

# Why Policy Matters

Renewable Energy Market  
Momentum at Risk

June 2015



# Executive Summary

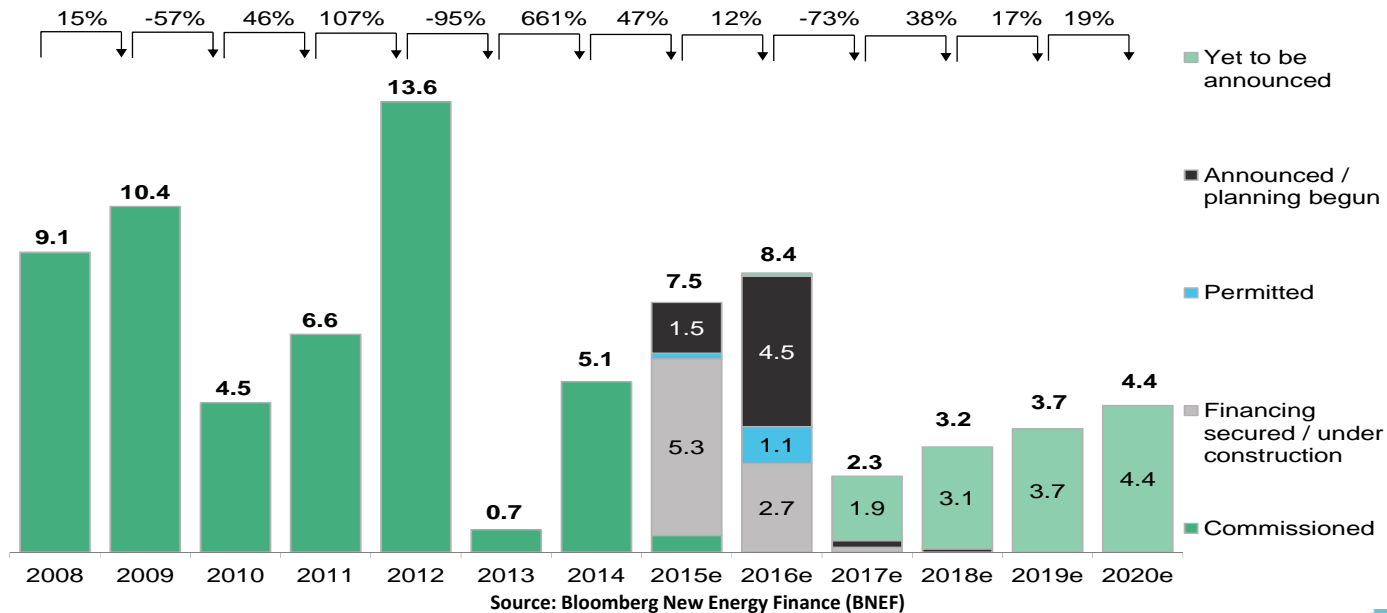
- ▶ Effective policies such as the Production Tax Credit (PTC) and Investment Tax Credit (ITC) have been key motivators of capital in the renewable energy sector. In 2014, \$38 billion was invested in renewable energy in the U.S., and over \$350 billion has been invested cumulatively since 2004.
- ▶ These policies have enabled the rapid scale up of the renewable energy industry, and the increasing scale has driven down costs. Between 2009 and 2014, the Levelized Cost of Electricity (LCOE) for wind power has decreased by 58%; while the LCOE for solar power has decreased by 78%.
- ▶ The benefits of renewable energy policy (*i.e.*, the PTC and ITC) have largely helped consumers as utilities entered into long-term contracts on a competitive basis for renewable energy as a hedge against rising fuel prices. The ten states with the highest percentage of renewable energy have experienced lower electricity rates and smaller rate increases. Thus, the value of the credits has accrued to ratepayers, not to large investment firms and tax equity partners.
- ▶ Renewable energy policies have also created domestic supply chains that support domestic manufacturing, construction, and technology sectors and have created tens of thousands of jobs. In addition, the technologies and products developed and manufactured in the U.S. help support the global energy industry and are exported around the world.
- ▶ The growing renewable energy sector has also spurred private-sector financial innovations such as YieldCos and Green Bonds, that allow the sector to access low-cost capital to finance continued growth. These innovations are complementary to current federal policies and will likely contract if current policies are not renewed.
- ▶ The momentum of the sector is being jeopardized, however, by continuing policy uncertainty, which creates market uncertainty and inhibits long-term investment in the sector. Investors cannot make investment decisions when policies on which these investments are based are subject to continual expiration or change. Capital craves long-term certainty.
- ▶ As a result of this policy uncertainty, wind power construction is forecast to fall by 73% and solar construction by almost 50% if current policies are allowed to expire. These steep drop offs – or market cliffs – can be avoided by the extension of current tax policies; however, year-long extensions do not provide the optimal policy certainty needed to ensure continued investment in the sector.
- ▶ Greater policy certainty would provide a clear, stable signal to the market, motivate large amounts of capital, and allow for continued investment and growth of the renewable energy sector.

# Impact of Renewable Energy Finance Policies – PTC Uncertainty

## Production Tax Credit (PTC)

- ▶ Per-kilowatt-hour tax credit for electricity generated; provides 2.3¢/kWh for wind, landfill gas, biomass, hydroelectric, geothermal electric, municipal solid waste, hydrokinetic power, anaerobic digestion, tidal energy, wave energy, and ocean thermal energy projects; generally applies to first 10 years of operation.
- ▶ Deployment and innovation in the wind industry, largely due to the PTC, has allowed for a more than 90% reduction in the cost of wind power since 1980.<sup>1</sup>
- ▶ Between 2009 and 2014, the Levelized Cost of Electricity (LCOE) for wind power has decreased by 58% due to somewhat consistent policy support and technological advancements.<sup>2</sup>
- ▶ **The “commence construction” language in the PTC and 2014 retroactive extension demonstrated value** – current projections indicate annual wind installations to recover to pre-2013 levels, with 7.5 GW expected in 2015 and 8.4 GW expected in 2016 as projects that began construction in 2014 are completed.
- ▶ **With the PTC now expired, new installations are forecasted to fall to 2.3 GW in 2017, a 73% decline.**

## Annual Wind Installations (GW)



(1) U.S. Department of Energy, *Revolution Now: The Future Arrives for Four Clean Energy Technologies*, September 17, 2013.

(2) Lazard, *Lazard’s Levelized Cost of Energy Analysis – Version 8.0*, September 2014.

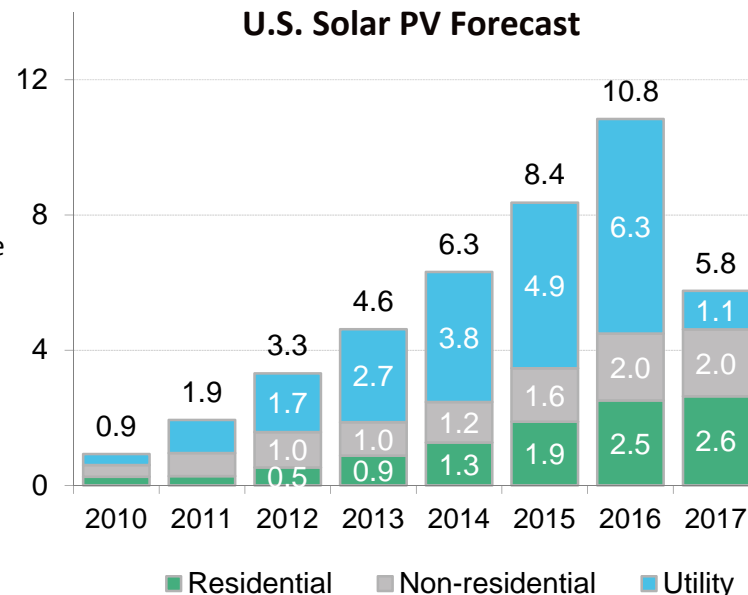
# Impact of Renewable Energy Finance Policies – ITC Uncertainty

## Investment Tax Credit (ITC)

- ▶ 30% tax credit for solar, wind, geothermal, fuel cell (with and without renewable fuels), municipal solid waste, CHP/cogeneration, solar hybrid lighting, tidal energy, and microturbine systems on residential and commercial properties.
- ▶ The multiple-year extension of the residential and commercial solar ITC has helped solar installations to grow by over 1,600% since the ITC was implemented in 2006, employing nearly 173,000 American workers.<sup>1, 2</sup>
- ▶ The ITC has been a significant driver of the scale deployment of solar power, which has contributed to massive reductions in average system prices – falling 78% since 2009 – and in the cost of solar panels and other critical components of the solar supply chain.<sup>3</sup>
- ▶ The U.S. installed 6,201 MW of solar PV in 2014, up 30% over 2013 and eighteen times the amount installed in 2007. For 2015, analysts forecast a 26% overall growth in the U.S. solar market, with installations reaching nearly 8.1 GW.<sup>4</sup>
- ▶ **The ITC is scheduled to decrease from 30% to 10% in 2016 for commercial systems and expire altogether for residential systems. This step down and expiration is forecast to cut solar installations by almost 50%, and is already effecting the market.**

## Commence Construction Modification: Potential Impact on the Solar Industry

- ▶ Large, utility-scale solar projects often require multi-year development timelines:
  - Significant and time-consuming financing, siting, and permitting.
  - A September 2013 analysis from SEIA reveals that the median time from the early steps of development to commencement of construction is just over three years.<sup>5</sup>
- ▶ A change in the ITC's language to a commence construction standard provides certainty and flexibility for utility-scale solar projects.
- ▶ 12 large-scale solar projects are expected to come online in 2016.
- ▶ SEIA predicts that a change in the ITC's language to a commence construction standard would yield an additional 4,000 MW of electric generation capacity in 2017 and 2018.<sup>5</sup>



Source: Bloomberg New Energy Finance (BNEF)

- (1) SEIA, <http://www.seia.org/policy/finance-tax/solar-investment-tax-credit>.
- (2) The Solar Foundation, *National Solar Jobs Census 2014: The Annual Review of the U.S. Solar Workforce*, January 2015.
- (3) Lazard, *Lazard's Levelized Cost of Energy Analysis – Version 8.0*, September 2014.
- (4) SEIA, *Solar Market Insight Report 2014-Q4*, March 2015.
- (5) SEIA, *Commence Construction Modification for Renewable Energy Tax Incentives*, September 5, 2013.

# Historical Impact of Finance Policies: Massive Private Capital Investment

The U.S. has implemented policies that have successfully attracted massive sums of private capital to the burgeoning renewable energy industry.

- ▶ Over \$325 billion was invested in the U.S. renewable energy sector from 2004-2014.
- ▶ In 2014 alone, \$38 billion was invested in U.S. renewable energy.<sup>1</sup>
- ▶ This capital has been invested to create domestic supply chains that support both our domestic energy market and the global energy technology industry, which attracted \$1.6 trillion in global new investment from 2004-2014.<sup>1</sup>
- ▶ Global clean energy sector investment in 2014 alone is estimated at \$270 billion.<sup>1</sup>

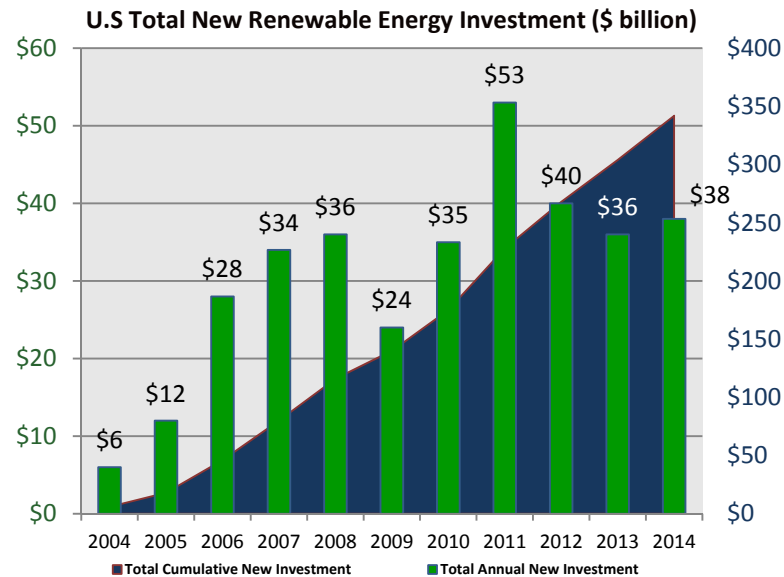
## Falling Renewable Energy Costs Are a Function of Industry Scale Up

- ▶ Thanks to policies that have driven investment, and therefore industry growth, both wind and solar PV have reduced their respective costs over the past four years by ~58% and ~78% respectively.<sup>3</sup>
- ▶ Empirical data suggests that coal, natural gas, and nuclear generation technologies have required massive increases in scale in order to achieve current favorable cost structures. Solar and wind, by contrast, are continuing to experience significant improvements in their cost structure with relatively much smaller increases in scale.

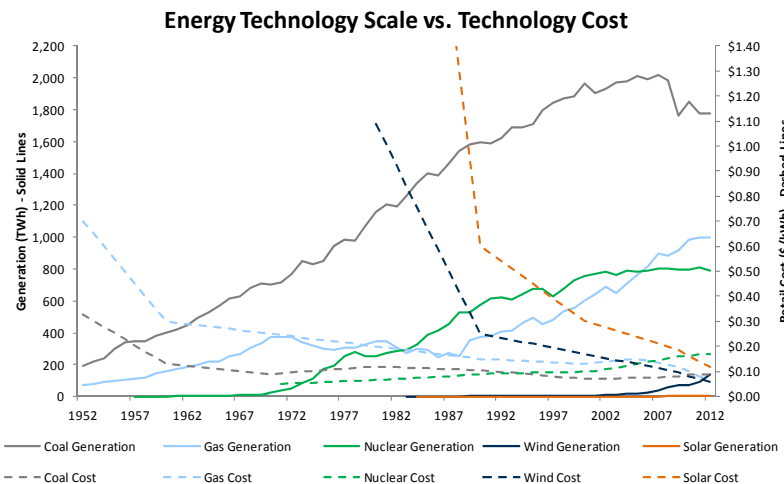
## Economic Impact: Job Creation

- ▶ The solar industry experienced a nearly 20% growth in employment from 2012-2014, 20 times the national average.
- ▶ The solar industry is forecasting jobs growth at 20.9% in 2015.<sup>4</sup>
- ▶ At the end of 2014, over 73,000 wind-related jobs existed in the U.S.<sup>5</sup>

- (1) UNEP and BNEF, *Global Trends in Renewable Energy Investment 2015*, [http://fs-unesp-centre.org/sites/default/files/attachments/key\\_findings.pdf](http://fs-unesp-centre.org/sites/default/files/attachments/key_findings.pdf).
- (2) Lazard, *Lazard's Levelized Cost of Energy Analysis – Version 8.0*, September 2014.
- (3) The Solar Foundation, *National Solar Jobs Census 2014: The Annual Review of the U.S. Solar Workforce*, January 2015.
- (4) AWEA, *Wind Energy Facts at a Glance*, <https://www.awea.org/Resources/Content.aspx?ItemNumber=5059>.



Source: Frankfurt School-UNEP/BNEF  
Technologies include: all biomass and waste-to-energy, geothermal, and wind projects greater than 1 MW; all hydropower between 1 MW and 50 MW; all wave and tidal projects; all biofuel projects with a capacity of one million liters or greater per year.



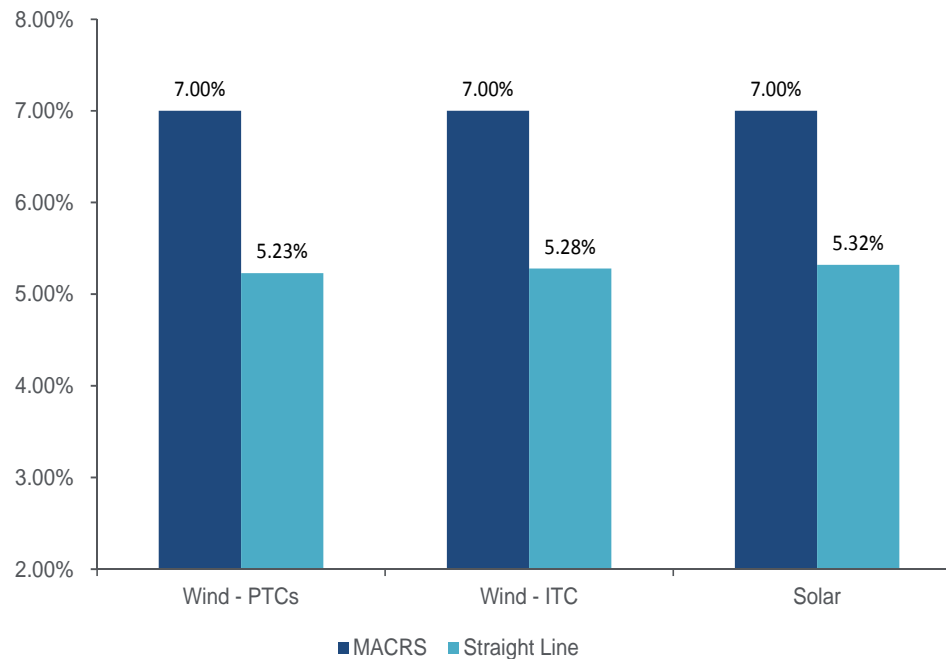
Source: Hudson Clean Energy Partners Analysis

# Impact of Renewable Energy Finance Policies: MACRS

## Modified Accelerated Cost Recovery System (MACRS)

- ▶ Under the current tax depreciation system, the capitalized cost of tangible property is recovered over a specified life by annual deductions for depreciation.
- ▶ MACRS reduces the present value of corporate income tax liabilities for renewable project developers, enabling developers to place more renewable energy projects in service, and for those projects to deliver renewable energy at lower cost to consumers.
- ▶ Essential in driving private investment to renewable energy infrastructure, MACRS has served to immediately lower consumers' electricity costs, create high-paying American jobs, enhance energy independence, and reduce greenhouse gas emissions.

### MACRS Impact on Project Returns

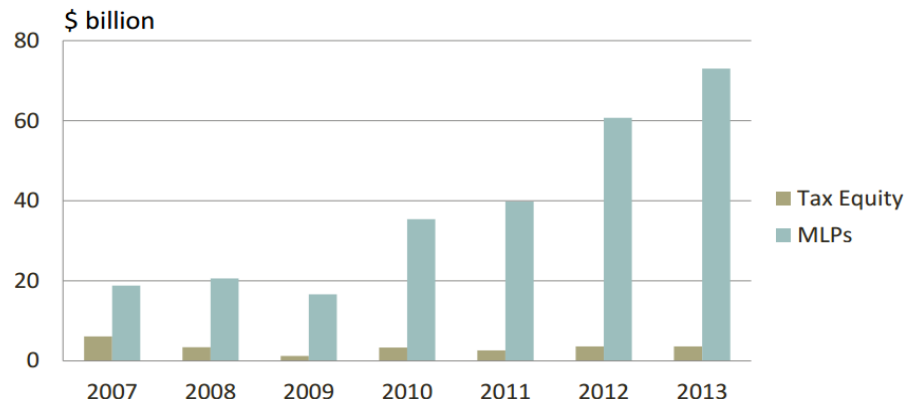


Source: US PREF, *MACRS Depreciation and Renewable Energy Finance*

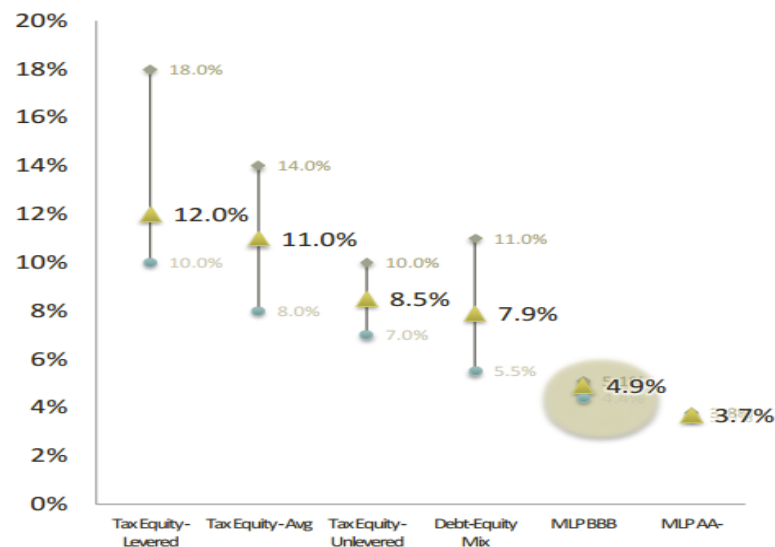
# Benefits of Extending Master Limited Partnerships (MLPs) to Renewable Energy Projects

- ▶ **Master Limited Partnerships (MLPs)** carry the fund-raising advantages of a corporation: ownership interests are publicly traded and offer investors the liquidity, limited liability and dividends of classic corporations. The limited partners provide needed low-cost capital and, in return, receive quarterly required distributions.
- ▶ Currently, MLPs are limited to qualified sources such as crude oil, natural gas, petroleum products, coal, timber, and other minerals. The tax code requires these sources be “depletable resources” preventing MLPs from holding renewable energy assets.
- ▶ MLP parity, as proposed in the recently reintroduced MLP Parity Act, could help raise this additional capital from institutional MLP investors against already operating projects, making available to renewable energy private investors and developers approximately 40% of the \$519 billion MLP capital market.<sup>1, 2</sup>
- ▶ Renewable energy MLP status would be a very important policy addition that, when combined with existing tax driven policies, would not only support, but also accelerate growth in renewable energy.
- ▶ While the recent development of YieldCos has been important to the sector, they cannot fully replace the benefits of MLPs which enjoy a market capitalization of more than 25x’s that of YieldCos along with a more efficient tax structure.
- ▶ Renewable energy MLPs could reduce the cost of capital for renewable energy projects by ~50% or more.<sup>3</sup>

## Annual Capital Formation



## Cost of Capital



(1) US PREF, *Renewable Energy MLP Considerations*, May 2013.

(2) Market capitalization as of Jun 15, 2015, <http://www.yorkvillecapital.com/asset-class-overview.aspx>

(3) NREL, *Financing U.S. Renewable Energy Projects Through Public Capital Vehicles: Qualitative and Quantitative Benefits*, April 2013

Source: Meister Consultants Group

# Market Innovation

The industry has responded in part to the current policy uncertainty with development of important finance innovations, including YieldCos, Green Bonds, and Securitization finance structures. However, policy consistency is important to sustained market investment and growth.

A **YieldCo** is an entity that owns cash-generating infrastructure assets, allows investors to purchase shares, and spins out dividends to public markets. The goal is to provide an attractive total return to investors through a mix of regular dividends payments and sustainable growth.

- ▶ Tax efficient with no corporate tax projected for almost 10 years.
- ▶ Includes a mix of technologies and assets with project based leverage, and can include assets with certain tax equity structures.
- ▶ There are currently 8 YieldCos and several more are in formation.
- ▶ YieldCos have a collective market capitalization of over \$20 billion.

**Green Bonds** enable capital-raising and investment for new and existing projects with environmental benefits.

- ▶ Green Bond sales to development banks, projects, and companies reached nearly \$40 billion in 2014, a new record.<sup>1</sup>
- ▶ The growth in green bond activity has been catalyzed by the release of Green Bond Principles by a consortium of bank and loaning agencies in 2014.
- ▶ Citigroup predicts that green-bond sales and initial public offerings backing clean-energy and environmental ventures will expand to account for 10 to 20 percent of a \$7 trillion per year market for securities by the end of the decade.<sup>2</sup>

**Securitization** involves pooling loans to create consolidated securities that investors can purchase; allows greater levels of investment for clean energy projects.

- ▶ SolarCity's securitization in November 2013 raised \$54.4 million in bond sales, generating a BBB+ credit rating.
- ▶ The company's contracts were effectively positioned for securitization due to the perceived stability of electricity sales from solar systems as a long-term source of revenue.

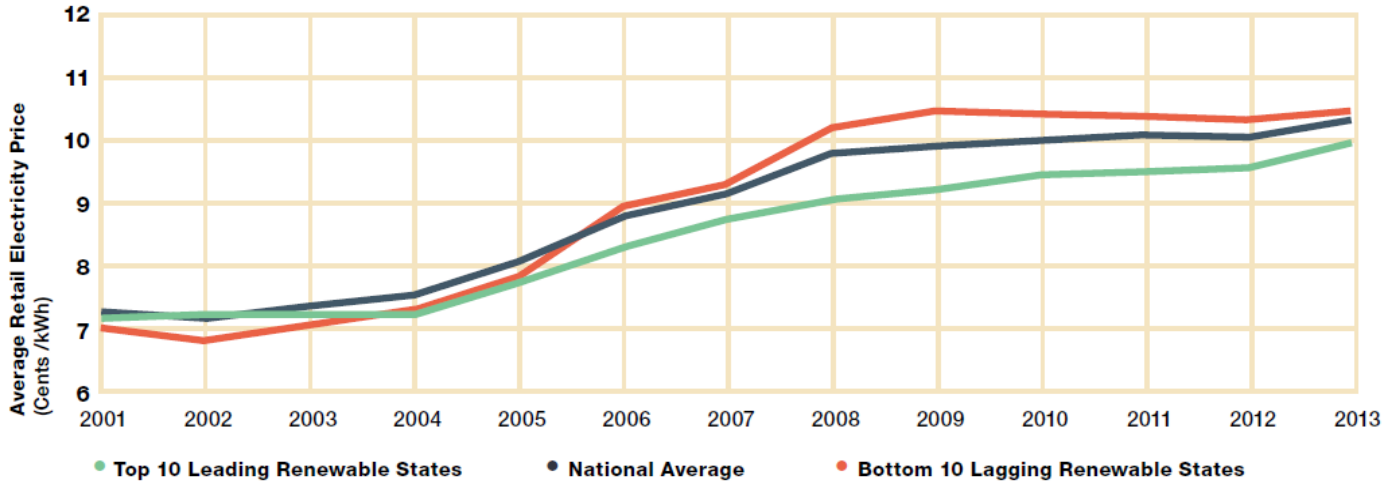
(1) BNEF, *Q1 2015 Green Bonds Market Outlook*, January 2015.

(2) Sally Bakewell, *CitiGroup Executive Sees Capital Markets Reviving Renewables*, BNEF, January 27, 2014



# Renewable Energy Policies Are Saving Consumers Money

Average Retail Electricity Prices 2001 - 2013

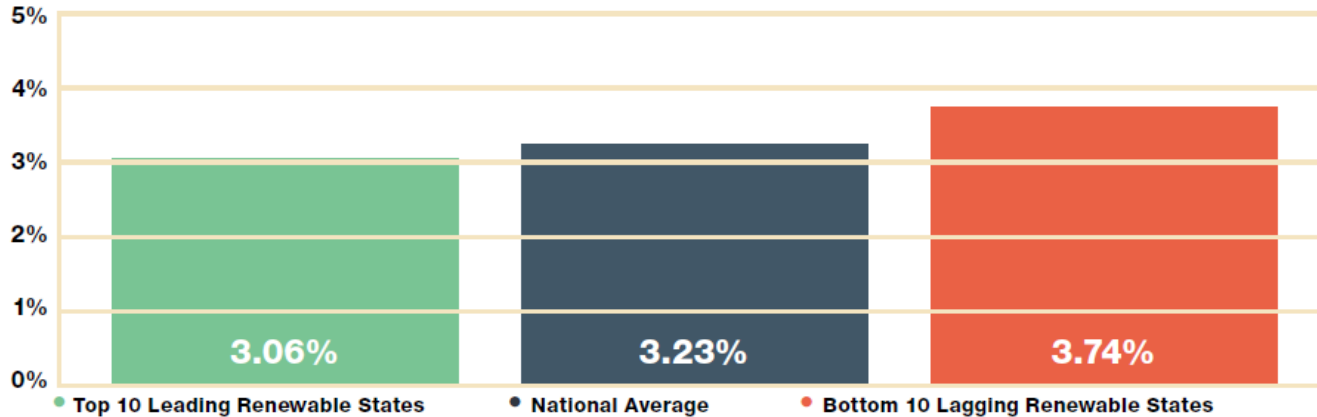


Source: U.S. Energy Information Administration

\* The Top 10 Renewable States have experienced low retail prices for a variety of reasons, including, in many cases, abundant wind resources.

## Renewable Leaders and Laggards:

Average Annual Increases in Retail Electricity Prices 2002 - 2013



Source: DBL Investors

# Looking Forward

## Industry Investment & Growth at Risk Due to Uncertain Policy

- ▶ A decade of increasing scale in wind and solar, made possible in large part by effective tax policies for renewable energy, has helped achieve dramatic reductions in the cost of wind and solar, as much as traditional energy resources were able to achieve in the early and middle of the last century from favorable tax policies and other government support.
- ▶ More than 50% of all new U.S. power generation capacity in 2014 came from renewable energy sources.<sup>1</sup>
- ▶ To achieve continued growth, and to help America avoid excessive and risky reliance on a few fossil fuels, the continued deployment of renewable energy at scale is essential. Despite this, the continued deployment of renewable energy is now at risk, primarily due to continuing policy uncertainties.

## Clean Energy Policy is a Bi-Partisan Issue

- ▶ **85%** of Americans say we should increase our use of solar power.
- ▶ **74%** of Americans say we should increase our use of wind power.
- ▶ **72%** of Americans say renewable energy “helps make our nation more secure.”
- ▶ **72%** of Americans support continuing tax incentives for solar energy production.
- ▶ **70%** of Americans support establishing a national standard to require more of our electricity be generated from renewables like wind and solar.
- ▶ **69%** of Americans say renewable energy is “important to your state’s jobs and economy.”
- ▶ **68%** of Americans support restoring the production tax credit for wind power.<sup>2</sup>

(1) FERC, Office of Energy Projects Energy Infrastructure Update For January 2015. (The energy infrastructure update only captures utility-scale projects, of which renewables amounted to 49.8% of all added capacity. When the more than 1 GW of installed residential roof-top solar is included in the total the percentage climbs to well above 50%).

(2) A poll of 1,600 voters conducted by Public Opinion Strategies in January and February, 2015 on behalf of The Pew Charitable Trusts’ Clean Energy Initiative.



## ABOUT US PREF

US PREF is a coalition of senior level financiers who invest in all sectors of the energy industry, including renewable energy. US PREF members focus on increasing capital formation and investment in renewable energy and educate the public sector to assure policy impacts the market as efficiently and effectively as possible. US PREF is a program of the American Council On Renewable Energy (ACORE), a Washington, DC - based non-profit organization dedicated to building a secure and prosperous America with clean, renewable energy.

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## ABOUT ACORE

ACORE, a 501(c)(3) non-profit membership organization, is dedicated to building a secure and prosperous America with clean, renewable energy. ACORE seeks to advance renewable energy through finance, policy, technology, and market development and is concentrating its member focus in 2015 on National Defense & Security, Power Generation & Infrastructure, and Transportation. Additional information is available at [www.acore.org](http://www.acore.org).