



Playing to win in  
**CLEAN ENERGY**

United States Senator Harry Reid



# Preface

Six billion dollars are invested in Nevada's clean energy economy. The positive impacts from these investments are visible in every corner of Nevada.

These renewable energy successes are offering good-paying jobs for Nevadans. With hundreds of billions of dollars of additional investment expected to be made in clean energy in the coming years, Nevada has a meaningful opportunity to build on our progress and become the epicenter for clean energy jobs and economic growth. This path offers Nevada a meaningful opportunity to move towards energy independence and an improved quality of life for every Nevadan. Every Nevadan should know that successes like Tesla's gigafactory and the overall growth of clean energy in Nevada did not happen by accident. These investments in Nevada shows what is possible when public-private partnerships and smart federal and state policies are encouraged. In the 21st century, this is how public-private partnerships should work.

In order to help illustrate these successes, I released a report in 2012 that detailed the coordinated federal and state actions Nevada has taken to catalyze growth in this important sector of our economy. Today, I am releasing an updated version that highlights recent efforts at building our clean energy economy.

There is no lack of experience or expertise to keep Nevada's clean energy economy growing. The challenge for businesses, stakeholders and policymakers is to counter the negative forces that seek to undermine a cleaner and more secure future for Nevada.

At the first National Clean Energy Summit in 2008, President Bill Clinton challenged Nevada to become the first "self-sufficient clean energy state in the nation." Nevada has responded and we are proving that President Clinton's challenge is achievable.

We cannot look back. As we push ourselves to become more innovative and less reliant on traditional energy sources, I will continue to do everything that I can to ensure that Nevada benefits from its clean energy resources.

HARRY REID



United States Senator for Nevada

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## Playing to Win in Clean Energy

Nevada has acted on the need to expand its economy to help avert the effects of economic downturns by attracting new businesses and expanding its employment base beyond the hospitality and mining industries. Those industries have and will continue to play a vital role in Nevada's future, but despite the improving economy the recent recession should remind us that much more needs to be done to broaden Nevada's economy so that we are better positioned to grow and succeed in the coming decades.

A bright spot in Nevada's effort to attract new economic opportunities has been the clean energy sector. Nevada's work to take advantage of its renewable energy resources does not come without risk, as many states have historically struggled to advance different economic diversification plans. It is important to note that a key reason why many of those diversification plans have struggled is because they lacked symmetry between the local goals and the establishment of policies and incentives at state and federal levels to advance those efforts.

In contrast, the burgeoning success of Nevada's renewable energy sector is being aided by more than a decade of actions at the federal and state level that have been notably focused on the deployment of Nevada's clean energy resources.

This development is especially important because it gives Nevada the opportunity to leverage its successes into additional private sector investment in our clean energy economy and the chance to realize the goal of diversifying the Silver State's broader economy.

Nevada has become a national leader in clean energy and the state is in a position to enjoy additional successes. In fact, there have been more renewable energy projects constructed in Nevada in recent years than at any other time in the state's history. These successes did not happen overnight and they did not happen by accident, but are instead due in part to sustained efforts at the federal and state levels to encourage clean energy economic growth. As this report details, the efforts at the federal level to help build a clean energy economy in Nevada have been aided by legislation that increased investment in clean energy, reforms of policies to accelerate deployment, and leadership to position Nevada at the front of the clean energy race.

A fierce competition is underway between states and nations around the world about how to best market their clean energy potential to the private sector. In addition, many people have advocated for policies that would derail investment in Nevada's clean energy resources because they want to shift the nation's attention away from clean energy and



*Senator Reid speaks at the National Clean Energy Summit*

maintain the status quo.

Nevada has much to gain by continuing to aggressively develop its renewable energy resources by ensuring that federal and state policies are working together. The case studies and timeline presented in this report demonstrate the critical role that federal actions have played in combination with important state policies in the development of Nevada's clean energy economy. These examples illustrate Nevada's impressive clean energy future, but also the risks of repealing federal and state programs, policies, and incentives that would shift investment away from the development of Nevada's clean energy potential.

# The State of Clean Energy in Nevada

By developing its substantial geothermal, solar, and wind energy resources, Nevada is leading the way towards a clean energy economy. Deployment of Nevada's clean energy resources has boomed as a result of federal investment in and incentives for clean energy and through the reform of new and existing policies that govern the development of energy projects on public lands.

These acts, in combination with important state policies, such as Nevada's renewable electricity standard, have helped grow Nevada's clean energy sector and are paying significant dividends to Nevadans. The timeline shown over the next several pages of this report provides an overview of some of the most important actions taken at the federal and state levels over the last fifteen years that have assisted in strengthening Nevada's burgeoning clean energy economy.<sup>1</sup> Today, these dividends in Nevada include, but are not limited to:

- 21,800 jobs;<sup>2</sup>
- First in the nation for clean energy job creation during the third quarter of 2014;<sup>3</sup>
- First in the nation in installed geothermal energy and solar energy capacity on a per-person basis;
- Top five for installed solar photovoltaic, concentrating solar, and geothermal nameplate capacity;<sup>4</sup>
- \$22 million in revenue to Nevada's counties from geothermal royalties;<sup>5</sup>

In addition, the state of clean energy in Nevada shows promise for significant future growth because, at the time of this report,

- Nevada is ranked 1st nationally in the number of geothermal projects under development;
- Nevada is ranked 3rd nationally for utility scale solar photovoltaic capacity and projects under development;
- The Bureau of Land Management conducted the first competitive auction to develop solar energy on public lands in Nevada; and
- The ability to attract new clean energy manufacturing companies following Tesla's decision to build its gigafactory in Nevada.<sup>6</sup>

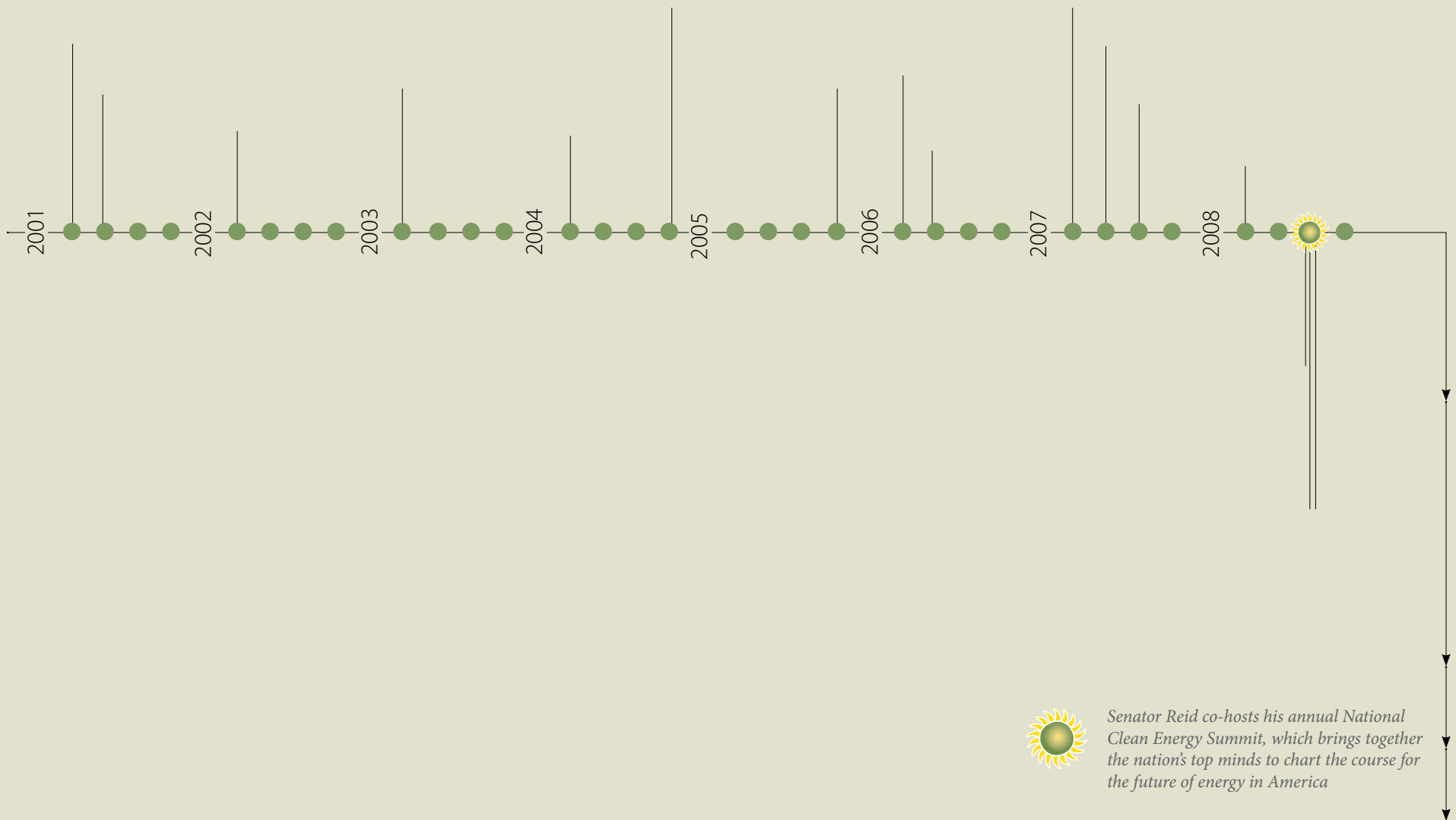


*Senator Reid meets with members of his blue ribbon panel on energy*

To help Nevada realize future clean energy growth, this report will detail the most important federal incentives, policies, and programs that Nevada's clean energy developers believe should be extended, expanded, or created to most effectively drive immediate investment in Nevada's clean energy future.

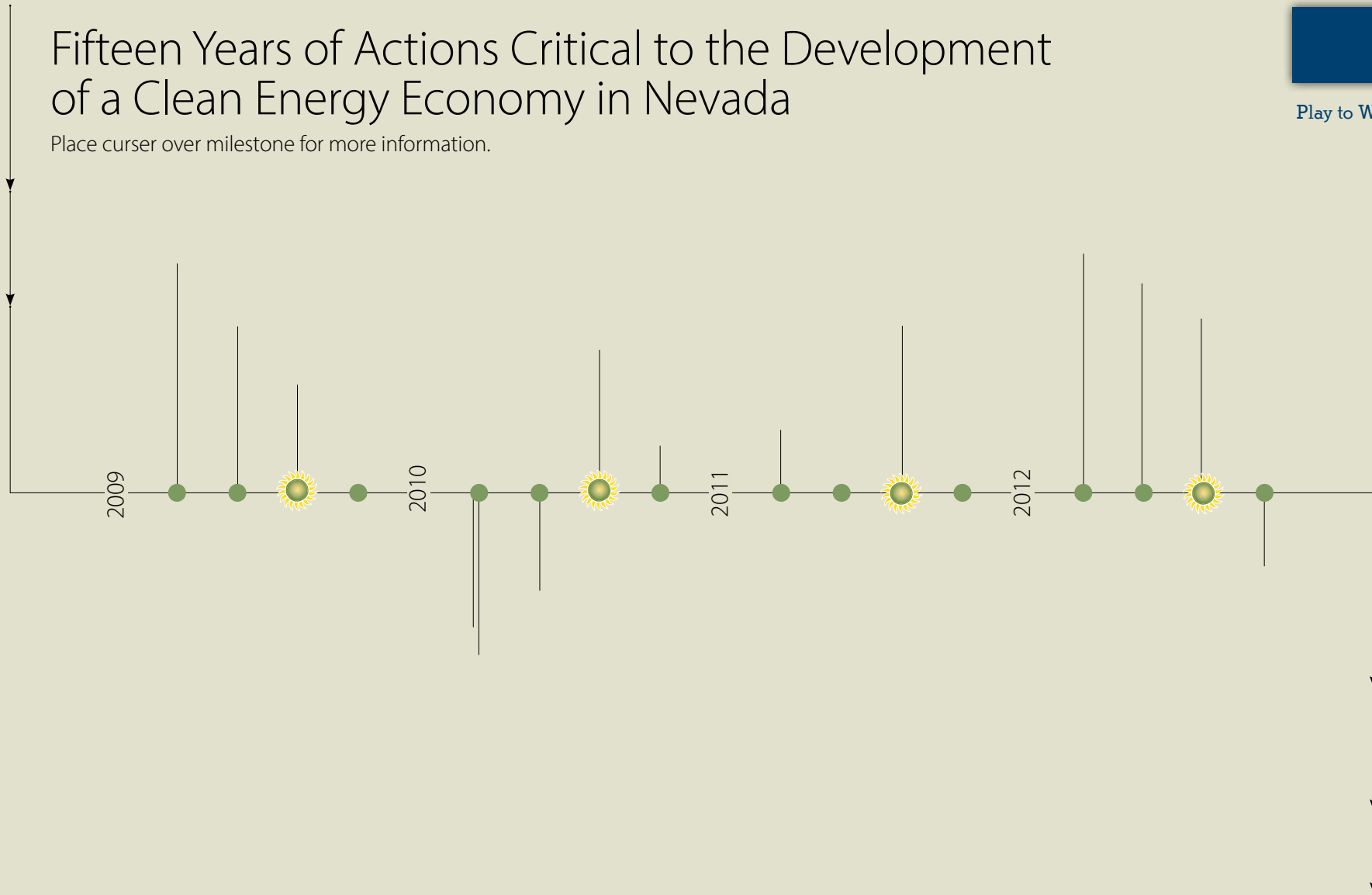
# Fifteen Years of Actions Critical to the Development of a Clean Energy Economy in Nevada

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# Fifteen Years of Actions Critical to the Development of a Clean Energy Economy in Nevada

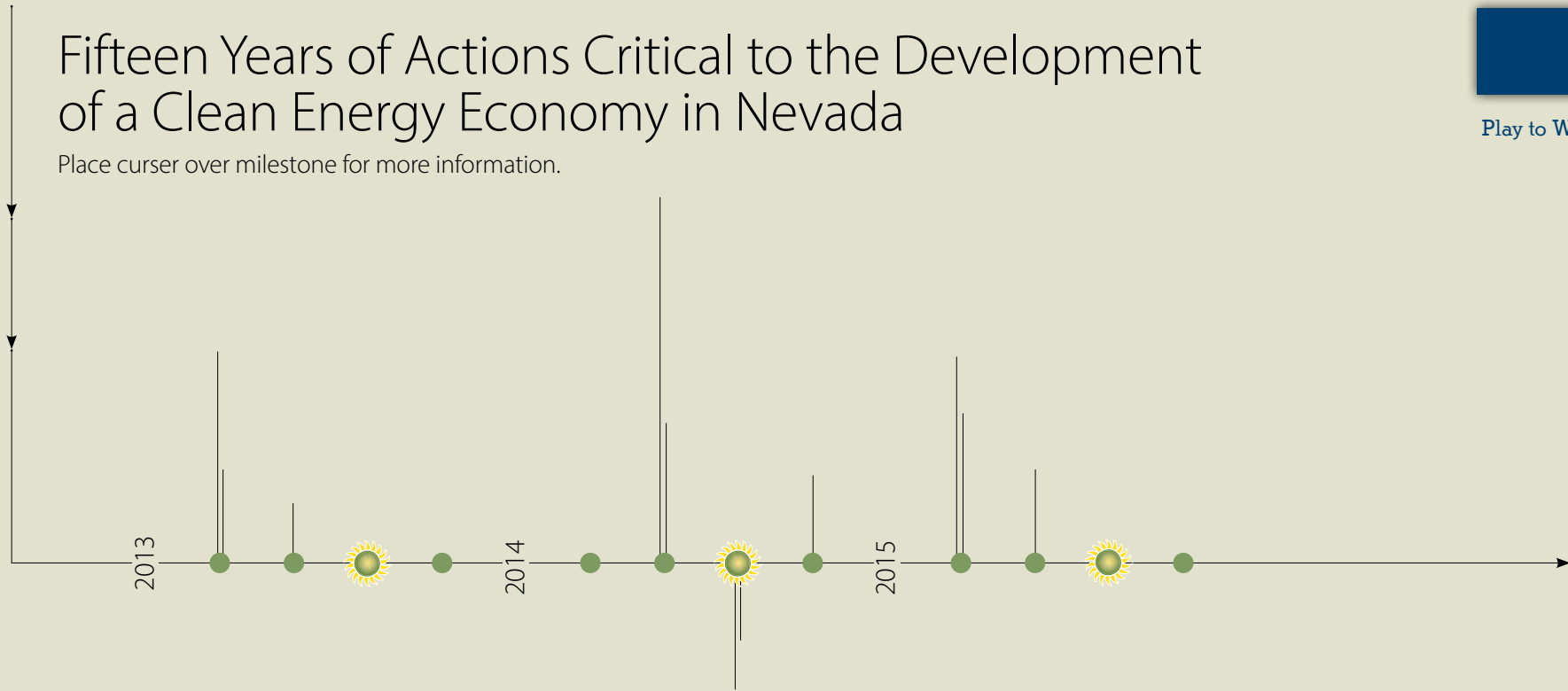
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*Senator Reid co-hosts his annual National Clean Energy Summit, which brings together the nation's top minds to chart the course for the future of energy in America*

# Fifteen Years of Actions Critical to the Development of a Clean Energy Economy in Nevada

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*Senator Reid co-hosts his annual National Clean Energy Summit, which brings together the nation's top minds to chart the course for the future of energy in America*



## Case Studies into Nevada's Clean Energy Future

There are more than a dozen clean energy projects in the construction, the advanced planning, or development stages in Nevada. Taking a closer look at a handful of these projects helps to illustrate the potential and promise of clean energy for the Silver State, but also the important role the federal government plays in their development. Below, one can learn about the significant roles the federal government is playing in advancing Nevada's development of new economic opportunities.

### SOLAR RESERVE

SolarReserve's Crescent Dunes project is a concentrating solar facility located just outside of Tonopah. This solar project will utilize a 538 foot tower with a 100 foot central receiver that will be surrounded by a large array of heliostats that will focus the heat of the sun onto the top of the central receiver. The heat focused onto the central receiver will be absorbed by liquid salt that will be circulated

through heat exchangers where steam is produced and electricity is generated through a conventional steam turbine.

The project is the tallest solar power tower in the world and it is expected to generate 110 megawatts of electricity, or enough power to serve over 43,000 homes. The project employed 600 people during construction, and many more indirect jobs are expected from the project. The Crescent Dunes facility is also expected to generate \$47 million in tax revenue over ten years while avoiding nearly 290,000 tons of carbon pollution annually, or the equivalent of 20 percent of the annual generation of an average coal-fired plant in the United States.

This landmark solar project was made possible when the Department of Energy finalized its \$737 million loan guarantee in September 2011. This financing option was made available by Congress in March 2009 when it passed the American Recovery and Reinvestment Act, which included \$6 billion to assist in the rapid deployment of renewable

### Federal, State, and Local Government Interaction with Crescent Dunes

- ✓ Department of Interior
- ✓ Bureau of Land Management
- ✓ Department of Defense
- ✓ Federal Energy Regulatory Commission
- ✓ Department of Energy
- ✓ Department of Treasury
- ✓ U.S. Department of Fish and Wildlife
- ✓ Nevada Department of Conservation and Natural Resources
- ✓ Public Utilities Commission of Nevada
- ✓ Nevada State Energy Office
- ✓ Nevada Department of Taxation
- ✓ Nye County
- ✓ Town of Tonopah

energy and electric power transmission projects. The financing provided by the Department of Energy loan guarantee was vital to the success of the project.

In order to secure the loan guarantee and to help make the project a reality, the developers of Crescent Dunes worked with a wide range of federal,



*Construction of the Crescent Dunes solar project in Nye County.*



*Spring Valley wind project near Ely, Nevada*

state, and local government agencies. Examples of some of the most notable interactions that helped make this project a reality occurred between the Department of Defense and its Scientific Advisory Board on the siting of the project so that it would have a minimal effect on Nellis Air Force Base. The project was also designated by the Bureau of Land Management as a priority project (see fast-track permitting in 2009 timeline) which helped to ensure that it complied with important environmental laws like the National Historic Preservation Act, Endangered Species Act, and National Environmental Policy Act.

The ability to secure financing through the Department of Energy's loan guarantee program helped it begin construction in time to qualify for Treasury Department's Section 1603 grant program. This

program, also established in the American Recovery and Reinvestment Act (see 2009 timeline), gave the project developers the opportunity to receive a one-time cash grant instead of using the solar investment tax credit, thereby reducing the need for third-party tax-equity investors. The key motivation for creating the Section 1603 grant program was the lack of tax equity financing capacity available for projects following the financial crisis.

These successes at the federal level allowed the Crescent Dunes project to subsequently help Nevada meet its renewable electricity standard and to also take advantage of its renewable energy property and sales tax abatements program.

#### **SPRING VALLEY WIND**

Pattern Energy is one of North America's leading independent wind and transmission companies. Pattern Energy has more than 520 megawatts of projects in operation and under construction,

including Nevada's first utility-scale wind energy project approximately 30 miles east of Ely. Pattern Energy has constructed the 150 megawatt project that will generate enough electricity to power 45,000 homes and has created 225 jobs during the construction phase.

The Spring Valley project utilized the Department of Treasury's Section 1603 program (see 2009 and 2010 timelines) that allows Pattern Energy to monetize renewable energy tax credits that were difficult to use because of the recession. In order to help take advantage of the 1603 program, the Department of Interior and Bureau of Land Management designated Spring Valley as a priority project in 2009 (see fast-track permitting in timeline) helping the project to receive permits in a timely manner. Finally, Pattern Energy worked with the U.S. Fish and Wildlife Service to set requirement and protection plans for species potentially impacted by the wind farm.

#### **Federal, State, and Local Government Interaction with Spring Valley Wind**

- ✓ Department of Interior
- ✓ Bureau of Land Management
- ✓ Department of Defense
- ✓ Federal Energy Regulatory Commission
- ✓ Department of Treasury
- ✓ U.S. Fish and Wildlife Service Nevada Department of Wildlife
- ✓ Public Utilities Commission of Nevada
- ✓ Nevada Department of Taxation
- ✓ White Pine County



*Ormat's McGinness Hills geothermal plant in Lander County © Ormat*

### ORMAT GEOTHERMAL

Ormat is a world leader in geothermal power and is the only vertically integrated provider of geothermal and recovered energy generation equipment, services, and power. Currently, Ormat operates 10 geothermal power plants in Nevada that are producing one million megawatt hours of base-load renewable energy annually.

Ormat has worked to develop several geothermal projects in Nevada, including the Jersey Valley project in Pershing County, the McGinness Hills project in Lander County, and the Tuscarora project in Elko County. Together, these projects are expected to produce a total of 121 megawatts of electricity, 330 construction jobs, nearly 65 permanent jobs, and increase geothermal power production in Nevada by nearly 25 percent.

The three projects are aided by a \$350 million loan guarantee from the Department of Energy and a production tax credit (see year 2009 on the timeline).

Ormat also received BLM fast-track permitting (see year 2009 on the timeline) to speed-up the development of the projects. These three projects already have over 800 agreements or contracts representing more than \$180 million dollars spent with U.S. suppliers in thirty-five states. Ormat is also taking advantage of the Treasury Department's renewable energy (Section 1603) grant. The funding received through this tax credit program (see 2009 on timeline) stimulated the early development and construction of the Tuscarora and McGinness Hills projects that are putting hundreds of Nevadans to work.

The availability of renewable energy tax credits (see 2008 and 2009 timeline references) for geothermal projects has been instrumental to development of Nevada's geothermal resources. Ormat has invested over \$1.1 billion in capital in the development of 14 geothermal power plants and 18 innovative, cutting edge, geothermal research and demonstration projects in the U.S. All 14 power plants have

received or are eligible to receive the production tax credit (PTC) investment tax credit (ITC), or cash grant option established by the American Recovery and Reinvestment Act. Eight of those power plants—including the three projects being built as result of their loan guarantee— have created between 500 and 750 construction jobs and 75 to 100 full-time operations jobs.

In addition, Ormat has teamed successfully with the Department of Energy's Geothermal Technologies Program in comprehensive research and demonstration programs that have expanded the use of geothermal energy in Nevada. Specifically, the Department of Energy and Ormat have invested \$47 million to develop and advance geothermal technology in Nevada that has helped to create a cluster of geothermal excellence in the Reno/Tahoe region. For instance, the first school for geothermal power plant operators in the world at Truckee Meadows Community College has recently been created and ten innovative geothermal research and development projects are located in Nevada. These projects are estimated to create 350 high quality drilling and research jobs.

### ONE NEVADA TRANSMISSION LINE (ON-LINE)

The ON-Line project is a 500 kilovolt (kV) AC transmission line that will run 235 miles through



*Construction of the One-Nevada Transmission Line*

White Pine, Nye, Lincoln, and Clark counties and is estimated to become operational in 2013. This transmission line will carry approximately 2,000 megawatts of electricity.

The ON-Line will allow northern and southern Nevada to pool their energy resources, providing the flexibility needed to select the lowest-cost mix of Nevada's renewable energy resources. With the ON-Line, NVEnergy will also link the northern and southern Nevada systems, which will improve reliability, ease integration of geothermal, solar and wind resources, and provide operational savings. These operations savings and more efficient use of the state's renewable resources will reduce total costs to Nevada consumers. The On-Line project was energized in 2014 and Nevadans have saved \$12 million thus far from the construction of this transmission line.<sup>8</sup> Furthermore, high-voltage transmission lines transport energy more efficiently than lower-voltage lines, and provide a stronger, more resilient connection between areas. The ON-Line also crosses several renewable energy

zones previously identified by Nevada's Renewable Energy Transmission Access Advisory Committee.

The construction of this transmission line is the result of a public-private partnership between NV Energy, LS Power and the Department of Energy's loan guarantee program. The Department of Energy provided a critical financing mechanism for this project through a \$363 million loan guarantee and is estimated to employ approximately 400 people during construction. Beyond the hundreds of construction jobs created by building this line, the ON-Line will make additional clean energy projects possible in Nevada that will create additional jobs as the ON-Line will better market Nevada as a renewable energy supplier for the West.

The ability to secure the \$363 million loan guarantee from the Department of Energy required a great deal of collaboration at the federal and state levels. At the federal level, coordination was required with the Department of Interior and Bureau of Land Management in order to obtain a right of way permit necessary for construction of the line on federal land in White Pine, Nye, Lincoln, and Clark counties. The construction of the ON-Line was also contingent upon the Federal Energy Regulatory Commission, pursuant to the Federal Power Act, granting a Transmission Use and Capacity Exchange Agreement. These

## Federal, State, and Local Government Interaction with Ormat

- ✓ Department of Interior
- ✓ Bureau of Land Management
- ✓ Federal Energy Regulatory Commission
- ✓ U.S. Fish and Wildlife Service
- ✓ Army Corps of Engineers
- ✓ Department of Treasury
- ✓ Nevada Department of Wildlife
- ✓ Public Utilities Commission of Nevada
- ✓ Nevada Division of Environmental Protection
- ✓ Nevada Division of Minerals
- ✓ Nevada Division of Water Resources
- ✓ Nevada State Historic Preservation Office
- ✓ Nevada Department of Taxation
- ✓ County Planning and Building Commissions

agreements set forth the terms and conditions of developing, constructing, operating, and owning the transmission line.

## Federal, State, and Local Government Interaction on Silver State North and Copper Mountain

- ✓ Department of Interior
- ✓ Bureau of Land Management
- ✓ U.S. Fish and Wildlife Service
- ✓ Federal Energy Regulatory Commission
- ✓ Department of Treasury
- ✓ Nevada State Office of Energy
- ✓ Nevada Public Utilities Commission
- ✓ Nevada Department of Transportation
- ✓ Clark County Planning Department

and is the developer of the Silver State North near Primm, Nevada. To date, First Solar has created 500 construction jobs in Nevada and this figure will rise to close to 1,200 when future construction commences.

The Silver State North project will generate 50 megawatts of power, employing 300 people during construction. When fully operational, the project will generate enough solar energy to power 9,000 homes and displace approximately 42,000 metric tons of carbon dioxide – the equivalent of taking 8,000 cars off the road. The Eldorado and Copper Mountain solar projects, owned by Sempra Generation, comprise one of the largest photovoltaic plants in North America. Together, they generate enough electricity to serve 20,000 homes and displace approximately 35,000 metric tons of carbon

pollution each year.

First Solar's projects in Nevada are estimated to inject close to \$300 million into Nevada's economy through development costs, material purchases, and wages paid. The ability to add those resources to Nevada's economy and 1,200 jobs was aided by the federal government's 1603 grant program (see 2009 on the timeline). In addition, these projects were also assisted by the BLM's fast-track permitting process. Finally, the State of Nevada's renewable energy tax abatement program also helped First Solar offer lower prices to utilities.

### STILLWATER SOLAR

Enel Green Power (Enel Green Power North America), is a leading owner and operator of renewable

### SILVER STATE NORTH AND COPPER MOUNTAIN

First Solar is one of the world's leading manufacturers of photovoltaic solar modules and utility-scale solar power plants. The company's advanced semiconductor technology is helping to continuously drive down the cost of solar energy and expand the market for solar energy.

In Nevada, First Solar is partnering with Sempra Generation to expand the existing solar facility in the Eldorado Valley known as Copper Mountain

### Federal, State, and Local Government Interaction with Stillwater Solar

- ✓ Bureau of Land Management
- ✓ Bureau of Reclamation
- ✓ U.S. Fish and Wild Life Service
- ✓ Environmental Protection Agency
- ✓ Department of Energy
- ✓ Federal Energy Regulatory Commission
- ✓ Federal Communications Commission
- ✓ Nevada Division of Minerals
- ✓ Nevada Division of Environmental Protection
- ✓ Nevada Division of Water Resources
- ✓ Nevada Public Utilities Commission
- ✓ Nevada Department of Taxation
- ✓ Office of the Nevada Secretary of State



*The hybrid geothermal and solar plant in Churchill County.*

energy plants in North America, with projects operating and under development in 21 U.S. states and three Canadian provinces. The company has an installed capacity of more than 6,100 megawatts with over 650 facilities around the world and a generation mix that includes wind, solar, and geothermal power. In Nevada, Enel Green Power North America has already constructed the Stillwater and Salt Wells geothermal power plants near Fallon. Together, these installations generate over 70 megawatts of electricity, enough to power up to 40,000 households in Northern Nevada.

Enel Green Power North America recently finished constructing a 24 megawatt solar photovoltaic array that is integrated with the existing Stillwater geothermal plant. This plant is the first-ever hybrid geothermal and solar plant and it employed more than 150 workers during construction. The solar project used 81,000 polycrystalline photovoltaic panels which enable the delivery of more clean power to the electricity grid, allowing the hybrid geothermal and solar plant to better meet electricity demand. This solar project is the first utility scale photovoltaic plant in Churchill County.

The availability of renewable energy tax credits and the U.S. Department of the Treasury's Section 1603 grant program have played an important role in the development of the Stillwater project. Overall, converting tax credits to grants through the 1603 program has enabled Enel to lower the cost of renewable power as much as 20 to 25 percent.

The construction of the world's first hybrid solar and geothermal plant in Churchill County is bringing that community a number of benefits. First, the installation of the solar panels resulted in the creation of 150 construction jobs that added strength to the local economy. Second, the project is projected to add an estimated \$22 million in total financial benefits to the region. Finally, the project helped to further establish Nevada as a leader in the race to deploy new and innovative clean energy technologies.

### SIERRA BIOFUELS

Fulcrum BioEnergy is constructing one of the nation's most advanced biofuel refineries outside of Reno. This plant will convert 200,000 tons of municipal solid waste that would otherwise go into the Lockwood Landfill into more than 10 million gallons of low-carbon renewable jet and diesel fuels per year. The biofuels that will be produced by this plant will put Nevada on the leading edge of clean biofuels production as they are expected to

### Federal, State, and Local Government Interaction with Sierra Biofuels

- ✓ U.S. Department of Agriculture
- ✓ Department of Defense
- ✓ Environmental Protection Agency
- ✓ Nevada Department of Environmental Protection
- ✓ Nevada Public Utility Commission
- ✓ Storey County Board of Commissioners
- ✓ Storey County Planning Commission
- ✓ Storey County Fire Department



*Construction of the Sierra Biofuels facility outside Reno*

reduce greenhouse gas emissions by more than 80 percent compared to traditional petroleum sources. More than 500 engineering and construction jobs



*Crescent Dunes solar project in Tonopah, Nevada ©Solar Reserve*

and an additional 100 permanent jobs will be created by the Sierra Biofuels facility within two years. The Sierra Biofuels project utilized the United States Department of Agriculture's biorefinery assistance program that was originally authorized in the 2008 farm bill. This program provides loan guarantees for the development and construction and of commercial-scale biorefineries in order to help reduce the nation's reliance on oil. At the most recent National Clean Energy Summit, Agriculture Secretary Vilsack joined Senator Reid to announce that this project would receive a \$105 million loan guarantee.

The Sierra Biofuels plant also utilized the authorities under the Defense Protection Act to produce bio-fuels that meet the specific needs of our nation's military forces. In order to help make our nation less susceptible to foreign sources of energy, the Departments of Navy, Energy, and Agriculture jointly awarded \$70 million grant for this plant to produce jet fuels for its customers, including the U.S. military. This investment in our nation's national security was protected in 2012 and 2013 when the

Senate rejected amendments to kill the program during its consideration of the Fiscal Year 2013 National Defense Authorization<sup>9</sup> and the Fiscal Year 2013 Continuing Appropriations Act.<sup>10</sup>

These partnerships catalyzed more than \$100 million of private capital to complete the financing of the Sierra Biofuels project, as well as financing to accelerate the development of future projects. These private sector investments include Cathay Pacific, which is a Hong Kong-based airline offering scheduled passenger and cargo services to more than 180 destinations throughout the world, and Waste Management, which will provide the municipal solid waste for ten or more projects across North America. These partnerships have the potential to create thousands of more jobs and hundreds of millions of dollars of investment in Nevada and across the United States.

#### **MOAPA PAIUTE SOLAR PROJECT**

A historic partnership between the Moapa Band of Paiutes, Los Angeles Department of Water and Power, and K Road Power has resulted in the construction of the first large-scale solar project on tribal lands in the United States. First Solar purchased this project from K Road Power in September 2013 and

it will create approximately 400 construction jobs as well as new economic opportunities for the Moapa Band of Paiutes. Construction has begun and First Solar expects it to be complete by June of 2016.

When construction is completed, this solar project will be built on 2,000 acres of land and generate 250 megawatts of clean electricity on the Moapa River Indian Reservation. The power plant is expected to generate enough clean solar energy to serve the needs of about 100,000 homes. This amount of renewable energy will displace approximately 178,000 metric tons of carbon dioxide (CO<sub>2</sub>) annually—the equivalent of taking about 34,000 cars off the road.

This partnership was supported by the availability

#### **Federal State and Local Government Interaction with the Moapa Paiute Solar Project**

- ✓ Bureau of Indian Affairs
- ✓ Bureau of Land Management
- ✓ Los Angeles Department of Water and Power
- ✓ Nevada State Energy Office
- ✓ U.S. Fish and Wildlife Service



*Senator Reid at the groundbreaking of the Moapa Band of Paiutes Solar Project*

of the solar investment tax credit and fast-track permitting from the Bureau of Land Management to speedup the development of this project. In recent years, Senator Reid worked hard to include an eight-year extension of the solar investment tax credit for residential and commercial solar installations. The availability of this tax credit has attracted private sector investment and job creation in Nevada. Fast-track permitting ensured that an appropriate amount of resources were dedicated to the project to ensure it conformed to important environmental laws.

This project is also an important partnership with the City of Los Angeles, California. The electricity from this project will replace electricity the city receives from a coal plant in Arizona. This will reduce greenhouse gas pollution by 8.4 million metric tons.

## **GIGAFACTORY**

In September 2014, Tesla announced that it would construct its gigafactory in Nevada. This five million square foot facility will be the largest and most advanced battery factory in the world and is expected to create \$40 billion in direct economic impacts over the next twenty years.

The gigafactory is also estimated to add three percent to Nevada's gross domestic product which would represent a twenty percent increase in the regional gross domestic product.

The gigafactory will also create a significant number of jobs. At peak construction, this project is expected to employ 3,000 individuals over a three year period. Once the facility is operational, 6,500 direct jobs are expected to be needed on-site with an average wage in excess of \$25 per hour and a full benefits package.

Tesla's investment in Nevada shows what is possible when public-private partnerships and smart federal and state policies are encouraged. This began in 2007 with the passage of the Energy Independence and Security Act, which created the Advanced Technology Vehicles Manufacturing program. Under this program, the Department of Energy awarded a \$465 million loan guarantee to Tesla for the construction of its vehicle manufacturing facility in California.

The ability to produce lithium in Nevada was expanded by the American Recovery and Reinvestment Act – better known as the stimulus. This legislation was critical to providing a \$28.4 million grant to help expand and improve the only operating domestic lithium facility in the country that is near the historic mining town of Goldfield in a place called Silver Peak.



In 2008, Congress encouraged investment in the growth of the electric car industry with tax credits for qualified electric vehicles. The Energy Improvement and Extension Act in the Emergency Economic and Stabilization Act includes a provision to provide a tax credit up to \$7,500 for the purchase of qualified plug in electric vehicles. This law also requires the tax credit to be phased out when total U.S. sales of vehicles eligible for the credit reaches 250,000. The American Recovery and Reinvestment Act further expands the availability of the tax credit by making its eventual phase out contingent upon a manufacturer limit of 200,000 rather than a total vehicle limitation.



## Growing Nevada's Clean Energy Economy

The case studies and timeline found in this report help to demonstrate that smart policies have driven investment in clean energy in Nevada. These efforts have helped the eight case study projects featured in this report bring billions in estimated financial benefits to Nevada, created thousands of jobs, and grow our recovering economy.

To ensure that future steps to grow Nevada's clean energy economy are as effective as possible and to most effectively drive immediate investment in Nevada, a number of federal incentives, policies, or programs could be extended, expanded, or created. To assist in this effort, several clean energy developers in Nevada have offered suggestions about which federal incentives, policies, or programs would best accomplish these shared goals.

The following synthesizes their suggestions, in no particular order, about what actions would most effectively drive immediate investment in Nevada's clean energy future.

### **NATIONAL RENEWABLE ELECTRICITY STANDARD**

Nevada's renewable electricity standard has proven to be one of the most effective tools for creating demand for clean energy generation. However, the challenge remains for ensuring demand for clean energy generation in future years.

The enactment of a nation-wide renewable electricity standard would help sustain demand for Nevada's renewable electricity resources. In fact, each of the clean developers surveyed for this report reported that enactment of a federal renewable electricity standard could expand demand for renewable energy. The benefits of a federal renewable electricity

standard to Nevada and the nation would help facilitate the most cost-effective imports and exports of renewable energy resources. For instance, it would help to ensure the development of the nation's estimated 39,000 MW of geothermal resources, much of which is located in Nevada.

### **EXPLORATORY GEOTHERMAL DRILLING AND MAPPING**

Tens of thousands of megawatts of geothermal power potential could be developed, but it will require a significant and sustained effort to support geothermal exploration and resource quantification. The establishment of a new loan fund to promote exploratory drilling and to encourage

mapping of the nation's geothermal resource base would help to capture some of Nevada's untapped geothermal resources.

Such a program would involve drilling and testing numerous (between 50 and 100) new exploration wells in promising but unproven areas during the next few years, leading to the discovery and characterization of new electricity-grade resources. If the United States were to allocate the same resources as it did to create the Strategic Petroleum Reserve (\$4 billion) it could lead to the annual development of approximately 800 MW or 6.6 million MW/hrs of geothermal energy. The production of 800 MW annually would help to create between 4,000 and 6,000 construction jobs and between 750 and 800 full-time operations jobs.

### **21ST CENTURY TRANSMISSION GRID**

The modernization of the nation's electricity transmission grid would be an effective tool to spur economic growth and job creation and better position our energy policy for years to come. The electricity transmission grid in the United States is regionally fragmented and does not utilize the state-of-the-art technology that is needed effectively deliver the country's best renewable energy resources. Some analysts expect that \$300 billion (nominal) in public and private transmission investment will be needed

by 2030 to modernize the grid so that it can meet the challenges of the 21st century.

In order to create a 21st century electricity transmission grid the nation will need to invest in transmission and smart grid technologies and provide clearer federal authority to overcome today's regulatory barriers. Efforts at the federal level to support increased collaboration between state and regional transmission entities that will facilitate new clean energy development, to identify priority transmission projects needed for renewable energy development, and support for efforts to increase collaboration between the Department of Energy, Federal Energy Regulatory Commission, and state utility regulations would facilitate the permitting and construction of needed transmission capacity.

### **CLEAN ENERGY TAX INCENTIVES**

In recent years, fossil fuel interests have pushed some members of Congress in the way of progress toward a clean energy economy by opposing investments and tax incentives for clean energy production and deployment. Unfortunately, Congress has relied upon retroactive extensions of existing law to bridge the gap between tax filings instead of providing the long term certainty solar, wind and geothermal developers need to secure financing and build projects.

The planning, permitting, and public utility commission approval process spans several years for many renewable energy projects. Access to predictable and consistent tax incentives is important because they help put clean energy on a level playing field

with fossil fuels, which have been subsidized by taxpayers for decades and currently do not pay for the pollution they emit.

With the cost of clean energy rapidly falling and solar, wind and geothermal energy competing with traditional fossil fuel plants in Nevada and across America, pulling the plug on the decade of progress made developing clean energy would be bad for Nevada and bad for economic growth throughout the country. Key incentives should not abruptly expire at the hands of fossil fuel interests that fear competition from renewables.

## Playing to Win in Clean Energy

Over the last decade, several important federal and state policies and incentives have helped Nevada start to realize its enormous clean energy potential. As this report demonstrates, government support and private-public partnerships are helping to provide Nevadans with lower and more predictable energy bills, growing clean energy jobs, and a more diversified economy. Simply put, coordinated federal and state actions are helping to turn Nevada into a national leader in clean energy.

The real challenge for Nevada now is to leverage these recent successes so the Silver State can compete for a sizable portion of the \$7 trillion market in renewable energy technology and generation that experts predict will materialize over the next twenty years.<sup>11</sup> If Nevada is serious about competing for investments in this market, then our state must have a coherent strategy to attract new industries, to forge regional and national alliances, to create markets for our products and renewable power,

and to develop our human resources and capacity for innovation.

The proposals highlighted in this report came from a range of clean energy developers and represent only a small portion of the ideas that could potentially help Nevada grow its clean energy economy. Nevada can create thousands of jobs by developing more renewable energy projects, building new transmission and increasing energy efficiency. The most effective way to ensure that outcome is to continuously improve coordination between all levels of government and the private sector.

Realizing Nevada's clean energy future is not a sure thing. The opponents of clean energy have repeatedly sought to cut funding or repeal programs or policies that are essential to achieving that future. Fortunately, they have not succeeded and billions of dollars of private investments have been made in developing Nevada's clean energy resources, creating thousands of jobs. But these forces of

negativity continue their assault on behalf of polluting, outdated and inefficient energy sources.

The challenge is to make sure that we use our time and money wisely to ensure that Nevada becomes the central hub of clean energy the global growth industry of the 21st century. That means we must build on our successes in coordinating between all levels of government and the private sector and continue improving the siting, development and financing for new generation, transmission projects. Nevada's economic future will be much brighter if we can make the Silver State the vibrant core of a Western and national clean energy market unlike anywhere in the world.

## Citations

1. The timeline is not a comprehensive list of events important to clean energy in Nevada, but instead an illustrative list of events that demonstrate the important nexus that federal and state governments play in Nevada's development of a clean energy economy.
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