# Considerations for Austin Energy Resource, Generation, & Climate Protection Plan to 2035

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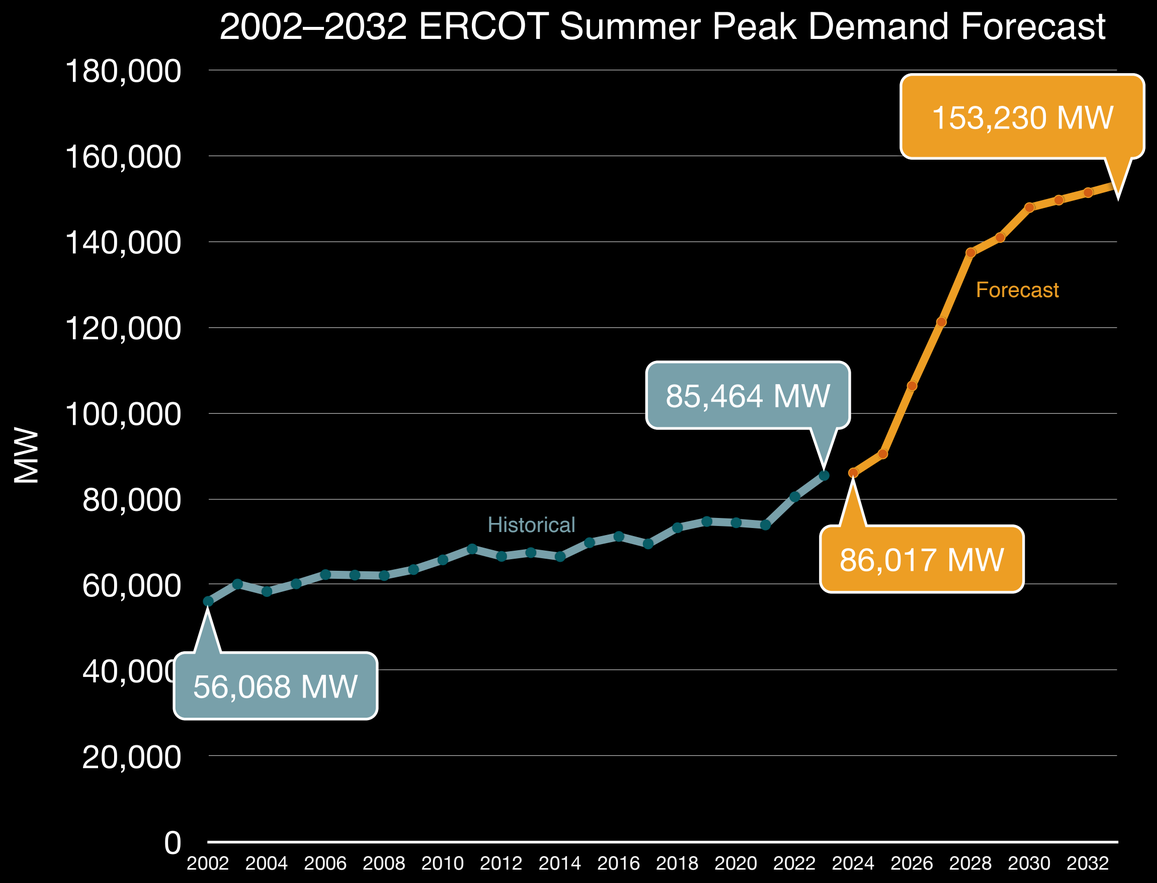
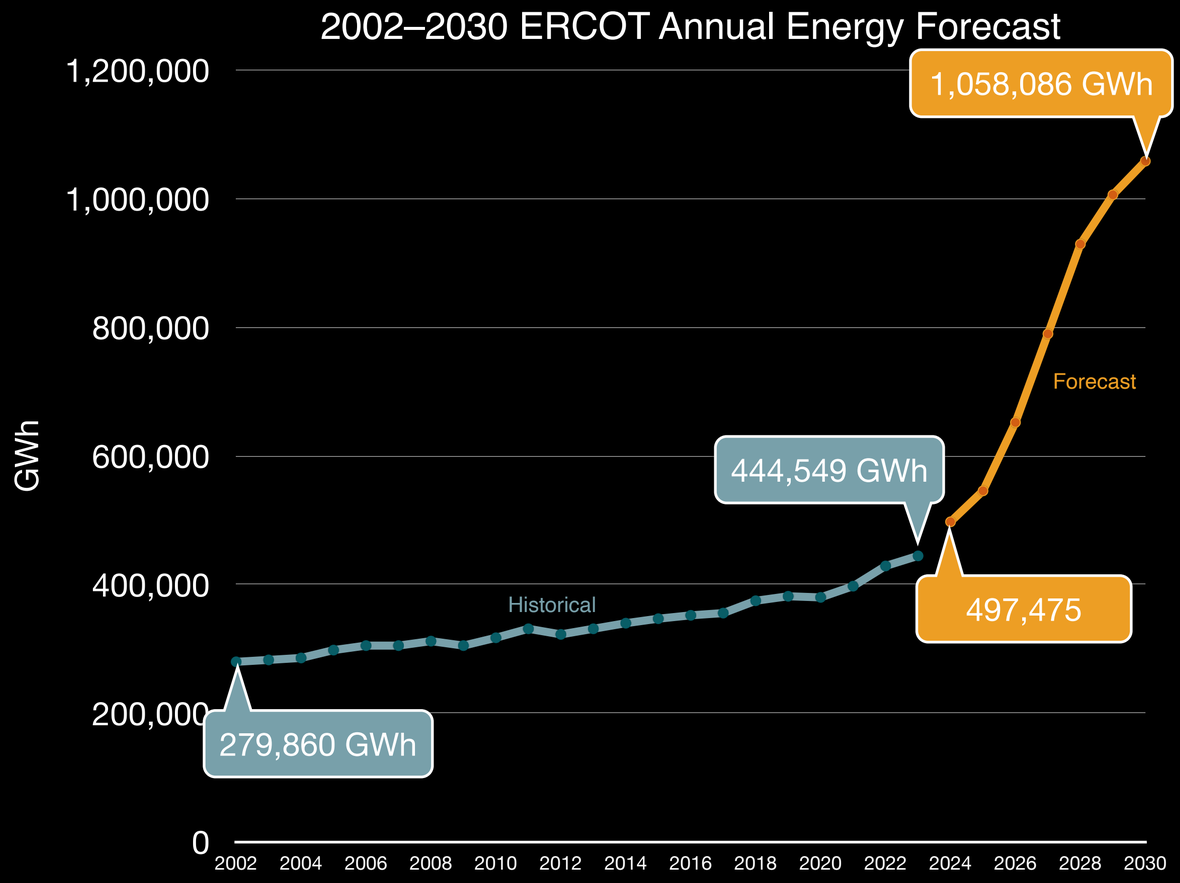
# ERCOT, Governor Abbott, Elon Musk, and environmental groups agree: Electricity demand is going up




source: https://www.ercot.com/gridinfo/load/forecast

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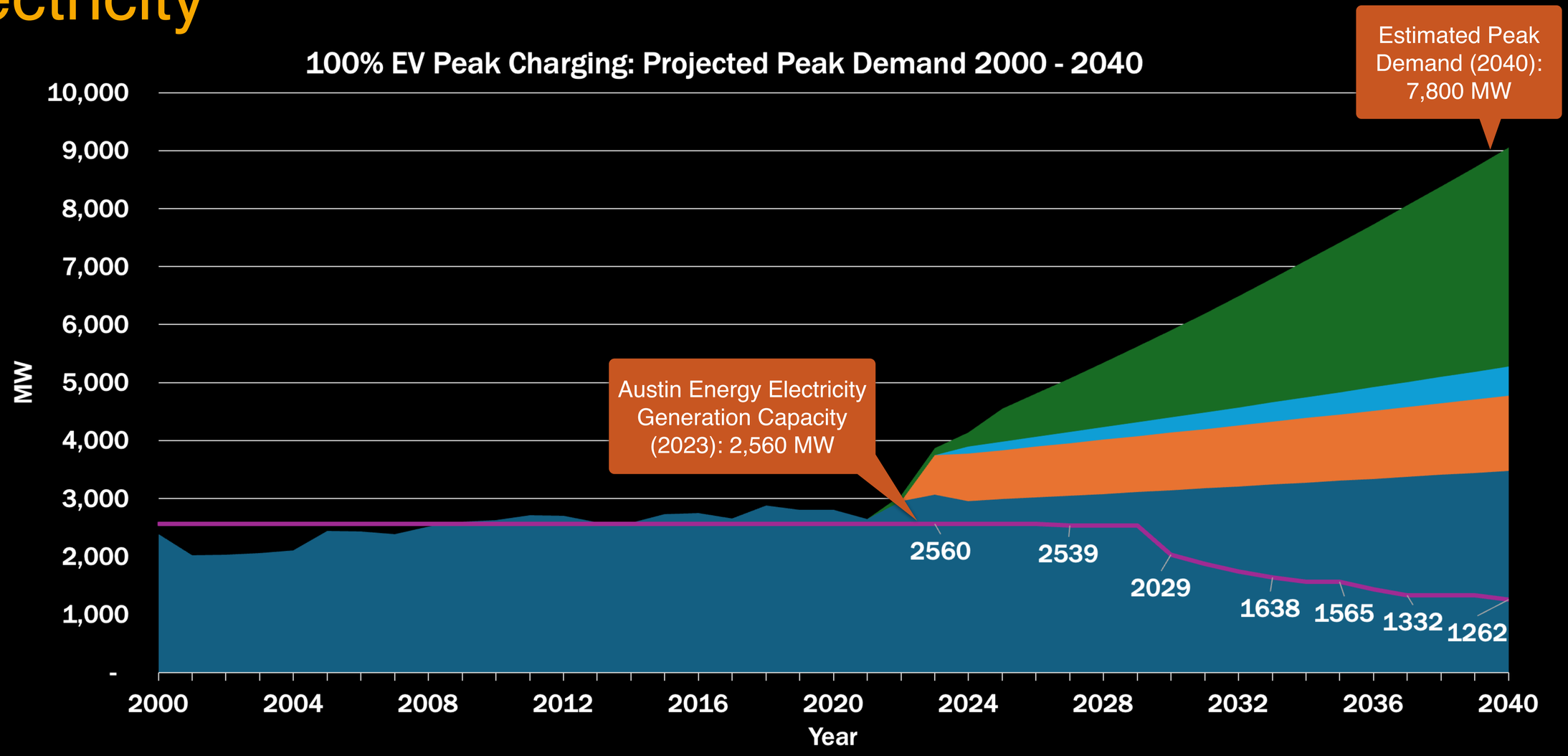
# The Challenge Before Us

Simultaneously expand and decarbonize the grid while the world is warming

# AE must prepare for an era of unprecedented growth in electricity



# Key Takeaways for AE

- Utilities (including AE) need to prepare for an era of unprecedented growth in electricity
- AE should expedite the deployment of a variety of supply and demand options to ensure resource adequacy while minimizing exposure to out-of-service area price volatility and transmission congestion fees
  - These resources include a mix of generation options (thermal, etc.) + demand side controls and options (rooftop solar, batteries, demand response, efficiency, etc.)
  - Opportunity to improve overall system performance and lower costs for customers
  - Updated fuel mix + electrification of vehicles and home heating/cooking will reduce emissions
  - Equity elements should also improve
- This is an opportunity to improve overall financial health of the utility (and therefore provide more benefit to the Austin community and customers)
- Key lens through which energy options should be considered: trade-offs

# Supply and demand options include a mix of generation resources + demand-side controls

- Generation options include:
  - Thermal power plants (e.g., hydrogen or gas turbines (w/ remote or on-site carbon management)
  - Renewing/replacing renewable power purchase agreements w/ wind or solar, targeting less congested areas
  - New solar in AE zone (commercial sites, parking lots, warehouses)

- Demand side controls include:
  - Efficiency (reducing the need for more electricity)
  - Batteries and other storage systems
  - Demand response
  - Residential rooftop solar

# An opportunity exists to improve overall system performance & lower costs for customers

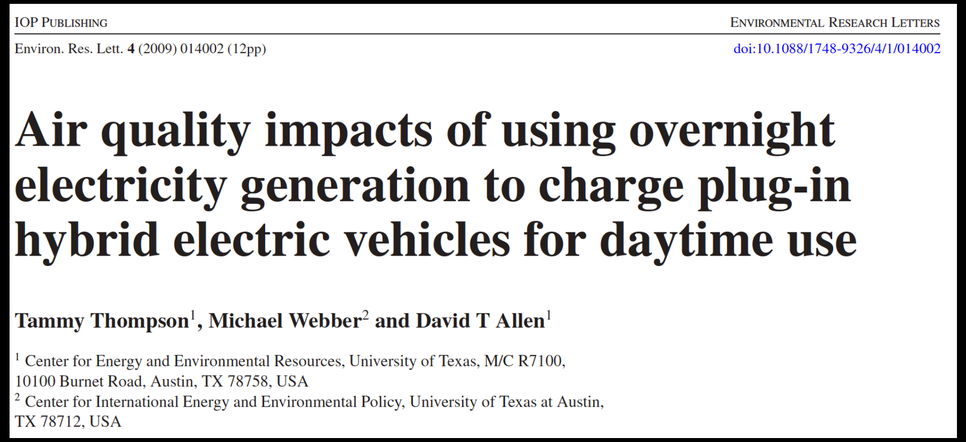
- Building dispatchable power within the AE service zone reduces exposure to significant financial risk from:
  1. Bulk grid price volatility
  2. Transmission congestion pricing
- Dispatchable power in the AE service zone also improves reliability for customers
  - Can provide voltage/frequency support
  - PPAs still have a part to play but are no longer as desirable b/c of new tax transferability rules + rising costs

# Equity Considerations

- Equity must be viewed holistically to include:
  - Fence-line pollution
  - Jobs and economic growth
  - Electricity cost
  - Electricity reliability
  - Other nuisances (noise, sight pollution, etc.)
- AE holding stakeholder workshops as part of resource generation plan process

# Environmental Sustainability Considerations

- Using electricity to displace gasoline or diesel in vehicles or natural gas in home heating/cooking systems has distinct environmental benefits
- Using FPP to charge EVs is environmentally beneficial compared to gasoline or diesel engines
  - –ICEs (internal combustion engines): daytime, urban, ground level tailpipes in heavily-populated urban areas
  - –EVs (electric vehicles): night-time, rural, smokestacks
    - Reduces the formation of photochemical smog (because of no sunshine at night) and human exposure b/c of less populous areas around smokestacks and dilution from higher-altitude releases that spread more quickly



IOP PUBLISHING ENVIRONMENTAL RESEARCH LETTERS

Environ. Res. Lett. **4** (2009) 014002 (12pp) doi:10.1088/1748-9326/4/1/014002

**Air quality impacts of using overnight electricity generation to charge plug-in hybrid electric vehicles for daytime use**

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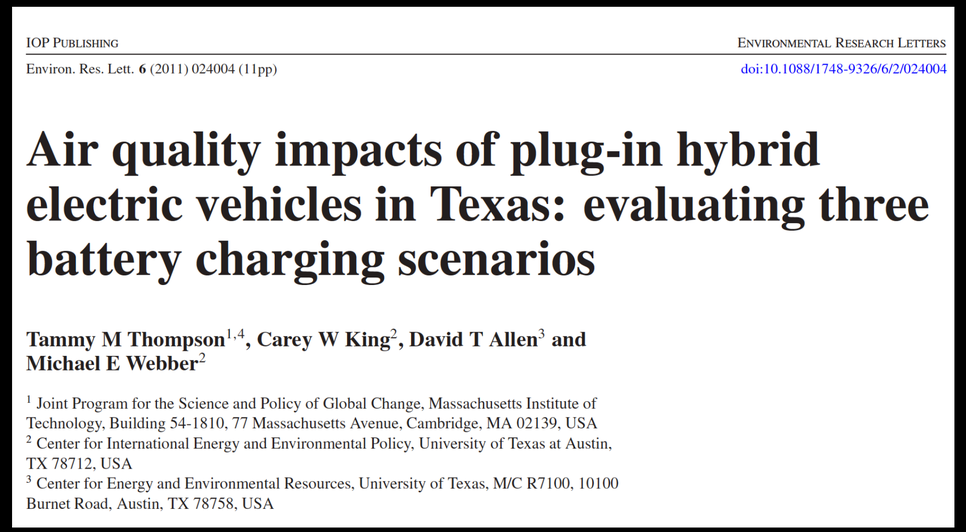

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Environ. Res. Lett. **6** (2011) 024004 (11pp) doi:10.1088/1748-9326/6/2/024004

**Air quality impacts of plug-in hybrid electric vehicles in Texas: evaluating three battery charging scenarios**

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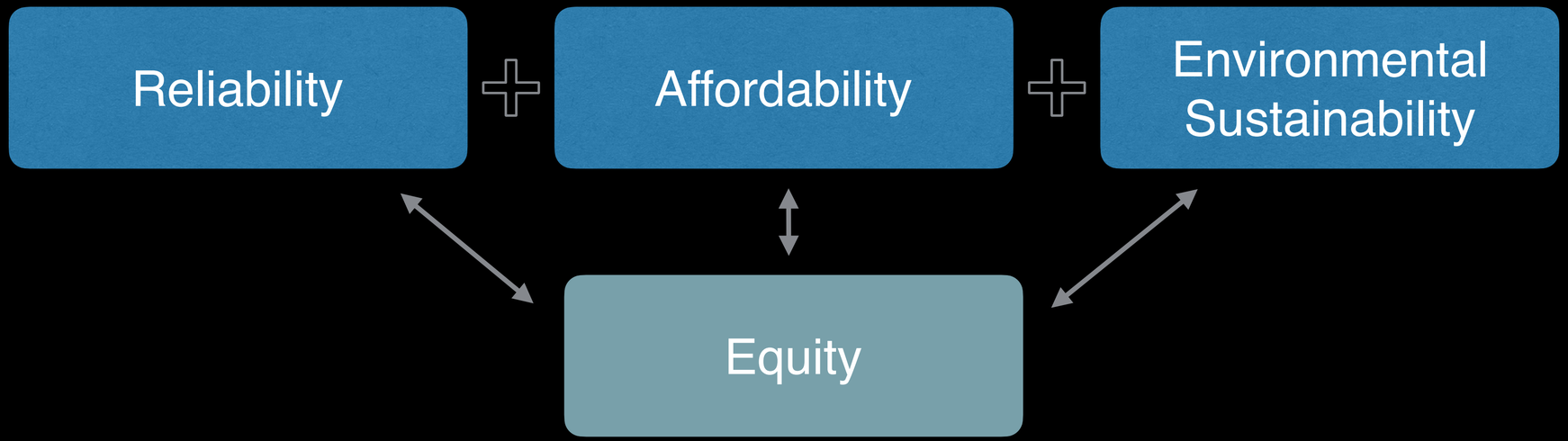
# Key Considerations for Policy-Makers

# Effective Policy Design Will Keep Tradeoffs in Mind

- What does it mean for policy-makers to understand AE's resource generation plan through the lens of trade-offs?
- Solutions that solve one element (e.g. cleanliness) might exacerbate other elements (e.g. affordability or reliability)



# Effective Policy Design Will Be Standards-Based Rather than Prescriptive

- Generally speaking, policies are more effective when they set (labor, environmental, reliability,…) standards then let market participants determine the best way to meet those standards
  - Example: Acid Rain mitigation via Clean Air Act Amendments in the early 1990s
    - Utilities were told to clean up their smokestacks, but were not told *how* to do so
    - Utilities had multiple options: cleaner coal, scrubbers, fuel-switching to natural gas, more efficient turbines
    - Benefit-to-cost ratio was 40:1 and acid rain was mitigated more easily and quickly than expected
- Generally speaking, policies are less effective when they mandate or prohibit specific fuels or technologies
  - Example: corn ethanol mandates
    - Competed with efficiency, electrification, mass transit, etc. for reducing oil imports for transportation
    - Impinged significantly on land and water resources (and some localized emissions)

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