

# **Nevada's Energy-Water Nexus: An Examination of Future Scenarios**

**Nevada Water Resources Association Annual  
Conference, March 6, 2008**

**Stacy Tellinghuisen,  
Water/Energy Analyst  
Western Resource Advocates**

**Charles Benjamin,  
Director, Nevada Office  
Western Resource Advocates**

# Project Introduction

**Goal 1:** Assess competing uses of water for municipal, agricultural, and energy demands in Nevada in 2015 and 2030

**Goal 2:** Recommend alternatives to minimize impacts on water demands – municipal conservation, energy efficiency, and renewable sources of energy

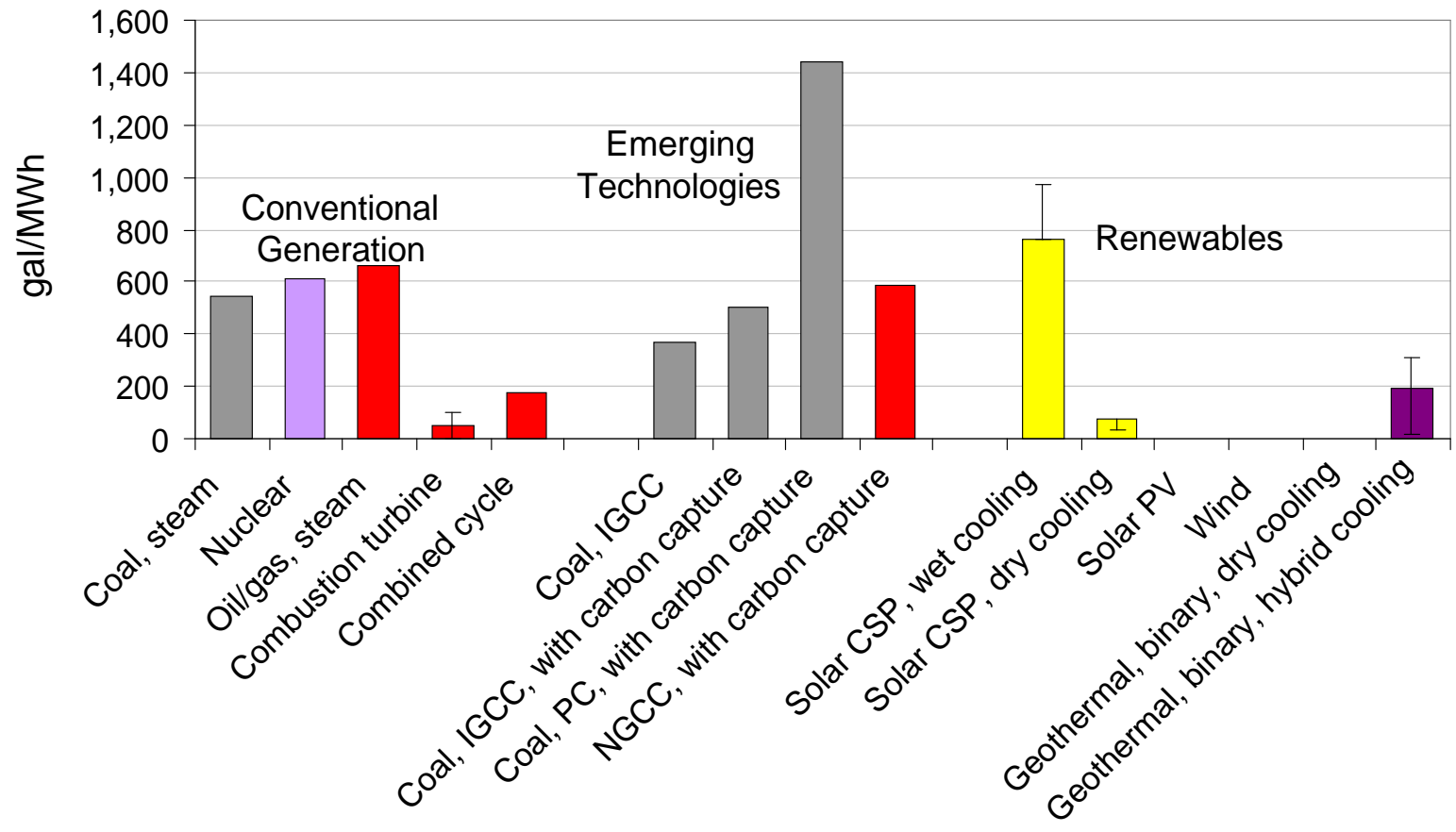
# Background

- **Water use for electricity generation**
  - Conventional generation
  - Alternatives

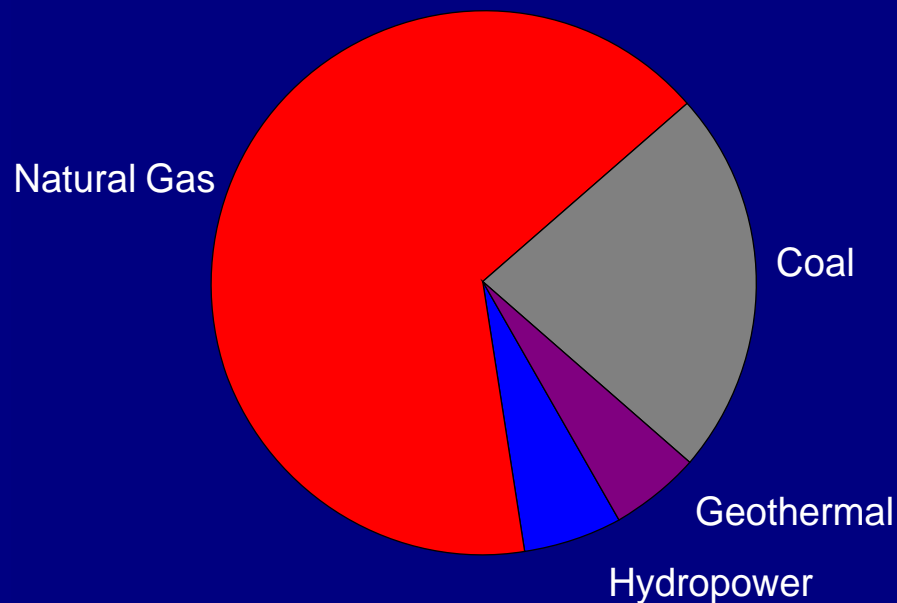


# Background

## Water Intensity of Electricity Generation



# Background: Electricity Generation, NV, 2006

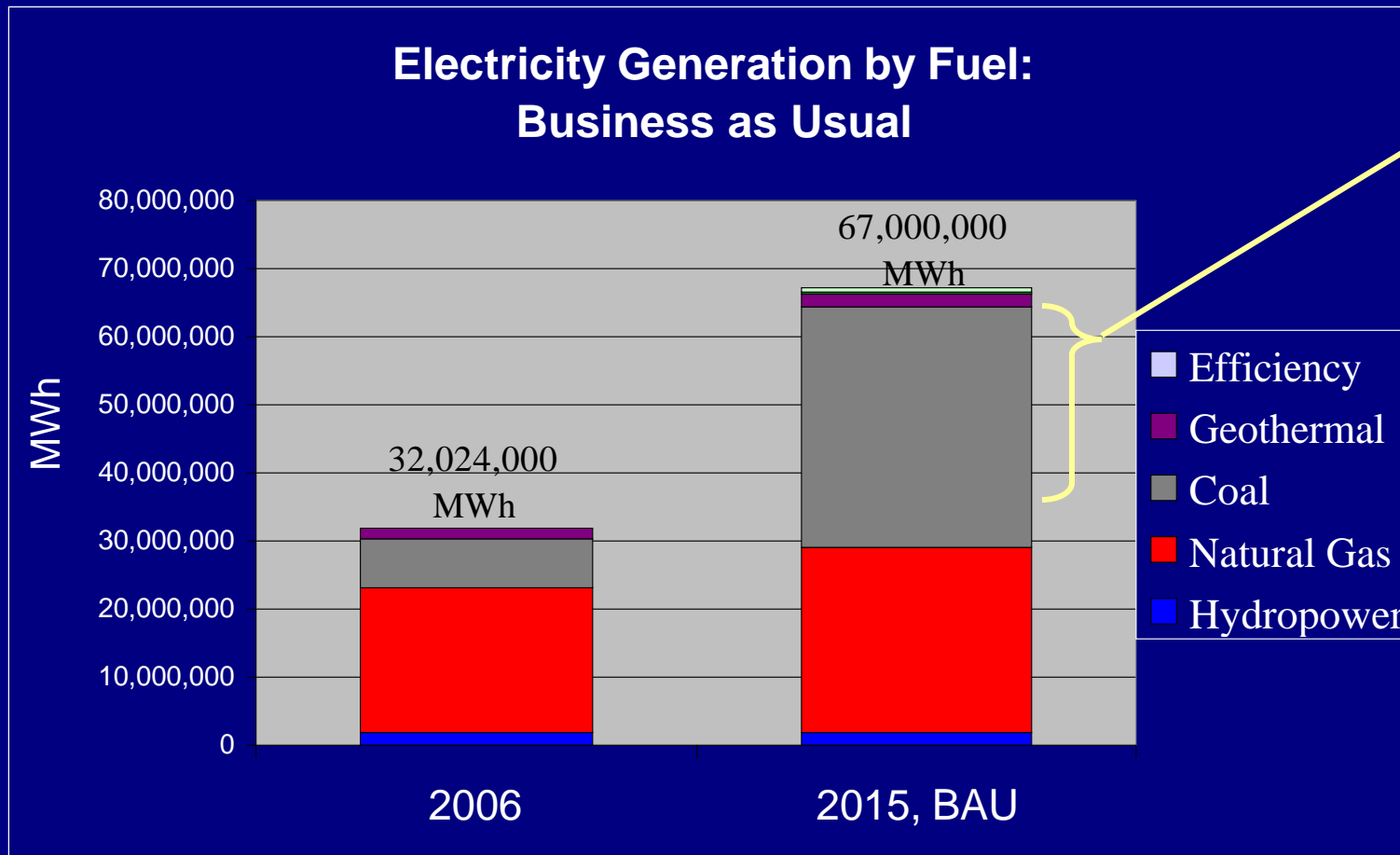


32,024,000 MWh



**~16,000 AF  
of water**

# Electricity Generation: 2015



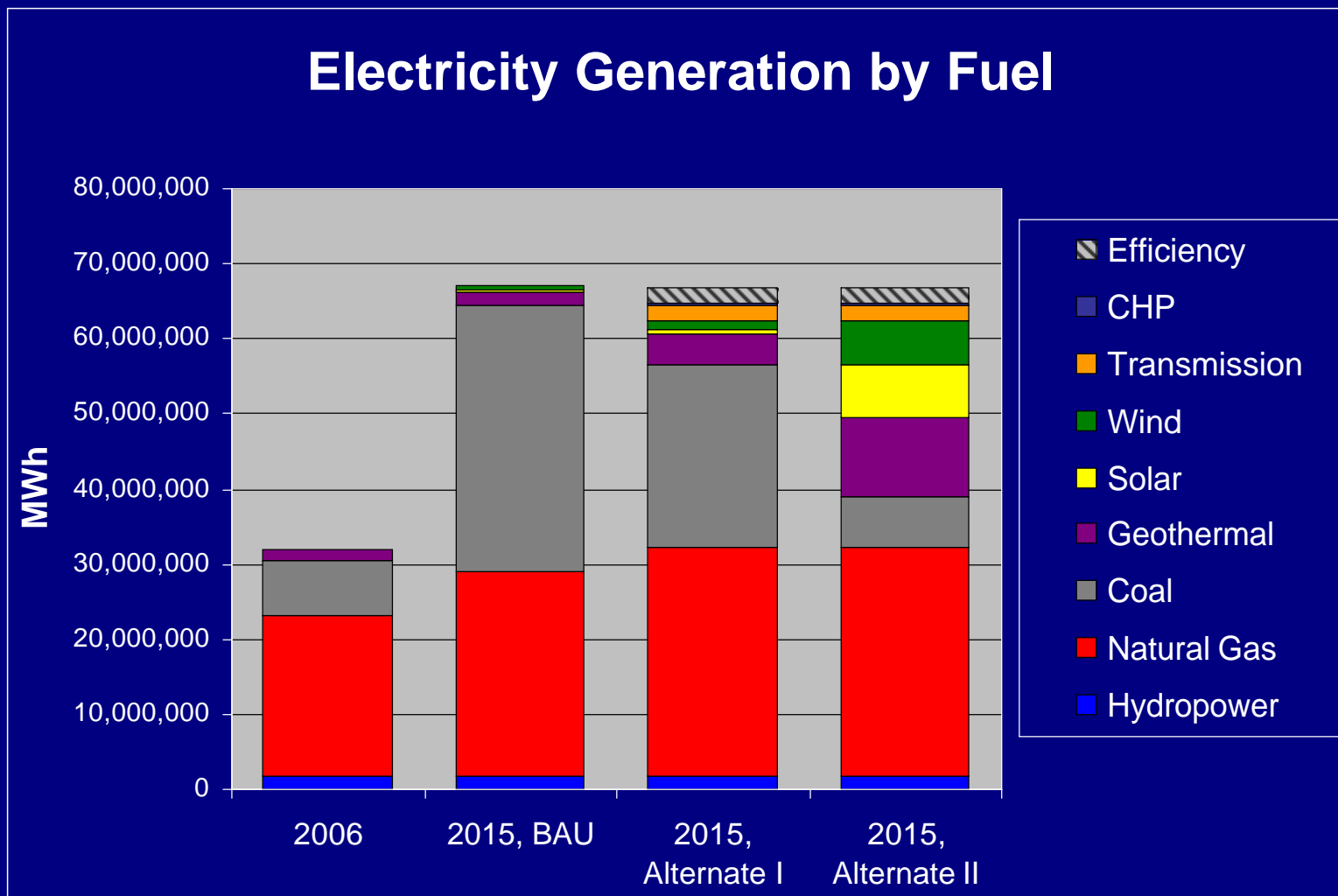
EEC,  
Toquop,  
White  
Pine

**Water Use: 16,000 AFY → 32,000 AFY**

# Electricity Generation: 2015

- Alternate I: Replace the planned EEC Phase I plants with energy efficiency, renewables, transmission, and combined heat and power
- Alternate II: Replace the EEC as described above, and Toquop and White Pine with generation from renewables

# Electricity Generation: 2015



**Water Use:**

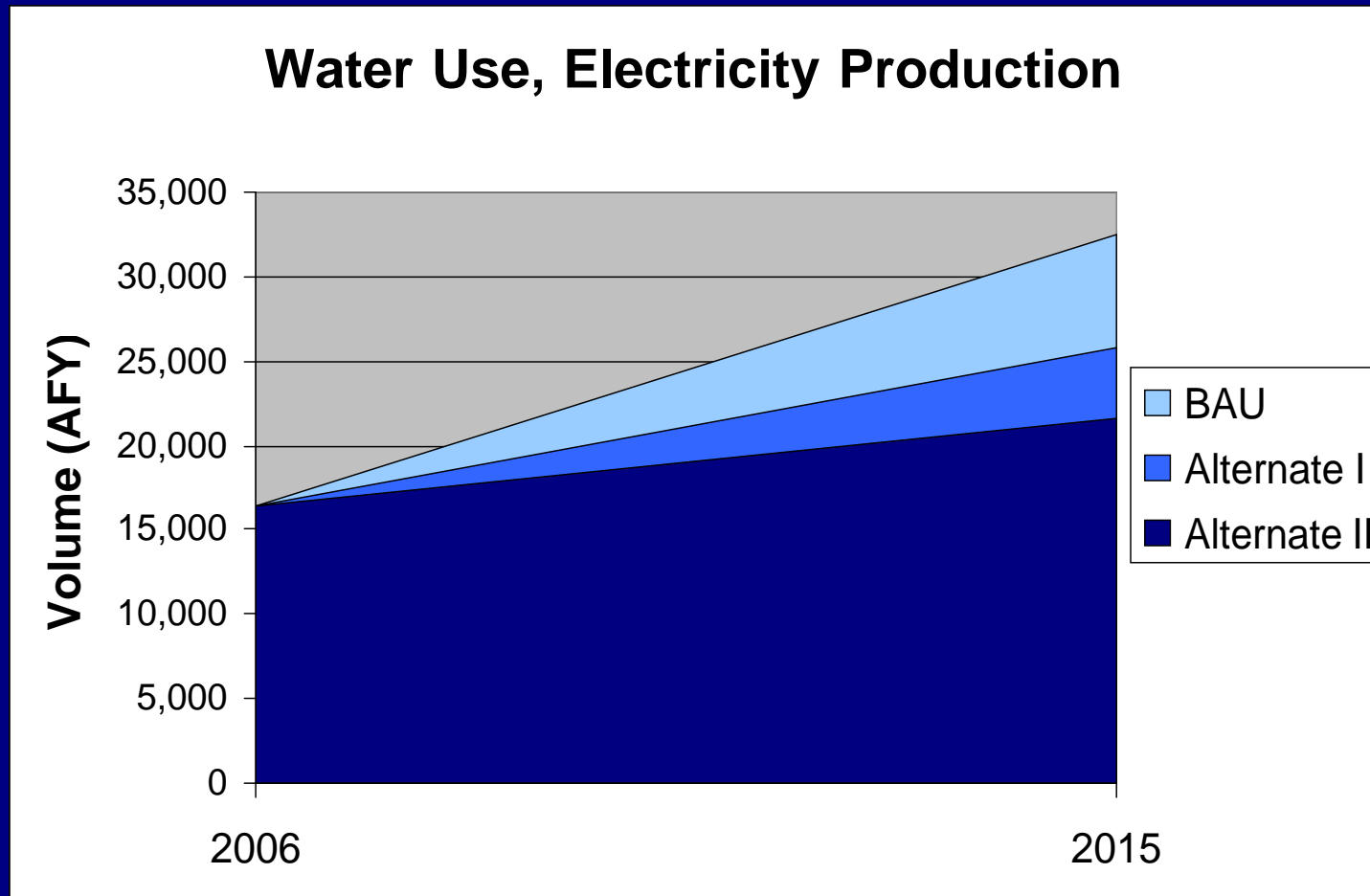
**16,500  
AFY**

**32,500  
AFY**

**25,800  
AFY**

**21,600  
AFY**

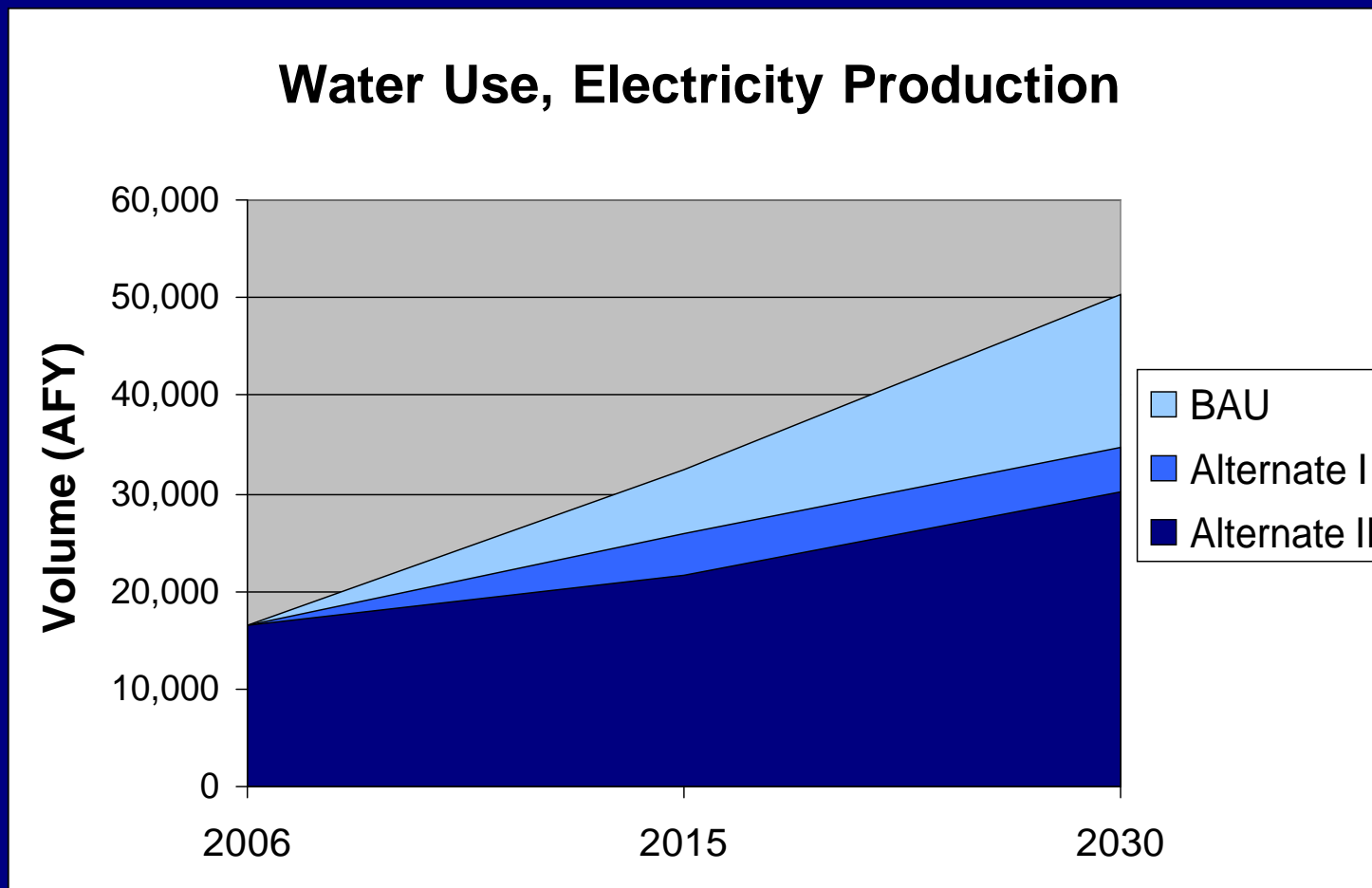
# Results: 2015



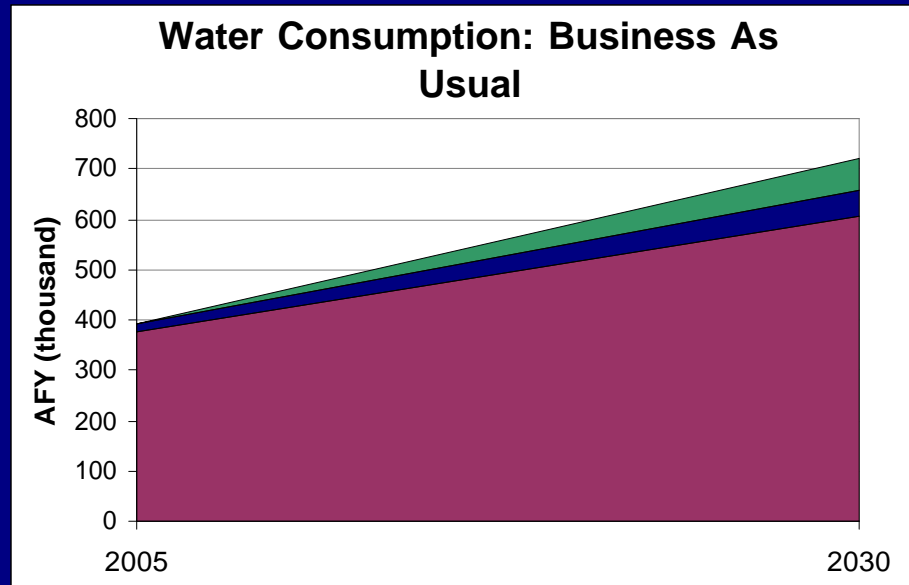
# Beyond 2015

- BAU
  - Continued reliance on conventional resources: large, baseload coal and natural gas plants
  - Assumption: new baseload plants require CCS
- Alternate Energy Scenarios I and II
  - Continued investment in renewable sources of energy

# Projected Water Use: 2030

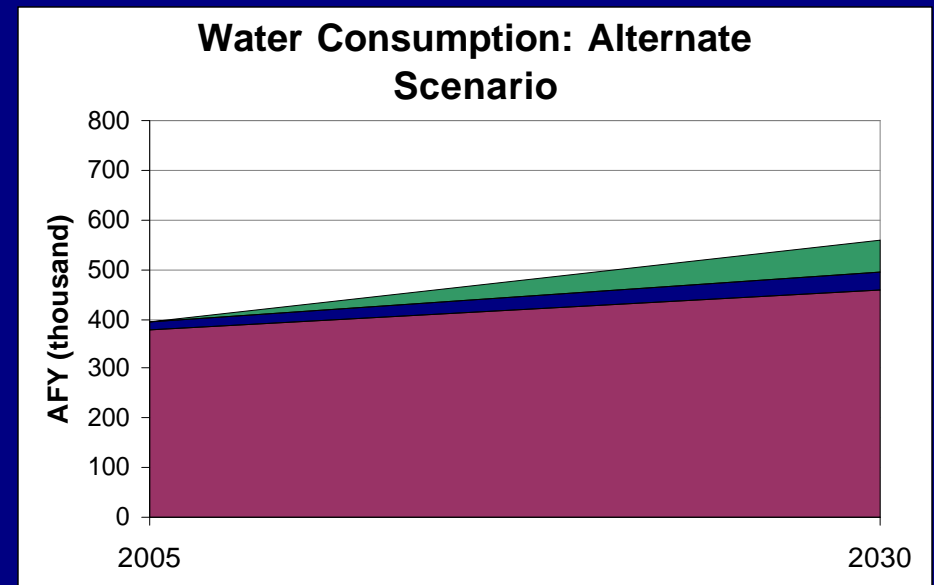


# Context: Competing Demands



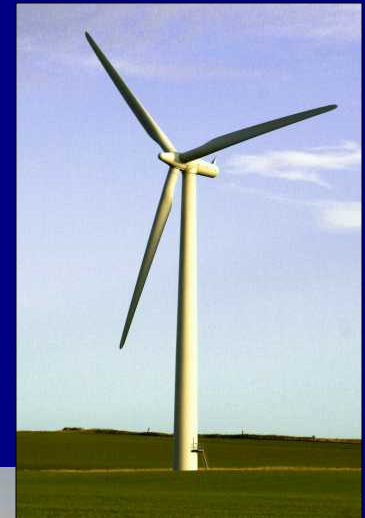
■ Municipal ■ Energy ■ Climate Change

- Sectors impacted by increasing demand: agriculture, environment

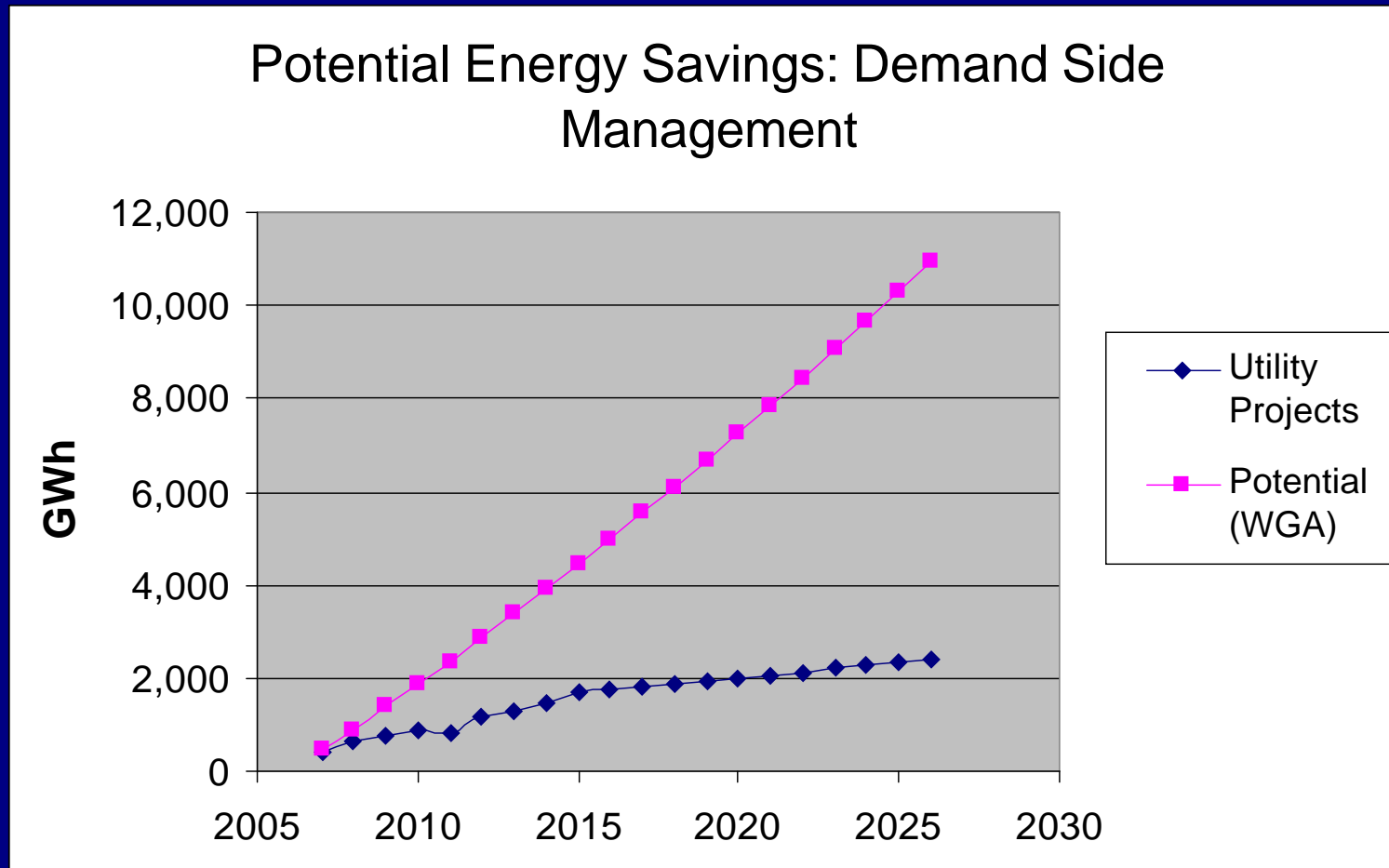


# Nevada's Potential for Renewable Energy

- Geothermal: 20,000,000 MWh
  - Wind: 55,000,000 MWh
  - Solar: 93,000,000 MWh
- 
- Alternate Energy Scenario II, 2015: ~21,000,000 MWh



# Additional Energy/Water Savings: Efficiency



# Other Factors

- Cost
  - Capital cost
    - Renewables
    - Dry cooling
  - Operating cost
    - Fuel prices
    - Carbon offsets
  - Risk
    - GHG regulation
- Transmission Needs



# Conclusions

- Competition for Nevada's limited water resources will increase
- Agricultural and environmental needs are most likely to be adversely affected
- Long range planning in the energy sector can reduce water demands – through investments in energy efficiency and renewable sources of energy

