

The Deloitte logo, consisting of the word "Deloitte." in a bold, blue, sans-serif font. The background of the entire page is a photograph of a solar farm, showing rows of solar panels with silver metal frames on a dark blue surface, with a wooden roof structure visible in the upper right corner.

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US Renewable M&A Revs Up
Renewable power enters the mainstream

Deloitte Center
for Energy Solutions

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Executive summary

This paper provides an overview of 2014 US wind and solar mergers and acquisitions (M&A) activity, explores the trends and drivers behind it, and discusses what these trends could mean for future renewable energy development and deal activity.

Key takeaways include:

- The renewable industry faced strong headwinds in 2014—from uncertain tax policy to lackluster electricity demand growth and competition from natural gas.
- Instead of idling, project development remained brisk and wind and solar M&A activity revved up, with 37 percent more capacity changing hands than the prior year.¹ This was largely due to financing innovations such as YieldCos, rapidly declining costs, and pending tax credit deadlines, as well as increasing investor confidence in wind and solar technologies.
- Looking ahead, renewable development and M&A activity appears to be poised for continued growth, as investor interest flourishes and renewables move further into the mainstream.

Introduction

Renewable power is fast-becoming a mainstream energy source as opposed to an alternative one. Despite continuing headwinds in the form of lackluster US electricity demand growth and competition from domestic natural gas, renewable M&A activity revved up in 2014, with acquisitions of new capacity rising 37 percent year-over-year (YoY).² On the whole, this activity was primarily driven by the success of financing innovations, such as the YieldCo and green bonds, which opened the floodgates to a sea of lower-cost capital. YieldCos, in particular, helped fuel deal activity as they ratcheted up the demand for renewable assets.

In the wind subsector, the retroactive extension of the production tax credit (PTC) for wind at the end of 2014 arrived too late to spur a great deal of new construction activity, but it did improve the economics of qualifying projects. Despite the uncertainty around the PTC, the wind development pipeline remained robust in 2014, mainly due to higher gas prices and improving competitiveness with other sources of generation—both of which made utilities and large commercial entities more willing to sign power purchase agreements (PPAs). With approximately 12.7 gigawatts (GW) of wind assets currently under construction and many older assets now eligible to be flipped, deal activity is expected to remain strong over the next two years (2015–2016).³

On the solar side, the impetus for continued growth primarily came from the continuing proliferation of rooftop solar in both residential and commercial & industrial (C&I) segments, as well as a boom in smaller utility-scale projects that could be completed before the investment tax credit (ITC) for solar steps down at the end of 2016. This activity was largely driven by favorable state policies, increased utility involvement, and by growing consumer acceptance of rooftop solar as a financially and environmentally appealing alternative to the current offerings from their electricity providers.



Deal activity in the renewable energy sector will likely remain strong over the next two years (2015–2016) due to these factors and others, particularly continuing innovation in financial structures, strong state support, and further declines in the levelized cost of energy (LCOE) for renewables.

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Renewable M&A activity revs up in 2014

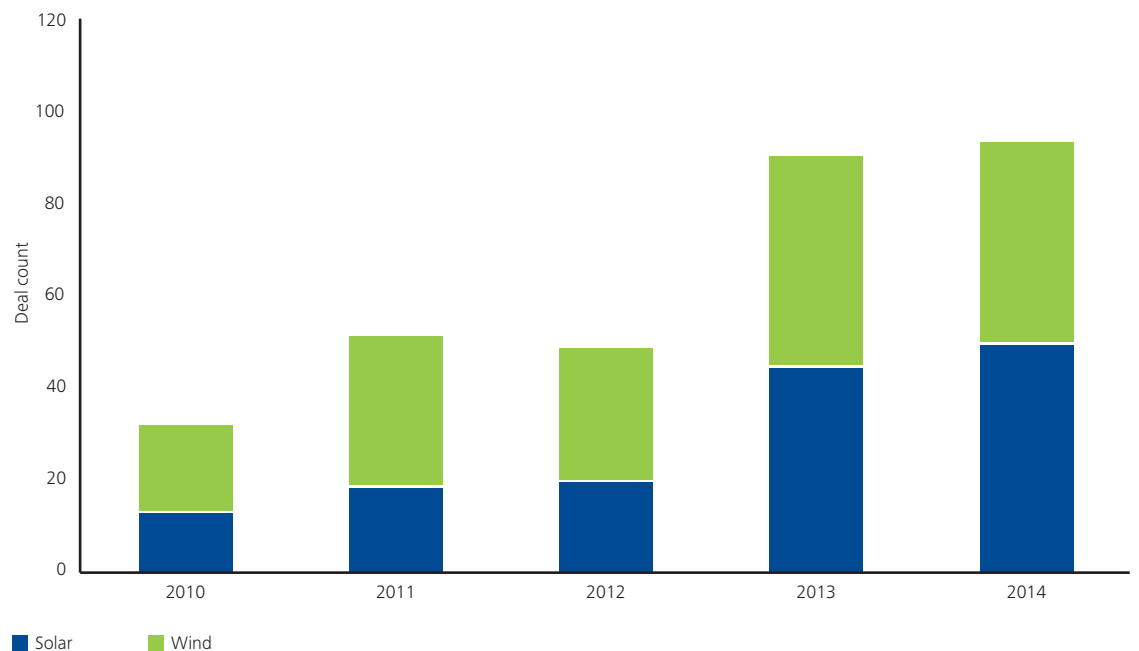
Renewable M&A activity gained momentum in 2014. Total solar and wind capacity acquired jumped 37 percent YoY to 16.9 GW.⁴ Deal count rose to 115 transactions and was once again almost evenly split between wind and solar.⁵ This activity supports a broader trend of increasing investor interest in the sector, with renewable M&A activity generally moving upward over the last five years (2010–2014).⁶

Once again, wind surpassed solar as the most popular renewable technology for buyers in 2014. While overall wind deal count declined slightly (dropping 3.6 percent YoY), capacity acquired rose 28 percent to 12.7 GW.⁷

Average deal size also jumped from 177 megawatts (MW) per deal in 2013 to 228 MW per deal in 2014.⁸ This move to larger size deals partially reflects expanding wind farm capacity, since advances in turbine design and size now allow more megawatts to be produced per unit.

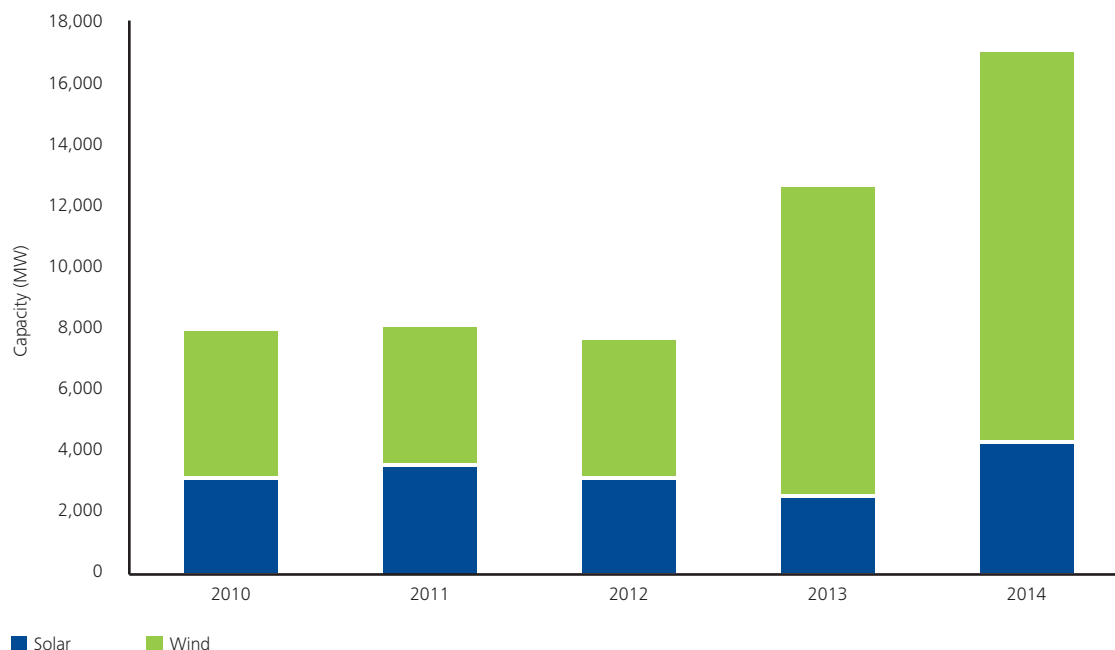
Solar M&A activity also turned up the heat in 2014. Although there were just six more deals YoY, capacity acquired jumped 71 percent to 4.14 GW, averaging about 68 MW per deal versus 44 MW per deal in 2013.⁹ This jump in capacity per deal can be largely attributed to several large utility-scale solar photovoltaic (PV) projects that changed hands in 2014.

Figure 1. M&A deal count by technology, 2010–2014



Source: SNL Energy, "M&A League Tables."

Figure 2. Capacity acquired by technology, 2010–2014



Source: SNL Energy, "M&A League Tables."

Independent Power Producers (IPPs) take reins from utilities as lead buyers

After being forced into "survival mode" by low wholesale power prices in 2012, PPAs showed renewed signs of life in 2013 as natural gas prices, and accordingly wholesale power prices, increased somewhat. This, however, was only the precursor to an explosion of IPP activity last year, as they leveraged new funding mechanisms to overtake utilities as the lead buyers in the renewables space in 2014.

IPPs voraciously added renewable capacity—approximately 80 percent wind and 20 percent solar—to consolidate market share, meet current and pending clean air rules, leverage the PTC, and feed their fledgling YieldCos (see figures 3 & 4).¹⁰ Indeed, their additions in 2014 towered over the previous year's numbers, as they acquired more than 10.1 GW of capacity, representing a stunning 147 percent YoY increase.¹¹

This activity, however, should not overshadow the ongoing role of utilities as strategic buyers of renewable assets. They remained influential investors in 2014, although deal

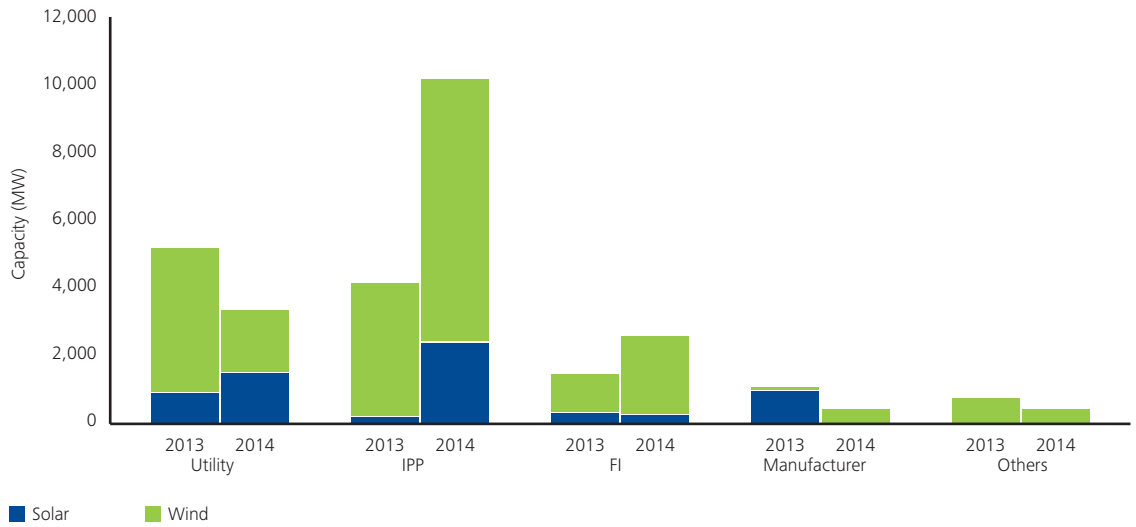
count and capacity acquired fell off from the previous year, declining 5 percent and 35 percent YoY, respectively.¹²

The story here was mainly about the emergence of new hot spots for solar deals in addition to ongoing activity in the West. Utilities sharpened their focus on solar last year, with southeastern power companies stepping into the spotlight. Deal activity was brisk in North Carolina, as utilities collected solar assets to meet renewable portfolio standards (RPS) and take advantage of state incentives. Some utilities also appear to be acting, at least in part, to position themselves as leaders in the renewable space in response to customer expectations. The findings of the Deloitte reSources 2014 Study, "*Informed and In Charge*," support this hypothesis, as responses indicated consumer support for renewables, particularly solar, continued to trend upward. Fifty-eight percent of the survey respondents ranked "increasing the use of solar power" among the top three energy-related issues most important to them, up from 44 percent in 2012.¹³ Similarly, 45 percent cited "increasing use of wind power" among their top three issues, up from 30 percent in 2012.¹⁴

Rounding out the cadre of renewable buyers, a handful of manufacturers completed deals in 2014 primarily to diversify into generation development in light of declining margins in the manufacturing space. Financial institutions (FIs) also remained active in 2014, acquiring mostly wind projects with existing PPAs for steady cash flows and returns. Notably, a private equity (PE) fund did the largest deal in the FI space,

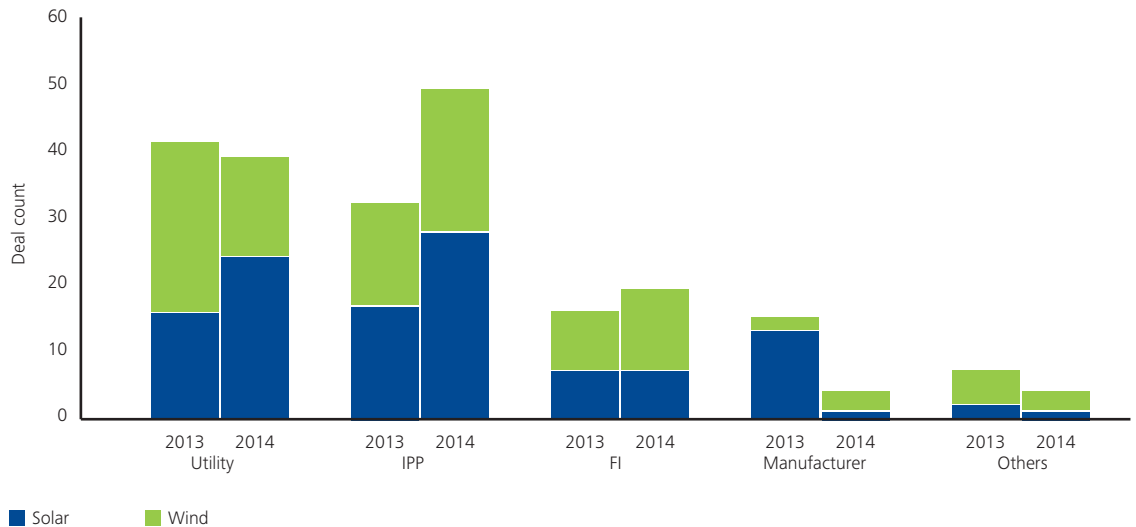
acquiring 500 MW of wind capacity in Texas.¹⁵ Infrastructure funds also showed growing interest in the space, with one large fund acquiring a minority interest in an IPP with 394.5 MW of wind capacity under construction.¹⁶ These deals and others suggest renewables have become a well-understood asset class worthy of consideration.

Figure 3. Capacity acquired by technology and type of buyer, 2013–2014



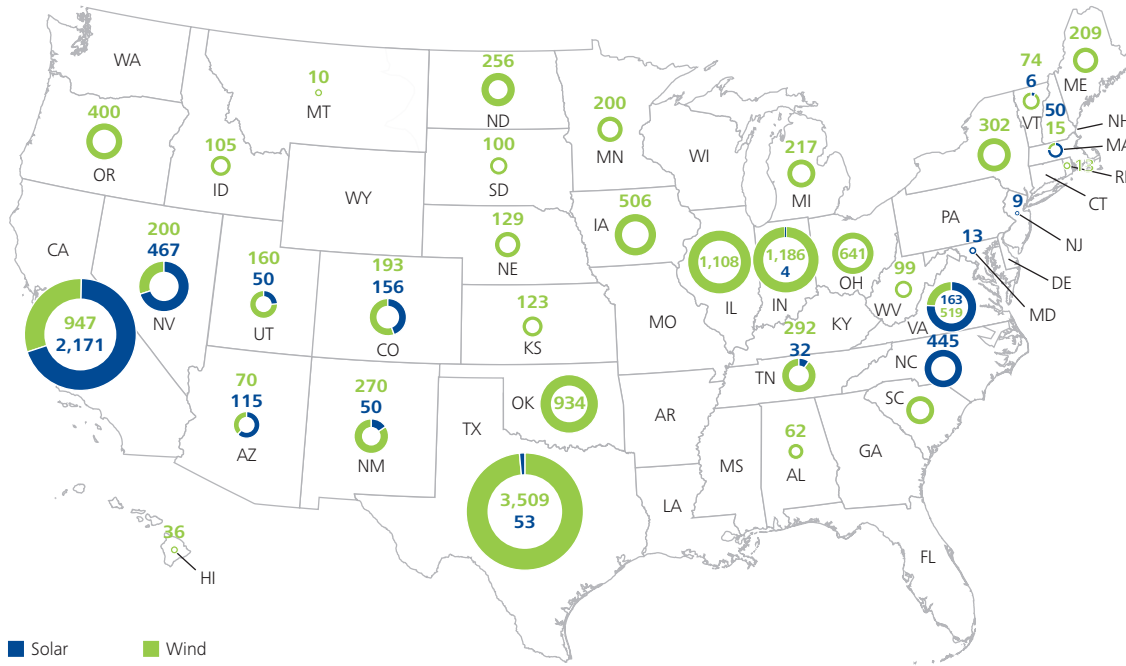
Source: SNL Energy, "M&A League Tables."

Figure 4. Deal count by technology and type of buyer, 2013–2014



Source: SNL Energy, "M&A League Tables."

Figure 5. Renewable capacity acquired by plant location



Source: SNL Energy, "MGA League Tables."

M&A outlook bright as renewables enter mainstream

Renewables have entered the mainstream. In our view, positive momentum in renewable development and M&A activity is likely to continue in 2015–2016 due to ongoing capital availability as a result of new financing structures that have captured investors' attention from Wall Street to Main Street. A rebound in traditional financing methods further supports the premise of continued growth. Nearly every type of investor, it seems, has become more comfortable with renewables as an asset class. Several broad market and policy conditions additionally favor M&A activity. For instance, a powerful and somewhat unanticipated driver has been the extent to which state policy and grassroots support are propelling renewables forward. This again points to continuing deal activity, despite the potential for unfavorable shifts in federal tax policy.

Capital influx spurs project development and M&A

After two consecutive years of decline, US clean energy investment rose about 12 percent in 2014, with wind and solar edging up 5 percent, to almost \$19 billion.¹⁷ Asset financing remained the primary source of investment in the two subsectors, attracting approximately \$12 billion from project lenders in 2014, compared with \$11.7 billion in 2013.¹⁸ Private equity (PE) and venture capital (VC) investment, while comprising a smaller piece of the pie, rose more sharply, spiking 106 percent to \$1.03 billion.¹⁹ This strength reflected rising cost-competitiveness, maturing technologies, and declining perceived risk in the wind and solar subsectors.

Venture capitalists showered funding on solar installers, including Sunnova Energy, which raised a total of \$505 million in three separate deals, and Sunrun, which raised \$150 million.²⁰ In addition to this enthusiasm for wind and solar, about 17 percent of VC funding went toward developing other renewable energy sources such as liquid fuels and fuel cells, demonstrating that innovation in the industry continues beyond the mature wind and solar subsectors.²¹

While renewable developers welcomed the resurgence of PE and VC funding in the marketplace, the headlines in 2014 belonged to financing innovations, such as YieldCos and securitization.

New financing tools propel sector growth and deal activity

YieldCos

In 2014, financial innovations like YieldCos expanded wind and solar developers' access to lower cost capital, spurring development and purchase of new projects and heating up M&A activity.

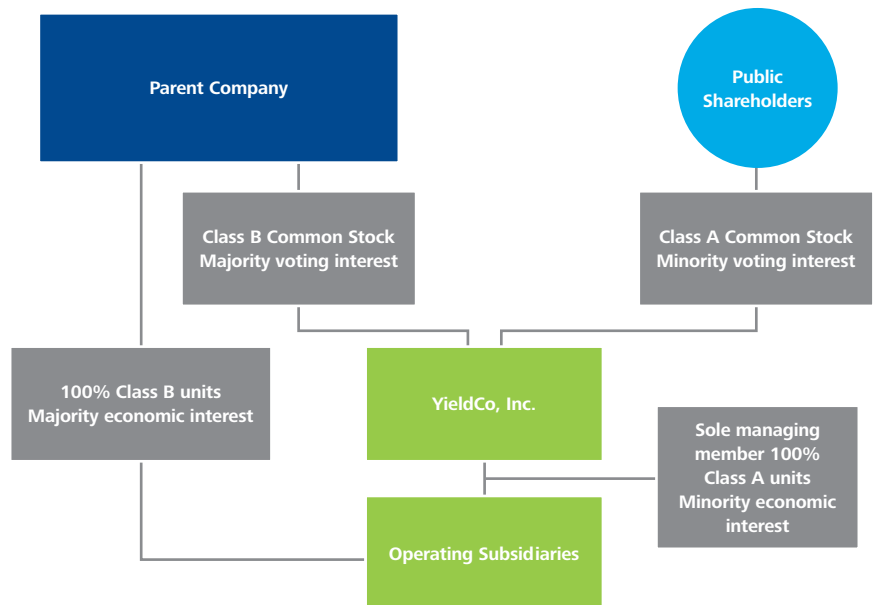
In light of limited availability and additional costs associated with traditional tax equity and project financing, participants in the renewable energy industry have long called for new financing alternatives with the goal of simplifying deal structures and reducing the cost of capital. Some believed the solution would be found in Real Estate Investment Trusts (REITs) and Master Limited Partnerships (MLPs). As these proposals languished in Congress and made minimal progress with the Internal Revenue Service (IRS), it became clear that these tools did not hold the near-term promise many had hoped. Consequently, the industry moved forward with other innovations for tapping the public markets and appealing directly to institutional as well as accredited individual investors. Some of these, such as the YieldCo and asset-backed securities, were effectively introduced in the renewable sector in 2013, but their viability was not largely demonstrated until last year. Indeed, 2014 statistics reflected a level of interest and proliferation that came as a surprise to many skeptics, and even to some ardent supporters.

YieldCos, in particular, gained significant traction in 2014. A YieldCo is a publicly traded company formed to own operating assets that produce cash flows, which are then distributed to investors as dividends (see figure 6). They are typically structured to have minimal taxable income to limit their cash tax requirements, thus renewable operating assets with tax benefits are particularly well-suited to be placed into this structure. YieldCos have multifaceted appeal. On the one hand, they let renewable developers access public markets by shifting their assets into a pure-play, dividend-oriented company. This allows them to access capital at a lower cost than they have historically been able to obtain. On the other hand, YieldCos provide investors with access to the reliable cash flows produced by renewable assets, which are largely backed by PPAs. The questions at the beginning of 2014 were: To what degree would investors be interested in purchasing YieldCo shares? And, what kind of yields would these companies actually deliver? Several successive developments during the year quickly provided answers.

The number of YieldCos listed on US exchanges doubled from three to six in 2014.²² Collectively, these six YieldCos returned an average yield of approximately 4.15 percent in 2014, which far exceeded the 1.97 percent standard yield on government bonds.²³ In terms of capital contributions, YieldCos raised close to \$3.2 billion from public markets in 2014 compared with \$1.07 billion in 2013.²⁴ Much of this increase can be attributed to the launch of three new YieldCos in 2014, including TerraForm Power, Inc., NextEra Energy, Inc. and Abengoa Yield PLC.²⁵

As one might expect, more renewable energy companies are lining up to ride the YieldCo wave toward expanded access to lower-cost capital. First Solar, Inc. and SunPower Corporation were first out of the gate in 2015, with plans to list a joint YieldCo on the Nasdaq exchange called "8point3 Energy Partners."²⁶ Sempra Energy is also contemplating a launch.²⁷ Pure financial players, however, are not to be left out, with some beginning to follow their corporate counterparts into the YieldCo arena. While this is a telling indicator of the momentum YieldCos presently have, it remains to be seen if the markets will be as receptive to these financial follow-ons (i.e., financial institutions, hedge funds, and PE investors) as they have been to the pioneers (i.e., large, vertically integrated renewable energy companies).

Figure 6. Typical YieldCo structure



Source: NREL, "A Deeper Look into YieldCo Structuring."

For instance, Sol-Wind Renewable Power LP, a hedge-fund-backed company with no ties to a larger renewable energy parent, recently postponed its planned \$100 million initial public offering (IPO) for a renewable YieldCo that sought to put a tax twist on the traditional YieldCo framework.²⁸ In a typical YieldCo structure, the public entity is a corporation that owns a partnership, but in Sol-Wind's proposal, referred to by some as an "upside down YieldCo," the public entity is a partnership that owns a corporation. This inverted structure gives investors tax advantages similar to those received in a MLP. Even though the structure appealed to certain groups of investors, Sol-Wind postponed the deal, reportedly due to too little cash available for distribution, which has become an unofficial, consensus-based metric for gauging a YieldCo's ability to service its dividends. The moral of the story appears to be two-fold: the advent of the traditional YieldCo is just the beginning, and certainly not the end, of financial innovation in the renewables space; and bigger is generally better in the equity capital markets. Both of these conditions indicate ongoing M&A activity, as developers continue to purchase or build new projects supported by lower cost capital, and as YieldCos, both existing and proposed, compete for renewable assets.

Securitization

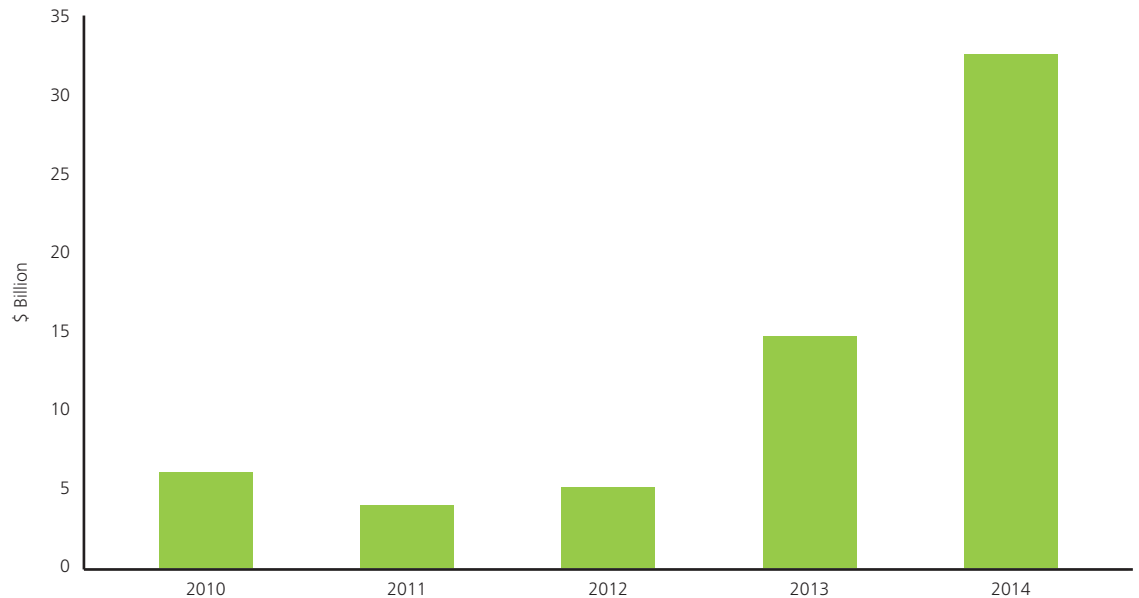
In addition to YieldCos, investors saw green in another way as securitizations grew exponentially. Corporate bonds with proceeds ring-fenced for clean energy investments have become a new source of capital for the renewables industry, as have innovative asset-backed securities similar to the distributed-solar-backed bonds pioneered by SolarCity Corporation in 2013. Over the last year, many shades of green bonds have appeared, with issuers ranging from major investment banks to corporations, and from leading investor-owned utilities to municipalities and non-governmental organizations. Green bonds indeed have become an international phenomenon.

Capital raised globally via green bonds more than doubled YoY to \$32.9 billion in 2014. In the US, state and municipal green bonds attracted \$1 billion in 2014, compared with \$350 million in 2013.²⁹

Crowdfunding

While not nearly approaching the scale of the aforementioned funding methods, another emerging source of capital that supports renewable development and deal activity deserves mention. Crowdfunding, or soliciting funds directly from retail investors via online platforms, is quickly becoming a viable way for individual US investors to participate in the growth of the rooftop solar industry.

Figure 7. Capital raised by green bonds worldwide, 2010–2014



Source: Bloomberg New Energy Finance, "Q4 2014 Green Bonds Market Outlook."

Figure 8. New financing structures

	2013	2014
# of YieldCos	3	6
Amount raised by YieldCos	\$1.07 billion	\$3.2 billion
Amount raised by US state and municipal green bonds (securitization)	\$350 million	\$1 billion

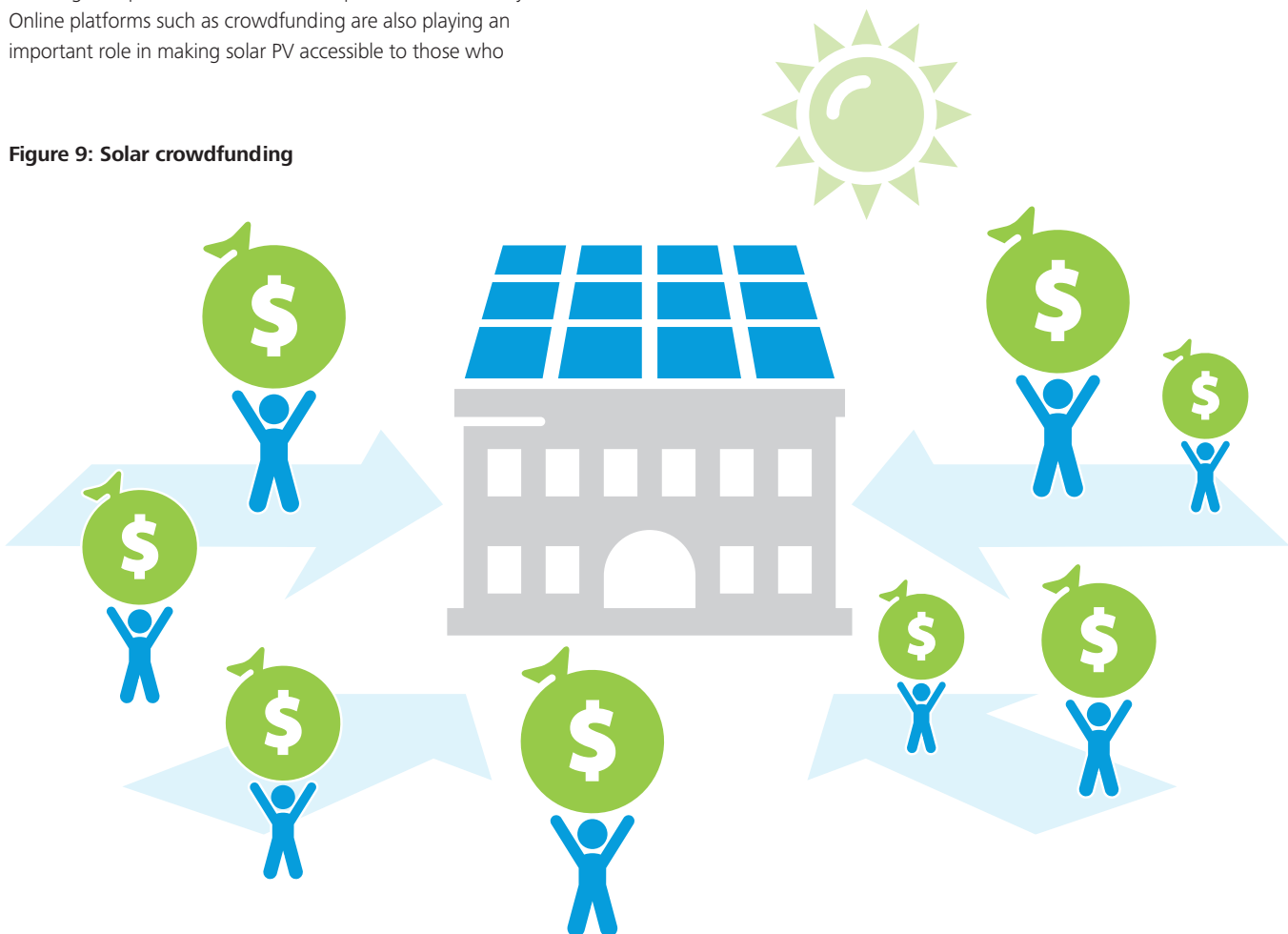
Source: Bloomberg New Energy Finance, "Q4 2014 Green Bonds Market Outlook."

This ability to harness the “power of the people” by tapping large numbers of small contributions is something at least one major rooftop solar provider is taking seriously. A top executive at SolarCity Corporation estimates crowdfunding will grow to supply rooftop solar projects with \$5 billion of investment within five years.³⁰ Many believe this estimate goes beyond the company’s enthusiasm as a pioneer in solar securitization. Crowdfunds appeal to investors because of their returns as well as their collaborative, grassroots nature. Existing crowdfunds, such as Mosaic and Crowdsun, are presently yielding 4–7 percent, well above what investors would earn from 10-year Treasury Bonds.³¹ Crowdfunds also offer renewable developers streamlined processes they cannot find elsewhere. They do not require the extensive underwriting and filing processes of a typical public offering, and they provide a simplified, automated due diligence process that saves developers time and money. Online platforms such as crowdfunding are also playing an important role in making solar PV accessible to those who

would otherwise not be able to qualify for traditional project financing. Non-profit crowdfunds, for example, are putting solar PV projects within reach of churches, schools, and other local organizations.

Finally, not to be outdone by the aforementioned types of investors, tax equity partners poured more than \$10 billion into wind and solar projects in 2014, a 54 percent jump from around \$6.5 billion in 2013.³² Increased participation by large, cash-rich corporations such as Google Inc., fueled this hearty expansion of the tax-equity piece of the renewable financing pie.³³ This suggests that other financing mechanisms may have to work hard to pick up the slack if the US Congress does not extend federal tax incentives beyond their scheduled expirations.

Figure 9: Solar crowdfunding



Development and deal activity rise as wind and solar system costs fall

In addition to the explosion of lower cost financing options for developers, rising wholesale power prices—which are closely linked to upward movement in natural gas prices—should also help renewables to move closer toward grid parity. Deloitte MarketPoint’s World Gas Model projects natural gas prices at Henry Hub may increase at a compound annual growth rate of 4.06 percent from 2015 through 2020 (see figure 10). Wholesale electricity prices

increased on average nearly 17 percent YoY across major US regional markets in 2014 (see figure 11).³⁴ Notably, the greatest increase was in the PJM Interconnection, which was up more than 30.9 percent YoY.³⁵ Rising wholesale electricity prices help renewables compete with other sources of generation, since utilities and corporations are more willing to lock in PPAs. Higher electricity prices also encourage more consumers and businesses to switch to renewables, which supports further development and continuing M&A activity.

Figure 10. Henry Hub natural gas spot prices (\$/MMBtu)



4.06%*
Compound annual growth rate projected for natural gas prices over next five years

Source: US Energy Information Administration (EIA) "Natural Gas Data."

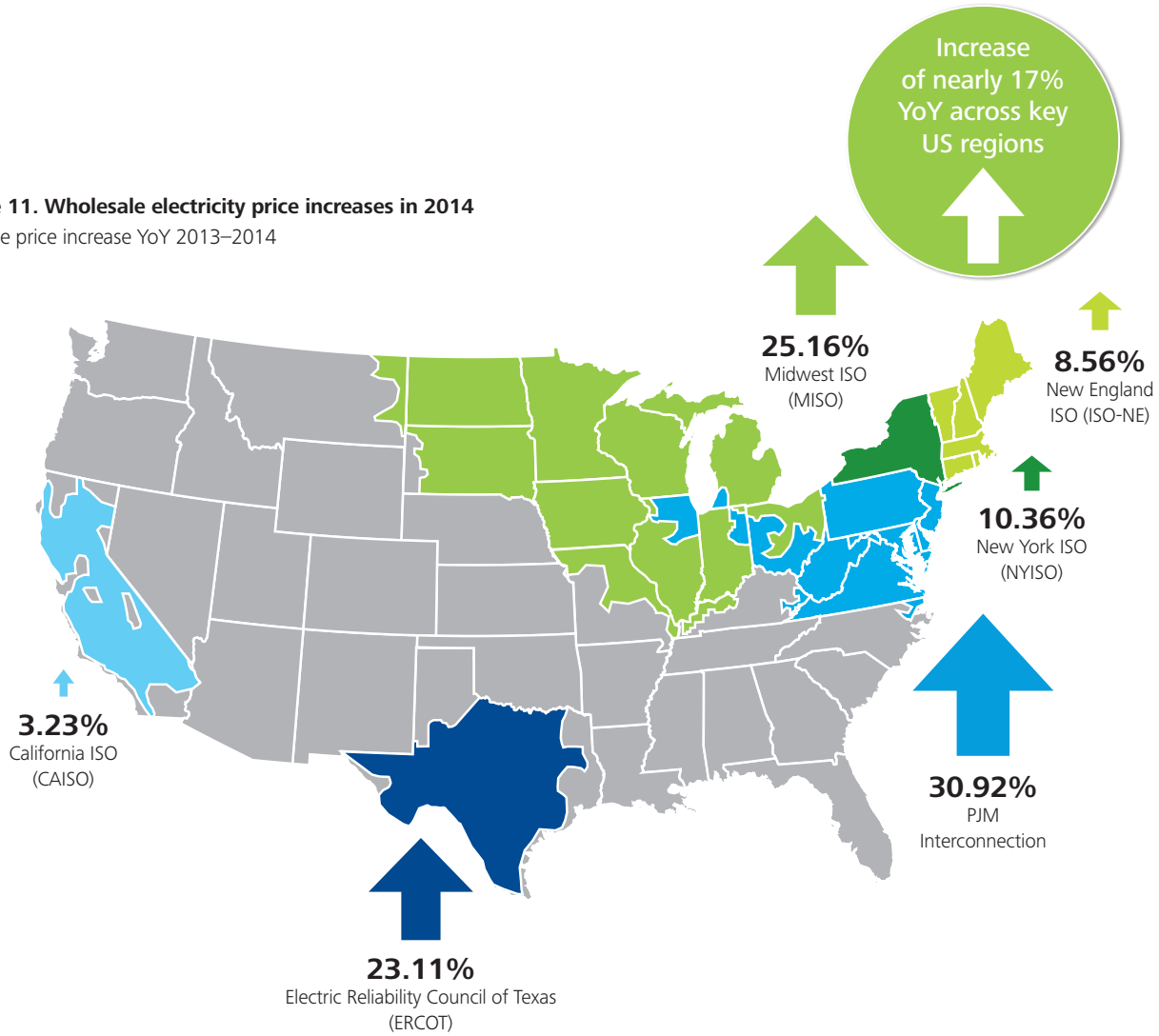
* Projected by [Deloitte MarketPoint's World Gas Model](#)

Interestingly, many thought that record-low natural gas prices over the last few years would impede renewable development as utilities shifted their fleets en masse toward gas-fired generation. This did not come to pass, as the cost of renewables continued to fall and those seeking to build natural gas plants encountered difficulties in hedging fuel prices. In addition, many utilities opted for a more balanced portfolio approach. While low natural gas prices,

together with concurrently depressed wholesale electricity prices in 2012 failed to impede development to the extent many had predicted, they did cause renewable developers to narrow their focus into areas with optimal production factors. As natural gas prices rise, and competitive pressures ease somewhat on renewable developers, they should be able to expand their horizons as more locations become economically viable.

Figure 11. Wholesale electricity price increases in 2014

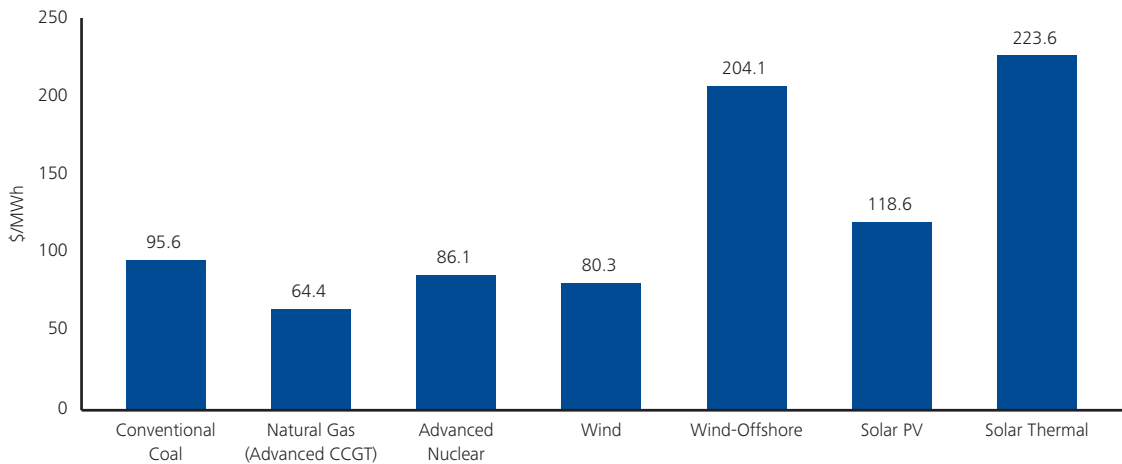
Average price increase YoY 2013–2014



Source: SNL Energy, "Power Summary."

Figure 12. Levelized cost of electricity (LCOE)

2012 dollars per megawatt hour for plants entering service in 2019



Source: US EIA, "2014 Annual Energy Outlook."

Policies support renewable development and deal activity

Federal and state policies that impact the wind and solar sectors saw some ups and downs in 2014, but the overall effect was to support further development, which will likely motivate deals in the next two years.

Federal: Policy spurs new projects, while regulatory initiatives suggest future support

On December 16, 2014, President Obama signed the Tax Increase Prevention Act of 2014.³⁶ The Act extended the PTC for wind retroactively for 2014, making projects that had begun construction before January 1, 2015, eligible for the tax credit. By and large, the PTC extension came too late to stimulate large numbers of new wind construction starts during 2014, since there was not enough time for new projects to physically begin construction before the end of the year. The extension, however, did improve the economics of qualifying projects. Recent IRS guidance, along with the retroactive PTC extension, is adding to the volume of renewable projects rushing to be placed in service by the end of 2016. In Notice 2015–25, issued on March 11, 2015, the IRS clarified the “beginning of construction” rules for renewable energy facilities. According to the Notice, a qualifying facility will be deemed to have satisfied the “begun construction” physical work or 5 percent safe harbor if a taxpayer begins construction before January 1, 2015, and places the facility in service before January 1, 2017, regardless of the physical work performed or cost paid after December 31, 2014, and before January 1, 2017.³⁷

The Act also retroactively extended the 50 percent, first-year bonus depreciation allowance for capital equipment placed in service in 2014. Similar to the PTC, the extension, which applies to both solar and wind assets, came too late to stimulate much new development, but it will benefit property now eligible.

The ITC for solar, which had previously been extended until 2016, did not change in 2014. Accordingly, it remains a strong incentive for solar development, with developers now picking up the pace in a race to get their projects in service before the end of 2016 to be eligible for the full 30 percent tax credit, which is scheduled to step down to 10 percent for utility-scale and commercial solar systems beginning in 2017 under Internal Revenue Code (IRC) section 48, and to zero for customer-owned residential installations, under IRC section 25D.

Aside from the last-minute extenders bill, the renewables industry did not see much progress in relation to federal tax policy in 2014. With the new Congress’s seemingly more lukewarm view of renewables and the short-term prospects of federal tax reform being dim, this situation is unlikely to change in the short term. Moving ahead, the industry will likely find more support in the regulatory realm than in the policy arena, from continued implementation of US Environmental Protection Agency (EPA) rules under the Clean Air Act—President Obama’s recent climate change accord with China—and new initiatives such as the EPA’s proposed Clean Power Plan. If approved, the latter in particular could favorably impact the sector. The Clean Power Plan seeks to lower carbon dioxide emissions from the US power sector by 19.2 percent from 2012 levels by 2030.³⁸ States would be required to comply by putting several “building blocks” in place, and adding renewables is one of those.³⁹

State: Renewable policies suggest continued development, despite challenges

With federal support in the policy realm being tepid, renewable developers turned to state policies to support future growth. Here, they were not disappointed. In 2014, many states continued to expand their programs to support and incentivize renewable energy development, which creates assets that will likely change hands in future M&A deals. Some states announced new, far-reaching goals that would take renewable penetration to new levels. State RPS by and large anchored these efforts, despite challenges in a handful of states. Efforts to repeal RPS have not succeeded for the most part, with the exception of campaigns in Ohio and West Virginia, which notably are large coal and natural-gas producing states.⁴⁰ Challenges to RPS, however, are expected to continue throughout the coming year since statehouses are more conservative than they have been in decades as a result of the 2014 elections.

Despite these challenges, the overall momentum of state policy appears to be accelerating in a direction that supports further renewable development and deal activity. Opposition to RPS will likely be countered by job creation from fast-growing renewable energy industries in conservative states, along with shifting opinions among policymakers regarding the need to address climate change. In fact, RPS increased in Montana, New York, and Texas in 2015 to meet established target levels.⁴¹ Other states have made novel proposals aimed at addressing climate change, improving resiliency of the electric grid, and reinforcing their claims as clean technology leaders. For instance, the chairman of the Hawaii Senate Committee on Energy and Environment has proposed legislation requiring the state to get 100 percent of its power from renewable energy sources by 2040.⁴² The current goal is 40 percent by 2030.⁴³ California has also articulated ambitious renewable energy goals. Governor Jerry Brown in his 2015 inaugural address proposed to expand the state's RPS from 33 percent by 2020 to 50 percent by 2030.⁴⁴ California is already the leader in installed solar capacity and ranks third in wind power.⁴⁵

RPS is not the only mechanism by which states are supporting development of renewables. State green banks continue to leverage public funding to generate private investment in clean energy. Connecticut created the first state green bank, known as the Clean Energy Finance and Investment Authority (CEFIA), in 2012. According to CEFIA's 2013 annual report, more than \$220 million is being invested in clean energy in Connecticut's communities as a result of the Authority's initiatives, and it has raised approximately \$10 of private capital for every one dollar of ratepayer funds invested. CEFIA is also making news with the success of its Commercial Property Assessed Clean Energy (C-PACE) program, which allows commercial customers to finance clean energy upgrades to their buildings, including solar PV installations, through their property tax bills with no money down.⁴⁶ To date, CEFIA has allocated more than \$65 million to 90 Connecticut businesses and nonprofits through the C-PACE program. Meanwhile, New Jersey established the NJ Energy Resilience Bank with \$200 million in federal disaster recovery grants related to Superstorm Sandy.⁴⁷ The Bank's objective is "to support the development of distributed energy resources at critical facilities throughout the state that will enable them to remain operational during future outages."⁴⁸



It is not surprising that the states hit the hardest by Superstorm Sandy have been leading the charge in addressing climate change and in improving grid resiliency. New York, however, made headlines in 2014 with its Reforming the Energy Vision plan, which goes far beyond storm preparedness. This plan proposes to overhaul the state's energy grid and utility regulatory system in an effort to achieve system-wide efficiency, reliability, resiliency, fuel diversity, affordability, carbon reduction, and increased customer choice and value.⁴⁹ In pursuing these objectives, the plan is expected to promote deeper penetration of wind and solar as well as to reshape the utility business model by incentivizing utilities to deploy distributed energy resources. As the most extensive initiative introduced to date, it will likely provide a framework for other states if it is successful. In the meantime, other states are experimenting with their own regulatory changes, such as Massachusetts, Georgia, North Carolina, and Minnesota. All told, these activities will likely result in net positive benefits for the renewable energy industry.

Subsector analysis

In addition to broad policy and market conditions, several micro-factors specific to the subsectors of wind and solar also point to continuing deal volume.

Solar

Access to lower cost capital, increasing customer demand and attractive yields will likely continue to spur solar development and M&A activity, and as the 2016 ITC stepdown approaches, acquisitions and consolidation may well intensify.

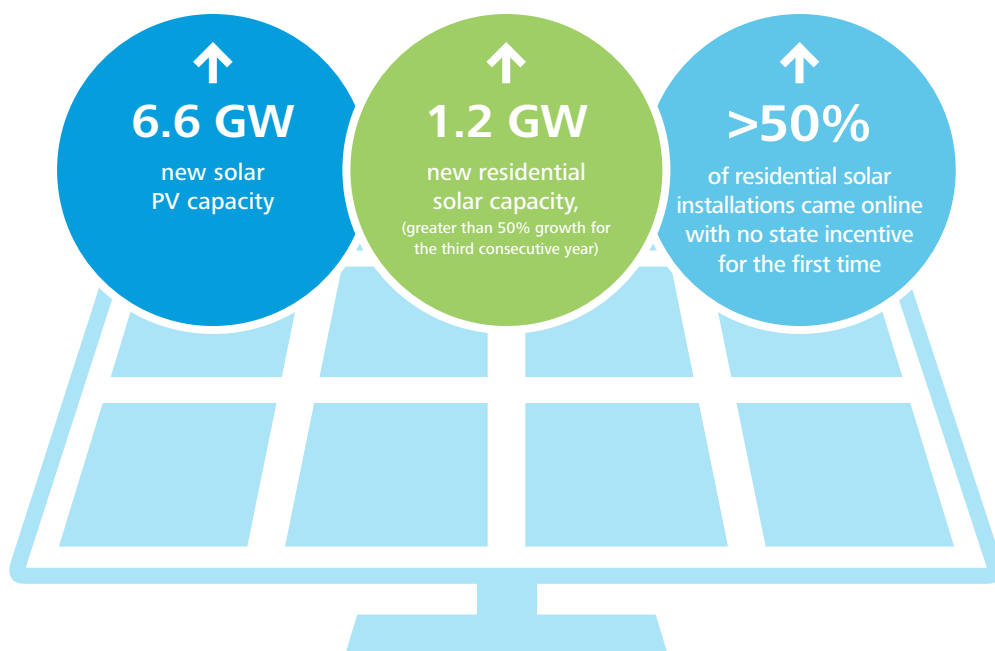
According to the Solar Energy Industry Association, 6.6 GW of new solar PV capacity and 767 MW of concentrating solar power capacity were installed in the United States in 2014.⁵⁰ The US residential solar market grew by leaps and bounds, adding 1.2 GW, which represents more than 50 percent growth for the third consecutive year.⁵¹ For the first time ever, more than half a gigawatt of residential solar installations came online without state incentives such as residential rebates in 2014.⁵² Indeed, the residential market has shown somewhat unexpected imperviousness to the reduction or expiration of state incentive programs. Innovative leasing and financing models and declining technology and installation costs appear to be fueling this

thriving market, and are at least partially offsetting the loss of state rebates and subsidies, and challenges to net metering in some areas.

The projections of SolarCity Corporation the largest US installer, illustrate the strength of the current momentum in the residential rooftop solar market. The company presently has about 190,000 customers and expects to hit one million by 2018.⁵³ If it succeeds, this would equate to about 6 GW of total generation capacity.⁵⁴ This statistic takes on more gravitas when one considers that SolarCity Corporation is only one company, and that many others also have aggressive growth targets.

As one might expect, the explosion of rooftop solar installations has shifted attention from centralized, utility-scale projects to distributed generation. This is not to suggest that utility-scale solar development has slowed. Despite the headlines made by residential installers, utility-scale development is also breaking records. In the fourth quarter of 2014, 1.5 GW of utility-scale solar PV projects came online, representing the largest quarterly total ever for any of the three solar market segments measured: residential, non-residential, and utility.⁵⁵

Figure 13. A year in review for solar, 2014



Source: Solar Energy Industries Association (SEIA), "Solar Market Insight Report 2014 Q4."

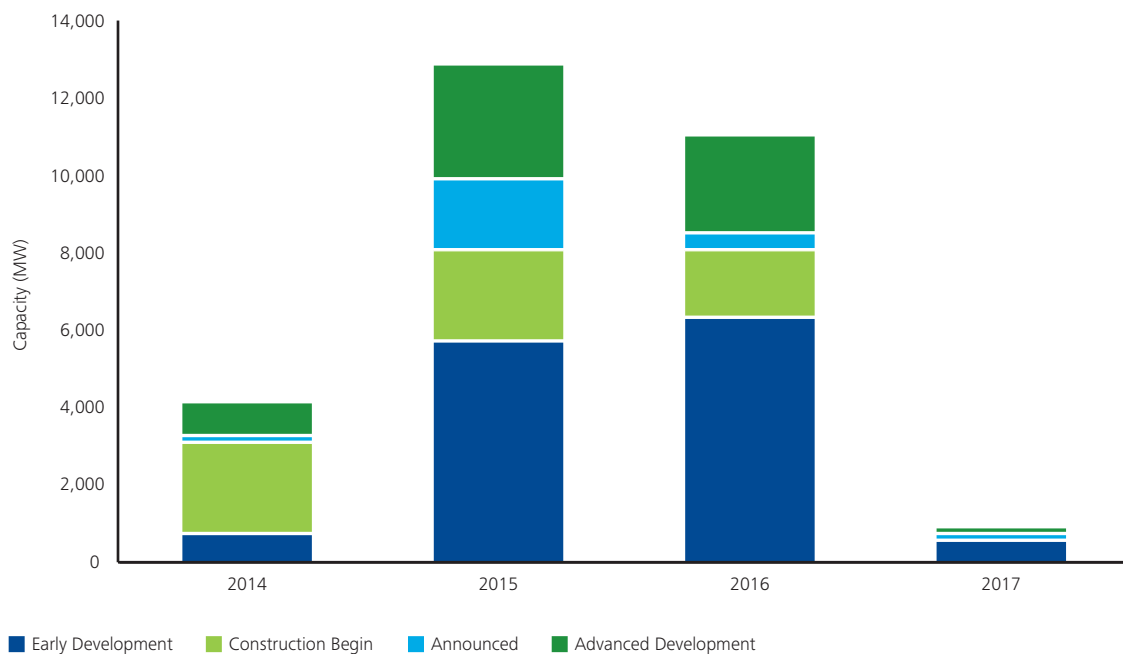
And, the development pipeline is still bulging. In the US, there are more than 14 GW of utility-scale solar projects with PPAs in place and expected completion dates of 2015 or 2016.⁵⁶

There was also growth in the C&I and not-for-profit segments, where solar PV projects have historically been perceived as too small or risky for traditional asset finance methods and too difficult to pool due to non-standardized contracts. Financing innovations such as crowdfunding and green bonds are helping to fill the funding gap, as are state green banks and developer-sponsored leasing programs. Companies that are motivated by both financial and environmental objectives, such as Google Inc., Apple Inc., and Kaiser Permanente, are also driving momentum in these segments. For instance, Google Inc. has ambitions to meet its power needs with 100 percent renewables,⁵⁷ and Kaiser Permanente recently struck deals with NextEra Energy, Inc. to buy electricity from utility-scale wind and solar plants in California, as well as with NRG Energy, Inc. to install more than 100 smaller rooftop and ground-mounted solar arrays at its hospitals, parking garages and medical offices.⁵⁸ The deal by Apple Inc. to buy nearly \$1 billion of power from

a massive First Solar, Inc. plant could add to solar's mainstream credibility and inspire other companies to consider solar as an option.⁵⁹ Expansion of the C&I segment, however, is not all good news for renewable developers. As in any boom, growth invites competition. Here, utilities are increasingly countering direct plays between corporations and solar providers by acquiring assets or building plants themselves and then selling the power directly to C&I and not-for-profit customers via PPAs. For instance, Duke Energy Corporation recently inked a 20-year deal to sell power from a 52 MW project in North Carolina to The George Washington University, American University, and George Washington University Hospital.⁶⁰

Despite increasing competition among utilities and solar developers, the influx of capital and ongoing grassroots support will likely shine on all solar segments. Accordingly, it appears the M&A market is poised to heat up even further, with active buying and consolidation likely ahead of the ITC step-down. Meanwhile, attractive yields and new financing structures are also expected to boost acquisitions in the short term. Financiers, in general, will be looking for developers with strong economics who can survive in a post-ITC environment.

Figure 14. Annual solar capacity installations, 2014–2017



Source: SNL Energy, "Power Project Database."

Wind

Wind deal growth will likely be moderate-to-high over the short-term (2015–2016), as PTC-qualified projects continue to change hands and as expiring tax provisions allow companies to flip older assets. The tax benefits will appeal to a host of buyers, including utilities, tax equity investors, corporate purchasers, and IPPs, an increasing number of whom will be looking for ways to offset taxable income as power prices rebound and market conditions continue to improve. In addition, the rising influx of capital into the renewables sector is raising all boats; as in solar, wind developers are also benefiting from YieldCos.

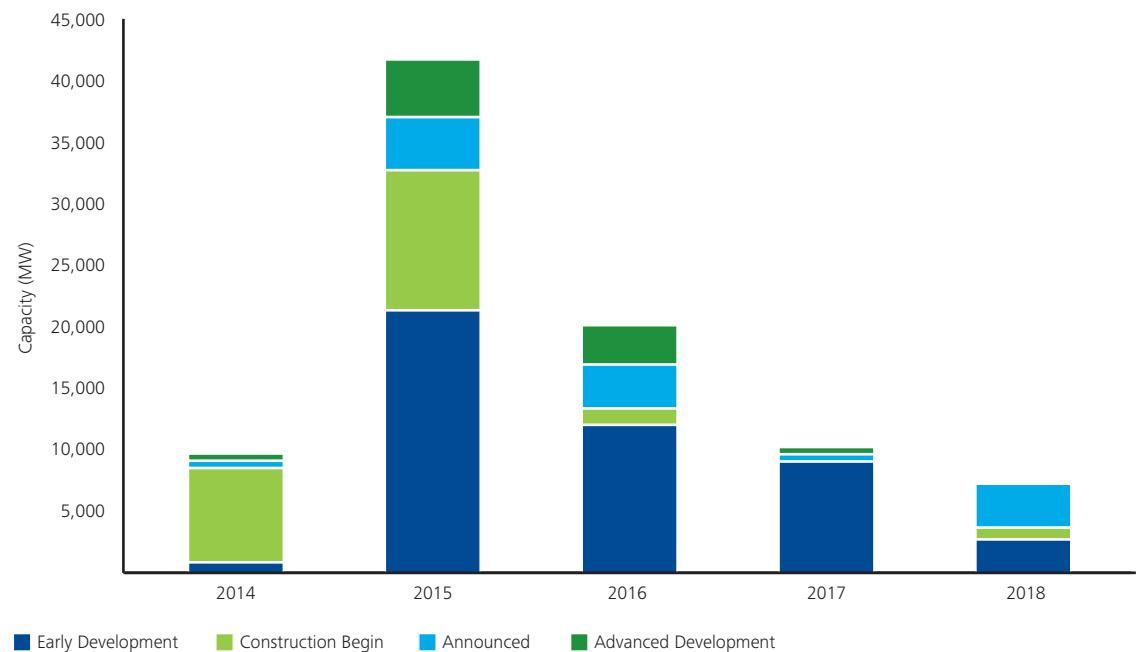
Interestingly, 2014 was not a bad year for wind developers, despite uncertainty concerning the PTC. According to the American Wind Energy Association, approximately 4.9 GW of wind power came online in 2014, and 12.7 GW are under construction.⁶¹ Texas currently accounts for the majority of wind construction activity at more than 7.5 GW (see figure 15).⁶² New Mexico, Kansas, Iowa, and North Dakota are also very active.⁶³

Even though a Congressional decision to extend the PTC did not arrive until very late in the year, wind construction carried on in 2014 as utilities and corporate purchasers

continued to sign PPAs. Over 3.3 GW of new wind PPAs were announced in 2014, building on the roughly 8 GW of power purchase agreements signed in 2013.⁶⁴ As in solar, declines in the cost of wind power, coupled with higher natural gas prices, made the idea of locking into a long-term PPA more attractive for many purchasers—especially considering that the cost of wind power is already competitive with other sources of generation in some areas, even without the PTC. The cost of wind power will likely continue to trend downward, as innovation drives further efficiencies. For instance, newer turbines, with increased hub height and rotor diameter, can produce power in areas with less wind than previously required. Progress is also being made in using battery storage and automation to boost operational efficiency.

With further PTC extensions in doubt, wind may soon be on its own, putting greater pressure on developers and manufacturers to continue to drive costs out of the value chain to remain competitive. The electric industry’s collective ability to streamline interconnection processes, relieve transmission bottlenecks, and reduce operating curtailments will likely influence the extent to which wind producers can lower their costs.

Figure 15. Annual wind capacity installations, 2014–2018



Source: SNL Energy, “Power Project Database.”

Headwinds and game-changers may impact renewable development and deal activity

While several policy and market conditions favor renewable M&A, the sector is not without its challenges, with the potential to slow development and reduce deal activity. Some headwinds that are kicking up relate mainly to grid integration, electricity demand, and the utility's role in balancing both. In terms of grid integration, the generally accepted notion is that when renewable power exceeds 10 percent of generated power, the grid requires greater flexibility to regulate frequency. Some contend this threshold could put a ceiling on renewable development; others argue that advances in storage and smart grid technologies will render the barrier moot long before it is approached in most states.

Hawaii has emerged as a proving ground for those on opposing sides of the debate. One in nine residences in Hawaii are solar powered and solar penetration indeed slowed when the state approached the 10 percent threshold.⁶⁵ In Oahu, solar penetration has exceeded daytime minimum load on many distribution grid circuits.⁶⁶ Or, put another way, on that section of the grid, there is more solar power being generated than customers are consuming. This caused the Hawaiian Electric Company (HECO) to slow down issuance of solar PV permits last year, triggering a swift response from the Hawaii Public Utilities Commission.⁶⁷ The Commission essentially issued a broad set of orders, demanding that interconnections proceed and that fundamental changes be made to how the utility manages distributed energy.

With a keen eye on Hawaii, utilities are very concerned about renewables penetration, particularly residential solar PV, and its potential impact on the grid. Some are lobbying their state commissions to allow them to play a bigger role in solar PV installations, arguing that they need to be able to own and dispatch these systems. Others see an opportunity in being able to resolve grid integration challenges. NextEra Energy, Inc. through its announced acquisition of HECO, is volunteering to take on these challenges, perhaps because it could gain a first-mover advantage in developing and implementing technologies capable of easing the situation.⁶⁸ The National Renewable Energy Laboratory (NREL), operated



by the US Department of Energy, has also joined the quest to resolve grid integration constraints by hosting tests of smart solar inverter capabilities with the Electric Power Research Institute and SolarCity Corporation.⁶⁹

While concerns about grid stability abound, a recent NREL study suggests the commonly perceived renewable penetration threshold of 10 percent may be low. The *Renewable Electricity Futures Study* found that renewable penetration levels of up to 50 percent could be accommodated with a more flexible electricity system, enabled by a broad portfolio of existing supply-side alternatives and demand-side options.⁷⁰ These options include technologies and operational improvements such as grid automation, physical sensors, advanced analytics, sophisticated forecasting, demand response programs, greater power plant flexibility, better coordination and efficiency throughout the grid, and of course, storage.

Furthermore, despite growing pains, both Hawaii and Germany are already experiencing peak load wind and solar penetration levels of 24 percent and 35 percent respectively, but so far neither has faced any major reliability issues.⁷¹

Overall, wind and solar accounted for approximately 5 percent of US electricity generation in 2014, and most regions have yet to approach wind and solar penetration levels that would impact reliability (see figure 16).⁷² This implies there is still time to resolve any grid integration challenges and there is still room for developers to grow before encountering any significant reliability constraints.

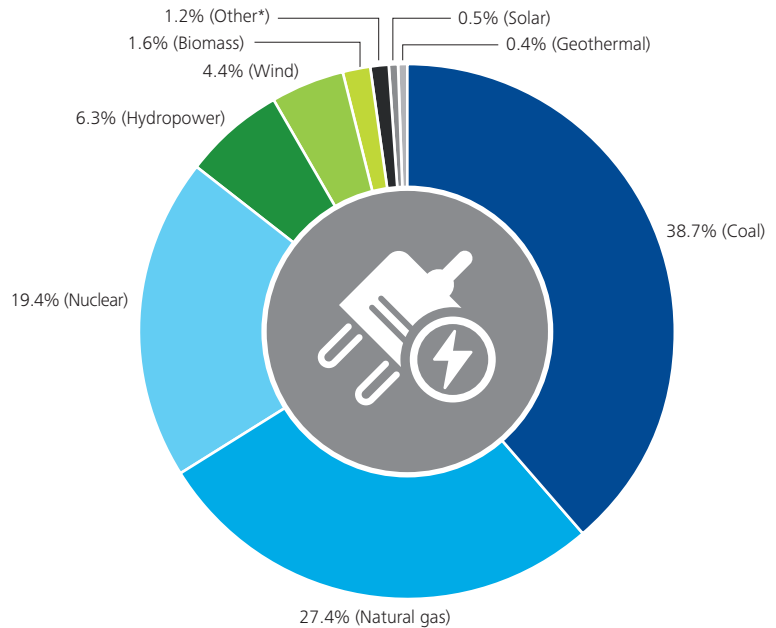
Reliability concerns aside, another headwind is blowing in the form of the uncertain role of utilities and the double-edged sword they currently wield—a sword that can cut into renewable development and reduce deal activity, or enable them. On the one hand, utilities greatly facilitate renewable M&A by developing and acquiring renewable assets and by signing PPAs. On the other hand, uncertainties concerning future utility business models could present an obstacle to renewables development, if not a threat.

As the disruptive force of distributed generation gains traction, the big question is: Who will pay for the shared infrastructure? Asserting that an unfair share of the costs are being shifted onto non-solar customers, utilities in some states have begun to petition regulators to repeal net metering programs, impose surcharges on solar PV customers to recover their system costs, and/or to impose higher fixed fees on all residential customers. In 2013, the Arizona Corporation Commission approved a monthly 70-cents-per-kilowatt surcharge for Arizona Public Service Co. ratepayers who install rooftop solar panels.⁷³ While the final decision was only a fraction of

what the utility had asked for, it may have resulted in other utilities increasing their participation in the net metering debate. In 2014, Connecticut Light and Power Co. received approval to charge residential customers higher fixed fees, and Indianapolis Power and Light Co., is petitioning its regulators to do the same.⁷⁴

The business models of solar providers often operate on thin margins, which is causing some to wonder if surcharges and/or the absence of net-metering could throw the economics of the whole sector off. Recent rate restructuring in Wisconsin suggests the answer could be “yes.” Here, the Public Service Commission gave the go-ahead for the state’s regulated electric utilities to increase their fixed charges roughly 80 percent.⁷⁵ This move effectively eroded the value proposition of solar installers to the point where they had to withdraw from the state.

Figure 16. Sources of US electricity generation in 2014 (thousand MWh/day)



* Other includes petroleum, other gases, other renewable fuels, minus pumped storage hydropower

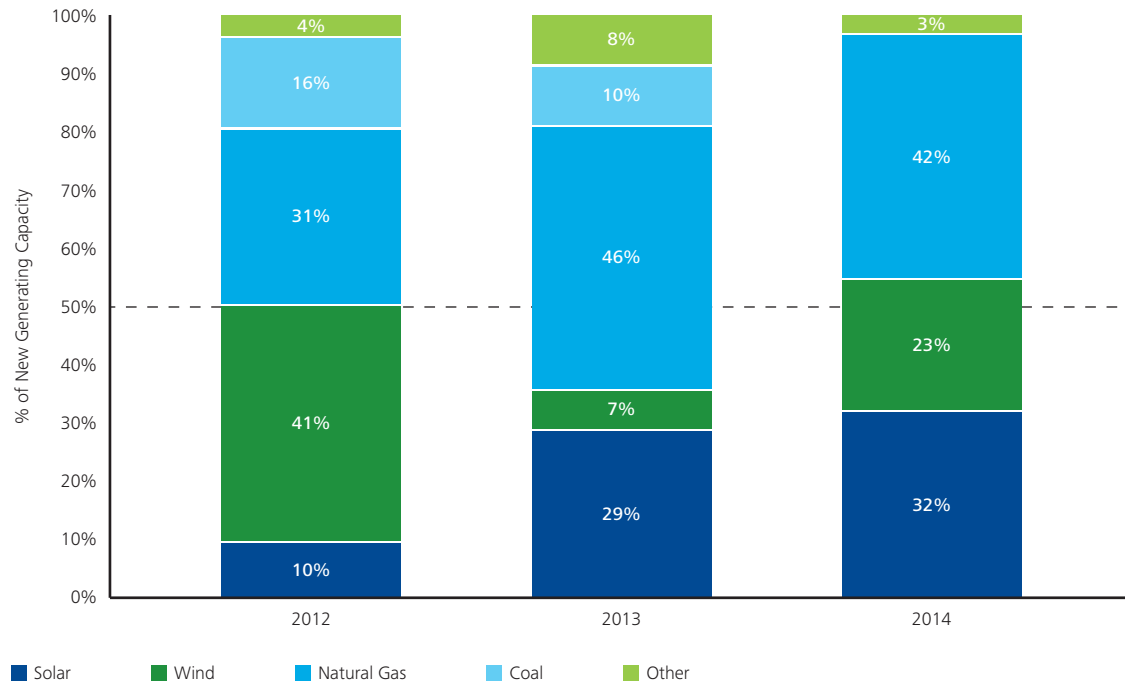
Source: US EIA, “Electric Power Monthly and Electric Power Annual Report.”

In addition to the fixed-fee movement, some utilities have started to revamp their business models to include rooftop solar installations and other distributed generation businesses. For some time, utilities typically ventured into distributed generation—if they were so inclined—through their non-regulated subsidiaries. A good example is Edison International’s SoCore Energy, which has carved out a niche in developing commercial and industrial solar installations.⁷⁶ But now, regulated utilities are testing the waters. Arizona Public Service Co. and Tucson Electric Power recently received approval from the Arizona Corporation Commission to form limited rooftop solar operations within their regulated territories and to get their investments in rate base.⁷⁷ If these trends continue, utilities could increasingly compete with existing providers on multiple fronts.

In addition to the cost-shifting questions posed by distributed generation, some utilities also face challenges

with current electricity rate structures because they have been predicated on the outdated premise of steadily increasing electricity demand. The US Energy Information Administration expects US electricity consumption to increase only about one percent per year on average for the rest of the decade.⁷⁸ This lackluster growth is producing an equal-opportunity headwind that is now buffeting all forms of generation. For wind and solar developers, the good news is that renewables appear to be taking a large share of what little load growth there is, accounting for more than 50 percent of new generation for two of the past three years.⁷⁹ Moving ahead, many believe renewables will remain well positioned in comparison to other forms of generation as the trend toward tighter federal regulation of greenhouse gases tips the balance toward cleaner, greener options in build or buy decisions (see figure 17).

Figure 17. New US electric generating capacity additions by energy source, 2012–2014



Source: SEIA/GTM Research, "US Solar Market Insight™ report for Q4 2014."

With the electricity demand pie barely expanding, it is prudent to consider if there are any developments on the horizon that could fundamentally alter who gets what piece of it. Two game-changing scenarios come to mind that would likely promote renewable development and stimulate deal activity. The first, more extensive deployment of electricity storage, could allow renewables to be adopted on a scale that was previously not thought possible. Last year, California made headlines with its electricity storage mandate, and since then some progress has been made. The big question is one of timing: Is widespread use of grid-scale storage something that is far off, or is it around the corner? Electricity storage is just one of many options for smoothing the effects of variable energy resources such as wind and solar on the grid. But grid-scale storage technologies, particularly batteries, are gaining traction quickly as performance improves and costs decline rapidly.

The energy storage industry is expected to grow from just \$200 million in 2012 to \$19 billion by 2017, according to research firm IHS.⁸⁰ Following California's lead, many states are now implementing policies that "put storage on the menu" for utilities and grid operators. These policies are likely to spur deployment, ease renewables integration, and optimize operation of the grid—not to mention help lower the cost of installed electricity storage by more than half over the next three years.⁸¹

As evidenced by their actions, companies within the renewables sector, as well as state policymakers, are taking the storage value proposition seriously. For instance, SunEdison Inc. recently purchased US-based Solar Grid Storage LLC, whose batteries are presently being used in combination with solar arrays installed at commercial properties on the US East Coast.⁸² The PJM Interconnection then pays to use the batteries to balance supply and demand on its system, while the commercial properties

can also use the batteries as backup power in the event of an outage.⁸³ While not the only game in town for alleviating grid integration headaches, battery storage could fundamentally alter the playing field and reallocate participants' shares of the electricity market.

The second potential game-changer pertains to regulatory reform. While this could take many shapes, initiatives to revamp the industry's regulatory construct at the state level could have warmly positive, or chillingly negative, consequences for the US renewables sector. Initiatives such as New York's Reforming the Energy Vision, which are focused on improving resiliency, optimizing efficiency and promoting distributed generation, will likely benefit renewable developers. Furthermore, if successful, this initiative or others like it could provide a useful template for others to follow. Conversely, initiatives focused primarily on implementing fixed fees and repealing net metering—if widely adopted—could inhibit rooftop solar growth, as they have done in Wisconsin.

As the rooftop solar business in particular evolves, each state decision could be viewed as precedent-setting, and it will likely take some time before a consensus is reached regarding the role of regulated utilities in maintaining the grid infrastructure, the value offered by distributed generation, and what constitutes an equitable rate structure for customers. Accordingly, the financial margins for the providers of distributed technologies will likely vary greatly from state-to-state in the near term, with rooftop solar providers betting that the opportunities in some states will be sufficient to outweigh the inhospitable business climates in others.

Buyers motivated across the board

Despite these headwinds, overall policy and market factors suggest that renewable M&A activity will be brisk over the next two years, with capital remaining widely available. IPPs will likely continue to lead this charge. On the solar side, they will likely be driven by a desire to acquire projects to generate yield and put the projects in service before the ITC step-down. They may also be looking to consolidate to gain strength for surviving post-ITC. On the wind side, IPPs will likely seek to acquire projects that qualify for the PTC and to grow capacity as the LCOE for wind becomes increasingly competitive. YieldCos appear to provide the subtext underlying much of this anticipated activity; the YieldCos sponsored by IPPs and integrated utilities will likely need the combination of growth and tax credits provided by solar and wind generation, thus strengthening demand for these assets.

At the same time, utilities will likely rival IPPs in activity as they seek to acquire assets to fill the megawatt void left by retiring fossil-fuel plants, diversify their generation portfolios, comply with federal environmental mandates, and meet state RPS. Many utilities have a tax appetite so they are likely to seek PTC-qualified projects on the wind side. They are also likely to invest in solar assets as a means of complying with environmental mandates, exploring new revenue sources, earning attractive risk-adjusted rates of returns by investing their growing cash reserves, leveraging the solar ITC before the step-down, and enhancing their brand image since many of their customers want them to be “cleaner and greener.” Also, as the technology has matured and costs have decreased, utilities now see solar as less risky, and more mainstream.



We also anticipate FIs will step up their activity as they acquire wind and solar projects with either PPAs or hedge arrangements to ensure steady cash flows, and as they become more amenable to partnering with the public sector, such as with state green banks, to fund projects. Standardization of contracts and growing data history also appear to be facilitating FI participation by lowering the risk associated with acquiring renewable assets.

Conclusion

Renewable developers were dealt a very tough hand in 2012 when natural gas prices hit record lows. Many believed that thin margins and difficulties in obtaining PPAs would slow progress in the renewable sector, if not halt it entirely. Others, however, contended that the future was much brighter, as technologies matured, costs came down, and investors become more comfortable with the sector. The latter scenario has largely been playing out. Even more, the sector had an ace in the hole: A grass-roots movement toward distributed generation appears to be wholly underway as state policies shift and as both businesses and consumers either place new demands upon their electricity providers or take action on their own to save costs, boost resiliency, and achieve environmental objectives. Despite the present limitations associated with grid integration and the ever-present possibility of disruptive innovation, the sector appears to be on a growth trajectory that is outstripping even the most optimistic predictions that were made just a couple of years ago. Accordingly, we expect M&A activity not only to continue in 2015 but also to pick up speed through 2016 as the capital influx continues, financing options proliferate, innovation drives down costs, technological and commercial advances begin to resolve storage and grid limitations, and state support for all types of renewable energy remains strong.



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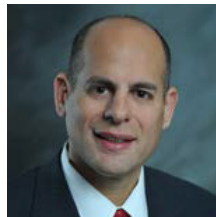
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