

# Austin Energy Generation Task Force

Wind/Compressed Air Energy Storage

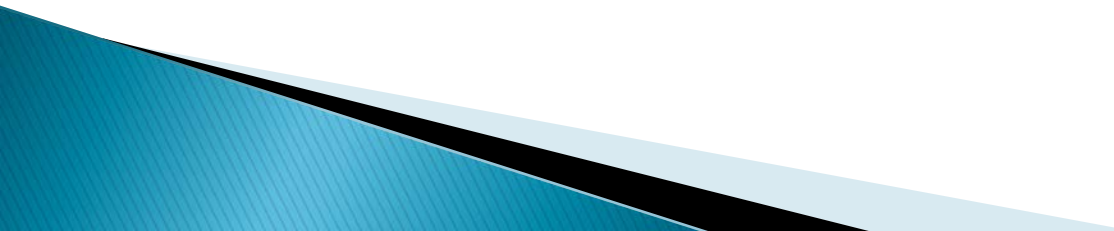
WindSoHy

Joe Spease, CEO

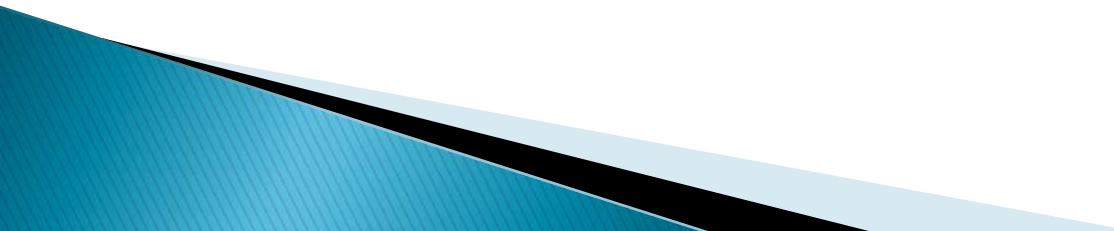
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# The WindSoHy Difference

## Wind/CAES/H2

- ▶ Unique technologies
  - ▶ Energy efficiency, reliability, sustainability
  - ▶ Major cost advantages
  - ▶ Clean; no fossil fuels used in our process
  - ▶ Lower cost of energy for customers
  - ▶ Supported by DOE
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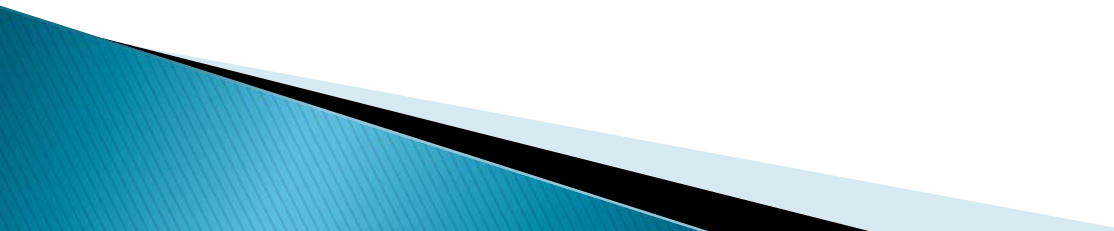
# Technological Advantage

- ▶ Wind power at night is the key element
  - ▶ Renewable, sustainable, clean
  - ▶ Compressed air is heated before hitting the turbine blades
  - ▶ Traditional CAES plants use NG combustion
  - ▶ WindSoHy uses H<sub>2</sub>/O<sub>2</sub>
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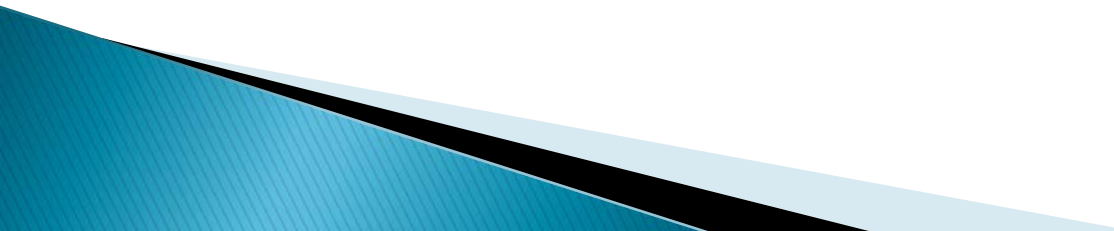
# NG Problems Going Forward

- ▶ Breakeven price for fracked gas \$8/mmBtu


Arthur Berman, Petroleum Engineer

- ▶ Fugitive methane at NGCC plants produces 2–5 times more GHG emissions than coal plants (Cornell study)
  - ▶ Casing failures at frack wells start at 5–10% in the first year and increase annually
  - ▶ Carbon taxes and cost to lower methane emissions will increase NG prices
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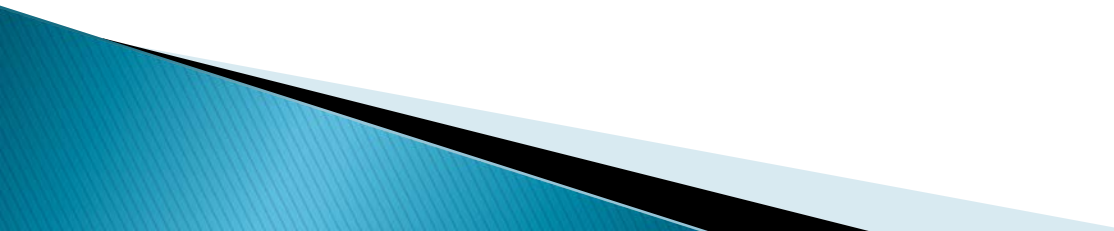
# Depleted Gas Wells for Storage

- ▶ Existing CAES projects use caverns mined from salt domes
  - ▶ WSH prefers depleted gas wells
  - ▶ Lower cost to develop and maintain
  - ▶ Large size allows for 2,000 MW CAES
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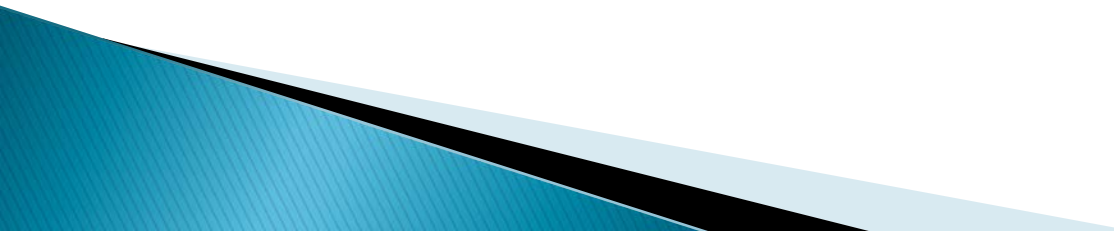
# WindSoHy Cost Advantages

- ▶ Wind, waste water and H<sub>2</sub> are a fraction of the fuel cost of NG (10–20%)
  - ▶ Electricity from fracked gas cannot compete with wind/CAES
  - ▶ NG price volatility is avoided
  - ▶ 1 cent per kWh for compression/H<sub>2</sub> charge
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# WSH Project Suggestions

- ▶ Bulk scale creates price advantage for customer
  - ▶ Oversize to produce energy for Ancillary Services (2000–3000 MW)
  - ▶ Sell excess energy on wholesale market
  - ▶ Produce H<sub>2</sub> to lower fuel costs for city vehicles
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# Project Funding

- ▶ DOE support for storage funding
  - ▶ Bond project financing support
  - ▶ DOE funding to lower project costs
  - ▶ DOE funding for vehicle conversion
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# WindSoHy CAES/H2 is Best Choice for Austin Energy

- ▶ Completely clean.
  - ▶ Lowest priced baseload power
  - ▶ Eliminates cost increases and volatility of fossil fuels
  - ▶ Plant efficiency and reliability higher than gas, coal, nuclear
  - ▶ Opportunities for project finance help from DOE are greater than NGCC
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