

# Accounting for All of the Benefits of Renewable Energy Production

## NEITF TAC on Clean Energy Sources

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# Benefits of Renewable Energy

- **Green** – Reduces or eliminates fossil fuel generation
  - Reduces emissions, global warming, etc..
  - Nevada is on track to be >80% dependent on natural gas



## How is it valued?

- State mandated Renewable Portfolio Standards (RPS)
- Federal Clean Power Plan

# Benefits of Renewable Energy

- **Environmental Protection - land use**
  - Renewables don't require fuel infrastructure – can be built basically anywhere
  - BUT – must be environmentally conscious
  - Land use efficiency; MWh vs. acres disturbed
    - Varies per renewable technology

## How is it valued?

- No specific value applied

# Benefits of Renewable Energy

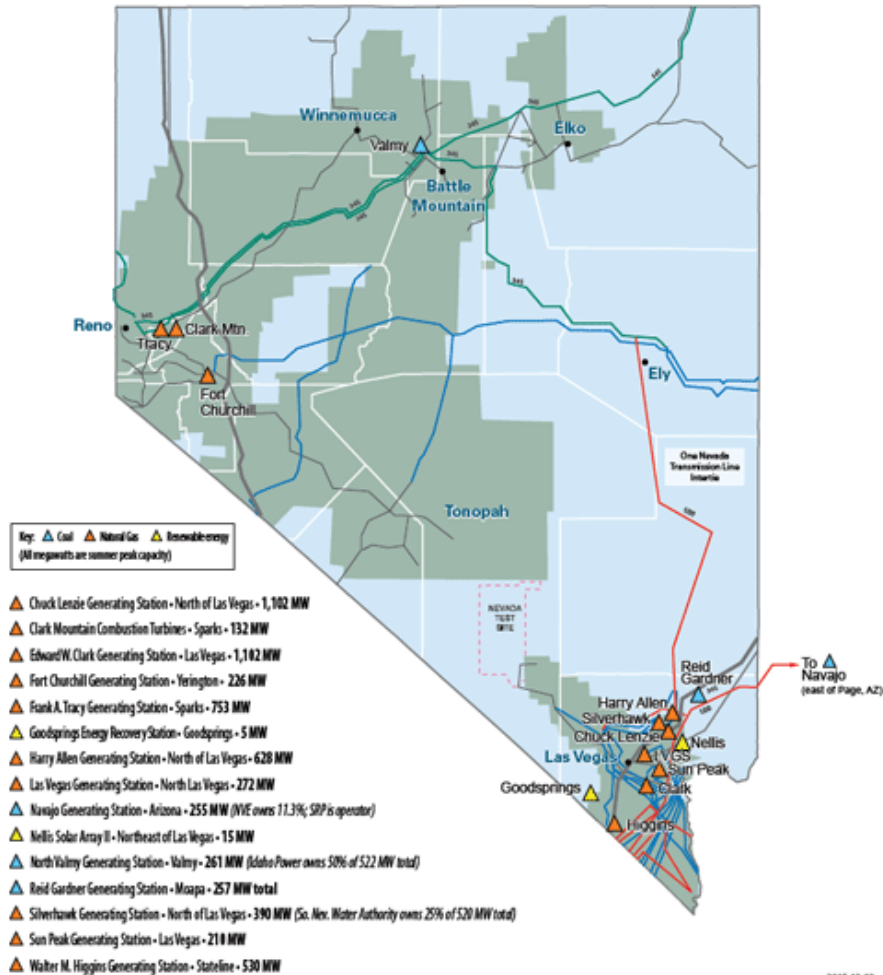
- **Less centralized Generation** - Generation throughout the grid system
  - Inherently more distributed than fossil fuels
    - Smaller power plants in more locations
  - Builds stability and reliability throughout a grid system
    - With reliable generation (ancillary services)
    - A balanced portfolio is crucial for reliability
  - Generation that better matches load growth/need

## How is it valued?

- No specific value applied

# Renewable Energy in Nevada

## NV Energy Generating Resources



## NV Energy's Renewable Energy Sources



# Benefits of Renewable Energy

- **Nevada Resources** – home grown
  - Local resources for local consumption
  - Local resources for export
    - Nevada gets ALL the economic benefit, other states pay for it
    - BUT – these projects pay wheeling fees to export energy, reducing competitiveness
    - The same fee applies to out of state resources traveling to CA
  - No natural gas or coal is produced in Nevada

## How is it valued?

- No specific value applied



# Benefits of Renewable Energy

- **Pricing stability** – absence of fuel volatility
  - Today – fuel costs are passed on to the ratepayer, therefore assuming this risk (without any influence or control)
  - Renewables have no fuel cost
  - Renewables can offer fixed pricing, no volatility
    - Ratepayers benefit the most from fixed and stable energy pricing
  - Existing renewable facilities that re-contract (NV geothermal) can offer discounted power – don't need significant work

## How is it valued?

- ONLY when fuel energy rates are higher



# Benefits of Renewable Energy

- **Load Following** – ability to match load profile
  - A balanced portfolio of technologies is imperative to meet load profile
    - E3, Low Carbon Grid Study (CA) as examples
  - Over reliance on one technology is not a solution – it's a problem
    - California has acquired too much intermittent power, and serious issues have arisen
  - Intermittent sources (solar & wind) must be backed with on-demand sources (integration costs)
  - Renewables are providing on-demand services today (geothermal)

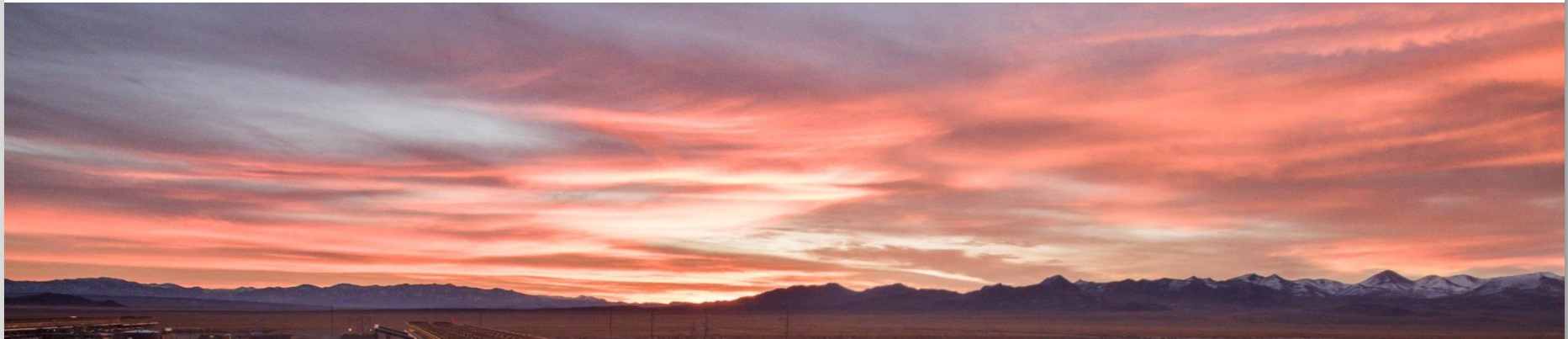
## How is it valued?

- (see next slide)

# Benefits of Renewable Energy

## How is it valued?

- No specific value applied
  - CA's planning process (CPUC) is determining integration costs for intermittent resources
  - PUCN docket #16-07001
  - Ancillary services are not currently quantified



# Benefits of Renewables

- **Green** economic benefits – directly into the state

- Constructions costs/capital investment
- Construction jobs

**Short Term**

- Long term jobs/salaries
- Purchases – goods, services (includes sales & use taxes)
- Property taxes
- Federal rents & royalties reinvested into the state
- Other state taxes

**Long Term**

## How is it valued?

- (see next slide)

# Benefits of Renewables

## **Short Term - How is it valued?**

- GOE's tax abatement program

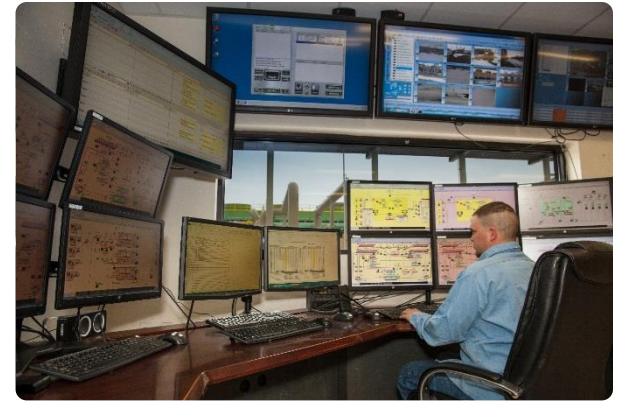
## **Long Term - How is it valued?**

- No specific value applied in resource selection

# Economic Benefits – Long Term

## What are they worth?

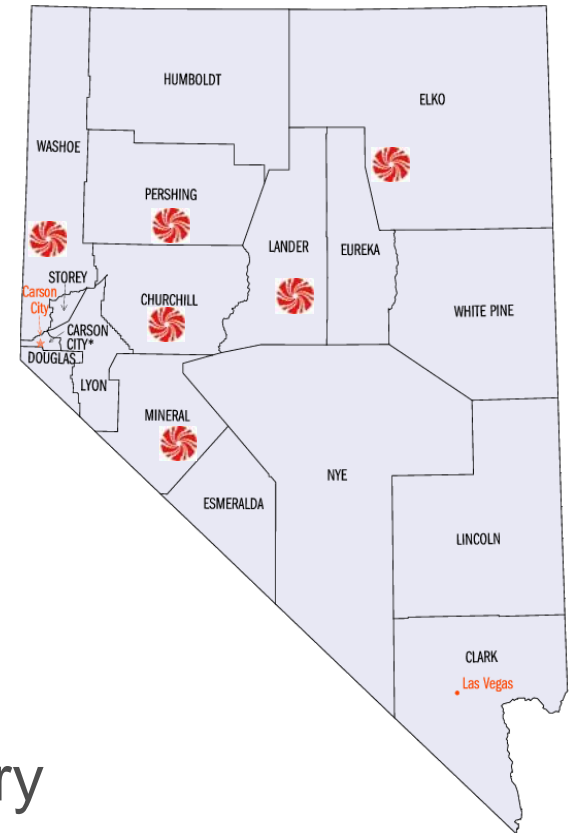
- Direct costs retained **in Nevada** for a typical 30 MW project
  - Based on Whalstrom & Associates report, 2011
- Operations (Purchases & employment)
  - Labor & contractor costs - \$3.6M
  - Materials & Equipment – \$1.4M
  - Royalties - \$0.2M
  - **Total - >\$5M annually – 29 new jobs**
- USGS estimates ~900MW of proven geothermal in Nevada
  - **\$150M in annual investment – 870 long term jobs**
- There is no value applied in resource selection for this benefit



# Economic Benefits – Long Term

## What are they doing today?

- Direct costs retained **in Nevada** by Ormat in 2015
  - 243 MW in operation
- Operations (Purchases & employment)
  - Labor & contractor costs - \$20M
  - Materials & Equipment – \$49M
  - Royalties - \$1.5M
  - Property taxes & NPMT - \$4M
  - **Total - \$74M+ annually – 240 jobs**
- Representative of the geothermal industry
- These benefits will **INCREASE** with more projects



# Economic Benefits – Renewables bring more!

- Renewables bring more benefits than fossil fuels
- Jobs - compared to natural gas
  - Geothermal - 20 times more jobs/MW
  - Solar PV – 10 times more jobs/MW

**Table 1: Comparative Job Creation**

Power Source	Construction Employment (jobs/MW)	O&M Employment (jobs/MW)	Total Employment for 500 MW Capacity (person-years)
Geothermal	4.0	1.7	27,050
Natural Gas	1.0	0.1	2,460

Source: US DOE<sup>iv</sup>

# How do we go forward?

- Policy has to drive an increase in renewable energy
- Utility and PUC must be GUIDED in decisions
- Economic benefits HAVE NOT been a major decisive factor
- Economic benefits MUST have a direct influence on resource selection
- Quantification of other factors that are not currently part of the rate evaluation



# How do we go forward?

- Establish an evaluation study (led by the Energy Office or 3<sup>rd</sup> party) based on actual data (from real projects)
  - Direct PUC to evaluate the value of intermittent, firm, and flexible renewables
  - Determine true economic benefits of renewable technologies
  - Provide clear direction (for the utility and the PUC) of preference of native Nevada renewable resources
    - Through a diversified portfolio to meet load profile demands and maximize the benefit to Nevada

# Nevada's RPS – A Growth Engine

## A Decade of Geothermal Development for Nevada

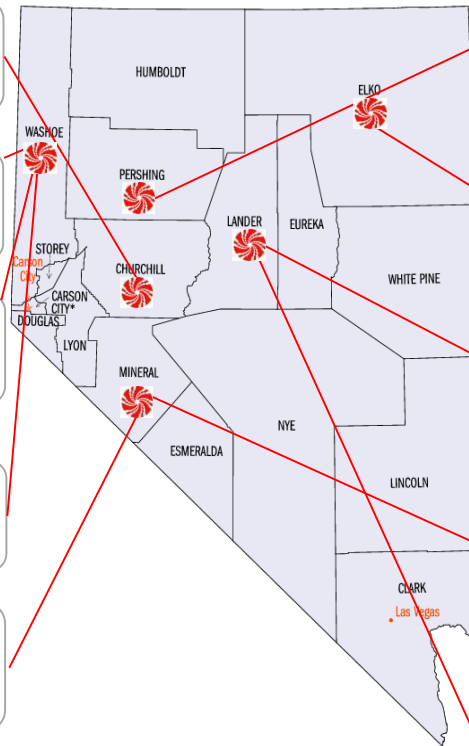
**Desert Peak II**  
13.7 MW, Online in 2006

**Galena I, Steamboat Complex**  
16 MW, Online in 2006

**Galena II, Steamboat Complex**  
7 MW, Online in 2007

**Galena III, Steamboat Complex**  
15 MW, Online in 2008

**Don A. Campbell Phase 2 Power Plant**  
19 MW, Online in 2015  
Expansion of Phase I



**Jersey Valley Geothermal Power Plant**  
12 MW, 2 plants total, Online 2010

**Tuscarora Geothermal Power Plant**  
18 MW, Online in 2011  
Developed in Category 1 sage grouse habitat

**McGinness Hills Geothermal Power Plant**  
38 MW, Online in 2012  
Developed in Category 1 sage grouse habitat

**Don A. Campbell Geothermal Power Plant**  
19 MW, Online in 2013  
First renewable energy provider to produce power in Nevada and sell the California using NV Energy's One Nevada Transmission Line

**McGinness Hills II Geothermal Power Plant**  
34 MW, Online 2015  
Expansion of McGinness Hills I