



Energy+Environmental Economics

US 2030 Climate Ambition

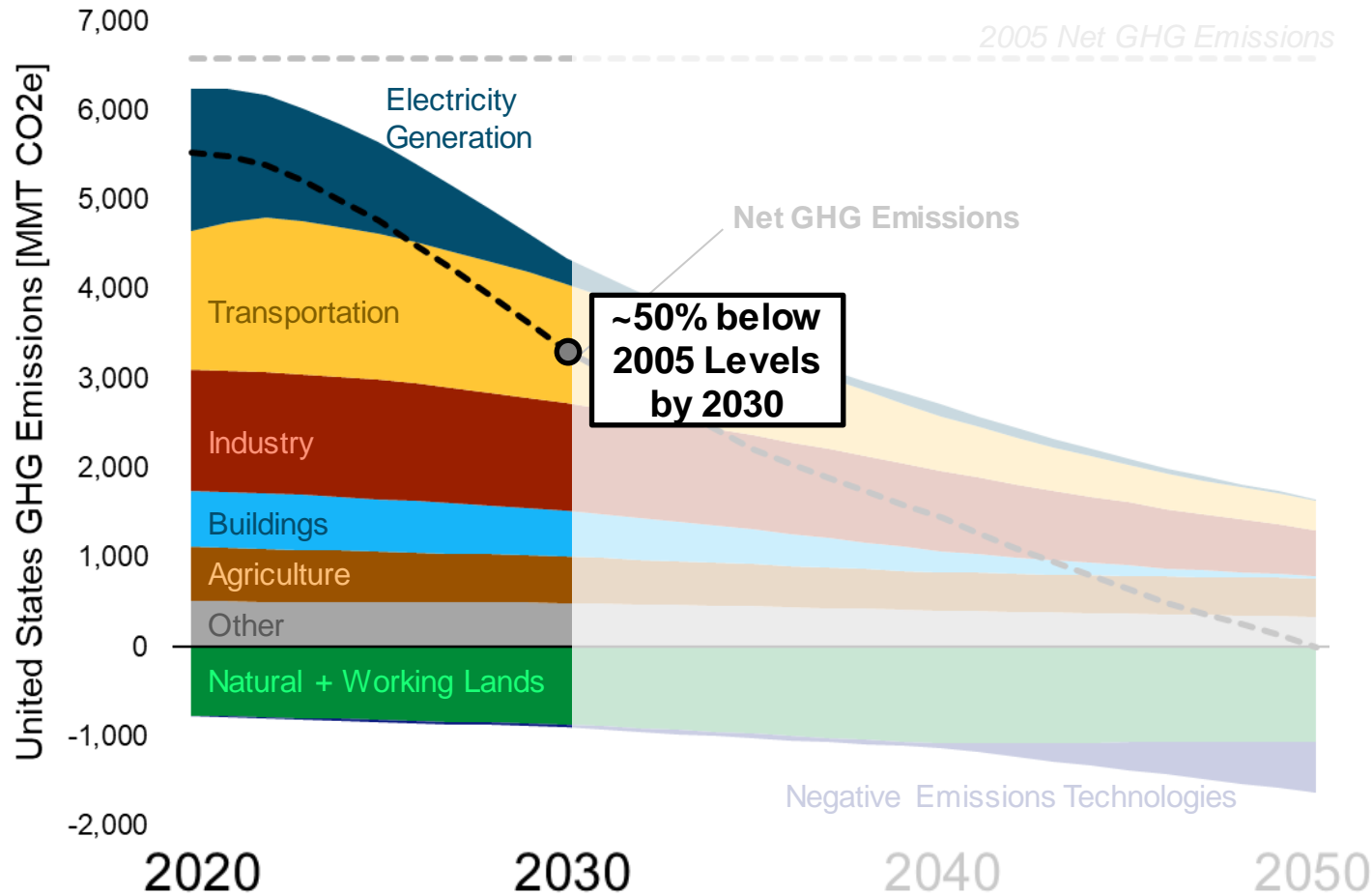
E3 Modeling and Insights

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Recent E3 PATHWAYS analysis achieves 50% GHG reductions by 2030 relative to 2005 levels



Key 2030 Actions

Coal retirements + renewables expansion

LDV + MHDV electrification

Energy efficiency, climate-friendly refrigerants, targeted fuel-switching to H₂/electricity and CCS

Energy efficiency, residential & commercial building electrification

Soil carbon management, root crops, methane management

Reduction in fugitive emissions from oil & gas

NWL sink expansion through reforestation, agroforestry, wildfire management

Notes:

- E3 PATHWAYS analysis conducted for World Resources Institute (not yet published). Results shown above are Scenario 3
- “Industry” includes energy consumption and industrial process emissions; “Other” includes natural gas and oil systems, waste management, and coal mining
- Emissions accounting on 100-yr AR5 basis using EPA methodology



Near-term building blocks to be on track for 2030 milestone and net zero by 2050



- 1. Align economics** for customers and companies to adopt clean energy technologies
 - Direct **incentives** and **tax credits** reduce upfront costs
 - **Research and development** can bring capital costs down and create a larger portfolio of commercialized technology options
 - Policies that ensure **affordability and equity** will be necessary



- 2. Align policy and institutions** to remove barriers to technology deployment
 - **Siting for transmission and renewables** will need to be prioritized
 - **Centralized infrastructure planning** will be needed (e.g. EV charging, electric distribution upgrades)



- 3. Increase consumer awareness and education** to unlock high levels of adoption
 - **Shifts in purchasing patterns in next decade are necessary**, especially in vehicles and building appliances
 - Even though most emissions reductions won't materialize until 2030-2050, **delays in adoption now could result in costly early retirement of inefficient devices** (e.g. cash for clunkers programs)



- 4. Create transition plan for fossil fuel jobs** to ensure smooth transition
 - To shift away from fossil fuel industries (the coal industry in particular), we will need **viable alternative job opportunities** to ensure minimal economic disruption



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Appendix



Key Scenario Assumptions

Scenario 3: Achieving Net Zero



Electricity Generation

ITC extended through 2035, ITC expanded to cover zero-carbon technologies (new nuclear, natural gas with CCS, flow batteries) through 2050, 100% CES by 2035



Transportation

Tax credit for EVs (e.g. \$7,500 for LDVs, \$13,750 for HDVs), 100% zero emissions tailpipe standard by 2035



Industry

Energy efficiency (16% reduction by 2050), targeted electrification and hydrogen fuel substitution, CCS for all cement production, Kigali Amendment implementation (36% reduction in HFCs by 2030, 90% by 2050)



Buildings

Building Code Adoption Incentives; Energy efficiency tax credit extensions (e.g. Energy Property Tax Credit, 25C Energy Property Tax Credit), Residential energy-savings dependent tax credit for electrification (avg: \$3,700 per household), Commercial System size dependent tax credit (\$100/ton of cooling capacity), phase out fossil fuel device sales by 2040



Agriculture

Soil carbon management, root crops, N2O reductions, CH4 reductions (high end of potential from WRI 2020 CarbonShot report)



Other

Reduction in fugitive emissions from oil and gas sector in line with reduced domestic consumption, reduction in active coal mine methane in line with reduced activity



Natural and Working Lands

Reforestation, agroforestry, wildfire management measures (high end of potential from WRI 2020 CarbonShot report)



Negative Emissions Technologies

US-wide LCFS with net-zero emissions constraint by 2050 including low-carbon fuels and negative emissions technologies (e.g. bioenergy with CCS for hydrogen production, direct air capture of CO2)