

# WELCOME AND OVERVIEW

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Webinar:

**How Big an Issue is Intermittency?**  
Integrating Renewables Into a Reliable, Low-Carbon Energy  
Grid

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April 17, 2013

# Research & Thinking Leading Up to the New Synapse Report for CSI

The generation mix must address the public needs of:

- Affordability
- Reliability
- Water Availability/Quality
- Human Health
- Environmental Quality
- Climate Change

# Research and Thinking, Part 2

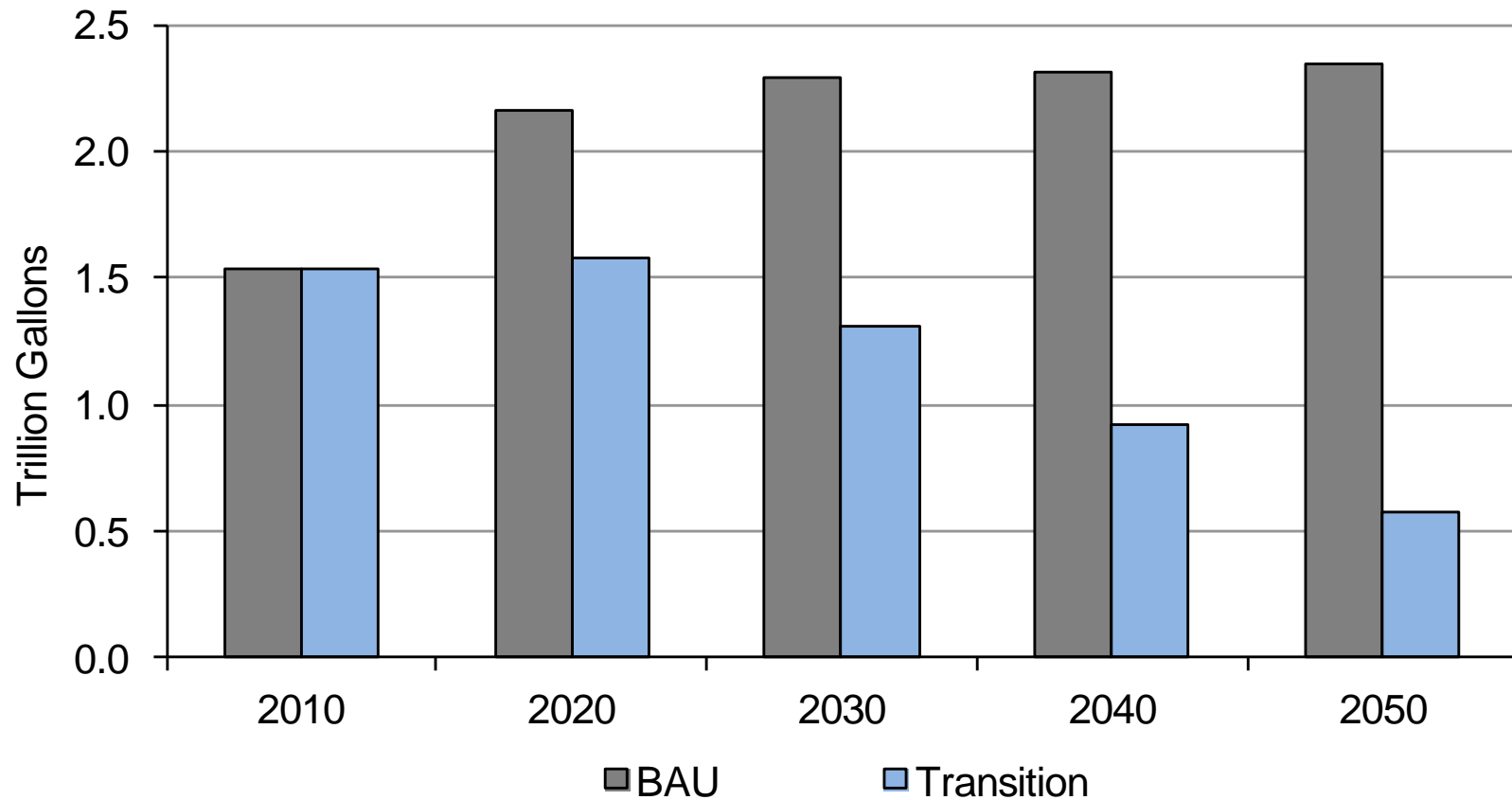
In 2011's *Beyond Business As Usual* report, CSI commissioned Synapse to analyze our ability to phase-out coal-fired power by 2050, as well as reducing reliance on nuclear and natural gas. Key assumptions:

- Purely on cost basis
- No direct subsidies taken into account
- Current technology
- No carbon price/policy
- Assessed externality costs (avoided premature deaths) separately

# Lessons from *Beyond Business as Usual* 2011

- Current technology can take us a long way in realizing a sustainable grid.
- It is cheaper to phase-out all coal and a portion of nuclear plants than to sustain or expand these generation technologies.
- Significant public health, environmental and climate (externality/hidden cost) gains can be made by phasing out coal-fired power.

# Example of Reduced Risks: Declining Water Consumption



## 2 Studies Address 2 Major Objections

- The 2011 report explored the first criticism of variable renewable penetration: **cost**, which was found to be manageable.
- This led to the Synapse's new 2013 report for CSI. It tackles the second major objection: **reliability** of high penetrations of variable, non-combustion renewables on the grid.