

**Testimony before the US Senate Committee on Finance**  
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**September 17, 2014**

Good morning. Thank you, Chairman Wyden, Senator Hatch and the committee staff for this privilege. It truly is an honor to participate in this important discussion.

I join you today in my role as an analyst with Bloomberg New Energy Finance (BNEF), a market research division of Bloomberg LP focused on the transitions underway in the global energy markets. Our firm's clients include financiers, energy equipment makers, independent power producers, utilities, oil majors, NGOs and government agencies in over 50 nations.

My remarks today represent my views alone, not the corporate positions of either Bloomberg LP or BNEF. I invite the committee members to review the accompanying slides I have submitted as I read my remarks.

I will focus my comments today on how the two largest US non-hydro renewables sectors – wind and solar – are impacted by their respective tax credits. I recognize there are a number of intriguing ideas on how to reform the tax code more holistically as it pertains to energy, including the Baucus white paper from last year. I look forward to discussing these during the Q & A.

Let me start with two basic assertions. First, the energy sector is in the midst of a fundamental transformation. How we produce, deliver, consume and even think about energy are all changing rapidly and, I would argue, irreversibly.

And second, these trends, which began in the past decade and picked up steam in the past five years, are going to continue over the next two decades.

This is inevitable, thanks to incredible advancements in natural gas extraction, declines in solar module prices, improvements in wind turbine technology, and greater connectivity and "intelligence" of electricity-consuming devices and of the grid itself, to name but four changes.

Since 1992, the Production Tax Credit has played a vital role in subsidizing and spurring the construction of US wind projects. The PTC's current \$23 per megawatt-hour benefit coupled with accelerated depreciation benefits has allowed wind capacity to grow nearly nine-fold since 2005.

The PTC's importance has been illustrated each time Congress has allowed it to expire without a quick retroactive reinstatement. Each time, installations have fallen sharply. The steepest of these declines came between 2012 and 2013 (SLIDE 1). In fact, last year was the industry's worst since 2004.

Today, the PTC remains officially off the books meaning that new, greenfield projects generally don't qualify for the benefit. However, due to a critical change contained in the 2013 Taxpayer Relief Act the credit continues to have important market impact. That change effectively allows most projects that began but did not complete construction before the credit sunset to still qualify.

The adjustment has helped to sustain the wind industry this year and will continue into 2015. In all, we anticipate 15 gigawatts new capacity will be installed in the US in 2014 and 2015 marking a significant rebound from last year when just 1 gigawatt was installed.

What happens in 2016 if Congress does not extend the credit? In our view, the market will as it has in the past experience a sharp decline in activity, potentially

resulting in layoffs for manufacturers with operations on US soil.

A somewhat similar cliff now looms for the solar sector, which enjoys the benefit of the Investment Tax Credit (ITC) allowing developers to receive a credit equal to 30% of their project's capital expenditures. The ITC is now due to sunset at the end of 2016. At that time, when the ITC "steps down" to 10% of capex, we anticipate a drop in solar installations similar to what we have historically witnessed with wind (SLIDE 2).

One option that has been proposed for the ITC is to adopt the same "placed in service" language associated currently with the PTC. Such a move could have the same positive impact on the solar market as it has on wind, in our view (SLIDE 3).

Critics charge that these tax credits provide little motivation for these nascent sectors to improve their economics and become price-competitive. But recent evidence suggests the wind and solar industries are rapidly reducing costs, in large part to compete with natural gas-fired generation.

In the case of solar, the cost of a photovoltaic panel today is \$0.50/Watt, compared to over \$3.00/Watt as recently as 2008. This has created areas in the US where "socket parity" exists for new solar installations -- i.e. the cost to the home or business owner is lower than buying from the grid when subsidies are taken into account.

In the case of large-scale solar projects, we have seen the prices associated with power contracts rapidly decline in the last few years (SLIDE 4). The main reason for the price declines: simple economies of scale as the PV industry has grown 10-fold in just the past five years.

Similarly, wind generation costs have dropped in recent years, though in this

case the reasons have more to do with technological advancements. Superior, utility-scale turbines employing longer blades and other improvements are achieving unprecedented capacity factors. In certain parts of the world, wind is the single lowest-cost source of power generation.

And further improvements are coming. These technologies will not stop evolving – and their costs will not stop declining. For this reason, we project that wind and solar will ultimately account for at least 20% of all capacity in the US by 2030 (SLIDE 5). This may sound ambitious, but on a generation basis (actual megawatt-hours generated), we anticipate that coal, gas, and nuclear will still meet the large majority of demand by 2030 (SLIDE 6). And no, our long-term forecasts do not assume these key tax credits get extended.

In closing, I would just reiterate my two basic points: (1) major changes in the energy sector are upon us and (2) these will continue through 2030 as the trends set in motion of recent years continue.

Thus the question becomes what role will the US play in this revolution? Will the US market follow a smooth or rocky path toward clean energy deployment? Will the US be a market maker or price taker? Will the US primarily be a clean energy equipment exporter or importer?

Inconsistent and unpredictable short-term policy-making will not fundamentally undermine the long-term changes underway in the energy sector worldwide. These are now inevitable thanks to technological innovation, economies of scale, and yes, policy support coming from many nations around the globe, including most notably, China.

But inconsistent policy-making can impact the role the US plays in this change.

Thus the decisions Congress takes on certain aspects of the tax code today could have far-reaching implications for US competitiveness tomorrow.

Once again, I thank the committee for this opportunity. I look forward to your questions.

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17 September 2014

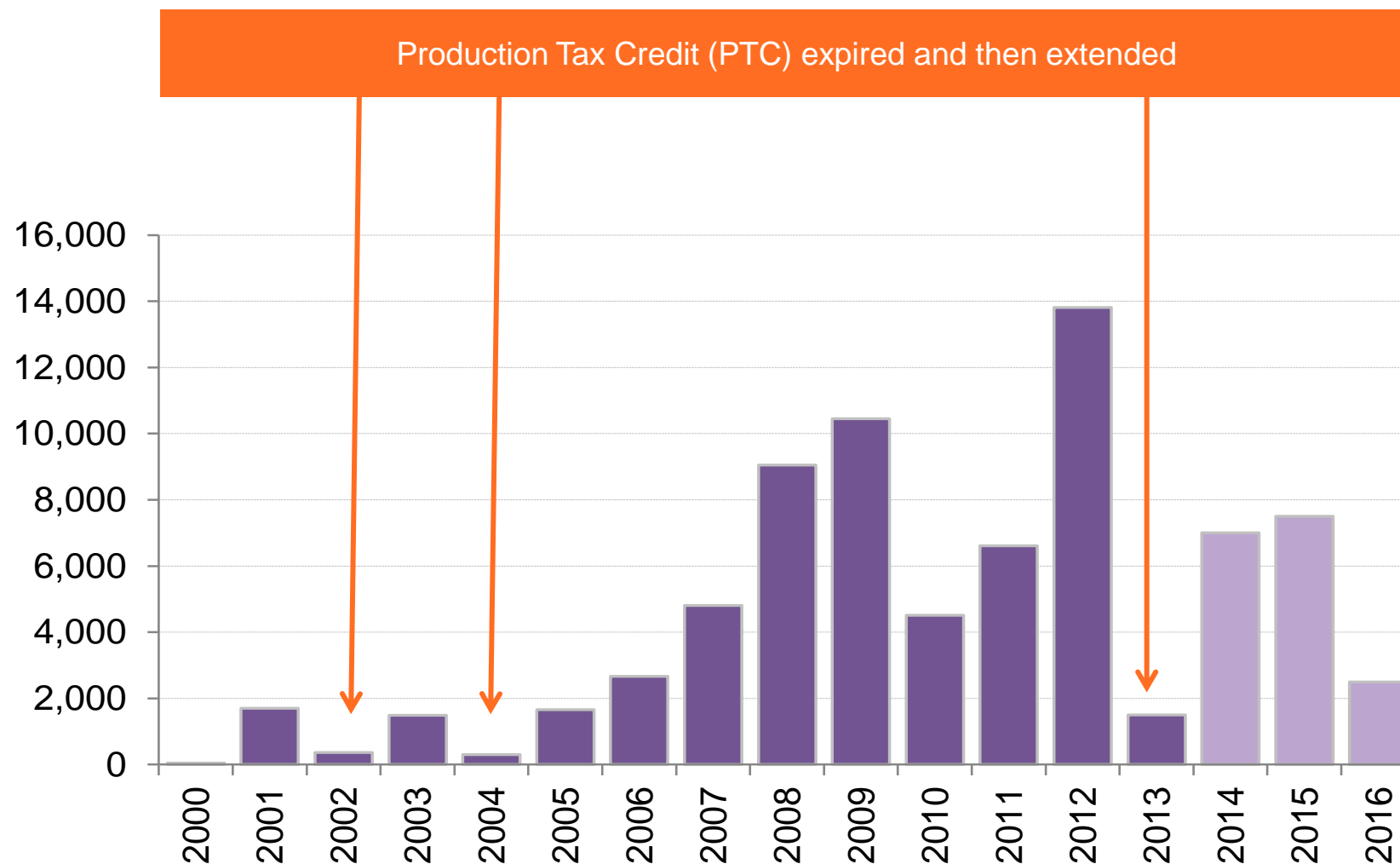
# TESTIMONY BEFORE SENATE FINANCE COMMITTEE

The impact of key tax credits  
on US wind and solar

Ethan Zindler

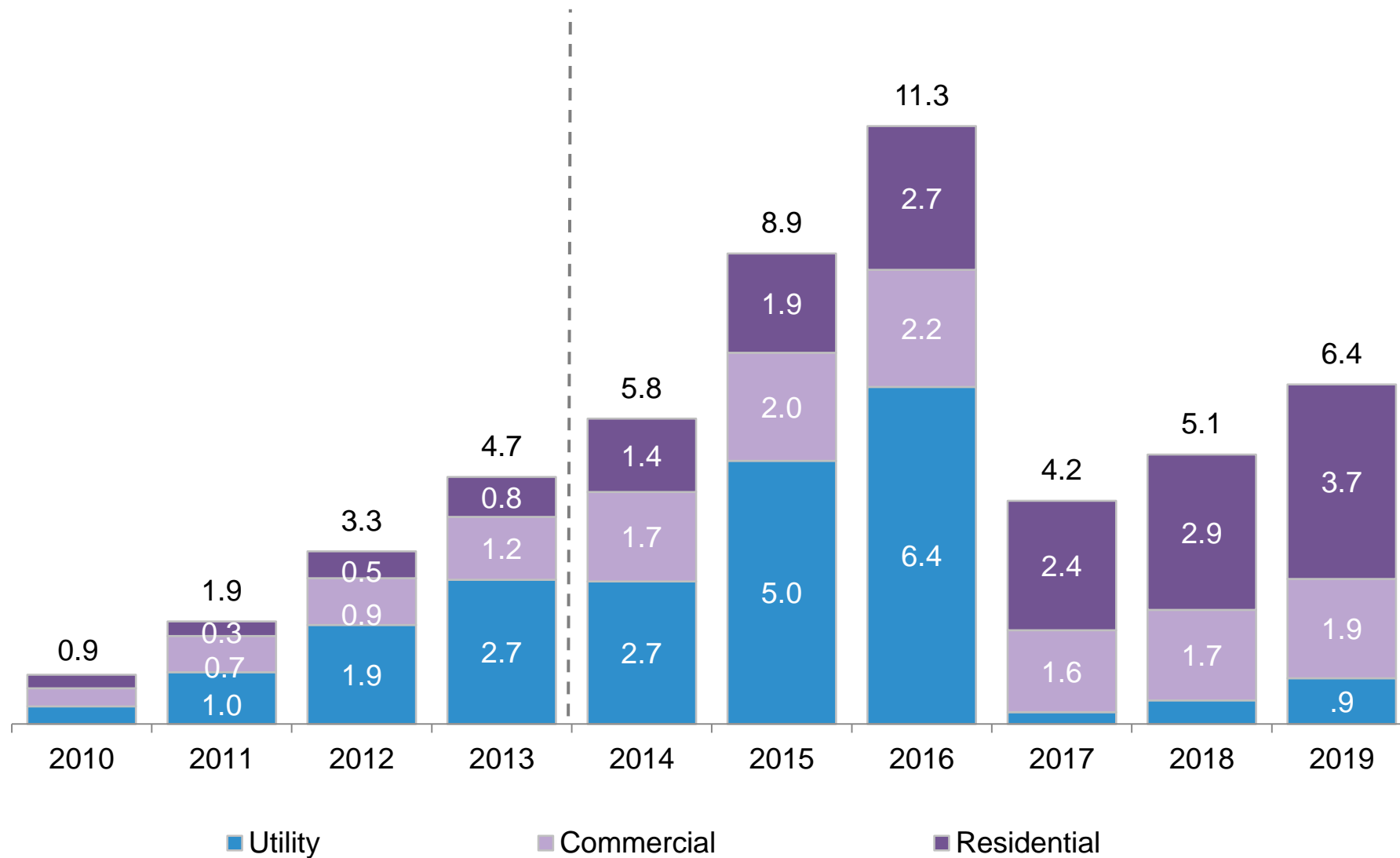
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# US ANNUAL WIND BUILD, 2000-2013 AND 2014-2016 FORECAST (MEGAWATTS)



Source: Bloomberg New Energy Finance

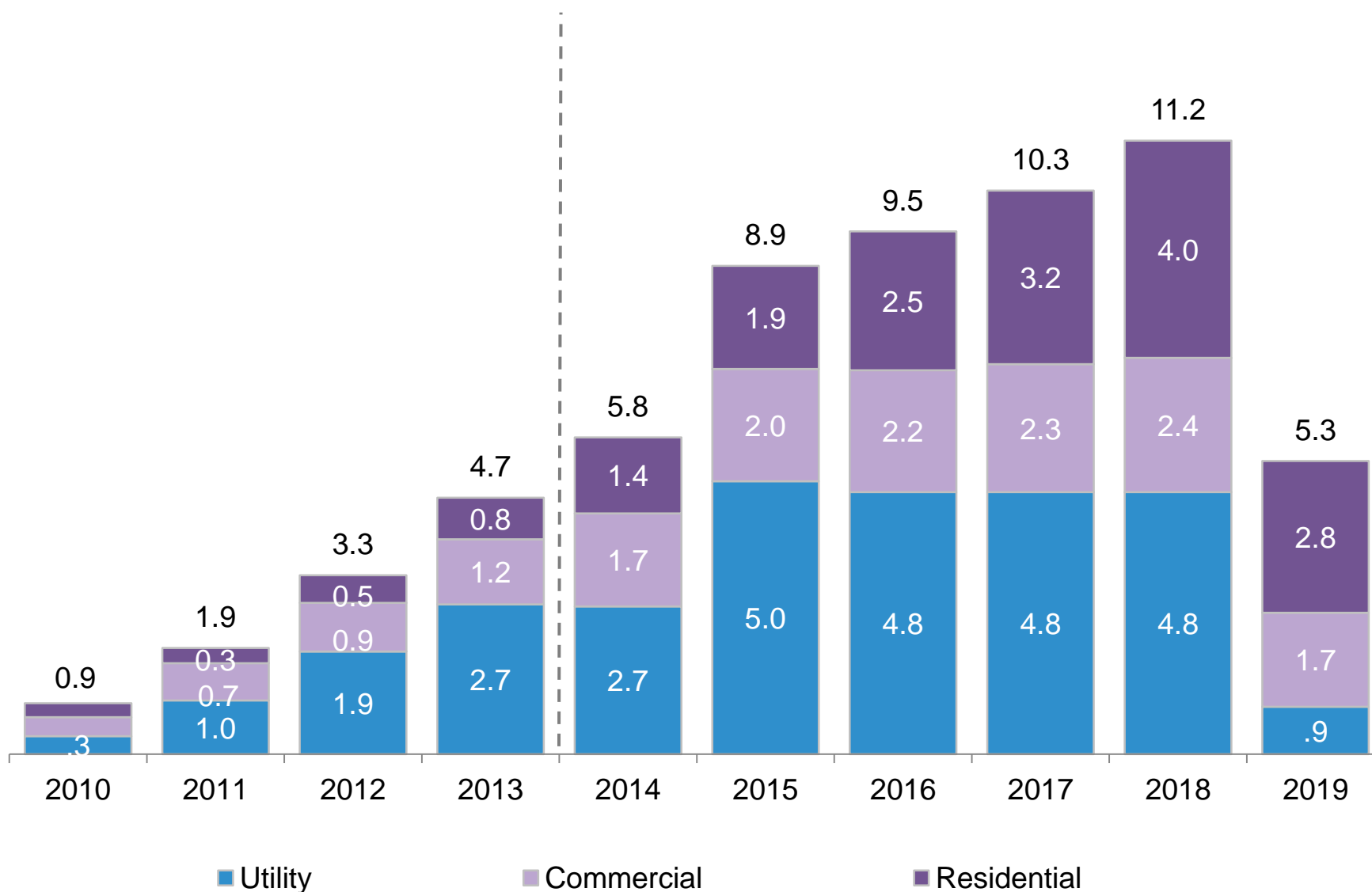
# US PHOTOVOLTAIC BUILD, ASSUMING INVESTMENT TAX CREDIT STEP DOWN TO 10% IN 2016 (GIGAWATTS)



Source: Bloomberg New Energy Finance

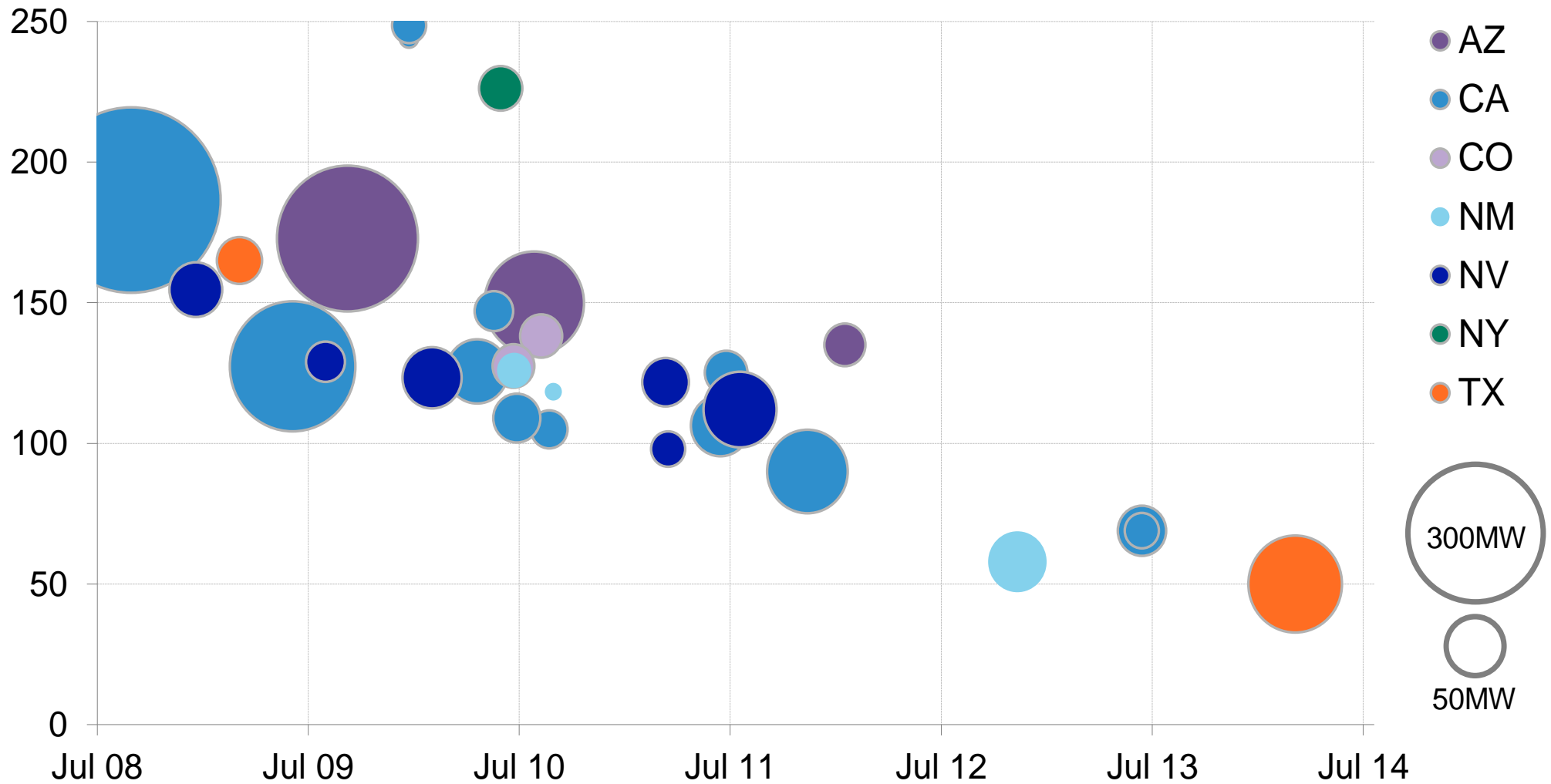


# US PHOTOVOLTAIC BUILD WITH ITC 'BEGIN CONSTRUCTION' RULE CHANGE (GIGAWATTS)



Source: Bloomberg New Energy Finance

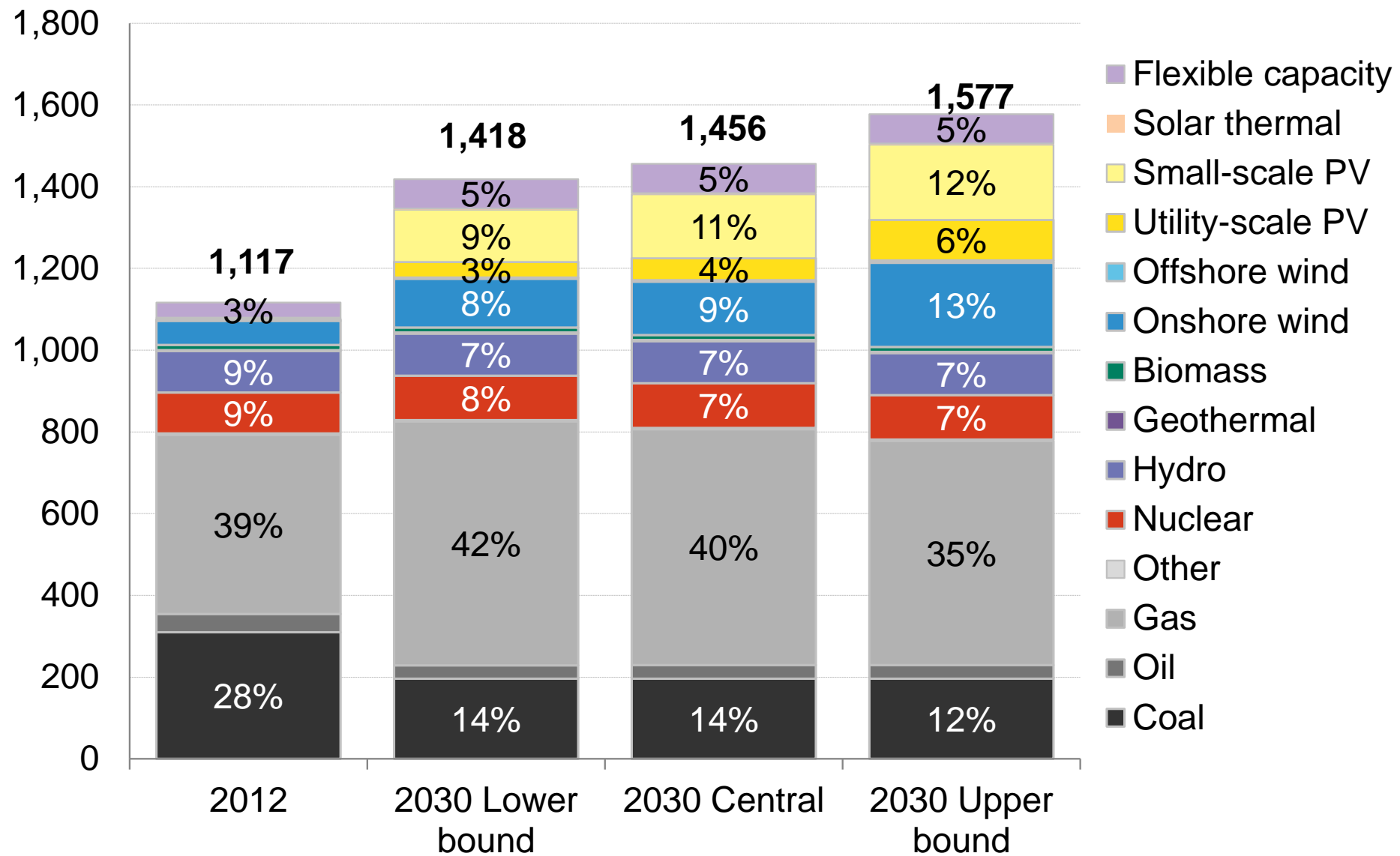
# US SOLAR POWER PURCHASE AGREEMENT PRICES BY SIGNING DATE, H2 2008 – H1 2014 (\$/MEGAWATT HOUR)



Note: Does not include PPAs under 5MW. 'PPA price' is calculated as the average offtake price over the period of project operation. Topaz PPA price estimate based on first-year total PPA revenues (\$198.8m)

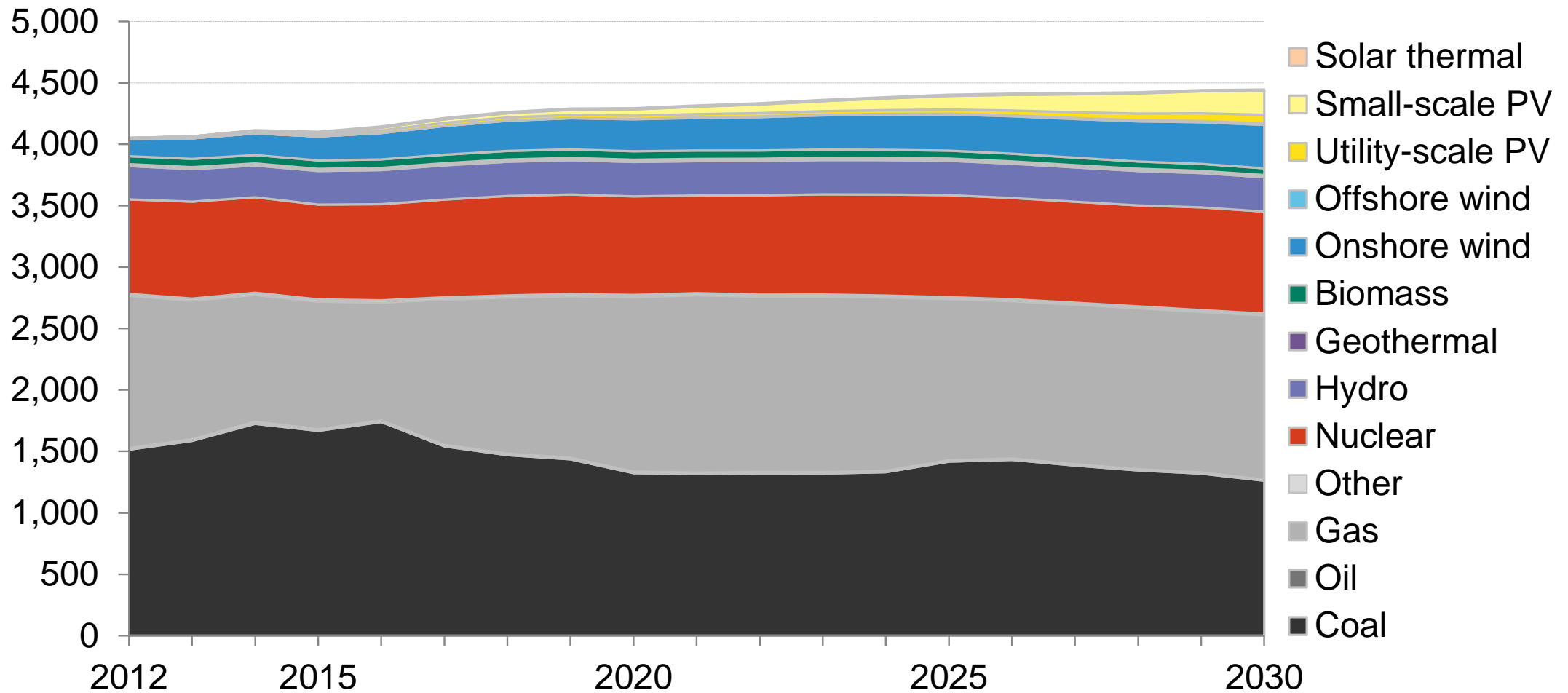
Source: Bloomberg New Energy Finance, FERC

# US FORECAST CUMULATIVE INSTALLED POWER GENERATING CAPACITY BY TECHNOLOGY (GIGAWATTS)



Source: Bloomberg New Energy Finance [2030 Market Outlook](#)

# US FORECAST POWER GENERATION BY TECHNOLOGY, 2012-30 (TERAWATT HOURS)



Source: Bloomberg New Energy Finance [2030 Market Outlook](#)

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