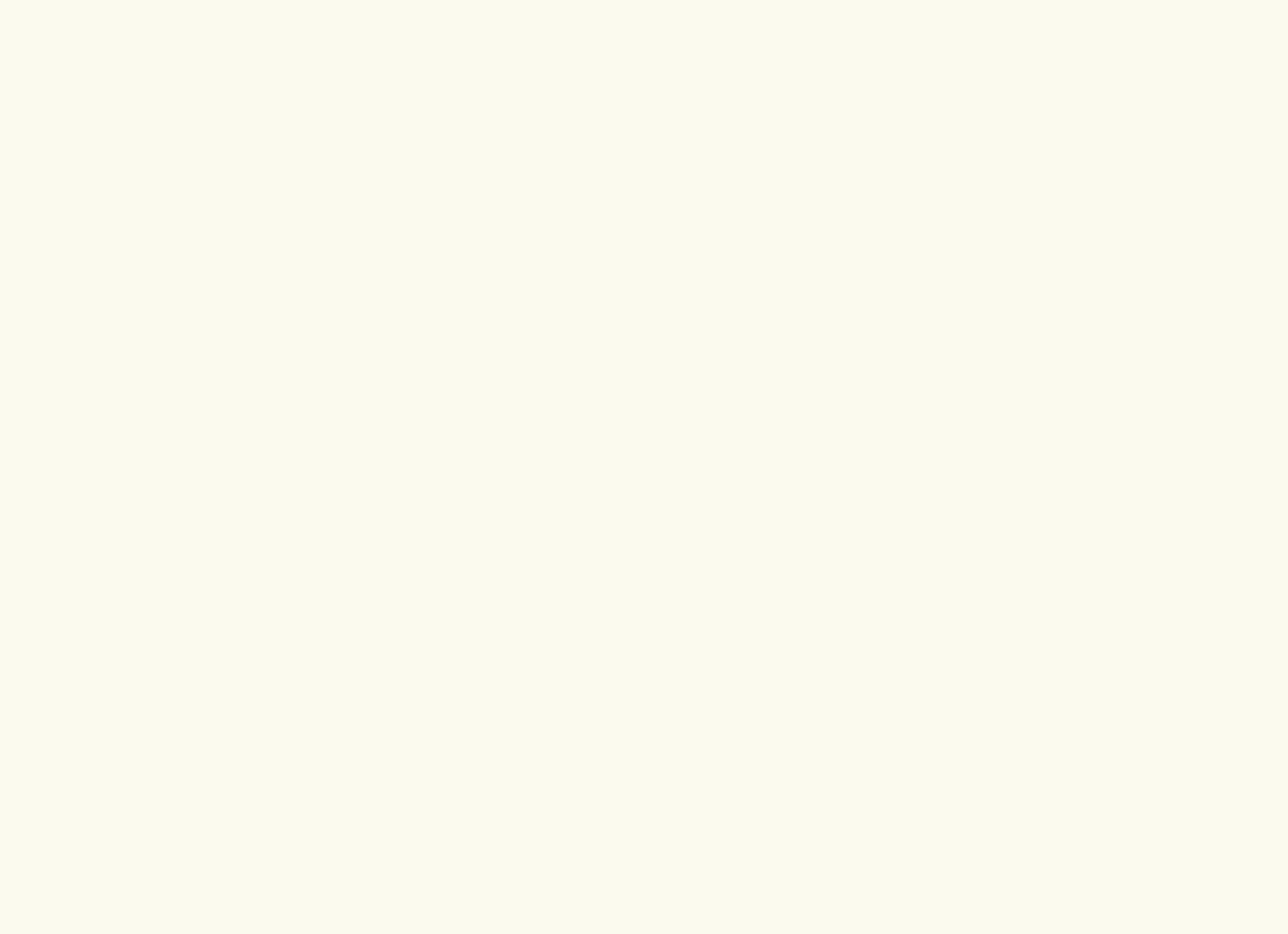




Playing to win in  
**CLEAN ENERGY**

United States Senator Harry Reid





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# Playing to Win in Clean Energy

Nevada has identified the need to diversify 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 though 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.

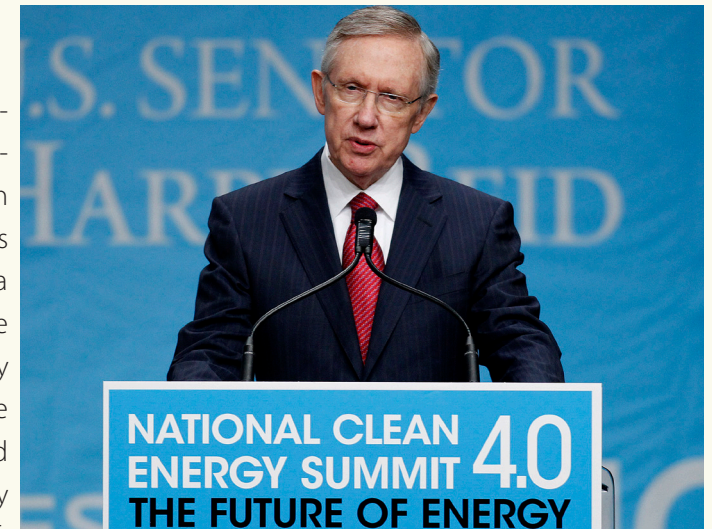
In contrast, the burgeoning success of Nevada's renewable energy sector is being aided by more than a decade of actions at the federal and state level that have been most notably focused on the commercial deployment of Nevada's clean energy resources. This development is especially important because it gives Nevada the opportunity to leverage its recent suc-

cesses into additional private sector investment in our clean energy resources and the chance to realize the long sought-after goal of diversifying the Silver State's economy.

These successes have turned Nevada into a national leader in clean energy and helped to position Nevada to enjoy additional successes. In fact, there are more renewable energy projects currently under construction today in Nevada 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 in Nevada 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 specifically aided by legislation that increased investment in clean energy, reforms of policies that have accelerated 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 maintain the status quo.



Nevada has much to gain by continuing to aggressively develop its renewable energy resources by ensuring that federal and state actions are working together to advance the state's interest. 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 programs, policies, and incentives that would shift attention 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. The recent increase in the deployment of Nevada's clean energy resources is being assisted by a number of actions at the federal level, including legislation aimed at spurring investment in 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 ten years that have assisted in strengthening Nevada's burgeoning clean energy economy.<sup>1</sup> Today, these dividends to Nevada include, but are not limited to:

- Clean energy job growth measured annually at 5.8 percent between 2003 to 2010;<sup>2</sup>
  - Clean energy jobs that pay \$8,000 more than the median wage for other jobs in Nevada;<sup>3</sup>
  - Nevada's Top 5 national ranking for installed solar photovoltaic, concentrating solar, and geothermal nameplate capacity;<sup>4</sup> and
  - The total estimated financial benefit of \$1.04 billion<sup>5</sup> to Nevada's economy from the six projects featured in this report.
- In addition, the state of clean energy in Nevada shows promise for significant amounts of future growth because:
- Nevada is ranked 1st nationally in the number of geothermal projects under development;<sup>6</sup>
  - Nevada is ranked 3rd nationally for utility-scale solar photovoltaic capacity and projects under development;<sup>7</sup>
  - Nevada's wind energy resources could provide nearly 60 percent of the state's current electricity needs<sup>8</sup>



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

- The Bureau of Land Management recently designated more than 1,100 megawatts of renewable energy projects in Nevada as priority projects in 2012;<sup>9</sup> and
- Clean energy jobs in Nevada are currently projected to increase by nearly 11 percent between 2011 and 2016<sup>10</sup>

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.

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

## Renewable Electricity Standard

Former Governor Guinn signs into law a new renewable electricity standard for Nevada that requires it to generate 15 percent of its electricity from renewable energy by 2013.

This legislation would be further amended, most notably in 2009, raising the percentage requirement to 25 percent by 2025 and increasing the percentage that solar energy must provide.

## Geothermal Energy Development

Senator Reid secures approximately \$1 million in an appropriations bill to speed up the Bureau of Land Management's permitting of geothermal energy projects.

Senator Reid also secures approximately \$1 million for the University of Nevada's Great Basin Center for Geothermal Energy. The Center works in partnership with the Department of Energy and industry to provide information on geothermal resources, collaborative research, and on emerging technologies for geothermal assessment and exploration.

## Solar Technology Development

As a longtime member of the Senate Appropriations Committee, Senator Reid secures millions to develop and support UNLV's solar technology and solar photonics research.

The funding provided in the bill, in combination with prior and future support, helps to establish UNLV and Southern Nevada as a national center for excellence for solar energy development and deployment.

## Renewable Energy Incentives Act

Senator Reid introduces legislation to permanently extend the renewable energy production tax credit for renewable energy and expand the current credit to additional renewable energy technologies.

Introduction of the legislation helps to increase support for including short-term extensions of the renewable energy production tax credit in the Job Creation and Worker Assistance Act of 2002.

## Consolidated Appropriations Act

This "omnibus" appropriations bill funds numerous renewable energy projects and research efforts in Nevada, including:

- ✓ Over \$1 million for hydrogen transportation development.
- ✓ \$1 million for geothermal research at the University of Nevada-Reno.
- ✓ Nearly \$7 million for solar energy research at the University of Nevada-Las Vegas.

## Renewable Energy Incentives Act

Senator Reid introduces legislation to permanently extend the renewable energy production tax credit for renewable energy and expand the current credit to additional renewable energy technologies.

Introduction of the legislation helps to increase support for including short-term extensions of the renewable energy production tax credit in the Working Families Tax Relief Act of 2004.

2001

2002

2003

2004

2005

## Energy and Water Appropriations

As a longtime member of the Senate Appropriations Committee, Senator Reid secures almost \$40 million for more than a dozen Nevada-based clean energy projects in the FY-2006 Energy and Water Appropriations bill.

Among numerous provisions, the legislation includes funding for UNR's geothermal and renewable energy laboratory and various renewable energy development projects through the Department of Energy's National Renewable Energy Laboratory.

## Renewable Energy Mapping

Senator Reid convenes a meeting of federal agency heads in Nevada where an agreement is reached to develop maps that identify where Nevada's "developable" renewable energy resources are located.

The maps serve as a resource guide to project developers, local groups, and counties in their efforts to encourage renewable energy growth.

## Energy Independence and Security Act

Senator Reid leads the Senate in passing landmark energy legislation that:

- ✓ Authorizes the Department of Energy to support additional and improved geothermal research and development.
- ✓ Creates new fuel economy standards for vehicles for the first time in 30 years.
- ✓ Establishes an aggressive renewable fuel standard that is helping to reduce the nation's dependence on oil.

## Senate Confirmation of Jon Wellinghoff

After recommending his nomination to the President, Senator Reid works to confirm Jon Wellinghoff as a Commissioner at the Federal Energy Regulatory Commission (FERC).

At FERC, Wellinghoff has supported renewable energy, smart grid, demand response, and energy efficiency policies. The Senate later confirms Wellinghoff for an additional term in December 2007.

## Clean EDGE Act

Senator Reid introduces comprehensive energy legislation that increased momentum for making investments in renewable energy and America energy independent.

Among the numerous provisions included in this bill that would eventually become law in additional pieces of legislation is the authorization for the Department of Energy's office of Advanced Research Projects Agency for Energy (ARPA-E).

## Clean Renewable Energy and Economic Development Act

This legislation, introduced by Senator Reid in 2007, and again in 2009 would accelerate energy development in Nevada in the following ways:

- ✓ Designate renewable energy zones as areas for transmission improvements, and support FERC coordination and energy grid integration efforts.
- ✓ Permit the acquisition of rights of way to develop electricity transmission.
- ✓ Establish wind, geothermal, and solar integration programs and transmission incentives.
- ✓ Allow for the creation of solar energy reserves on federal land.
- ✓ Companion legislation would create the necessary tax code incentives to encourage clean energy development.

2006

2007

## 2008 National Clean Energy Summit

Senator Reid hosts, in coordination with the Center for American Progress and UNLV, the inaugural National Clean Energy Summit in Las Vegas.

The inaugural Summit is attended by President Clinton and the successive summits have established and showcased Nevada's leadership role in the development of a clean energy economy.

## Emergency Economic Stabilization Act

Senator Reid works to include the following provisions that accelerated clean energy deployment in Nevada:

- ✓ One-year extension of the wind energy production tax credit.
- ✓ Two-year extension of the solar and geothermal production tax credit.
- ✓ Senator Reid works particularly hard to include a eight-year extension of the 30 percent tax credit for residential and commercial solar installations.



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

2008

## Nevada Blue Ribbon Panel on Energy

Senator Reid establishes the Nevada Blue Ribbon Panel on Energy to expand upon the progress of the first National Clean Energy Summit. The panel is comprised of Nevada policymakers, experts, industry leaders, representatives of business and labor, Democrats and Republicans.

The panel helps identify the steps Nevada must take to realize its full potential as a leader in clean energy development, which will result in thousands of jobs and a diversified economy.

## American Recovery and Reinvestment Act

This law includes the following provisions, among others, that accelerated clean energy deployment in Nevada:

- ✓ **Extension of Renewable Energy Production Tax Credit:** Incentivizes additional investment in Nevada's clean energy resources with a 2.2 cent per kilowatt-hour tax credit.
- ✓ **Grants in Lieu of Tax Credit:** Allows businesses that place renewable energy into service the option of a credit per kilowatt-hour a grant instead of the 30 percent energy production tax credit.
- ✓ **Loan Guarantee Program:** Loan guarantees for projects like geothermal, wind, solar, and transmission projects, authorizing up to \$50 billion under the existing DOE Title XVII program from the Energy Policy Act of 2005.
- ✓ **Western Area Power Administration:** \$3.25 billion is allocated to the Western Area Power Administration for the specific purpose of facilitating new transmission lines and delivering that power from renewable power plants.



2009

## Fast-Track Permitting

Senator Reid and Secretary Salazar announce a new fast-track permitting process for clean energy development on public lands.

The process expedites environmental reviews and right-of-way grants for wind, solar, geothermal, and transmission projects, helping capitalize on clean energy incentives in the Recovery Act.

## Senate Confirmation of Bob Abbey

After recommending his nomination to the President, Senator Reid works to confirm Bob Abbey to become the Director of the Bureau of Land Management (BLM).

At the BLM, Abbey has worked to prioritize the development of renewable energy resources on public lands throughout the West.





### Solar Demonstration Zone

The Nevada Test Site is selected from 26 possible locations in the southwest by the Department of Energy to develop innovative solar energy projects. The site will devote over 25 square miles of BLM land to demonstrate and help commercialize utility-scale solar power projects.

### Public Lands Renewable Energy Development Act

Senator Reid introduced legislation to create a competitive leasing program for solar and wind energy projects on land owned by the federal government. The bill would streamline permitting for renewable energy development, replace the current rental fee paid by companies with a reasonable royalty on production, and provide a fair share of revenues to states and counties. This legislation was reintroduced in 2011 by a bipartisan group of western Senators (S. 1775).

### Middle Class Tax Relief Act

A host of tax relief measures are extended at the end of the 111th Congress. Included are the Grants for Specified Energy Property in Lieu of Tax Credits program (initially authorized in the 2009 Recovery Act), extended through 2011.

### Clean Transmission for Rural Communities Act of 2010

Introduced by Senator Reid, this companion legislation to the Clean Energy Infrastructure for Rural Communities Act of 2010 would allow the issuance of renewable energy bonds to interconnect energy facilities to high-voltage transmission lines.

### Defeat of H.R. 1

The continuing resolution to fund the federal government through 2011 is defeated in the Senate on March 8.

H.R. 1 would have defunded many of the clean energy initiatives approved over the last several years, including the loan guarantee program that has leveraged billions of dollars of private investment in Nevada's clean energy resources.

### FERC Order 1000

The rule reforms transmission planning and cost allocation requirements of the Federal Energy Regulatory Commission (FERC), benefitting clean energy development in Nevada.

The rule is similar to some of the proposals Senator Reid included in the Clean Renewable Energy and Economic Development Act.

### Finalized Loan Guarantees

The Department of Energy finalizes loan guarantees that supports the construction of the largest solar power tower in the world, outside of Tonopah, and for three geothermal projects throughout rural Nevada.

Earlier in the year, the Department of Energy also finalizes a loan guarantee to construct the ON-Line that will enable wind and solar energy resources from across the West to deliver power to new markets in the southwest and California.

2010

2011

# 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.

## SOLARRESERVE

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.

When completed, the project will be 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 will employ 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.<sup>11</sup> This financing option was made available by Congress in March 2009 when it passed the American Recovery and Reinvestment Act, which included \$6 billion<sup>12</sup> to assist in the rapid deployment of renewable energy and electric power transmission projects. The financing provided by the Department of Energy loan guarantee was vital to the success of the project because many com-



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

mercial markets have not fully recovered from the recession and economic downturn, as evidenced by the fact that the Department of Energy received more applications for loan guarantees than they

could potentially support under statutory and fiscal limitations of the program.<sup>13</sup>

In order to secure the loan guarantee and to help make the project a reality, the developers of Crescent Dunes had interactions with a wide range and a large number of federal, state, and local government agencies. Examples of some of the most notable interactions that helped to make this project a reality occurred between the Department of Defense and its Scientific Advisory Board on the siting of the proj-

### 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

ect 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 and to commence construction on the Crescent Dunes project also allowed it to qualify for Treasury Department's (Section 1603) grant in lieu of tax credit 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.



*Wind turbine foundation construction at the Spring Valley project near Ely.*



*Construction workers at Ormat's McGinness Hills geothermal plant in Lander County.*

### 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 is currently constructing 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 to ensure

project could be permitted 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.

### ORMAT GEOTHERMAL

Ormat is a world leader in geothermal power and is the only vertically integrated provider of geother-

mal 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 is presently working 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

### 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

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 (Section 1603) grant in lieu of tax credit program. In September 2010, Ormat received \$108.2 million for specified energy property in lieu of tax credits relating to its North Brawley geothermal power plant in California. The funding received through this tax credit program (see 2009 on timeline)

### 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

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 also 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 in grants 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 once the research and demonstration projects are fully executed.

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

The ON-Line project is a 500 kilovolt (kV) AC transmission line that will run 235 miles through 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, NV Energy will also gain the ability to jointly dispatch 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. 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 region that wants to market its renewable energy resources.

The ability to secure the \$363 million loan guarantee from the Department of Energy required a great deal of coordination with several entities 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 agreements set forth the terms and conditions of developing, constructing, operating, and owning the transmission line.

### 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 advance 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 and is the developer of the Silver State North near Primm, Ne-

vada. In the coming years, First Solar is also expected to expand its development at the site near Primm and export the clean renewable energy to a major utility in California. 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, is employing 300 people during construction, and is located on approximately 600 acres of public land. 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 the 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 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.

### 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

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 in lieu of tax credit program have played an important role in the development of the Stillwater project. Specifically, the 1603 grant program has

## 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

been particularly helpful as it has alleviated problems with monetizing the more conventional renewable energy tax credits offered through other federal programs. Overall, monetization of tax credits 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.



*The Stillwater hybrid plant outside of Fallon.*

# Growing Nevada's Clean Energy Economy

The case studies and timeline found in this report help to demonstrate that specific efforts at the federal level have driven investment in clean energy in Nevada. These efforts have helped the six case study projects featured in this report bring more than \$1 billion in estimated financial benefits to Nevada's local and state governments, created more than a thousand jobs, and are helping to accomplish some of the goals outlined in recent economic diversification reports.

To make sure 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.

## **EXTENSION: TREASURY DEPARTMENT'S GRANT IN LIEU OF TAX CREDIT PROGRAM**

The U.S. Department of the Treasury's Section 1603 grant in lieu of tax credit program was first enacted by Congress in the American Recovery and Rein-

vestment Act of 2009. This program provides cash grants to project developers for renewable energy projects that qualify for the renewable energy production and/or investment tax credits. Originally, this program was to expire at the end of 2010, but as the 2010 expiration date approached it was clear that the tax equity markets were still unreliable and they were jeopardizing billions of dollars in clean energy investment nationwide.

Therefore, Congress extended the program for an additional year as part of the Tax Relief, Unemployment Reauthorization, and Job Creation Act of 2010. According to a Lawrence Berkeley National Laboratory study, the program has enabled hundreds of renewable energy projects to move forward and saved over 55,000 American jobs. The extension has also proven to be an effective way of temporarily replacing the value of the tax equity market because as of October 31, 2011, it has funded over 22,000 projects worth \$33 billion and supported 14.2 GW in installed capacity. In Nevada specifically, the program has assisted 45 renewable energy projects all across the Silver State.<sup>14</sup>

The importance of extending this program for at least an additional year to Nevada and the nation is highlighted by the fact that in 2012 there's not expected to be enough tax equity to meet demand. For instance, in 2011 the U.S. Partnership for Renewable Energy Finance estimated that there was a total of \$7.5 billion available through tax equity and the Treasury

Cash Grant. They project that there will only be \$3.6 billion in tax equity available in 2012, which is far less than recent history suggests will be needed. Therefore, failing to provide an extension of this program in the immediate future would jeopardize Nevada's and the nation's ability to make the transition to a clean energy economy.

## **ENACTMENT: 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.



**ENACTMENT: 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.

**ENACTMENT:  
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, inadequate, and does not offer the state-of-the-art transmission system that is needed to access 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 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 and Federal Energy Regulatory Commission would facilitate the permitting and construction of needed transmission capacity.

# 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>14</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 achieve significant and sustainable economic growth

and 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 ensure continuously improving 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 so 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 technologies.

The challenge in this age of austerity 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 all work

together to fend off attacks and budget cuts that might push investment beyond Nevada's borders. 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 process for new generation and transmission projects. Nevada's economic future will be much brighter if we can make the Silver State into the vibrant core of a Western and national clean energy market opportunity unlike anywhere in the world.



*The solar photovoltaic array at Nellis Air Force Base.*

# Citations

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