



Innovations in Energy Demand and Consumer Behavior in LTES



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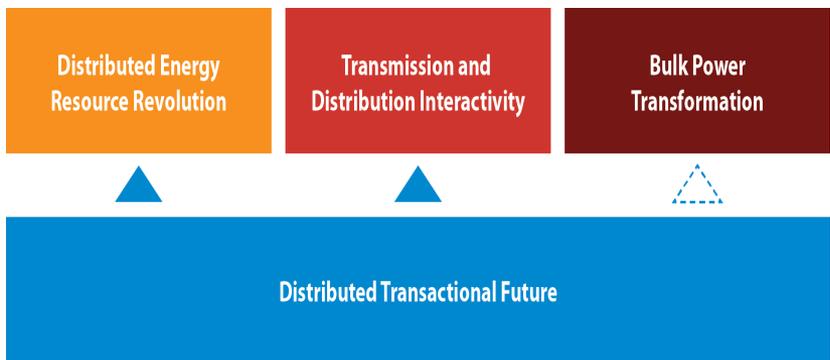
& Trieu Mai, Senior Analyst, NREL

**Second International Forum: Long
Term Energy Scenarios for the Clean
Energy Transition**

March 26, 2020

Recent NREL & LEADS GP Study of Power System Transformation Pathways

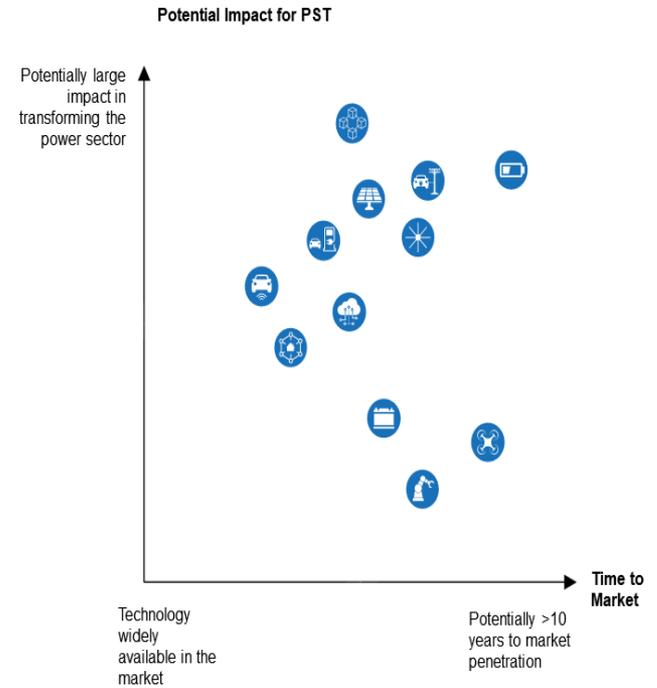
4 Key Pathways to Consider



7 Key Factors will Influence Pathways

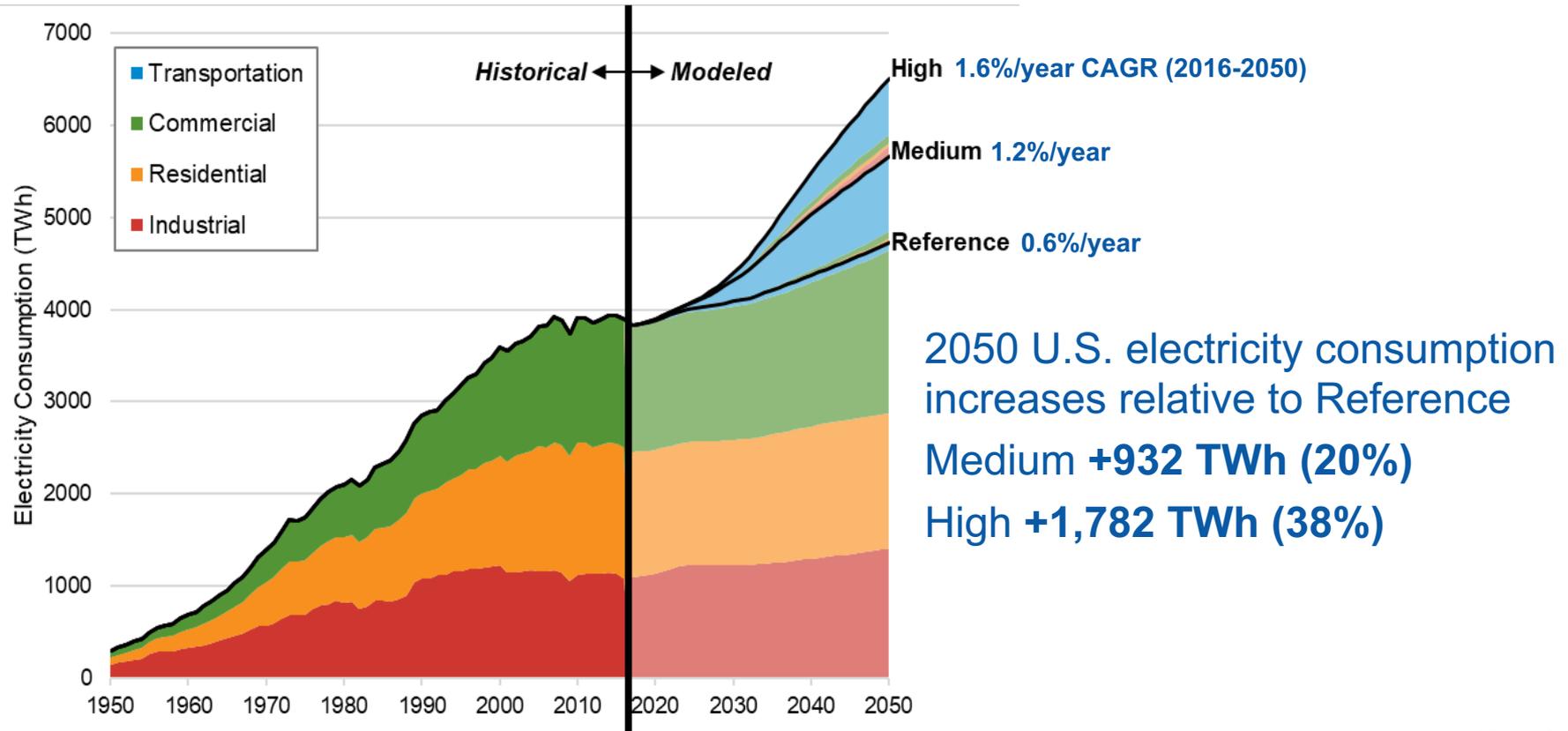
- PST objectives
- RE resource availability
- Land availability
- Key economic industries
- Market factors
- Grid characteristics
- Power system vulnerability

- DER**
- Blockchain Technology
 - Ultra Low Cost Storage
 - Vehicle to Grid Services and Infrastructure
 - Ultra Low Cost PV
 - Low Cost Microgrid Controller
 - Super Rapid EV Charging and Compatible Vehicles
 - Inductive EV Charging
 - Internet of Things
 - Home Area Networks
 - Fuel Cells
 - Personal Drones
 - Robotics & Automation



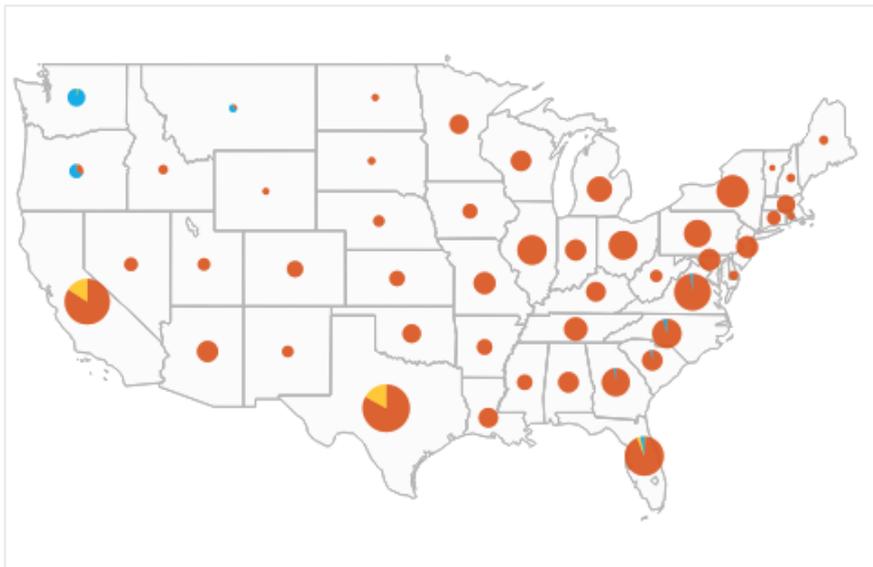
<https://www.nrel.gov/docs/fy20osti/75138.pdf>

U.S. Electrification Futures Study - nrel.gov/EFS shows vehicle electrification dominates growth in annual consumption

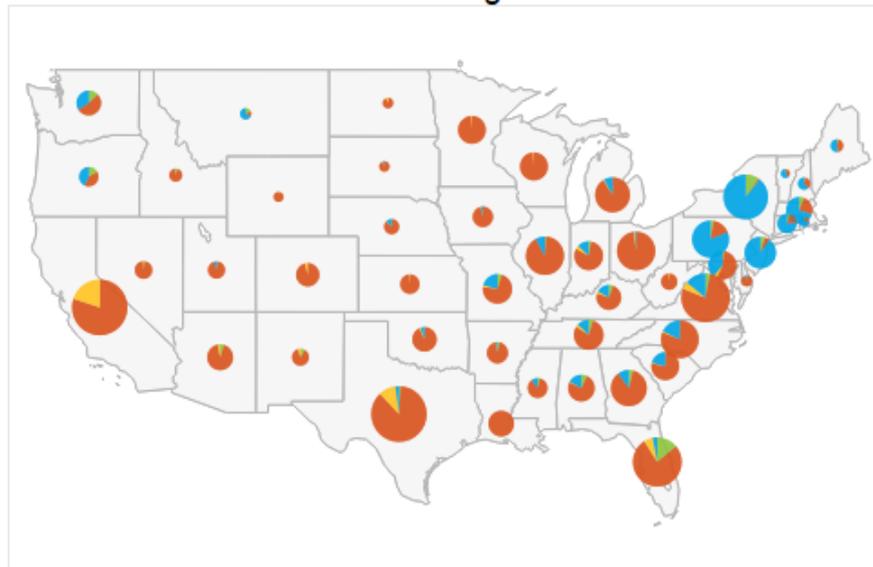


Electric space heating has a stronger impact on the timing and magnitude of peak demand

2015



2050 High



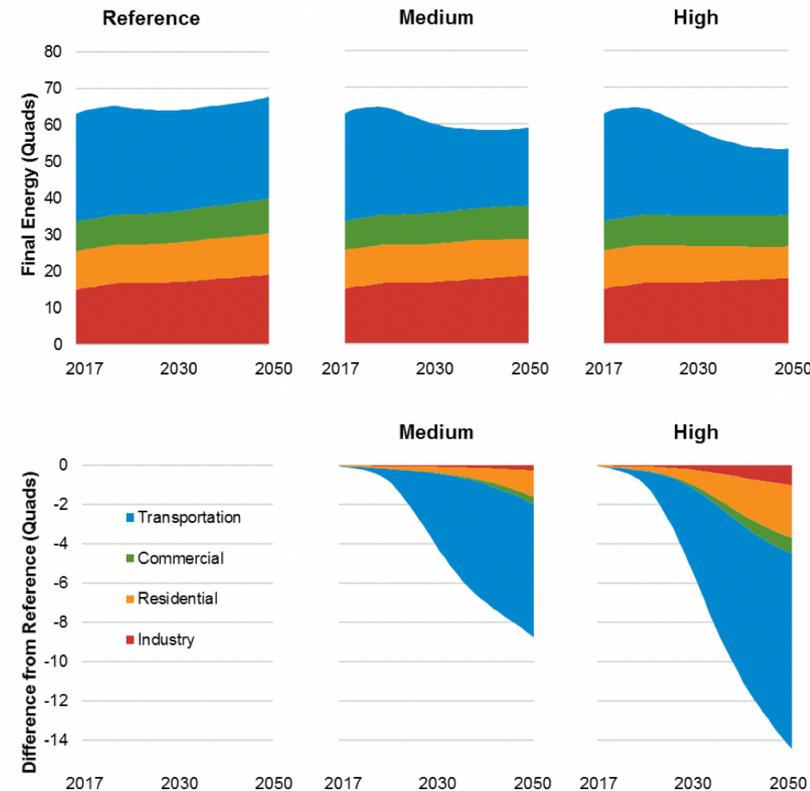
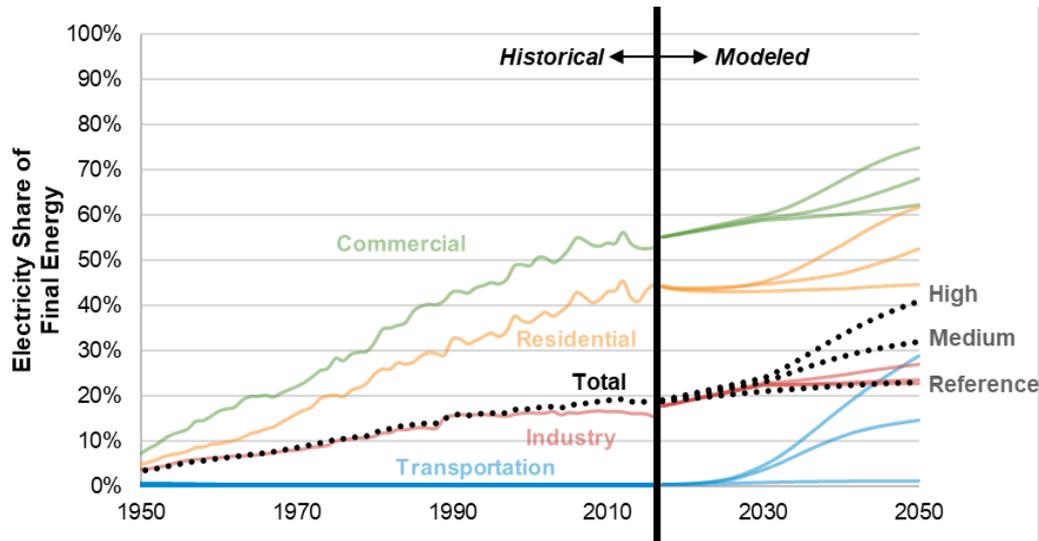
Season



Peak Load (GWh)



High scenario: Electricity's share of final energy doubles by 2050 while final energy consumption is 21% lower than the Reference

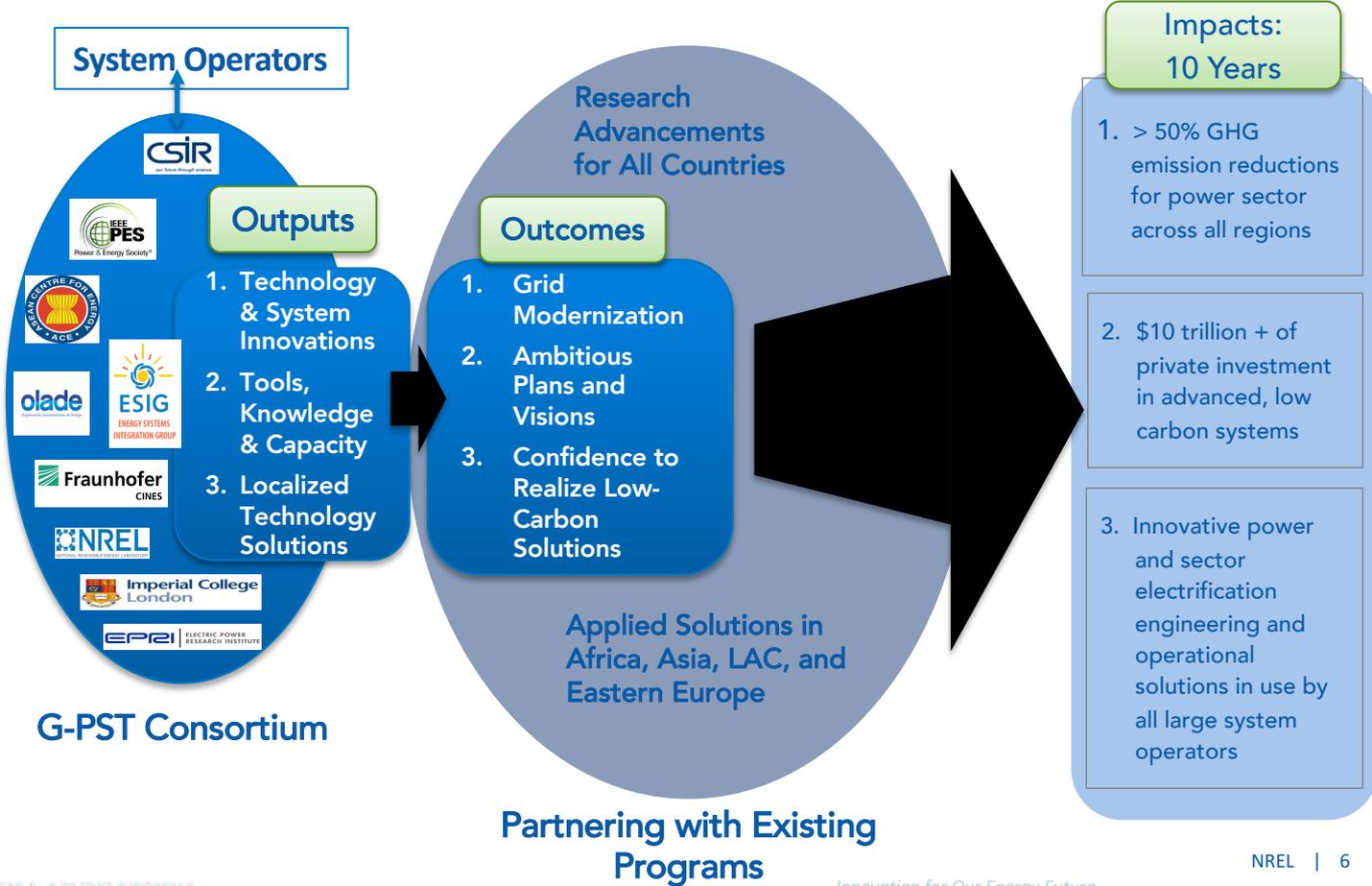


Note: Sector definitions and scope differ slightly between Historical and Modeled data

New Global Power System Transformation Consortium

Action Pillars

- 1- Advancing world class system operator and grid integration solutions
- 2- Foundational workforce development
- 3- Localized technology adoption support
- 4- Power system planning and analysis with open data and tools





Thank You

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<http://nrel.gov/international>