# Joint Interim Standing Committee on Growth and Infrastructure

*Hydrogen Uses for Utilities*

May 29, 2024

# Company Overview

- Service area covers nearly 46,000 square miles throughout Nevada and about 90 percent of the state's population

- We serve more than 1.5 million customers and a typical state tourist population of more than 54 million annually

- 2,485 employees statewide
  - Average tenure is 14 years
  - Half of our workforce represented by the IBEW
    - Local 396 in southern Nevada
    - Local 1245 in northern Nevada

# Renewable Energy Profile

- Our company has long understood the benefits of renewable energy and signed its first geothermal contract in 1987 – a decade before our state's Renewable Portfolio standard was established

- NV Energy achieved a Renewable Portfolio Standard of 39.7 percent and exceeded the renewable energy requirement in 2023 by 10%

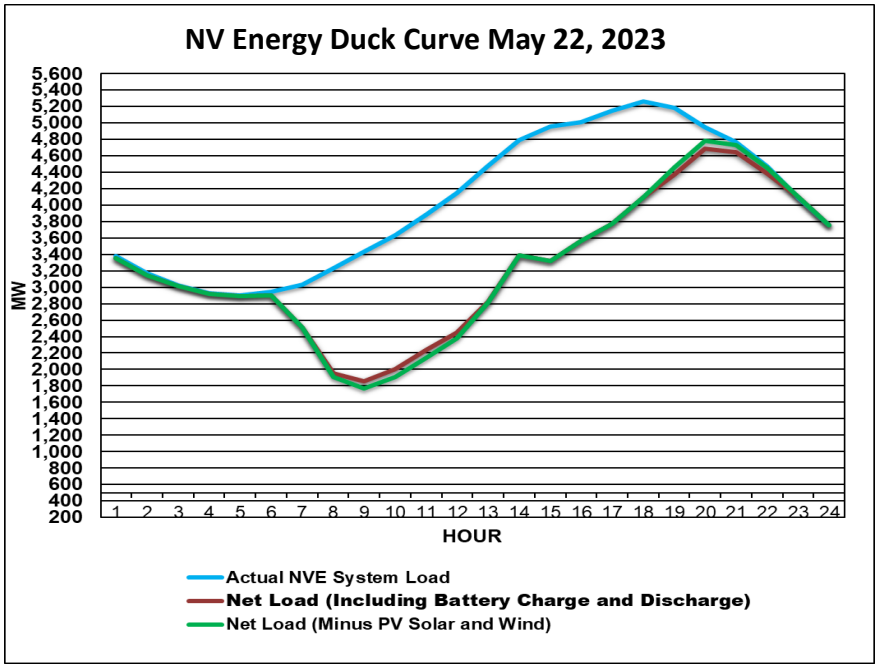
- We are well on our way to meeting Nevada's renewable portfolio standard requirement of 50% by 2030 and its net zero carbon reduction goal by 2050

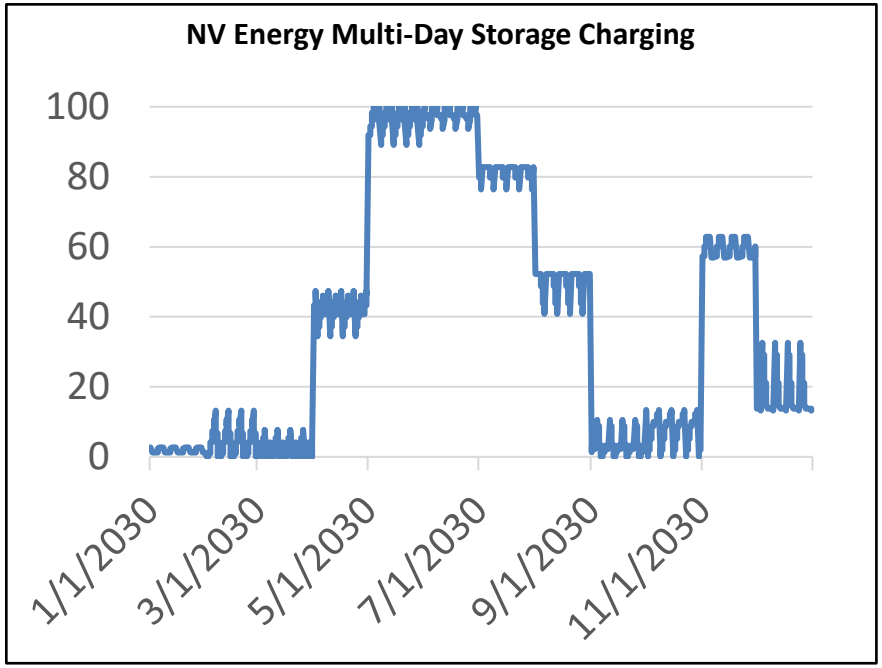
- Our current portfolio consists of 59 large-scale geothermal, solar, solar plus storage, hydro, wind, and biomass

# How Hydrogen Plays a Role as an Energy Storage Vector for Utilities

**Daily Energy Storage:** Hydrogen can be used to store excess electricity generated from renewable sources such as wind and solar during periods of low demand. The surplus electricity can be utilized to produce hydrogen through electrolysis, and the hydrogen can be stored for later use. When electricity demand increases, the stored hydrogen can be converted back into electricity using combustion in new or existing hydrogen capable turbines, thus enabling grid balancing and meeting peak demands.

**Seasonal Storage:** Hydrogen has the potential to address the challenge of seasonal energy storage. In regions with seasonal variations in renewable energy generation, excess electricity produced during peak seasons can be used to produce hydrogen and stored for use during low renewable energy generation periods. This allows for a more reliable and continuous energy supply throughout the year.



# Hydrogen In Nevada

- NV Energy produces over 4.5 GW of power from natural gas; to meet 2050 carbon goals, NV Energy will likely need to phase out production from the natural gas facilities, or modify the facilities to operate on green hydrogen
- Nevada is within the nation's sunniest region in North America while having significant available and abundant undeveloped land; this provides ample opportunities for integrated green power production from solar while hydrogen production is a form of energy storage that can help limit curtailed energy
- To maximize the advantage of significant solar resources, NV Energy is evaluating hydrogen sourcing to blend with natural gas; current combustion turbine technology can burn 10-20% hydrogen by volume in the feedstock stream by 2035 and with the capability to move to 100% hydrogen by 2050
- NV Energy's fleet of F-Class combustion turbines are expected to be able to operate on a 10% mix of hydrogen with modifications to fire protection, monitoring and purge systems; higher level of hydrogen would require replacement of the burners with different combustion configurations; the existing installations would also need to be investigated to determine how much additional oxidation catalyst would need to be added for emissions compliance; newer units with commercial operation date in 2025 will have capability to operate on 15% hydrogen

# Hydrogen Storage Opportunities for Producers and Technologists

- Utility scale energy storage systems based on hydrogen technologies are water intensive for both feedstock and cooling processes; these water requirements are troublesome because of Nevada's desert conditions and forecasted water supply
- Utility scale energy storage based on hydrogen technologies requires complex fuel cell, electrolyzer and compression systems that are currently inefficient, require extensive energy and are costly compared to lithium-ion battery systems