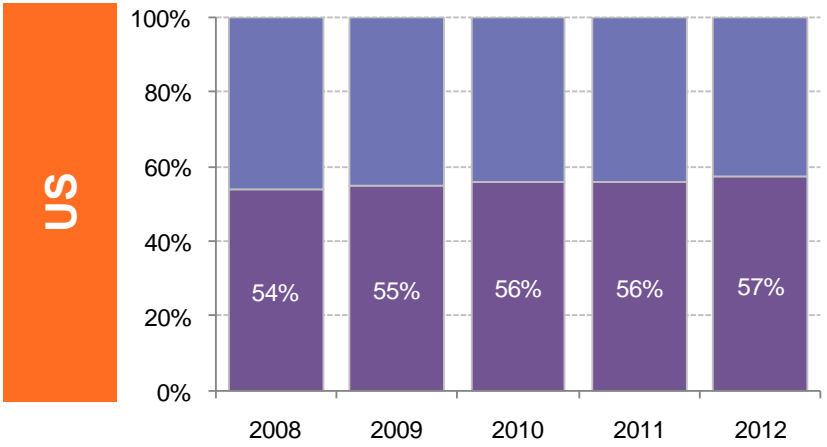
Source: Bloomberg New Energy Finance, American Gas Association, ACEEE, CEE

US PASSENGER HYBRID, PLUG-IN HYBRID AND BATTERY ELECTRIC VEHICLE SALES, 2012 (THOUSAND UNITS)



Source: Bloomberg New Energy Finance

COMPARISON OF NATURAL GAS' AND RENEWABLES' CONTRIBUTIONS TO CAPACITY ACROSS SELECT COUNTRIES



■ Other
 ■ Gas and renewables

Source: Bloomberg New Energy Finance

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