

Preliminary Findings from the New York Energy Efficiency and Renewable Resources Potential Study

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NYSERDA EMEP Conference
November 7, 2013
Albany, New York

Consultant Team

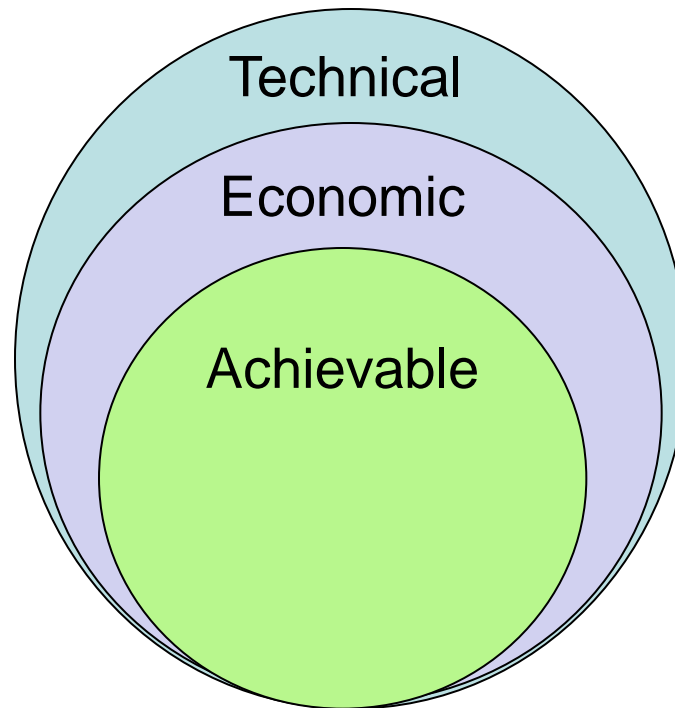
- ▶ Optimal Energy Inc. (OEI)
- ▶ Vermont Energy Investment Corp. (VEIC)
- ▶ American Council for an Energy-Efficient Economy (ACEEE)



Project Scope

- ▶ Assessment of long-term, 20-year potentials for:
 - End-use energy efficiency (EE)
 - Electricity, natural gas, and petroleum fuels
 - Residential, Commercial/Institutional, Industrial
 - Economic and Achievable Potential scenarios
 - Renewable energy (RE) resources
 - Grid-level electric generation
 - Customer-sited production of electric and thermal energy
 - Bounded Technical and Economic Potential scenarios
 - Assessment of Development Paths
 - Greenhouse gas and other air pollutant emission reductions associated with EE/RE

Conceptual Framework for Potential Study



General Methodology: Analysis by Zone

▶ Zones

- Long Island
- New York City
- Hudson Valley
- Rest-of-State

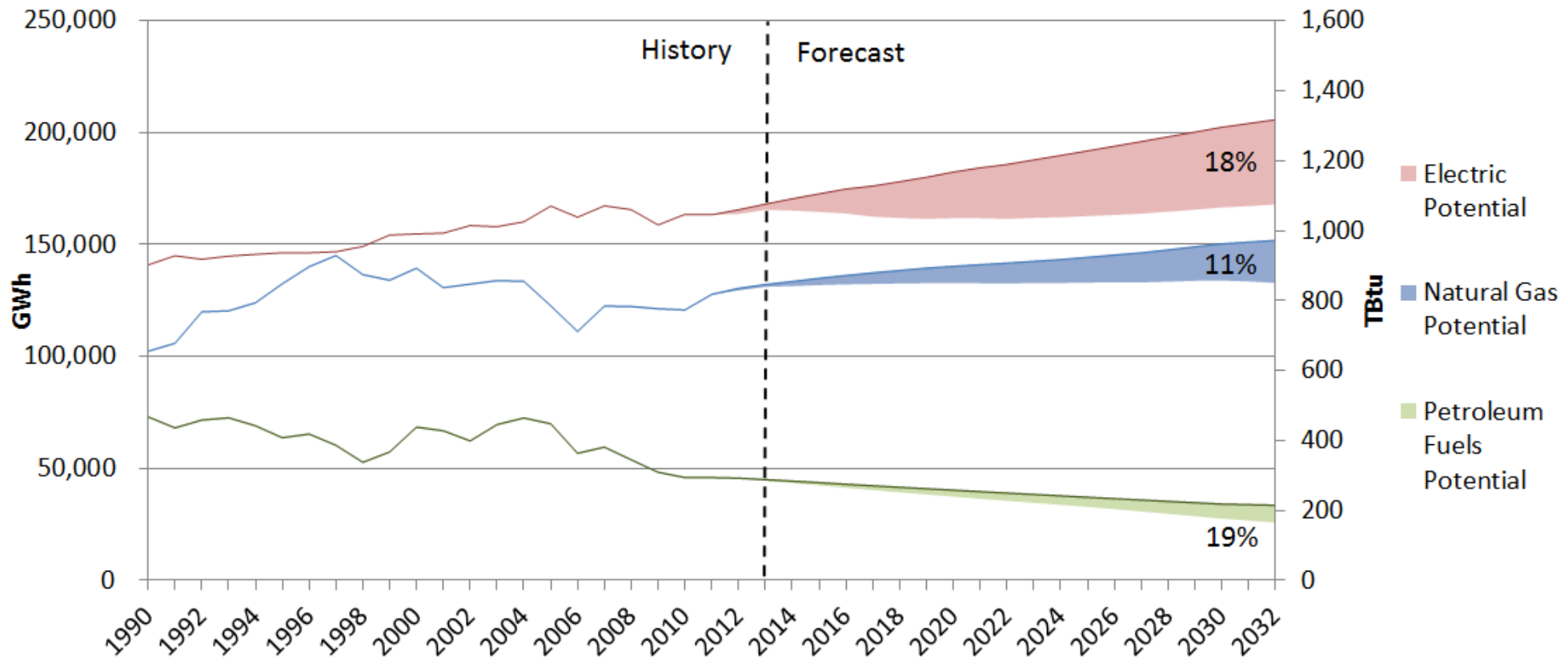
▶ Differentiated by

- Climate
- Avoided cost of energy supply
- Fuel use / availability
- Cost of EE/RE measures

EE Methodology Overview

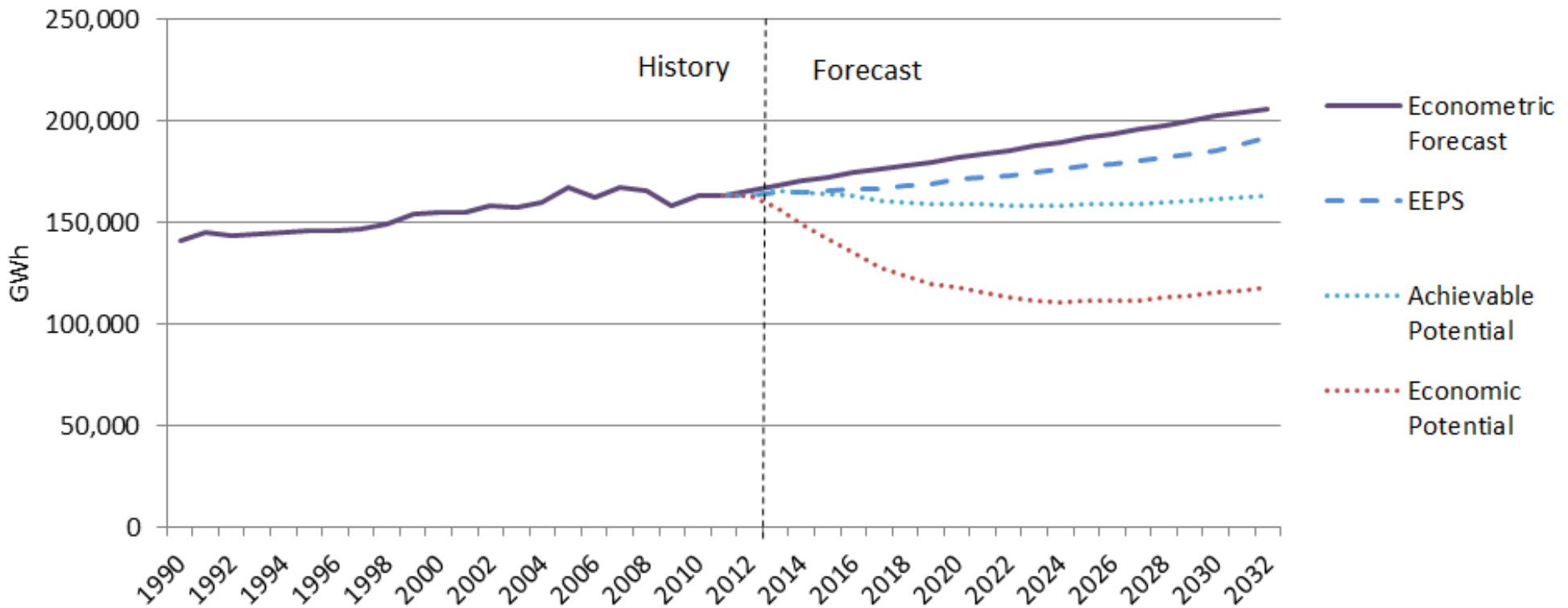
- ▶ Disaggregate the baseline energy sales forecasts
- ▶ Characterize the efficiency measures
- ▶ Screen measures for cost-effectiveness
- ▶ Estimate economic potential (apply measure penetrations)
- ▶ Estimate achievable potential

Achievable Potential Savings vs. Forecast, by Fuel

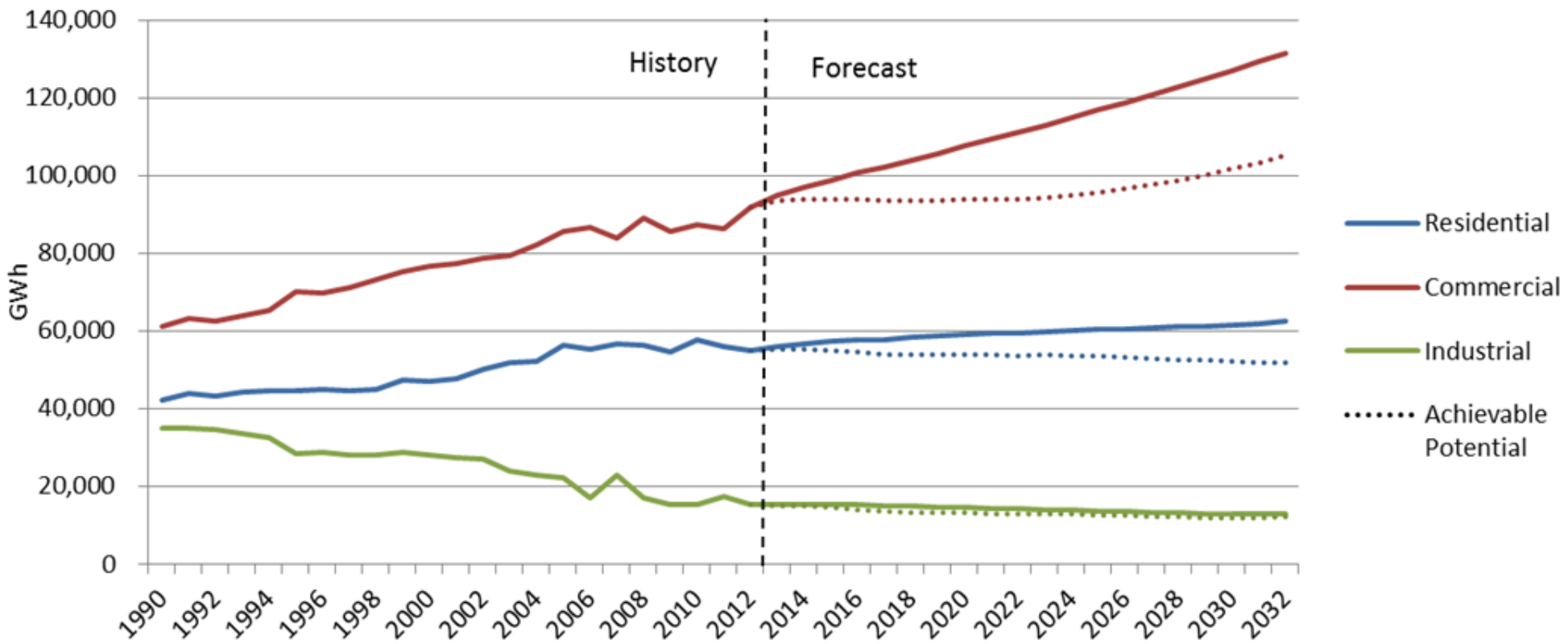


Percentages on the right are savings as a % of forecast in 2030

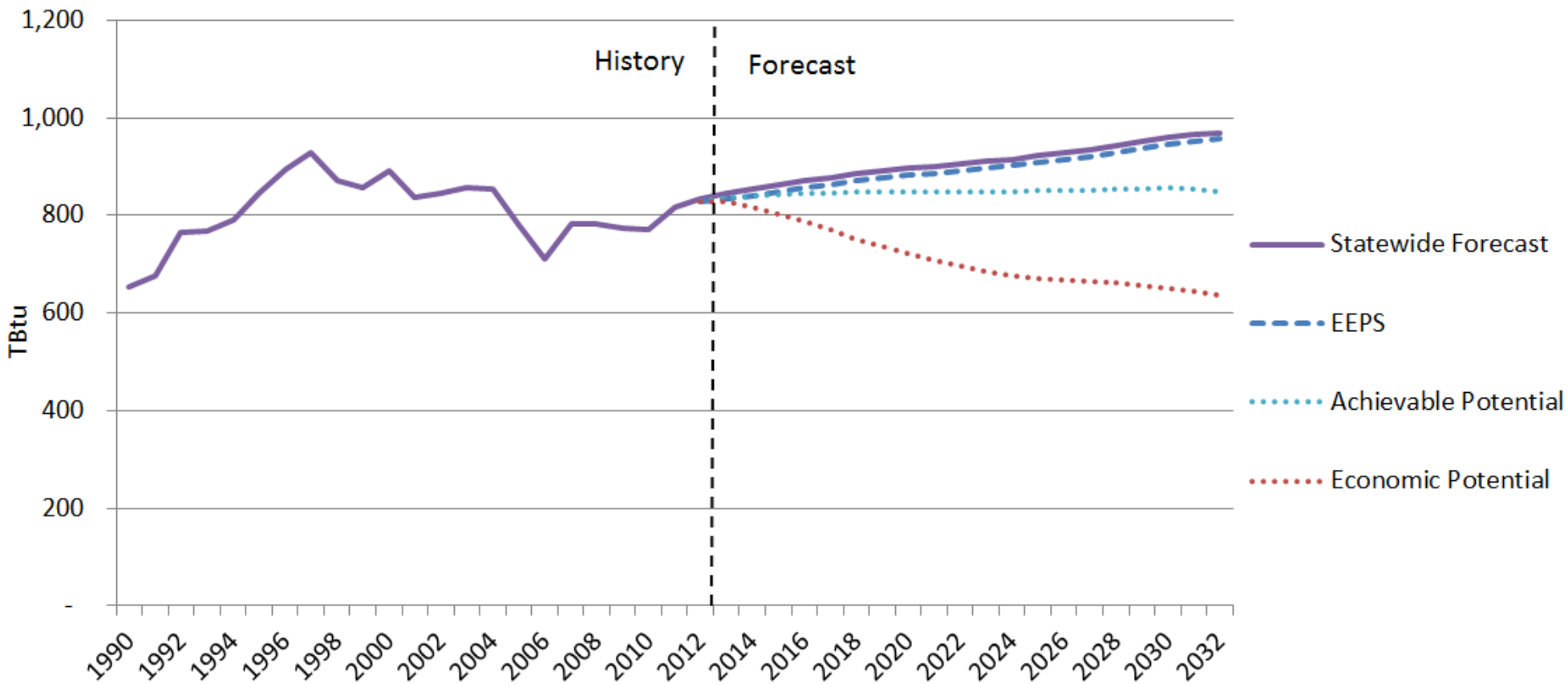
Electric Efficiency Potential vs. Forecast



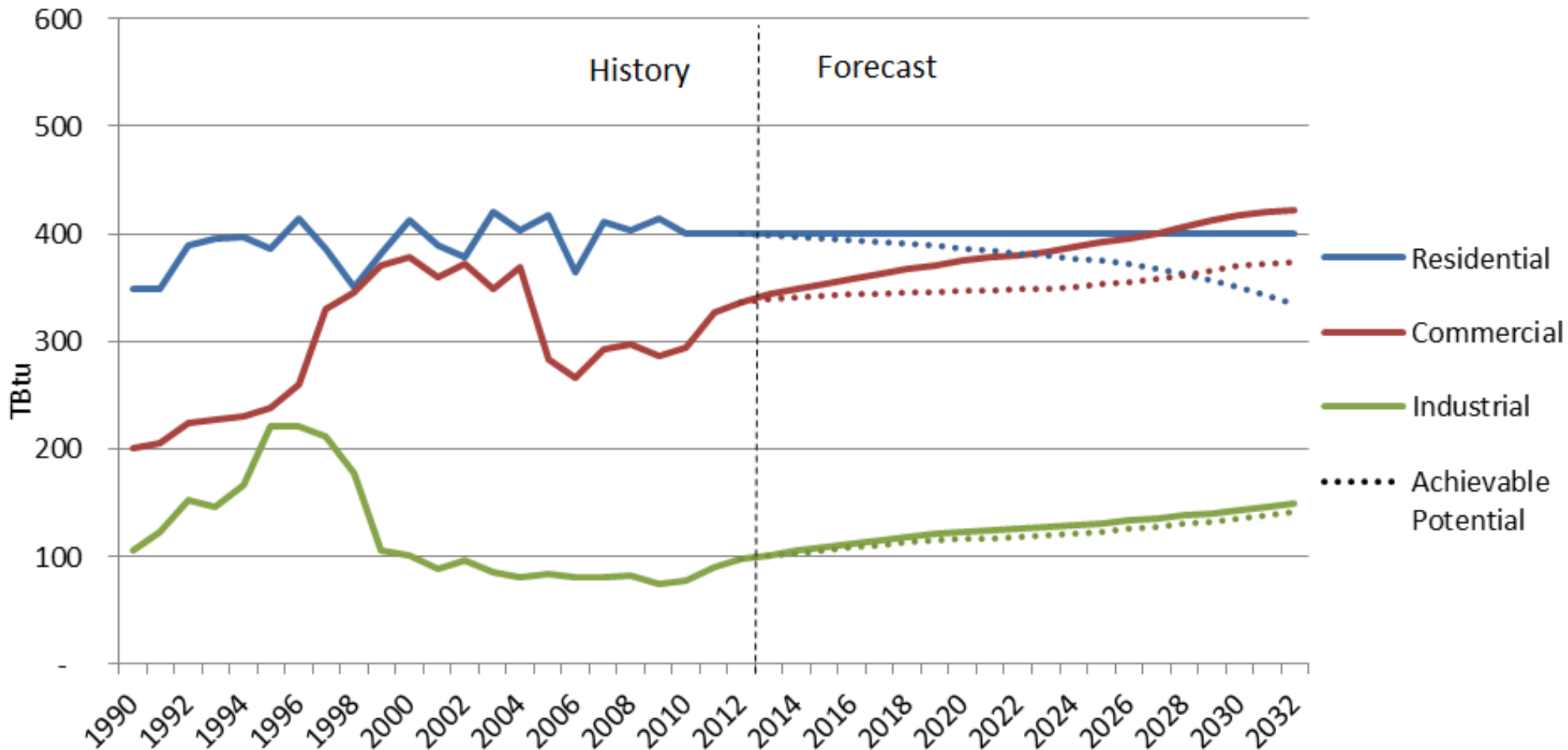
Electric Achievable Potential by Sector



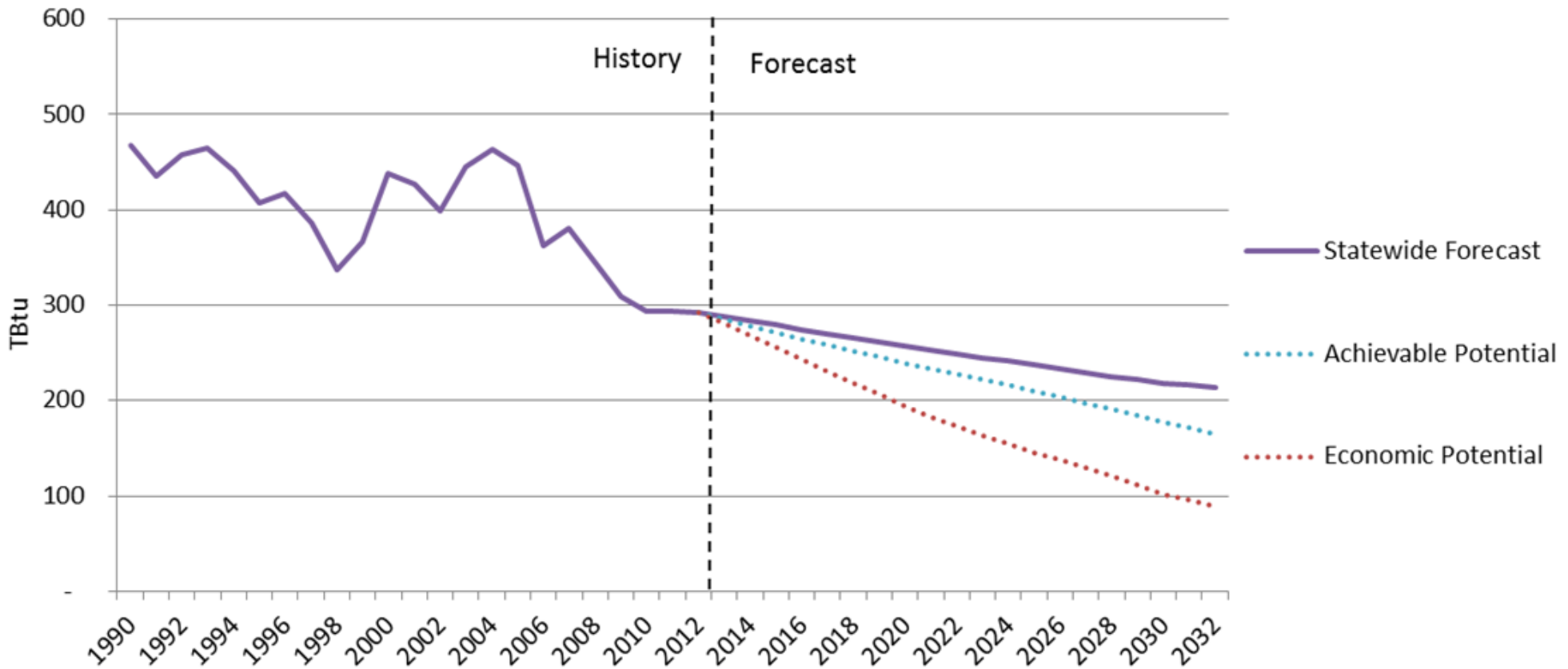
Natural Gas Potential vs. Forecast



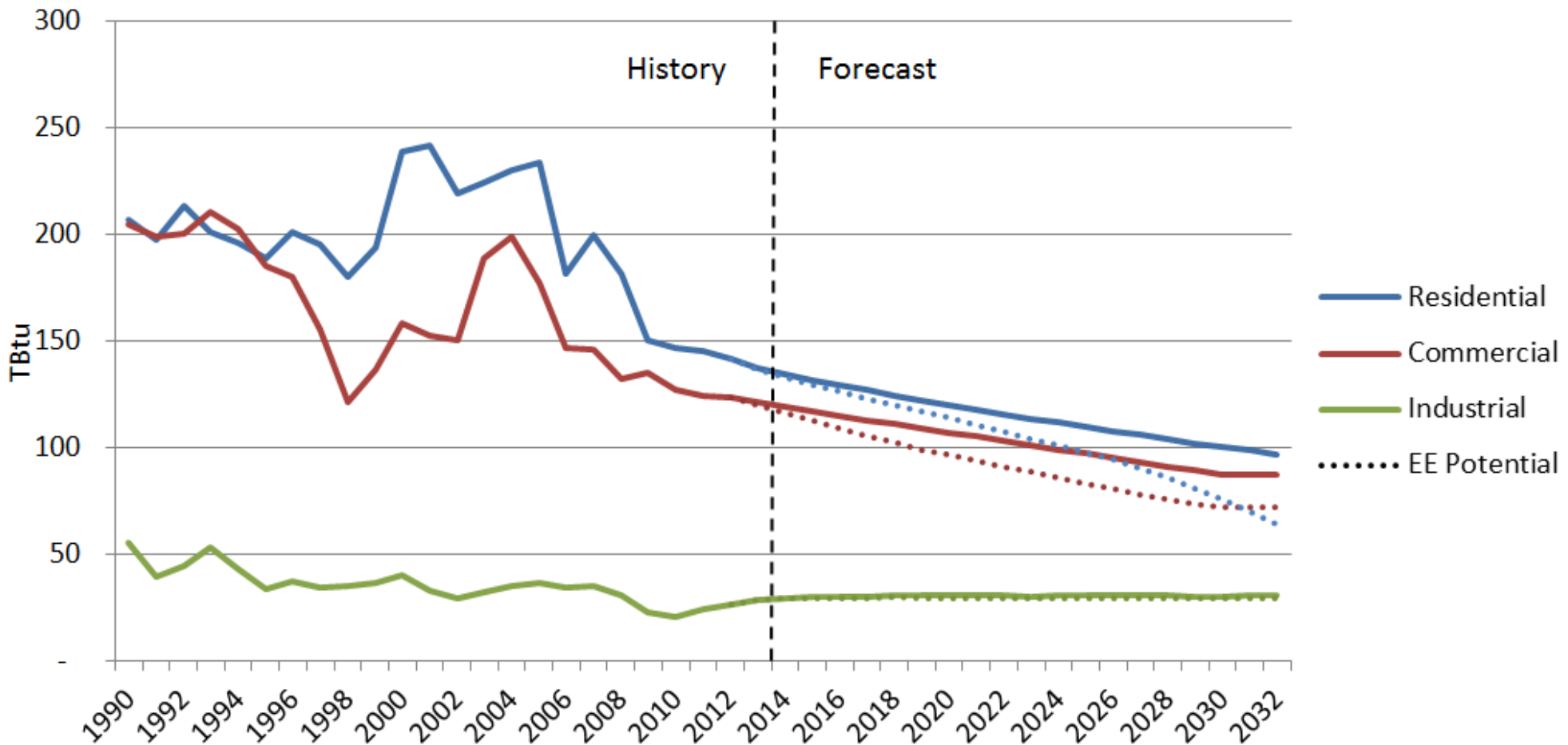
Natural Gas Achievable Potential by Sector



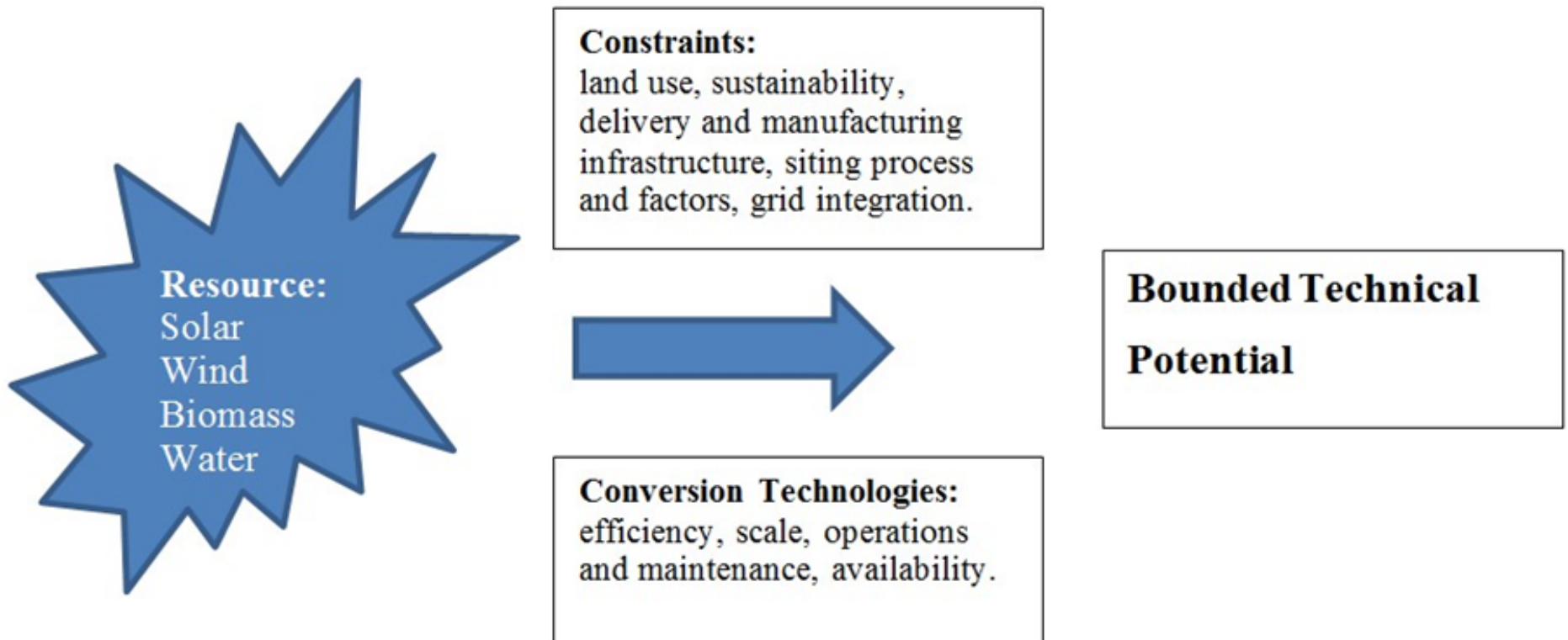
Petroleum Fuels Potential vs. Forecast



Petroleum Fuels Achievable Potential by Sector



RE Methodology: Bounded Technical Potential



RE Methodology: Economic Potential

- ▶ Phase in of Economic RE Potential
 - Resources included incrementally as they become cost effective



RE Technology Types

▶ Biomass

- Biomass Co-firing
- Biomass Direct-fired plants
- Commercial-Scale CHP/District Heat
- Landfill Gas
- Anaerobic Digesters
- Res stove, boilers, furnace
- Com stove, boilers, furnace
- Biodiesel B5 Fuel Oil Blend

▶ Hydro

- Run of River
- New Dams – Undeveloped Sites
- Repower/Upgrade Existing Dams
- Tidal Energy
- Wave Energy

▶ Solar PV

- Residential PV
- Small Commercial PV
- Large Commercial PV
- Grid Supply – MW Scale PV

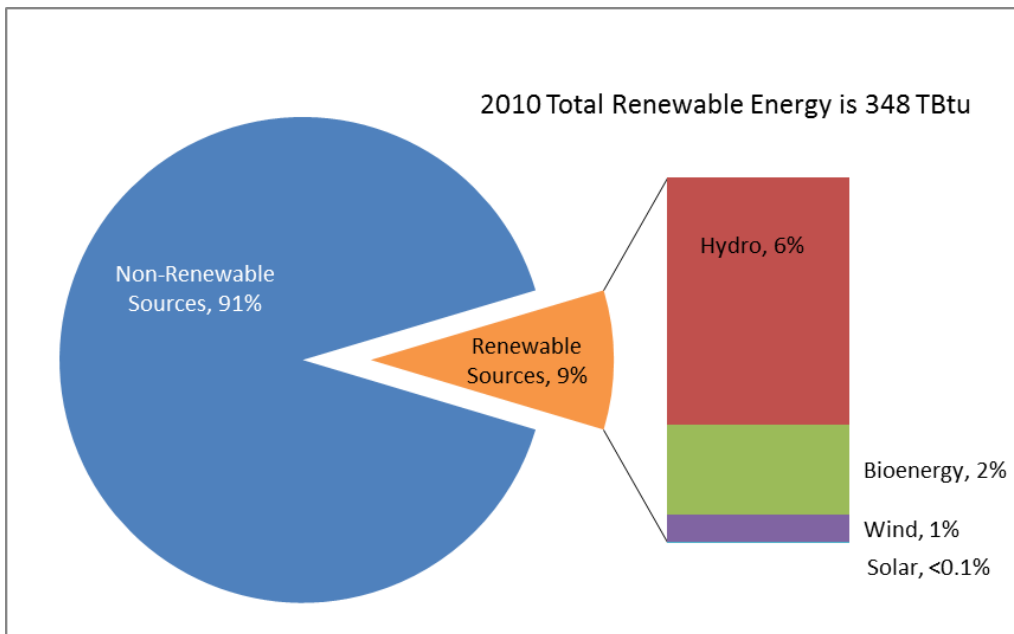
▶ Solar Thermal

- Residential
- Commercial

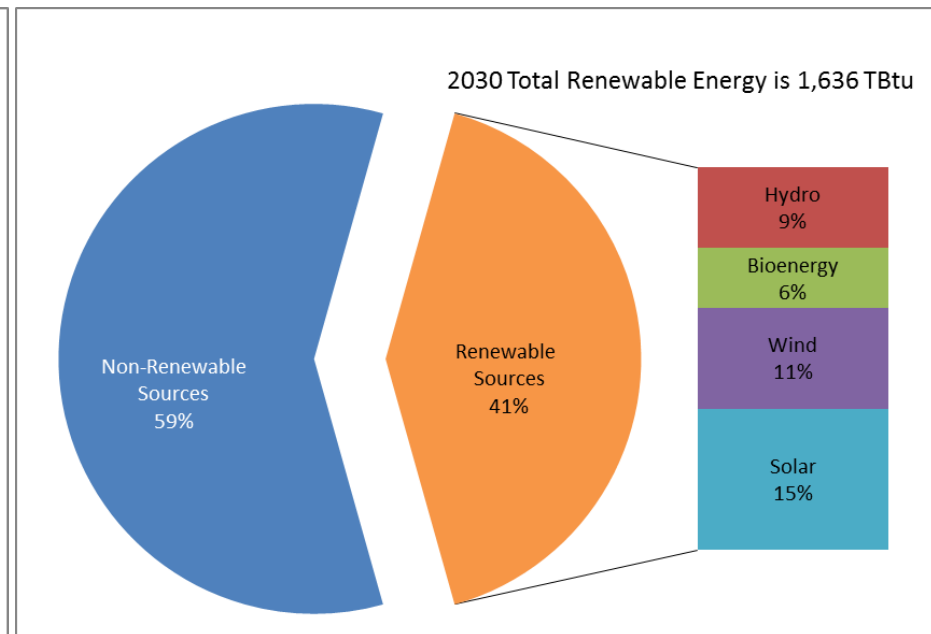
▶ Wind

- Residential
- Commercial – customer sited
- Cluster
- Onshore Wind Farm
- Offshore Wind Farm

Renewable Energy Bounded Technical Potential Summary Results

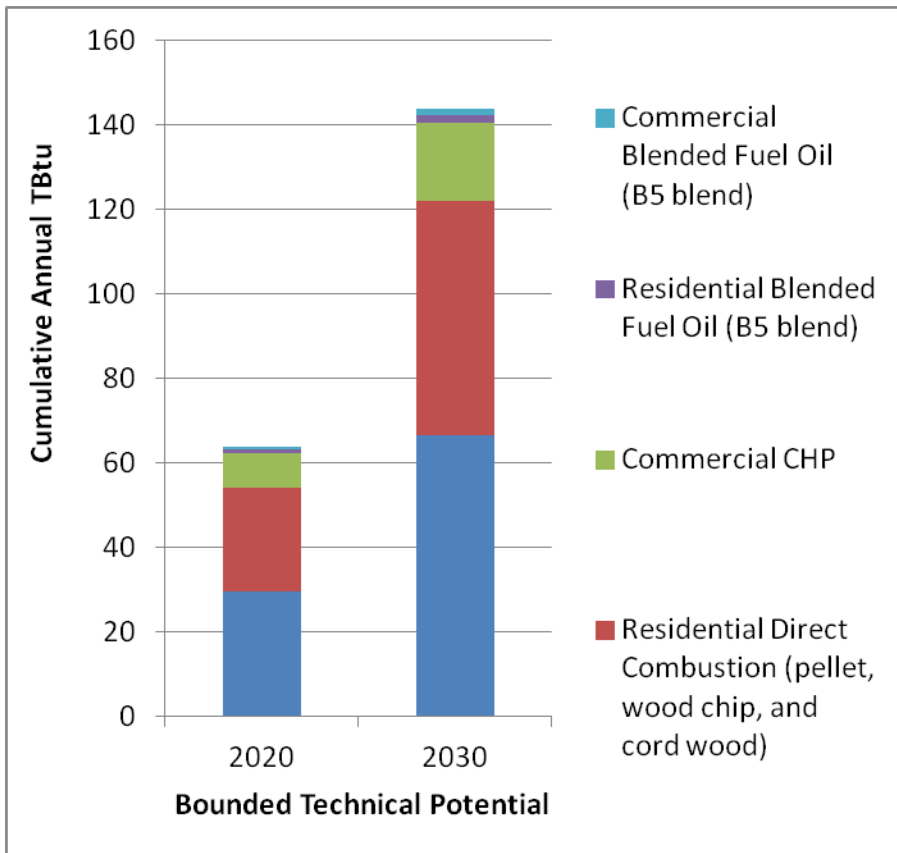


2010 Mix of Primary Energy

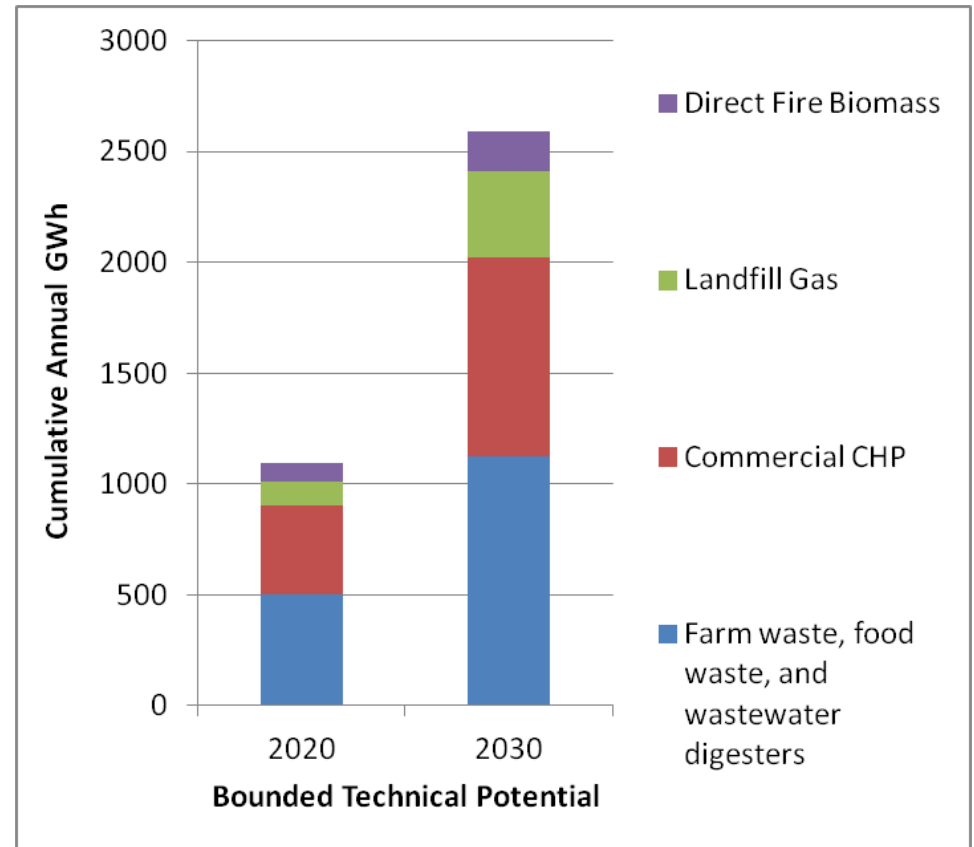


2030 BTP

Bioenergy Thermal and Electric Results

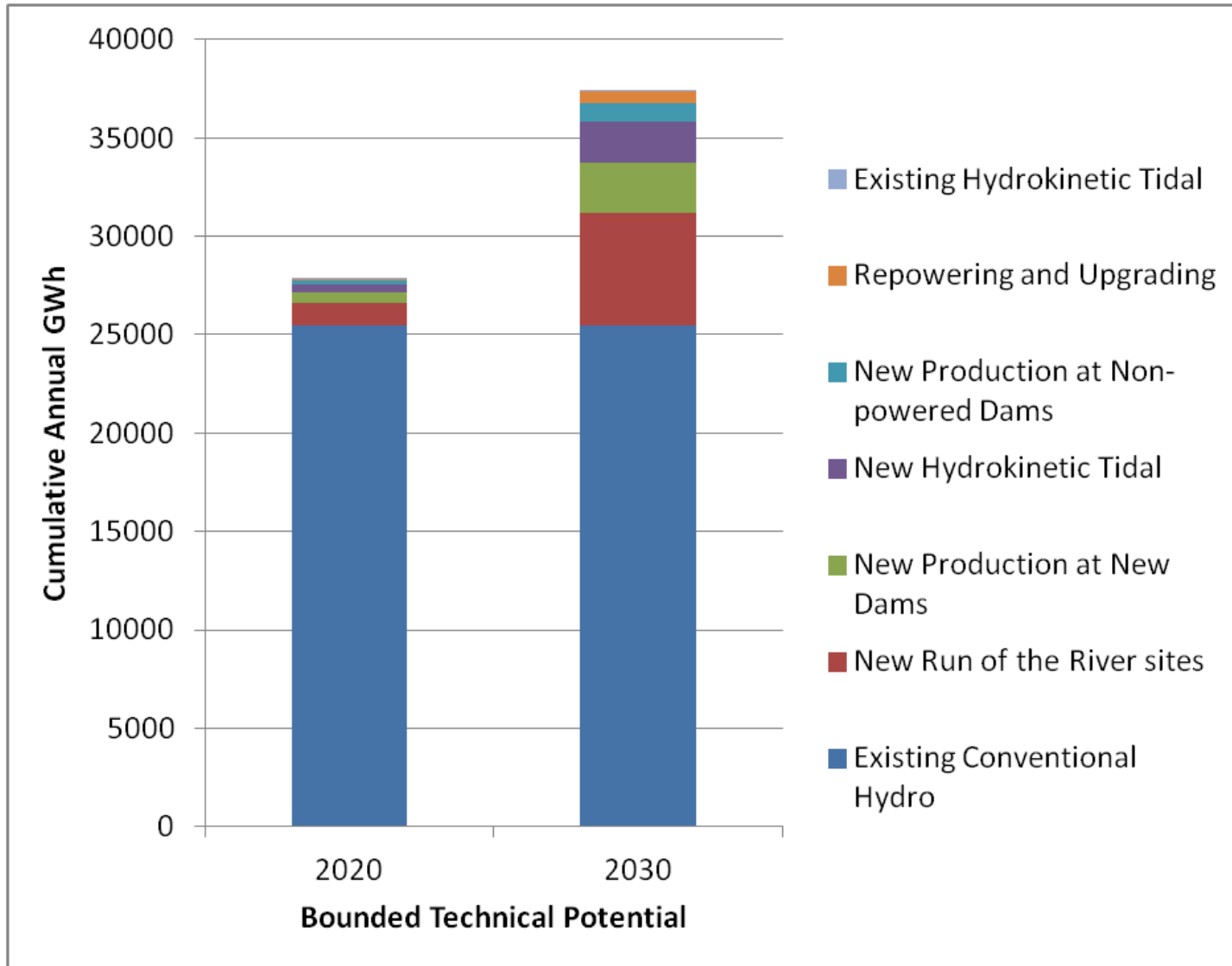


Thermal Applications

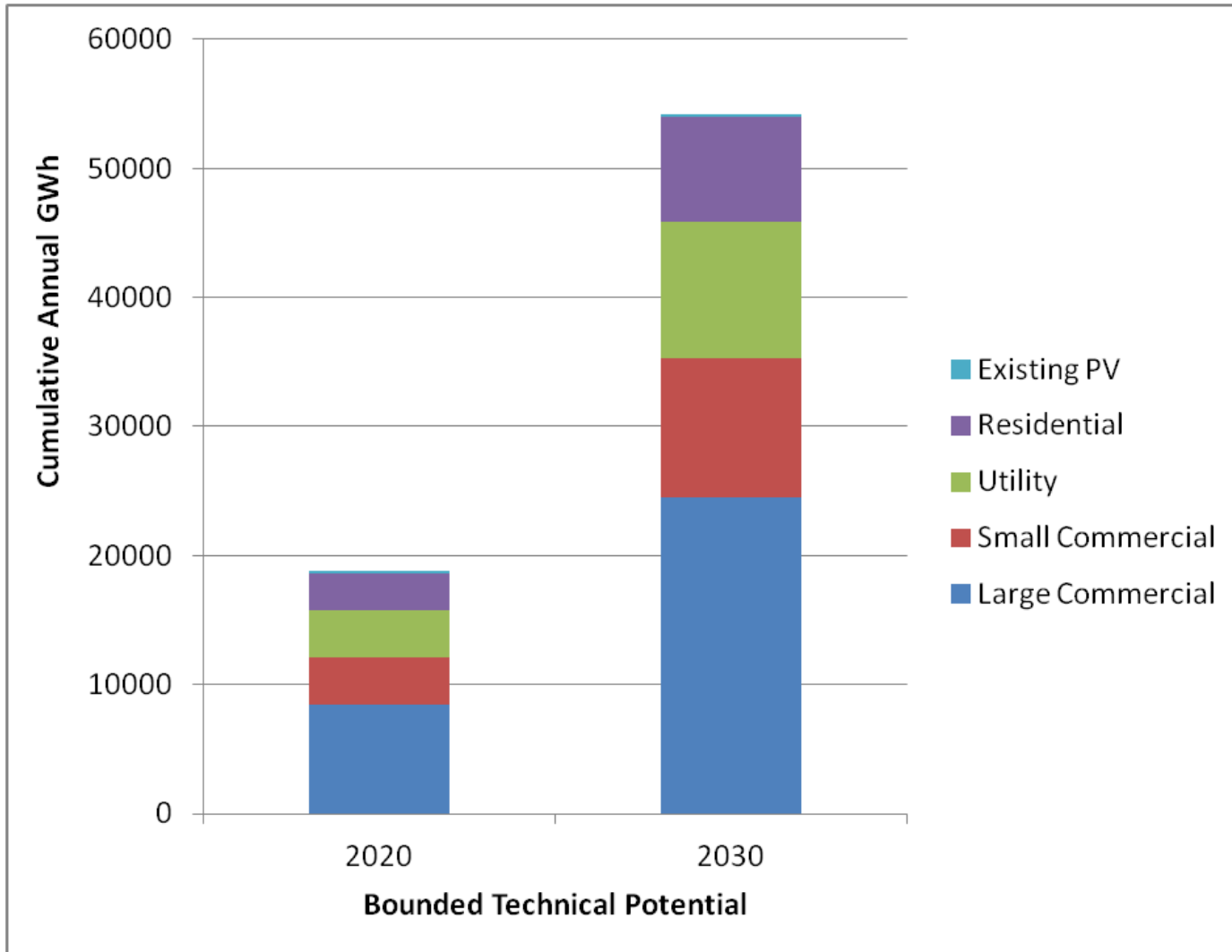


Electric Applications

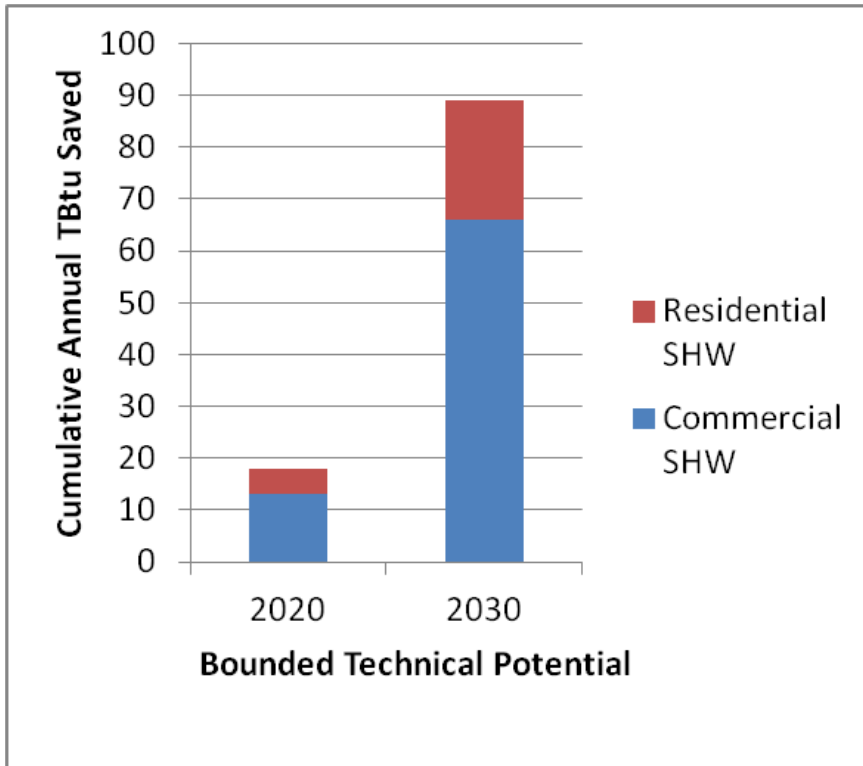
Hydro Results



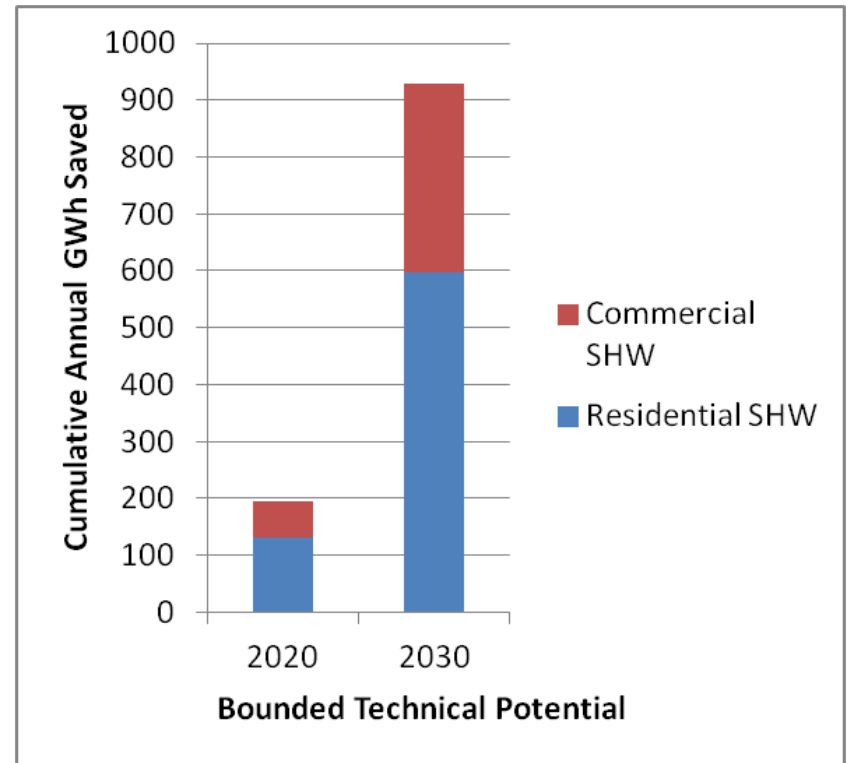
PV Results



Solar Thermal Results

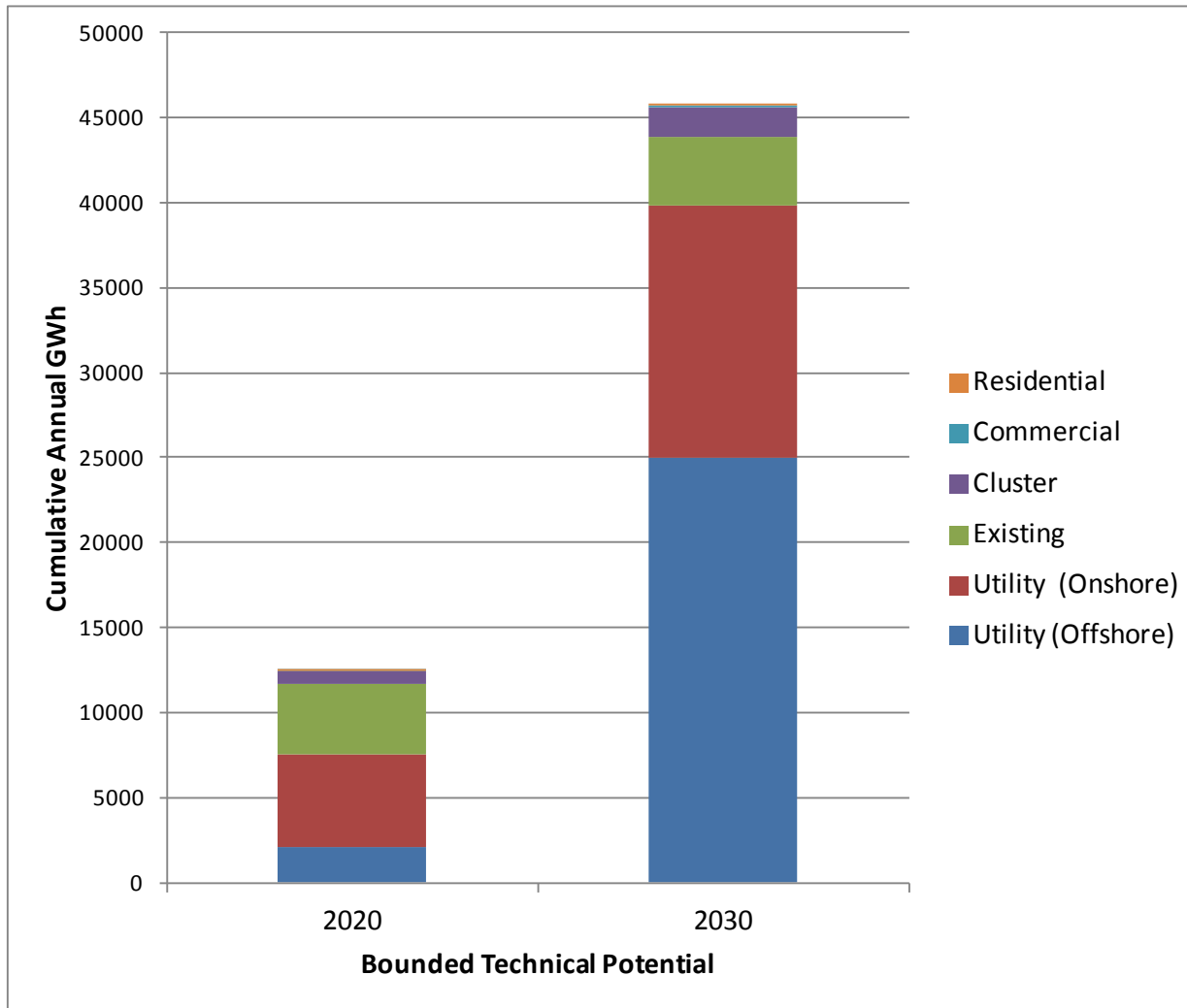


Thermal Applications



Electric Applications

Wind Results



Summary

- ▶ EE Achievable potential by 2030:
 - 18% of electric sales, 11% of natural gas, 19% of petroleum fuels

- ▶ RE Bounded Tech Potential: 41% of energy needs by 2030
 - 9% Hydro, 6% Bioenergy, 11% Wind, 15% Solar