

A Mid-Century Strategy

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October 03, 2017

Symposium

Kuramae Hall, Tokyo Institute of Technology

Tokyo, Japan



**JOINT GLOBAL CHANGE
RESEARCH INSTITUTE**

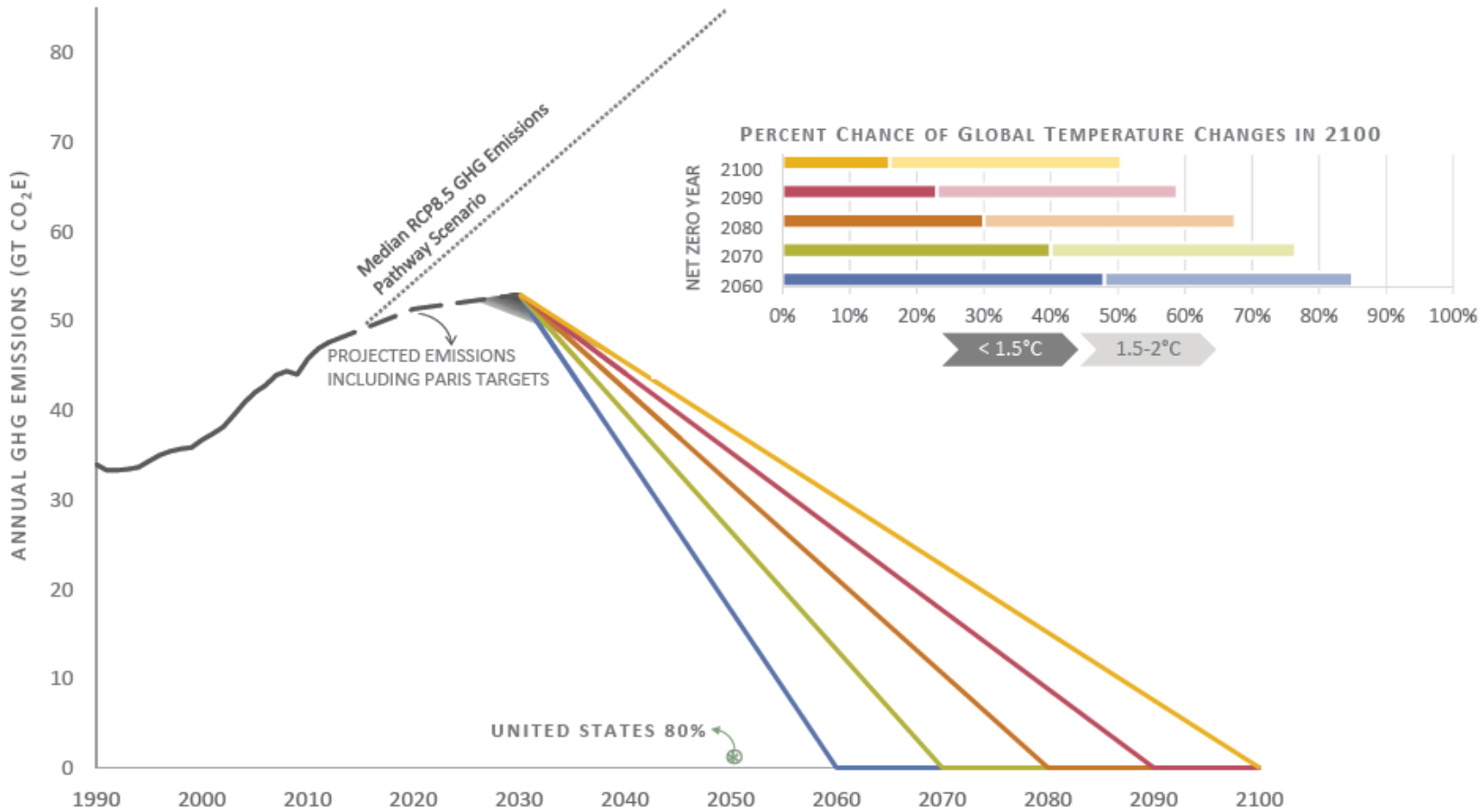


United States Mid-Century Strategy FOR DEEP DECARBONIZATION

http://unfccc.int/files/focus/long-term_strategies/application/pdf/us_mid_century_strategy.pdf

NOVEMBER 2016

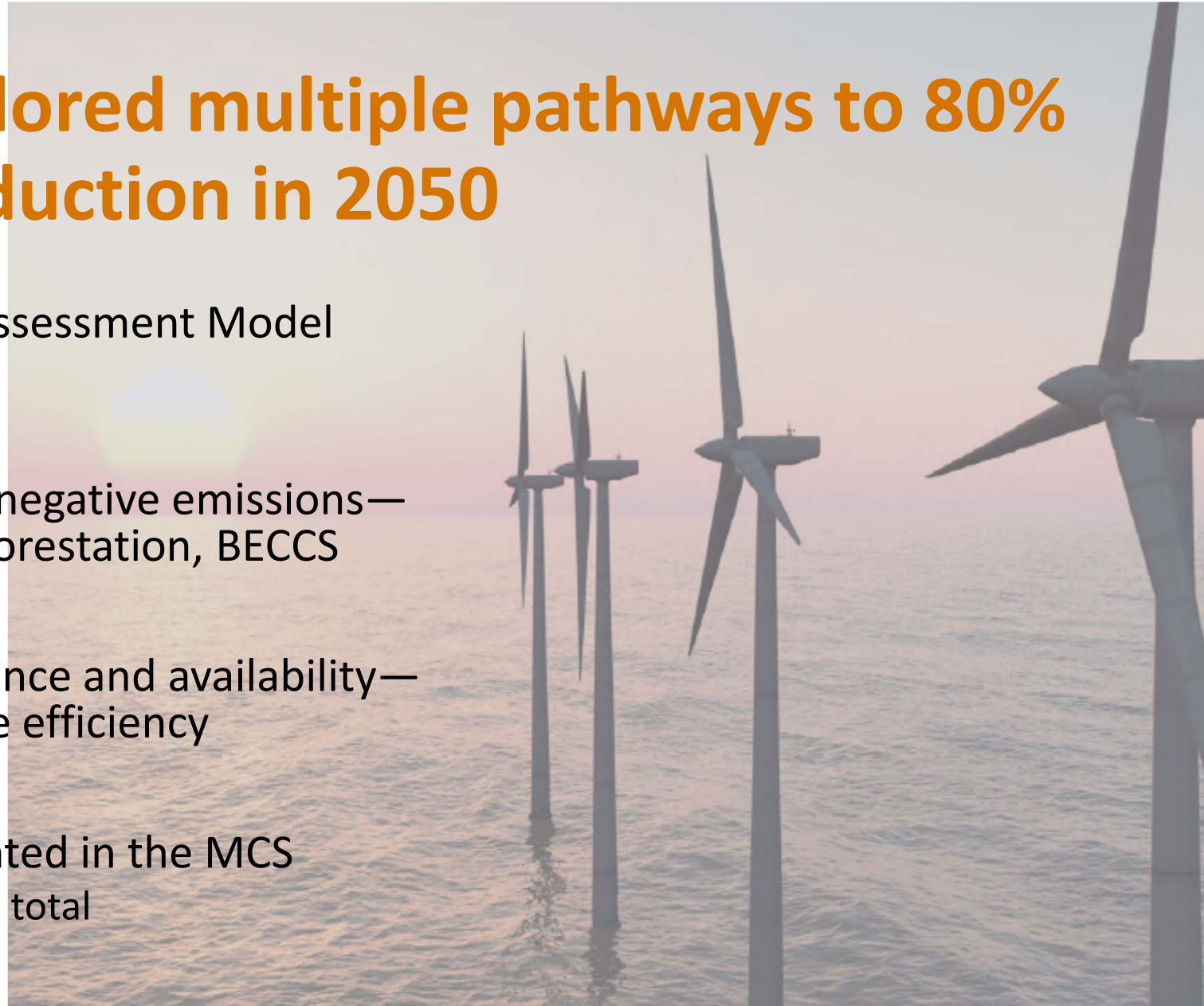
GLOBAL EMISSIONS TRAJECTORIES TO NET-ZERO GHG EMISSIONS AND PROBABILITY OF GLOBAL TEMPERATURE CHANGES



The United States MCS puts the nation on a path consistent with a successful global outcome. Achieving the Paris Agreement temperature goals will require increasing global ambition leading to 2030 and steep reductions to net-zero global GHG emissions following 2030. We show the probability of staying below 2° C and 1.5° C across global scenarios by 2100. While there could be an overshoot of the Paris Agreement temperature objectives before 2100, achieving net-zero GHG emissions globally could bring temperatures below peak levels in 2100 and beyond.

The MCS explored multiple pathways to 80% emissions reduction in 2050

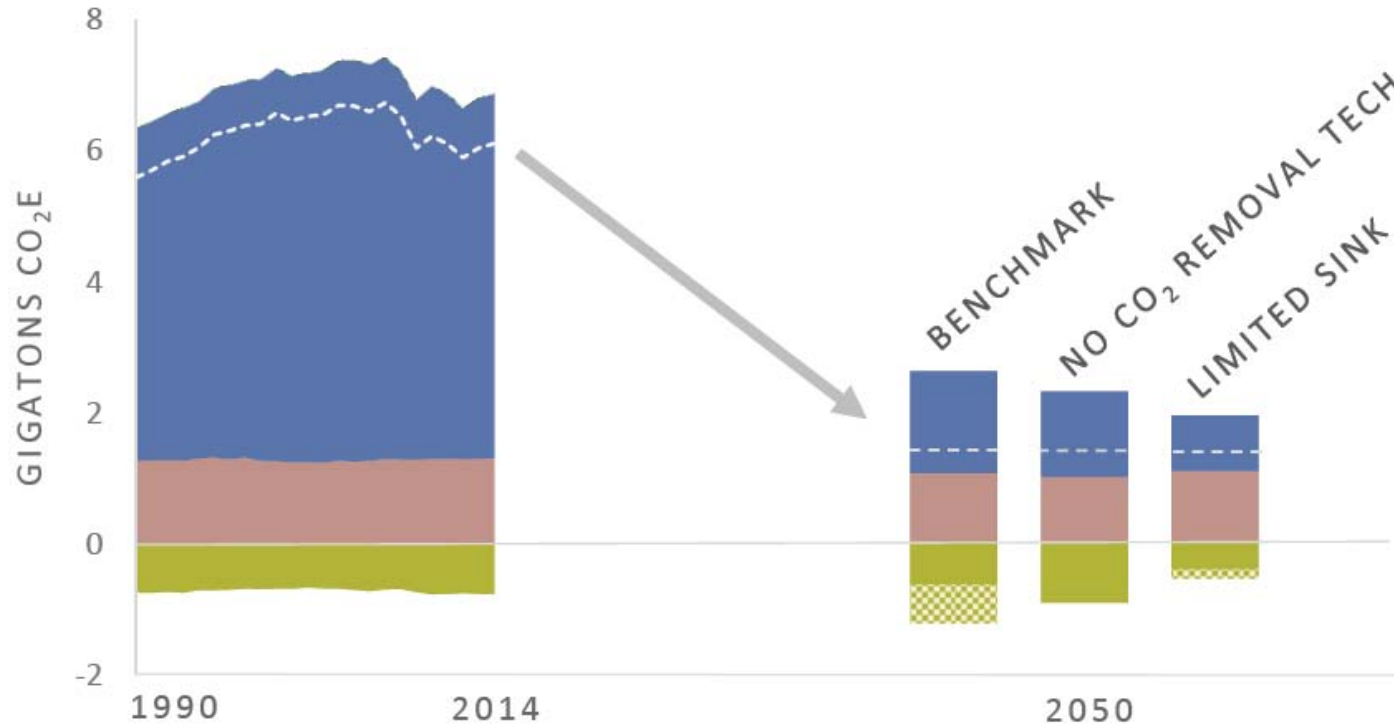
- The Global Change Assessment Model (GCAM)
- Role of land use and negative emissions—role of bioenergy, afforestation, BECCS
- Technology performance and availability—CCS, Nuclear, End-use efficiency
- 8 Scenarios documented in the MCS
 - 80 total cases run in total





A VISION FOR 2050

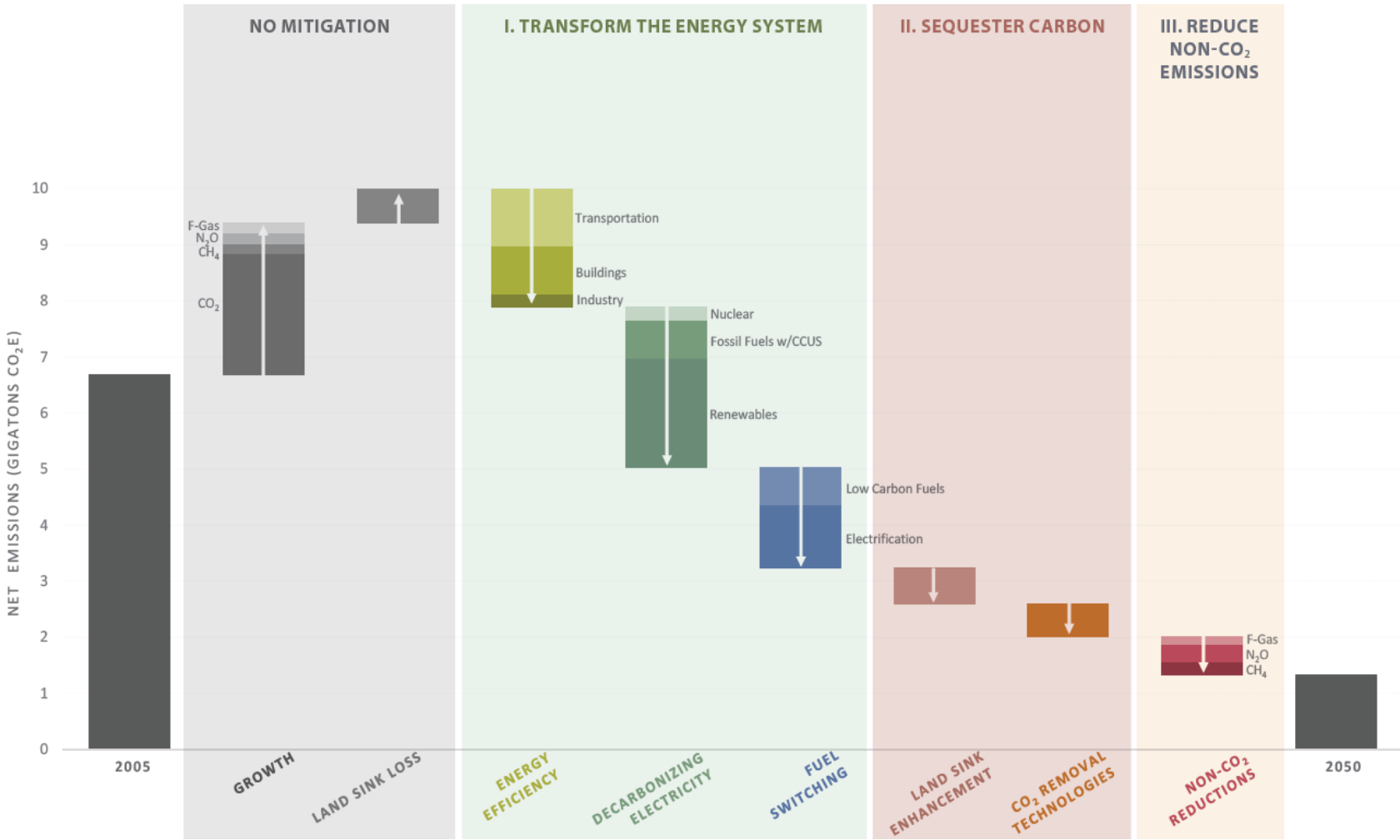
U.S. NET GHG EMISSIONS UNDER THREE MCS SCENARIOS



Multiple pathways to 80 percent GHG reductions by 2050 are achievable through large reductions in energy CO₂ emissions, smaller reductions in non-CO₂ emissions, and delivering negative emissions from land and CO₂ removal technologies. Note: “No CO₂ removal tech” assumes no availability of negative emissions technologies like BECCS.

-  Net GHG
-  CO₂
-  Non-CO₂
-  Land Sink
-  CO₂ Removal Technologies

COMPONENTS OF MCS 80 PERCENT GHG REDUCTIONS IN MCS BENCHMARK SCENARIO

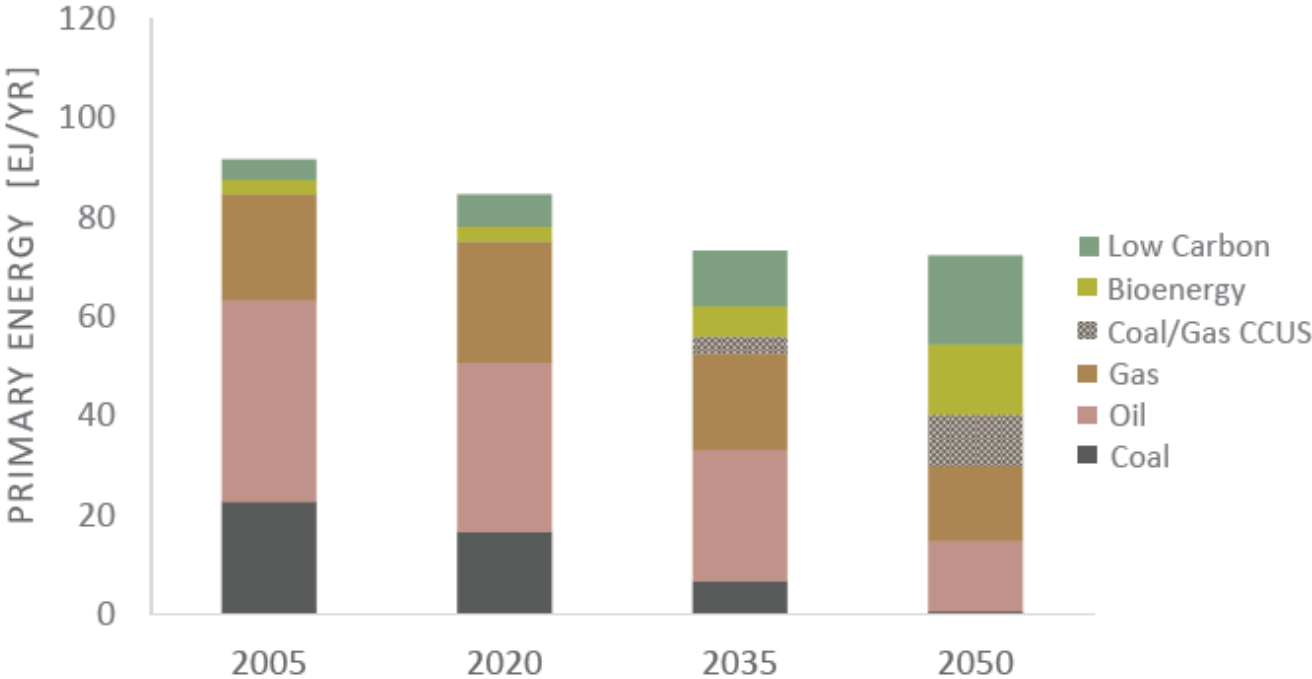


DECARBONIZING THE U.S. ENERGY SYSTEM



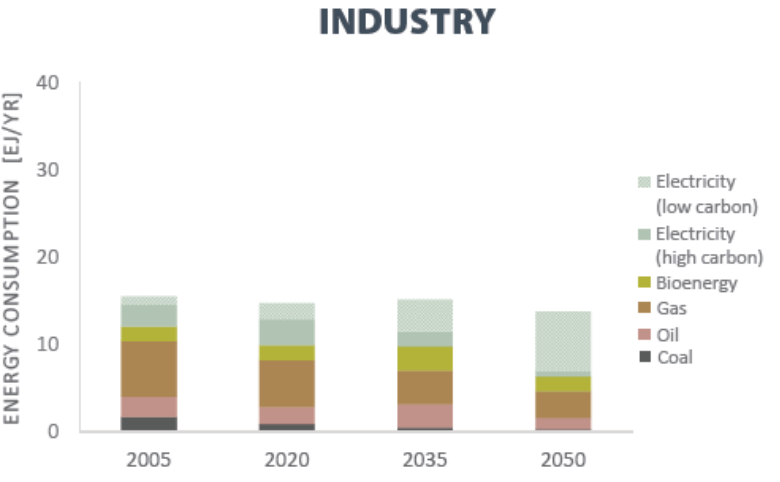
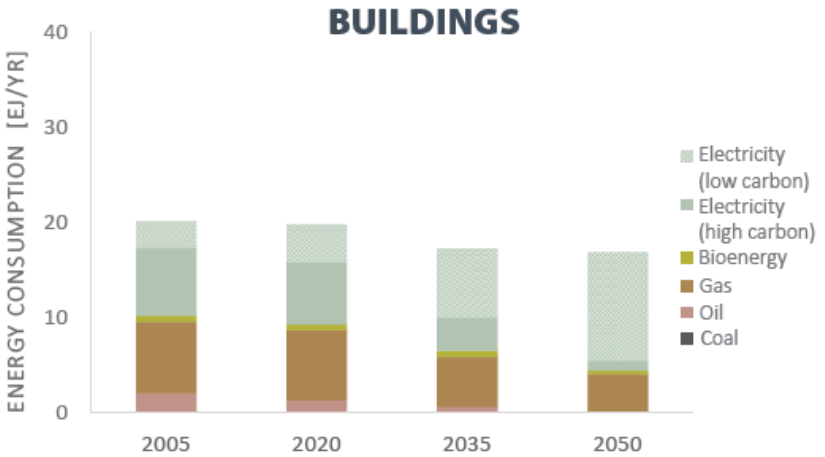
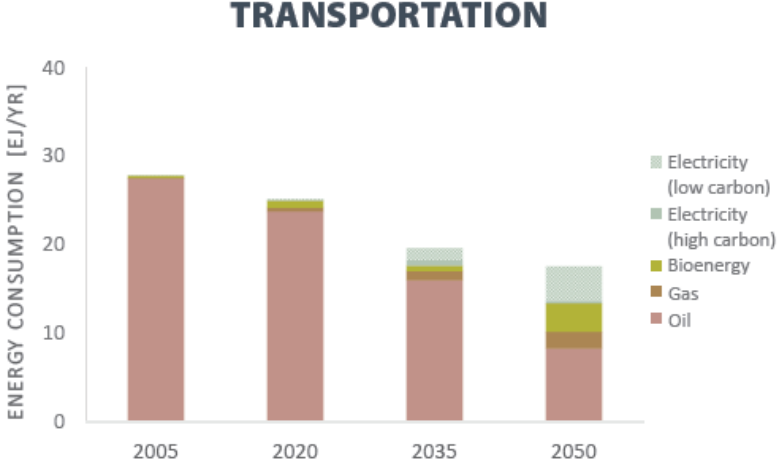
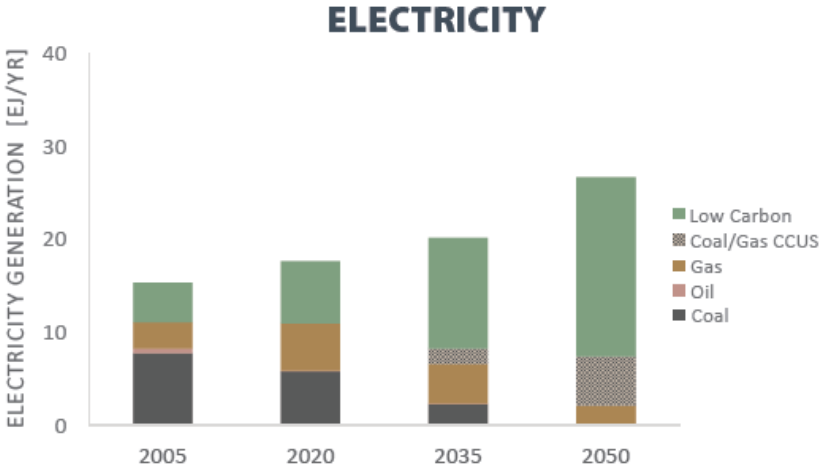
U.S. ENERGY SYSTEM TRANSITION BY SECTOR IN MCS BENCHMARK SCENARIO

PRIMARY ENERGY



Primary Energy declines over time with a growing economy as a result of improved energy efficiency across sectors. The electricity system is nearly decarbonized by 2050, and electricity production increases to support electrification across transportation, buildings, and industry. Efficiency increases markedly in the transportation sector, largely through the deployment of electric vehicles, which consume 1.6 to 3.7 times less energy per mile than conventional vehicles.

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Discussion