Connecticut Department of Energy and Environmental Protection
Agenda

1:30  Welcome & Announcements
      *DEEP Commissioner Klee*

1:05  Review REMI inputs, assumptions, and analysis of the transportation and building sectors to date
      *Stanley McMillen, Consultant*

1:35  Discuss and provide guidance on REMI inputs and assumptions

3:00  Public Comments
Review REMI inputs, assumptions, and analysis of the transportation and building sectors to date
Summary of Scenarios Modeled in REMI

• Compare relative costs of 35% and 55% GHG mid-term reduction targets in 2030 on the way to 80% reduction by 2050

• The current REMI analysis focuses on transportation and buildings
LEAP Outputs Used in the Transportation Sector REMI Analysis

- Changes in vehicle purchases relative to the reference case
- Changes in transportation fuel consumption relative to the reference case
Non-residential EV Charging Station Investment, 35% Case

Non-Residential Net New EV Charging Station Investment - 35% Case

- Total installation
- Total Maintenance
- Total Hardware

Millions

2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035

$0 $20 $40 $60 $80 $100 $120

2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035

Non-Residential Net New EV Charging Station Investment - 35% Case

Total installation Total Maintenance Total Hardware
Residential EV Charging Station Investment, 35% Case

Residential Net New EV Charging Station Investment - 35% Case

Total Hardware
Total Maintenance
Total Installation
Non-residential EV Charging Station Investment, 55% Case
Residential EV Charging Station Investment, 55% Case

Residential Net New EV Charging Station Investment - 55% Case

Years: 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035

Millions

- Total Hardware
- Total Maintenance
- Total installation
Hydrogen Filling Station Investment

H2 Filling Station Net New Investment in Current Dollars

- Reference Case
- 35% Case
- 55% Case

Years: 2020 to 2035

Investment in Millions of Dollars:
Total Retail Fuel Sales

Total Fuel Sales for Reference, 35%, 45% and 55% Cases

Reference Total Fuel Sales
35% Total Fuel Sales
55% Total Fuel Sales

Billions of Current Dollars

2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035
Gas Station Market Exit & Remediation Costs

Gas Station Decline & Remediation Expenditure in Current Dollars

- 35% Gas Stations (Car + Truck)
- 55% Case Gas Stations (Car + Truck)

Remediation Expenditure (assume $30K per station)
Gas Tax Shortfall From Reference Case (Included in REMI)

Fuel Tax Revenue Projections Relative to Reference Case

- **Ref**: 35%
- **35%**: 55%
- **55%**:
Electricity Demand

Electricity Sales (2013 Constant Dollars)

Reference Case  35% Case  55% Case
• CHEAPR continues at an average of $1.5 million per year through 2021 and induces a switch to EVs (about 600 vehicles per year).

• We assume consumers buy replacement vehicles that cost more.
Jobs ↑ 0.075%,
GSP ↑ 0.196%,
Pop ↓ -0.022%
REMI Population Forecast

**Jobs**: ↑0.075%, **GSP**: ↑0.196%, **Pop**: ↓0.022%

**REMI Population Control Forecast**

- **Natural Growth Individuals**
- **Migrants Individuals**
- **Starting Population Individuals**
- **Ending Population Individuals**

**Chart Details**:
- **Y-axis**: Thousands & Natural Growth
- **X-axis**: Millions of People
- **Data Points**: 2020 to 2025
Transportation Sector Fiscal Impact (% Changes), 35% Case

Transportation Strategy Fiscal Impact (Percent Changes), 35% Case

State rev. ↑ $93.4 mil.,
State exp. ↑ $4.17 mil.
Transportation Sector Economic Impact, 55% Case

Transportation Strategy Economic Impact: 55% Case

- Jobs ↑ 0.1%
- GSP ↑ 0.38%
- Pop ↓ -0.076%
State rev. ↑ $153.5 mil.,
State exp. ↓ $3 mil.
LEAP Outputs Used in the Building Sector REMI Analysis

• Changes in electric demand relative to the reference case
• Changes in the adoption of heat pumps relative to the reference case
• Changes in energy efficiency relative to the reference case
Building Sector Heat Pump Investment, 35% Case

Combined Residential & Commercial Heat Pump Investment: 35% Case

- Capital (hardware)
- Labor
- Material (wholesale)
- Wholesale Markup (20%)
Commercial Building Sector Heat Pump Deployment, 35% Case

Commercial Demand Changes for Electricity, Natural Gas, Diesel & LPG: 35% Case Heat Pump Deployment

Electricity Commercial
Natural Gas Commercial
Commercial Energy Savings

Millions of Current Dollars

2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035

-400 -300 -200 -100 0 100 200 300

Commercial Energy Savings

Electricity Commercial
Natural Gas Commercial
Building Sector Heat Pump Investment, 55% Case

Residential & Commercial Heat Pump Investment, 55% Case

- Capital (hardware)
- Labor
- Material (wholesale)
- Wholesale Markup (20%)
Residential Building Sector Heat Pump Deployment, 55% Case

Residential Demand Changes for Electricity & Natural Gas: 55% Case Heat Pump Deployment

Electricity Residential
Natural Gas Residential
Diesel
LPG
Residential Energy Savings

 Millions of Current Dollars

2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035
Commercial Building Sector Heat Pump Deployment, 55% Case

Commercial Demand Changes for Electricity, Natural Gas, Diesel & LPG: 55% Case Heat Pump Deployment

- Electricity Commercial
- Natural Gas Commercial
- Commercial Energy Savings
Building Sector Residential Savings from Energy Efficiency

Residential Natural Gas & Electricity Savings (Reduced Demand via Energy Efficiency)

No Change from Reference Case

Electricity Expenditure Savings; Million$ Residential
Gas Expenditure Savings; Million$ Residential

Millions of Current Dollars

2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035
Building Sector Commercial Savings from Energy Efficiency

Commercial Natural Gas & Electricity Savings (Reduced Demand via Energy Efficiency)

No Change from Reference Case

Electricity Expenditure Savings; Million$  Commercial
Gas Expenditure Savings; Million$ Commercial

Millions of Current Dollars

2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035
Combined Residential, Commercial & Institutional Energy Efficiency Spending (Electricity & Natural Gas)

No Change from Reference Case

- Computer, electronic prod mfg
- Construction
- Electrical equip, appliance mfg
- Machinery mfg
- Nonmetallic mineral prod mfg
- Paper product mfg
- Plastics, rubber prod mfg
- Scientific and Prof. Services
- Retail trade
- Utilities
- Wholesales trade
- Wood product mfg
Building Sector EE Expenditure & Net Savings

Residential, Commercial & Institutional Total Spending & Net Saving (Electricity & Natural Gas)

- Total Spend
- Consumption Reallocation (excess of saving over expenditure)
- Commercial Net Savings

No Change from Reference Case

Millions of Current Dollars
Building Sector Economic Impact, 35% Case

Jobs ↑ 0.58%,
GSP ↑ 0.43%,
Pop ↑ 0.355%
State rev. ↑$122.9 mil. (0.31%),
State exp. ↑$145.4 mil. (0.49%)
Building Sector Economic Impact, 55% Case

Jobs ↑ 0.97%,
GSP ↑ 0.375%,
Pop ↑ 0.75%
Building Sector Fiscal Impact (% Changes), 55% Case

State rev. ↑ $232.3 mil. (0.59%)
State exp. ↑ $274.1 mil. (0.93%)
Discuss and provide guidance on REMI inputs and assumptions
Public Comments