WRITTEN TESTIMONY OF
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Oversight Hearing on the Status of Ivanpah and Other Federal Loan-Guaranteed Solar Energy Projects on BLM Lands
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Introduction

Good Morning, Mr. Chairman and Members of the Oversight and Investigations Subcommittee of the House Committee on Natural Resources. My name is Gregory Wetstone and I am President and CEO of the American Council On Renewable Energy (ACORE). ACORE is a national non-profit organization dedicated to advancing the renewable energy sector through market development, policy changes, and financial innovation. Our membership includes hundreds of companies and organizations from across the spectrum of renewable energy technologies, consumers, and investors.

Thank you for the opportunity to testify this morning, and for the attention that the subcommittee is devoting to renewable energy projects assisted through DOE's Loan Guarantee Program. I believe it is important that the committee look closely at the substantial economic advances made possible by the relatively limited investment in renewable energy loan guarantees. Given the valuable impact of the renewable energy loan guarantee program, ACORE respectfully urges the subcommittee to reconsider the wisdom of Congress' decision to reduce investment in this area.

Additionally, we are grateful for the focus on renewable energy development on BLM lands. Our nation's federal lands contain vast quantities of untapped, high-potential renewable resources. However, renewable energy leases on BLM land constitute less than 1 percent of the total acreage leased for energy exploration and production.[1,2,3] Given this glaring under-representation, ACORE urges the subcommittee to support greater renewable energy development on federal lands.

The DOE Loan Guarantee Program: Catalyzing Investment and Growth

As you may know, DOE's loan guarantee program (LGP), like the renewable sector itself, has a history of strong bipartisan support. The program was established in 2005, signed into law by then President George W. Bush, and championed by long-time former Chairman of the Senate Energy Committee, Senator Pete Domenici (R-NM) with support from the current Chair, Senator Lisa Murkowski (R-AK).[4] The program is intended to help proven, innovative technologies make the leap to commercial scale, a step across what is often termed the "valley of death" because commercial financing is often unavailable at

[1] http://www.blm.gov/wo/st/en/prog/energy/renewable_energy/Renewable_Energy_Projects_Approved_to_Date.html
[2] http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/statistics.html
[3] http://www.blm.gov/wo/st/en/prog/energy/coal_and_non-energy/coal_lease_table.html
[4] http://energy.gov/lpo/timeline/history-loan-programs-office

this stage. The loan guarantee program's ideal outcome is clear: to facilitate an important tradeoff, mitigating short-term risk in order to nurture long-term opportunity.

This hearing focuses on Federal Loan Guarantee projects on BLM lands. It is important to note at the outset that all such projects are on track to fully repay their loans with interest.

With the support of the loan guarantee program, the leap to full commercialization in the renewable sector has taken place at a rapid pace, as evidenced by the dramatic increase in private sector investment in utility-scale solar, which went from $5.7 billion in 2008 to nearly $24 billion last year[5] (see Figure 1). Additionally, in 2009, the U.S. did not have a single solar PV facility larger than 100 megawatts (MW) in operation. In the several years since DOE issued loan guarantees to support construction of the first five utility-scale PV facilities over 100 MW, another 28 such solar projects have been privately financed in the U.S. without loan guarantees.[6] While two loan guarantee manufacturing investments in the renewable sector have failed, accounting for less than 2.5 percent of committed funds, it is important to note that not a single renewable energy generation project in the LGP's portfolio has failed to meet its repayment obligations under the program.[7]

Given the critical role that DOE-guaranteed loans played in the growth of America's world-class renewable energy sector, especially for utility-scale solar energy projects, there is every reason to conclude that the taxpayer funds associated with this program were well spent. DOE has conducted due diligence that is comparable to, if not more stringent than, that in the private sector. Program losses have fallen far below the ten percent budgeted in program risk planning. Ultimately, the program is fostering tens of billions of dollars in economic opportunity across the nation, creating more jobs and setting up long-term, market-driven success for the future.

With regards to today's hearing, is it unfair to characterize utility-scale solar or other renewable investments as "risky". Such thinking is well out of step with the realities of the commercial marketplace. Last year more than $44 billion in private capital was invested in renewable energy (see Figure 2), primarily in wind and solar energy, far exceeding investment levels in any other electric generation technologies.[8] These are mainstream technologies, not boutique projects. In fact, since 2005 more than 50% of all new U.S. electric generation capacity has come from wind and solar power, exceeding all other sources of generation (See figure 3).[9] **With more than $380 billion in private sector investment since 2004, renewable energy has not only become commercially viable, it has become a vitally important source of American economic growth and job creation.**[10]

This immense investment has important multiplicative effects. Renewable energy facilities provide significant tax revenue to state and local governments, supporting schools and local services, often in rural areas, and boosting state budgets. In addition, wind energy facilities make an additional $222

[5] http://fs-unep-centre.org/sites/default/files/publications/globaltrendsinrenewableenergyinvestment2016lowres_0.pdf
[6] http://www.energy.gov/articles/5-big-wins-clean-energy-loan-programs-office
[7] http://energy.gov/lpo/portfolio-projects
[8] http://fs-unep-centre.org/sites/default/files/publications/globaltrendsinrenewableenergyinvestment2016lowres_0.pdf
[9] http://www.bcse.org/wp-content/uploads/BCSE-2016-Sustainable-Energy-in-America-Factbook.pdf
[10] http://fs-unep-centre.org/sites/default/files/publications/globaltrendsinrenewableenergyinvestment2016lowres_0.pdf

million in annual lease payments to farmers, ranchers and other landowners providing them with significant supplemental income.[11] In Oklahoma, for example, wind farms are projected to return over $1 billion in property taxes to counties and local schools over their lifetimes.[12] **With hundreds of manufacturing facilities across the country and nearly 300,000 American workers in the wind and solar energy industries, renewable energy is one of the fastest growing sectors in our nation's economy.[13]**

The Power Source of Choice

The growing penetration of renewable energy as the nation's premier choice for new electricity is shown in Figure 3. **Despite record low natural gas prices, renewable sources constituted 68 percent of the nation's new electricity capacity in 2015, and more than half of all new capacity since 2005.[14]**

One central reason for this dramatic growth is the steep decline in the cost of renewable energy over the past several years as a result of improvements in technology and greater economies of scale.[15] Since 2009, the cost of wind energy has declined by more than 60% and the cost of solar power has declined by more than 80% (See Figure 4). Today the unsubsidized levelized costs of utility scale wind and solar power is cost-competitive with all other generation sources, including natural gas and coal. (See Figure 5).[16]

With little to no fuel costs, renewable sources allow for long-term, predictable pricing where electric power rates can be locked in for 20-30 years and are not subject to the price variability that plagues volatile fossil fuel markets. It is therefore no surprise that electric power prices are rising most slowly in the states with the most renewable energy, and most rapidly in the states with the least renewable power (See Figures 6).[17] Reduced and less-variable utility costs are especially important for low and moderate income households that spend a greater proportion of household income on energy.

Global Growth

Those who argue that renewable energy is thriving in the U.S. only because it is propped up by government incentives are not only ignoring commercial reality here at home, but also failing to appreciate the sector's dramatic global growth. **Renewable power is a growing global industry that attracted $286 billion in private investment in 2015 alone, and over $2.4 trillion since 2004 (See Figure 7).[18]**

The reality is that sustained Federal support of renewable energy enhances America's international economic competitiveness, and increasing U.S. investment is important to maintain our leadership role in a vital industry sector that was pioneered by American scientists and engineers. It is critical to note

[11] http://www.awea.org/amr2015
[12] http://www.okstatechamber.com/sites/www.okstatechamber.com/files/RevisedReport_WindStudy9_3_15.pdf
[13] http://www.energy.gov/sites/prod/files/2016/03/f30/U.S.%20Energy%20and%20Employment%20Report.pdf
[14] http://www.bcse.org/wp-content/uploads/BCSE-2016-Sustainable-Energy-in-America-Factbook.pdf
[15] https://www.lazard.com/media/2390/lazards-levelized-cost-of-energy-analysis-90.pdf
[16] Ibid.
[17] http://www.dblpartners.vc/resource/renewables-are-driving-up-electricity-prices-wait-what/
[18] http://fs-unep-centre.org/sites/default/files/publications/globaltrendsinrenewableenergyinvestment2016lowres_0.pdf

that, while the U.S. renewable sector is booming, investment has grown at an even steeper pace in China (See Figure 8).[19]

Incentives for Electric Generation

Some critics have derided Federal policies and incentives that promote renewable energy in the U.S. as an example of the government "picking winners and losers." Although they may be well-intentioned, such criticisms reflect a blindness to the reality of electricity generation in the United States, in which virtually all sectors have been important beneficiaries of Federal policy and incentives – in most cases for many decades.

For example, oil and gas producers have benefited from the intangible drilling cost deduction since 1913 and the percentage depletion deduction since 1926.[20] These are just two of eleven permanent tax subsidies available to fossil fuel producers.[21] Additionally, nuclear energy has historically benefitted from subsidies that not only enabled the nation's existing reactors to be built in the first place, but have also supported their operation for decades.[22]

While Federal incentives for other forms of electric generation – including from coal, natural gas and nuclear energy – are enshrined in permanent law, tax incentives for wind and solar energy are scheduled to phase out over the next several years, and tax incentives for other renewable sources like geothermal energy, fuel cells and hydropower expire at the end of this year.[23,24]

Renewable Energy on BLM Lands

It has been suggested that there is a double standard for the siting of renewable energy on BLM lands. In fact, the data indicate that, if there is such a standard, renewable energy is not the benefiary**. Some 32.6 million acres of BLM lands have been devoted to oil and gas development, while less than 286,000 acres have been committed to the siting of renewable energy.[25,26,27]** Those who think renewable developers get a pass on siting difficulties have not considered the challenges of trying to secure a permit for BLM siting when faced with a need to "start construction" of a wind, geothermal, or hydro project before the end of the year in order to qualify for the applicable tax incentive before it phases down or expires. Such debilitating timing pressures play an important role in the limited deployment of renewable technologies on Federal lands.

ACORE respectfully urges the subcommittee to look favorably on programs that facilitate siting of renewable projects on public lands, and to support the renewable sector as it fosters job creation and economic opportunity, reduces pollution and helps address concerns about the global climate.

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[19] Ibid.
[20] https://www.treasury.gov/open/Documents/USA%20FFSR%20progress%20report%20to%20G20%202014%20Final.pdf
[21] Ibid.
[22] http://candel.net/USC_Nuclear%20Subsidies_2011.pdf
[23] http://programs.dsireusa.org/system/program/detail/658
[24] http://programs.dsireusa.org/system/program/detail/734
[25] http://www.blm.gov/wo/st/en/prog/energy/renewable_energy/Renewable_Energy_Projects_Approved_to_Date.html
[26] http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/statistics.html
[27] http://www.blm.gov/wo/st/en/prog/energy/coal_and_non-energy/coal_lease_table.html

Ivanpah Solar Project

Committee sources have expressed concern regarding the energy production levels at the Ivanpah solar facility in California. While I do not have first-hand knowledge of the facility, trade press reporting suggests that production levels did not reach design specifications in the facilities first months of operation.[28] Importantly however, that is consistent with expectations. Ivanpah's initial 2010 DOE filing cautioned that, "initial performance will be less than full design," but will increase with "realization of the operator's learning curve, procedural optimization, and fine-turning of equipment and systems for increased plant performance."[29] Such ramp-up periods for new power plants, including new fossil-fired facilities, are the norm and not the exception. (Conventional fossil systems are typically given a 6-month grace period before EPA assumes they are fully operational.[30]) Ivanpah is a first-of-its-kind solar thermal plant, and a four-year ramp-up period was expected. We are now two and a half years into operation and, according to trade press reports based on EIA filings, the facility has increased production to the point that it is now reaching 97% of its goal.[31] Spokesmen for the facility have commented that it is on track to fully meet the obligations of its power sales contract.

Avian Mortality

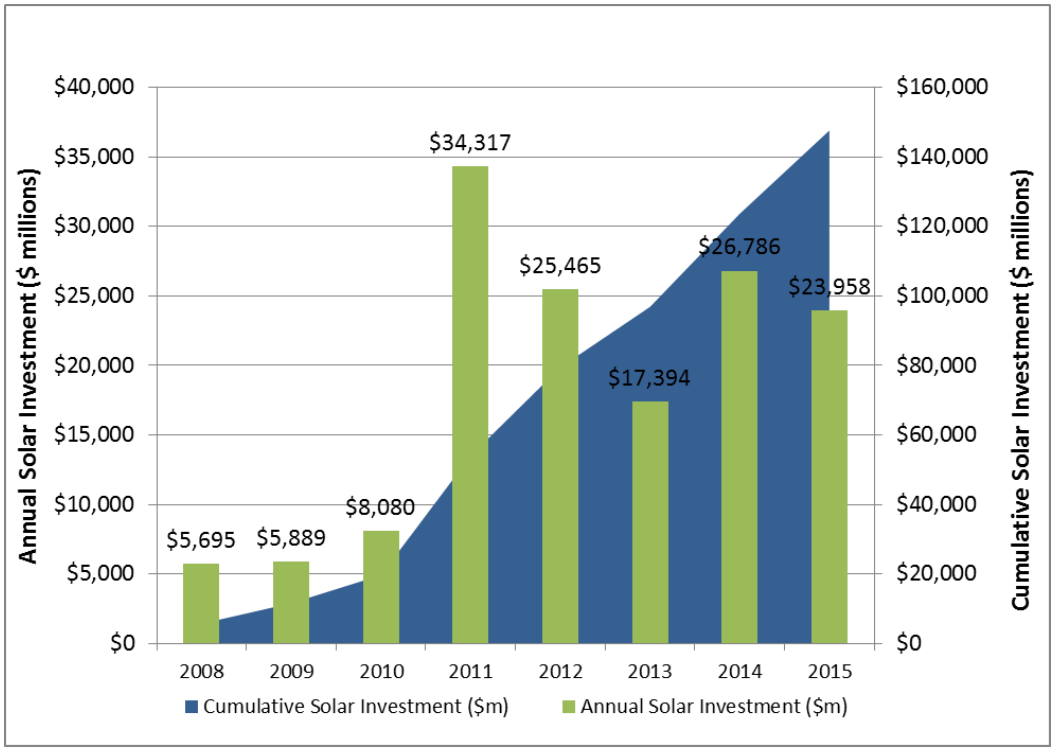
The renewable energy sector is proud of its commitment to wildlife protection. All forms of energy production have wildlife impacts and the producers of renewable energy have worked hard to fully understand and address such concerns. That said, if the subcommittee's central concern is with sources of human-induced bird fatality, the renewable sector is not the place to start in an effort to address the problem. Figure 9 includes the most recent data available on sources of avian mortality.[32] The data indicate that, roughly speaking, pesticides kill more than 200 times as many birds as wind power, vehicles and roads kill 800 times as many birds, buildings and windows kill 2500 times as many birds, and cats kill more than 9000 times as many birds.[33] Any of these sources could just as easily be charged with a violation of the Migratory Bird Treaty Act, as any renewable source. Solar power is generally associated with lower levels of avian deaths, and the Ivanpah facility, even with a highly conservative estimate, is responsible for less than 0.006 percent of the bird kills associated with pesticides.[34,35]

I appreciate the opportunity to address the subcommittee and look forward to any questions you may have.

[28] http://cleantechnica.com/2016/03/18/cpuc-gets-right-pge-can-keep-ivanpah-contract/
[29] https://www.sec.gov/Archives/edgar/data/1471443/000119312511153384/dex1022.htm
[30] http://cleantechnica.com/2016/03/18/cpuc-gets-right-pge-can-keep-ivanpah-contract/
[31] Ibid.
[32] http://www.awea.org/Issues/Content.aspx?ItemNumber=856
[33] http://www.wingpowerenergy.com/wp-content/uploads/2012/07/birdmortality.pdf
[34] http://www.evs.anl.gov/downloads/ANL-EVS_15-2.pdf
[35] http://www.wingpowerenergy.com/wp-content/uploads/2012/07/birdmortality.pdf

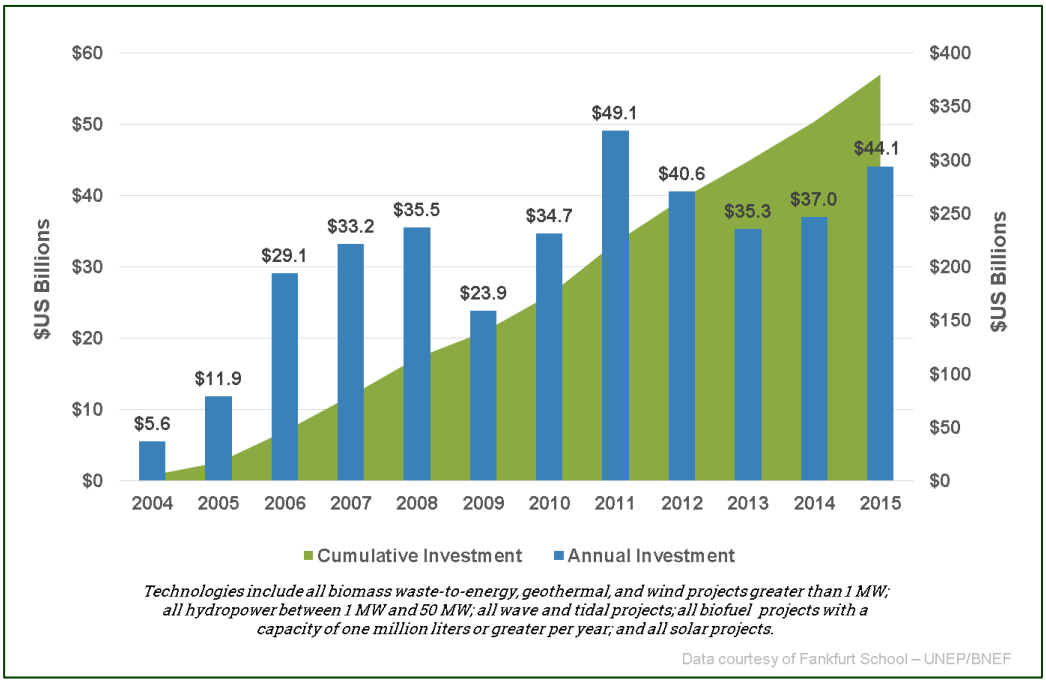
Referenced Figures 1-9

Figure 1: U.S. Total Solar Energy Investment ($Billions)



Data courtesy of Fankfurt School – UNEP/BNEF

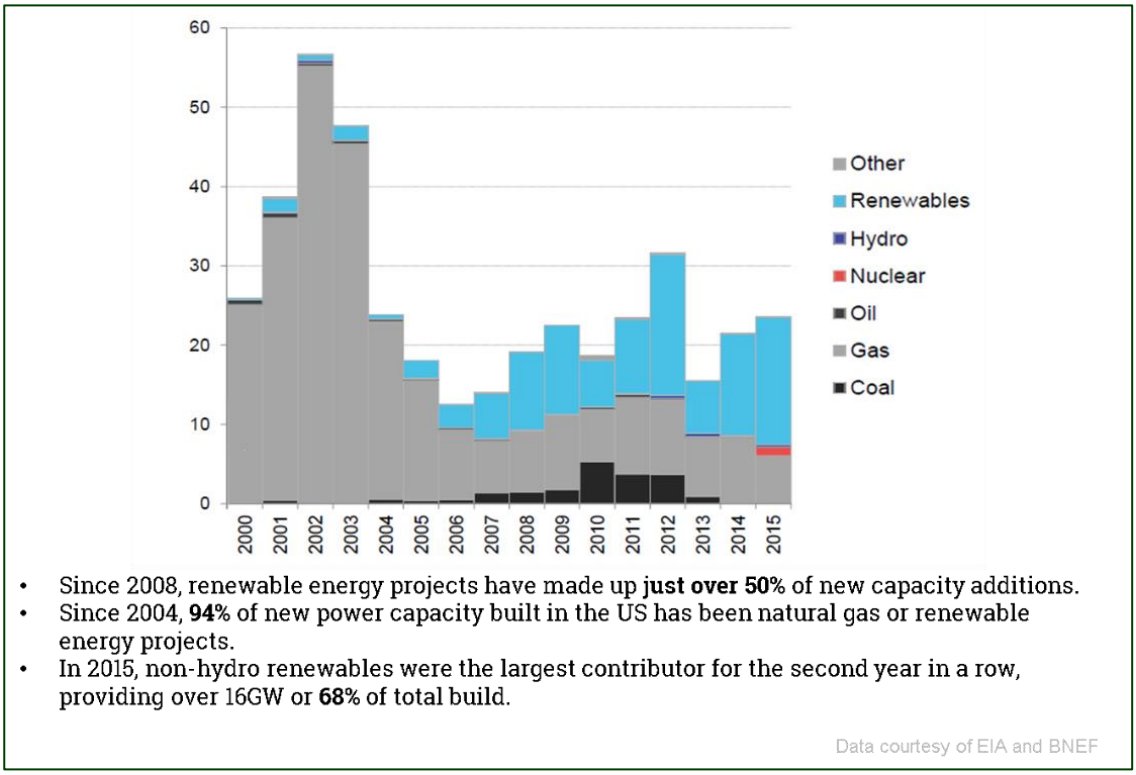
Figure 2: Total U.S. Renewable Energy Investment ($Billions)



Technologies include all biomass 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; and all solar projects.

Data courtesy of Fankfurt School – UNEP/BNEF

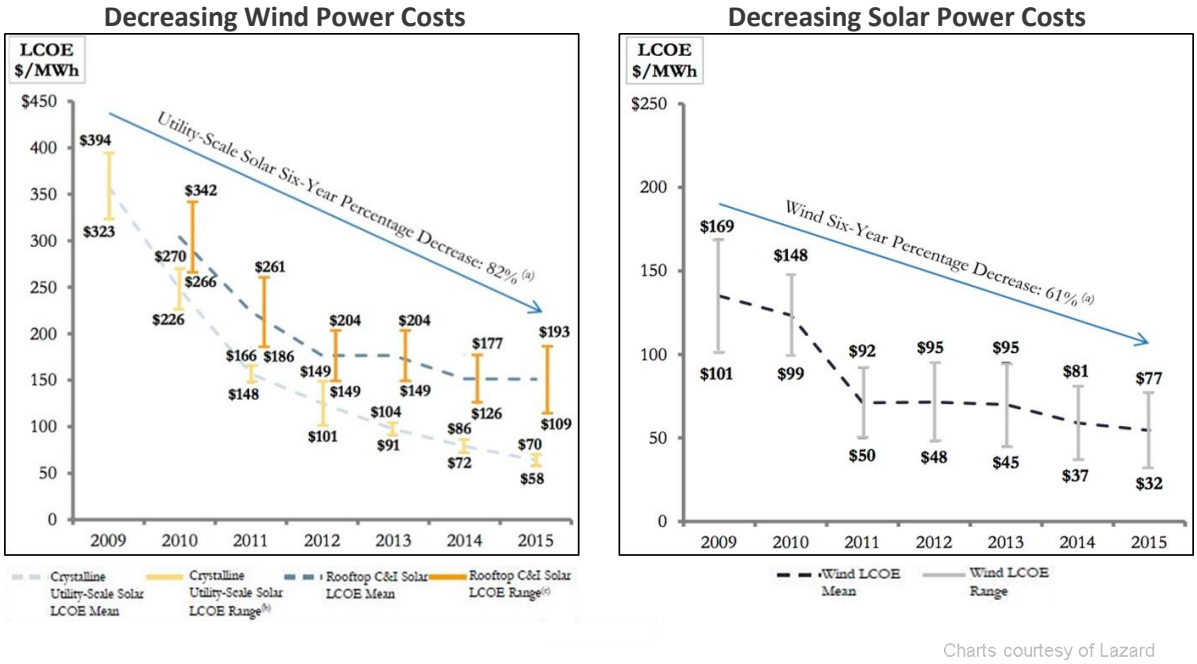
Figure 3: Electric Generation Capacity Build by Fuel Type (BNEF/BSCE) Electricity
Source: EIA, Bloomberg New Energy Finance



- Since 2008, renewable energy projects have made up **just over 50%** of new capacity additions.
- Since 2004, **94%** of new power capacity built in the US has been natural gas or renewable energy projects.
- In 2015, non-hydro renewables were the largest contributor for the second year in a row, providing over 16GW or **68%** of total build.

Data courtesy of EIA and BNEF

Figure 4: The Levelized Costs of Wind and Solar Energy



Charts courtesy of Lazard

Figure 5: Unsubsidized Levelized Cost of Energy (2015)

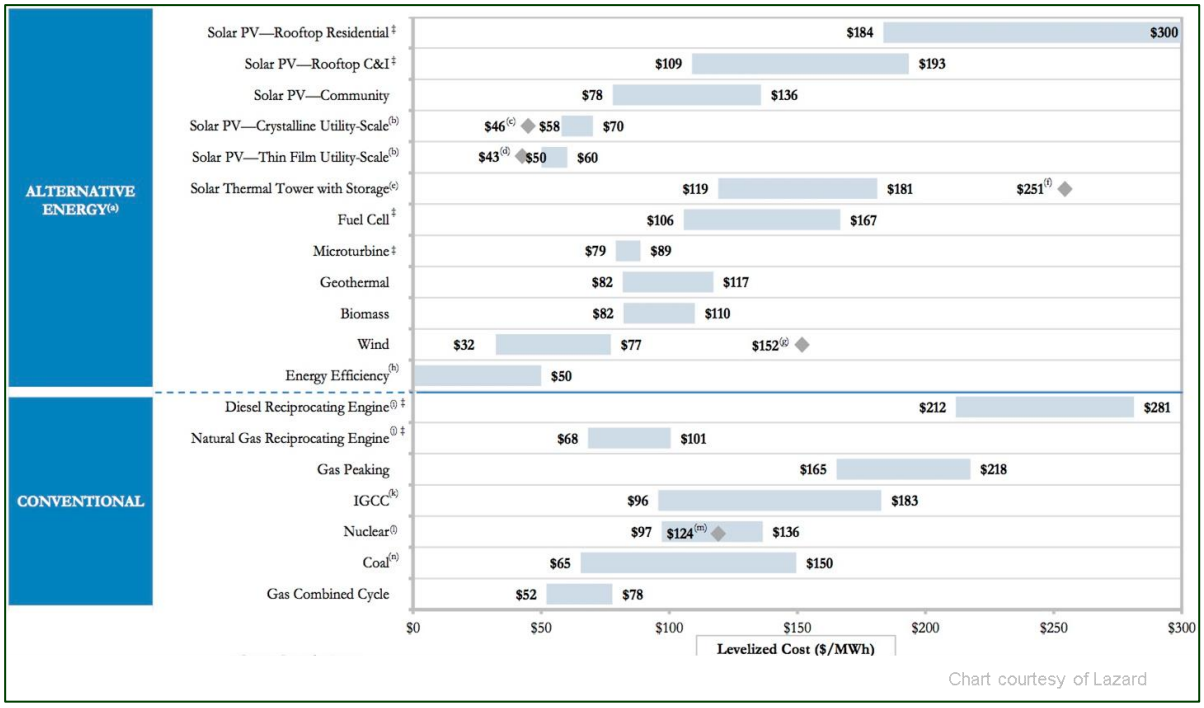


Figure 6: Average Annual Increases in Retail Electricity Prices, 2002-2013

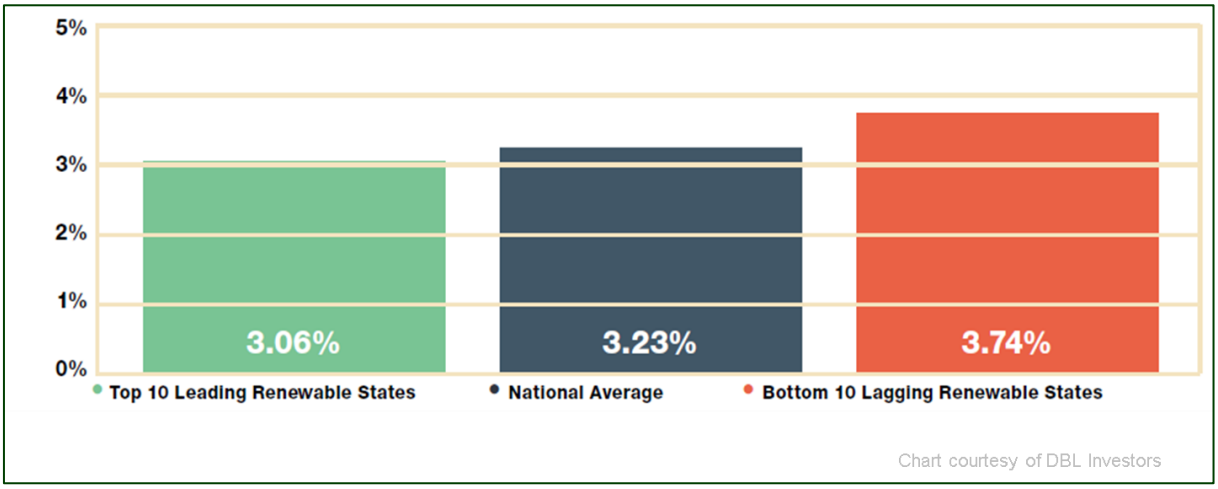


Figure 7: Global Renewable Energy Investment

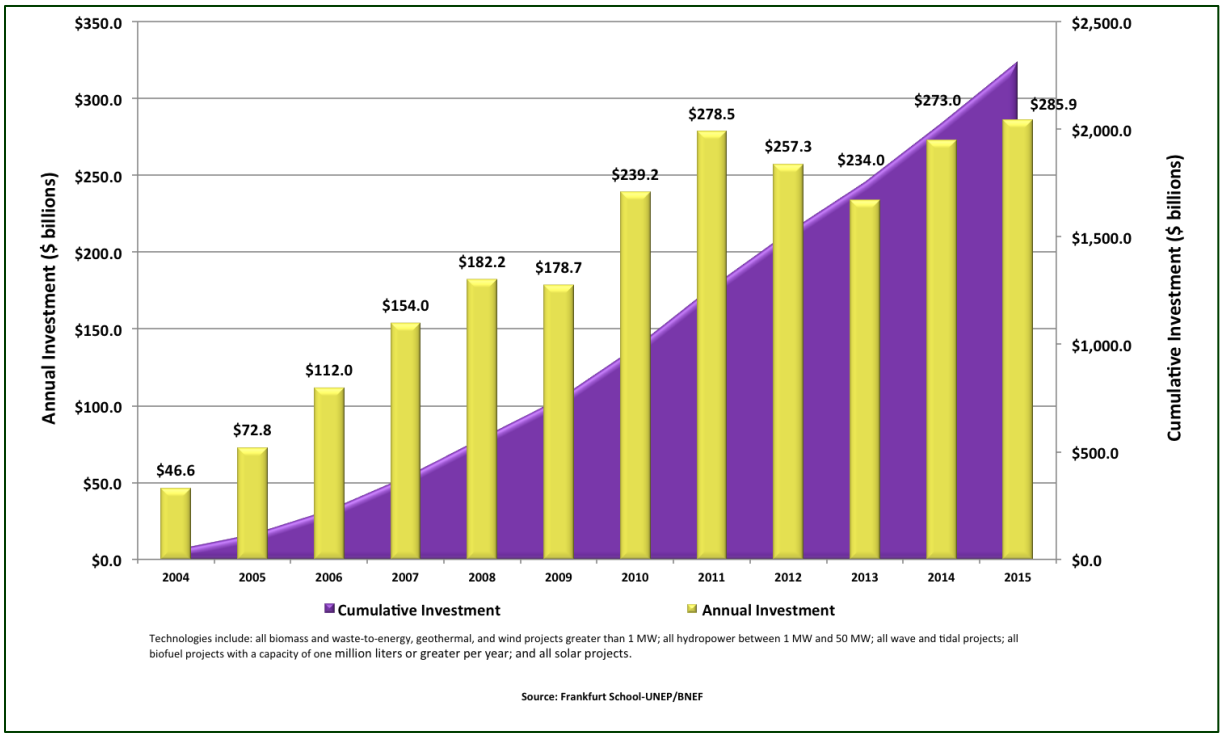


Figure 8: U.S. and China Renewable Energy Investment

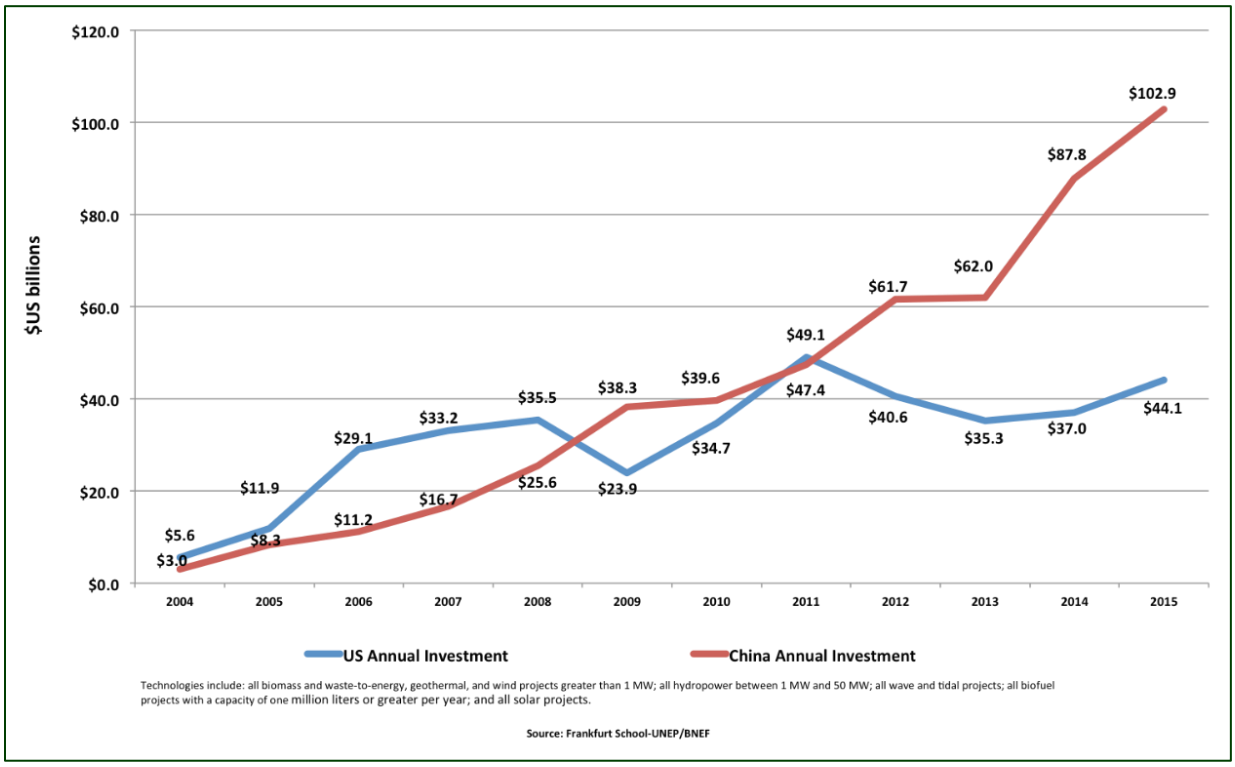


Figure 9: Sources of Human-Induced Avian Mortality

Cause of Mortality	Bird Fatalities/year	Reference
Cats	1.4 – 3.7 billion	Loss et al. 2013
Buildings and windows	365 – 988 million	Loss et al. 2014a
Vehicles/roads	89 – 340 million	Loss et al. 2014b
Pesticides	17 – 91 million	Mineau 2004, 2005
Overhead lines	12 – 64 million	Loss et al. 2014c
Communication towers	6.5 million	Longcore et al. 2012
Lead ingestion	1 – 2 million	Scheuhammer and Norris 1995, Kendall et al. 1996
Mowing,agricultural cultivation	1 million – 2 million	Tews et al. 2013
Commercial fishing	750,000 – 2 million	Manville 2005, Brothers et al. 2010
Oil pits	500,000 – 1 million	Trail 2006
Forestry	300,000 – 1 million	Hobson et al. 2013
Wind energy	200 ,000– 350,000	Erickson et al. 2014

Credit: American Wind Energy Association