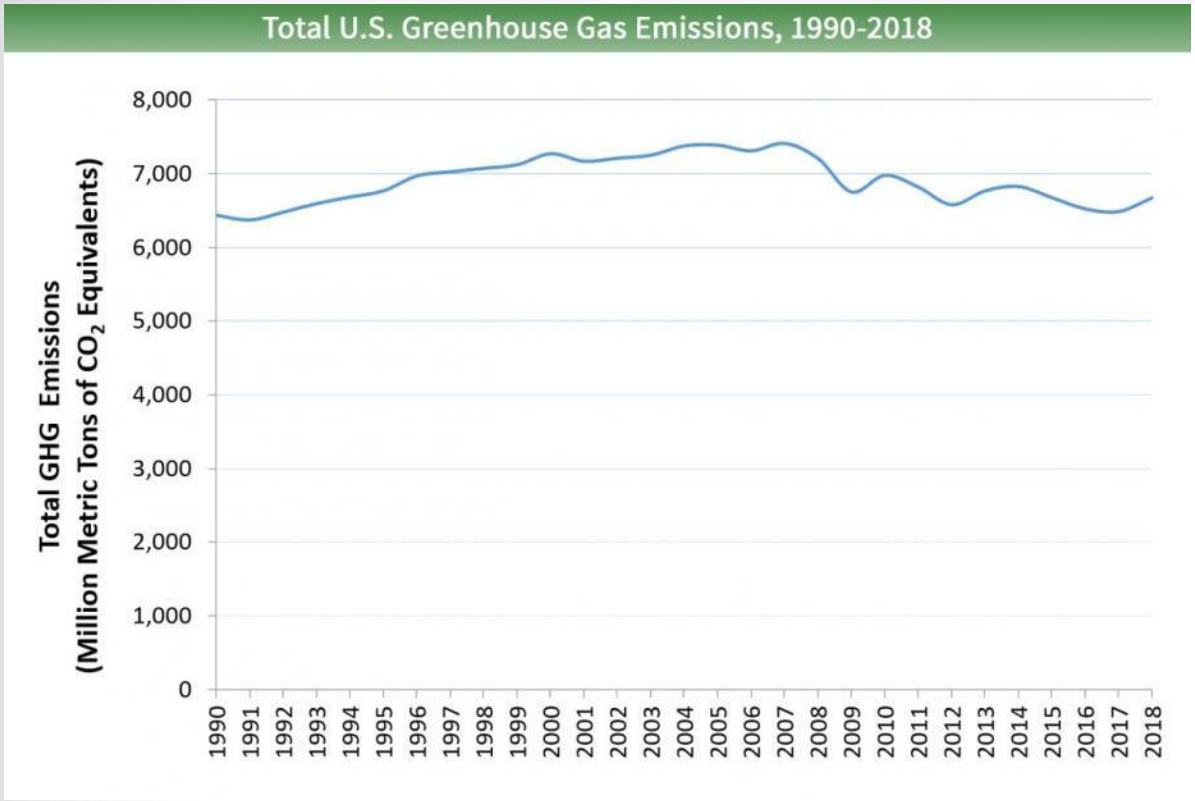
Air, Climate, and Energy (ACE)

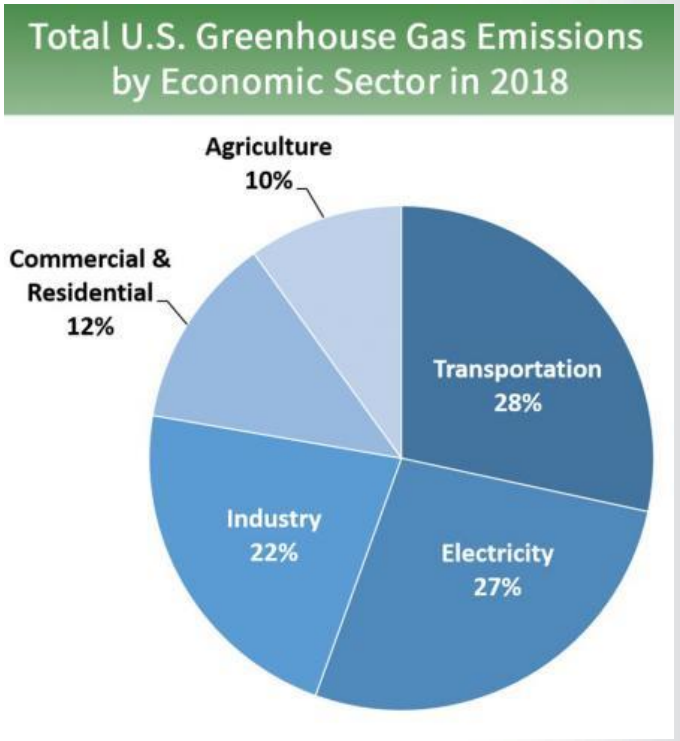
Science and Energy Systems

BOSC Subcommittee Meeting, October 12 - 14, 2021

Sherri Hunt, ACE Principal Associate National Program Director

GHG Emissions in the US have decreased



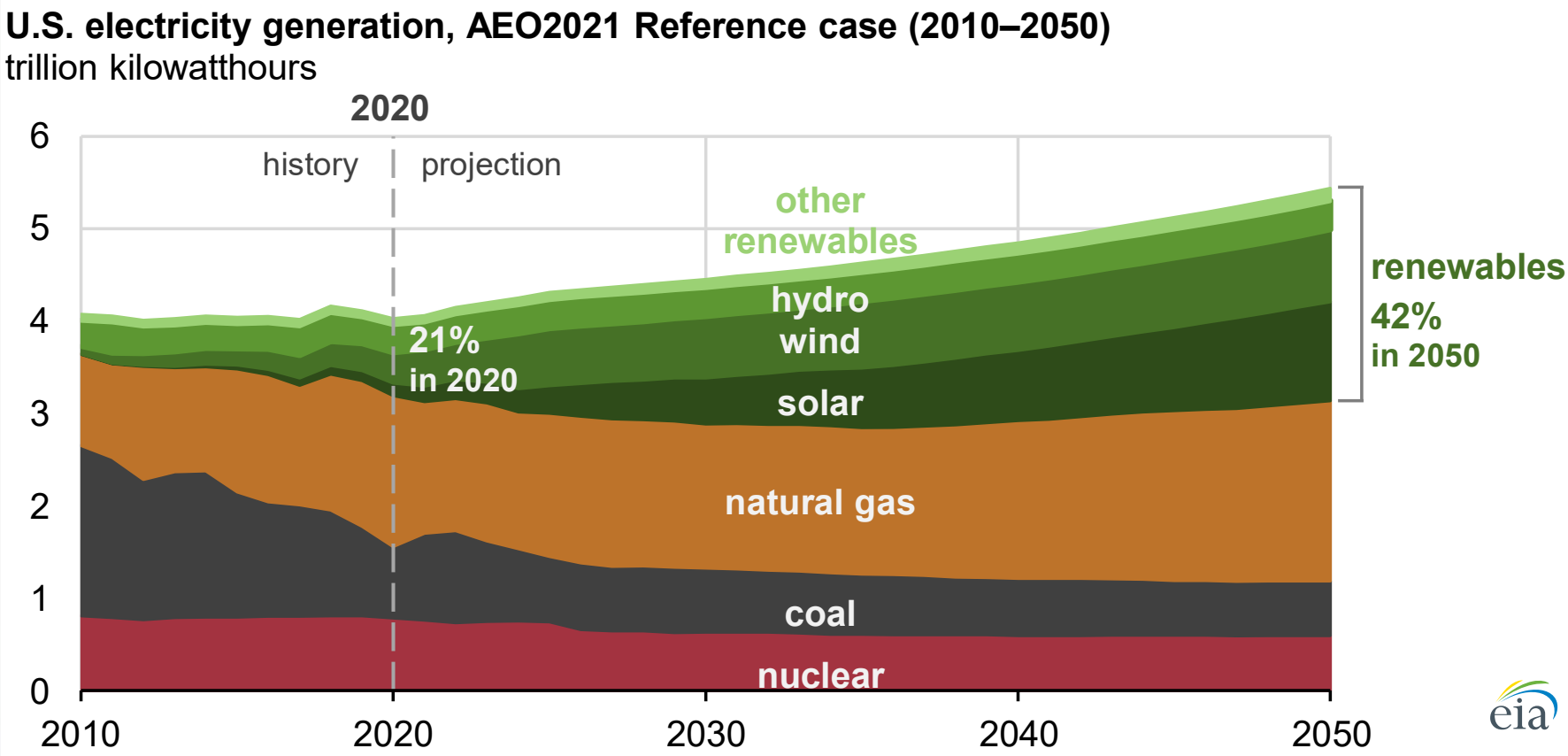


Reasons for emissions reductions in the US:

- Retirement of coal plants
- Increasing electricity from wind, solar power, gas
- More efficient vehicles

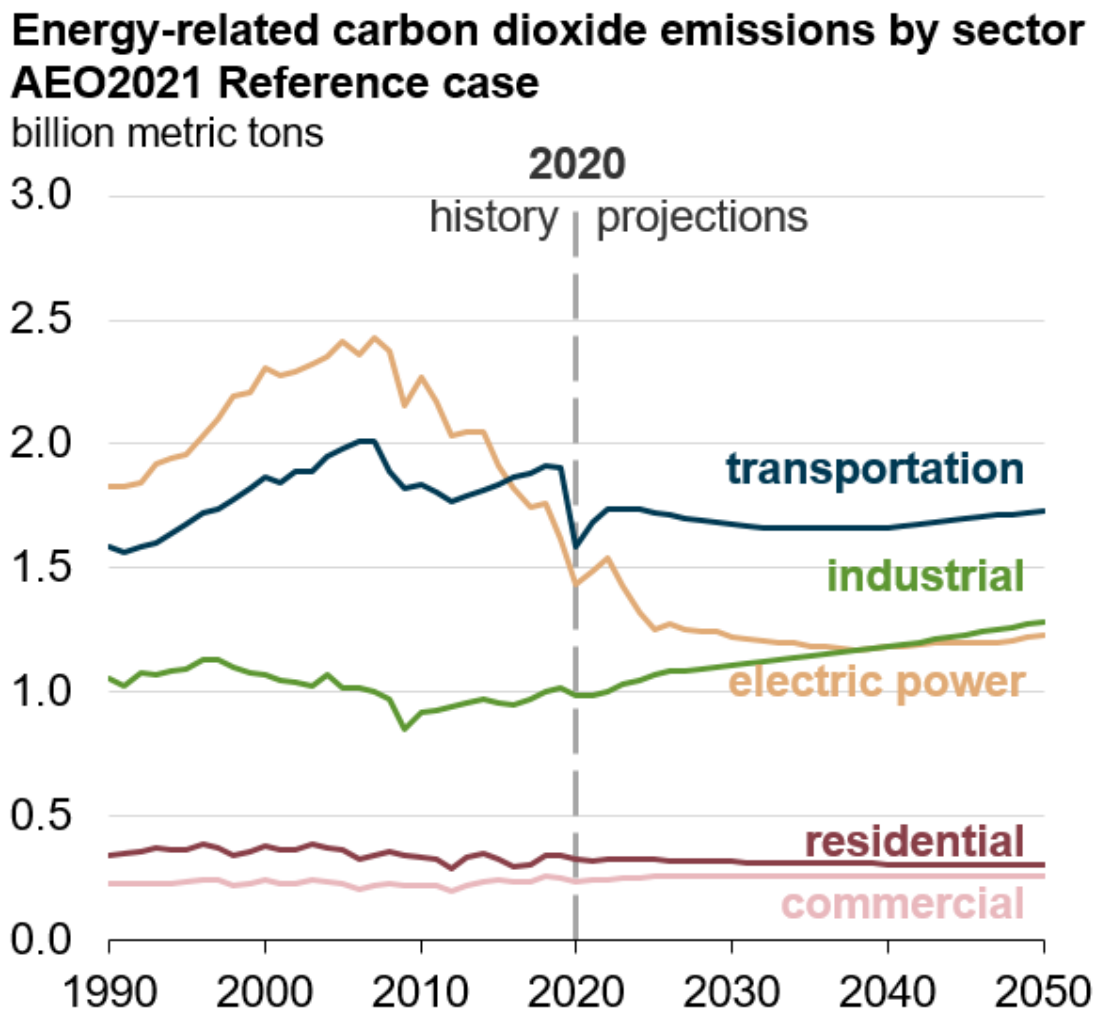
Source: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks

Electricity production is changing



Source: U.S. EIA Annual Energy Outlook, 2021

Energy use is changing

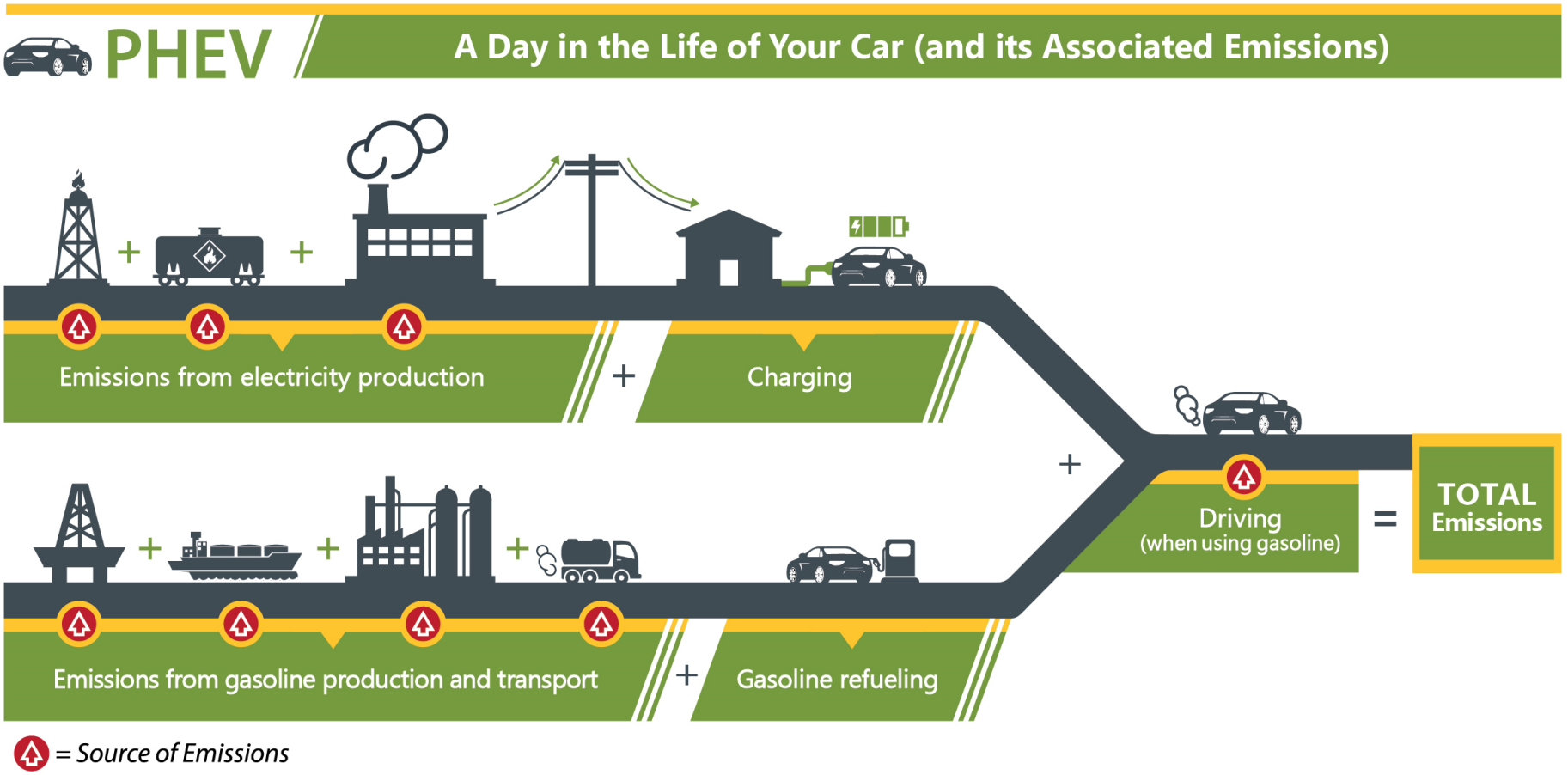


Transportation sector shifts:

- Emergence and increase of electric vehicles
- Vehicle ownership vs. ride-sharing services
- Telework and online shopping
- Autonomous vehicles

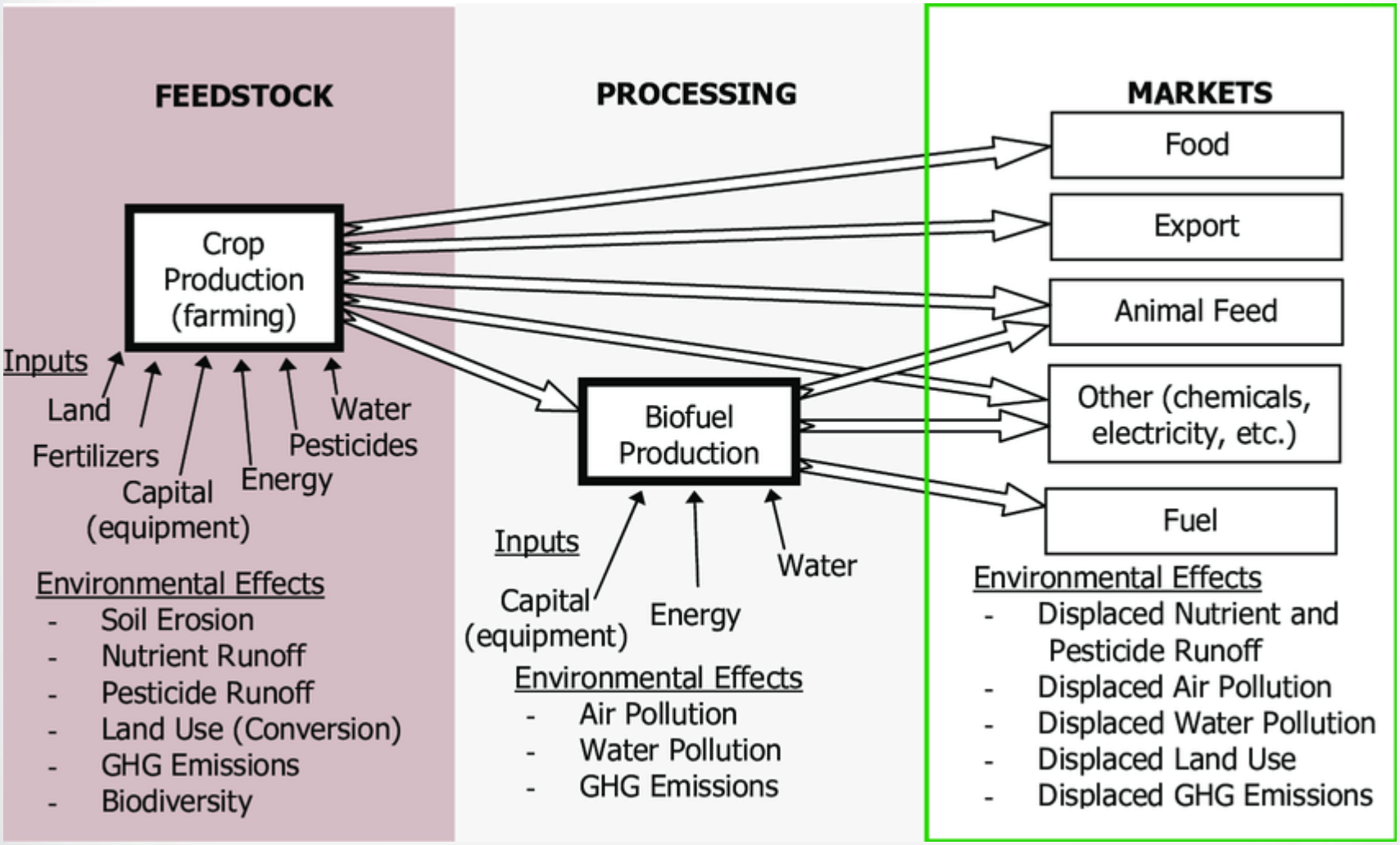
Source: U.S. EIA Annual Energy Outlook, 2021

Transportation emissions are complex



Source: www.fueleconomy.gov

Environmental impacts of biofuels



Source: Kammen 2008

The Role of ACE Research

- The Air, Climate, and Energy program develops tools to inform our partners about the positive and negative consequences of alternative potential ways to meet policy goals.

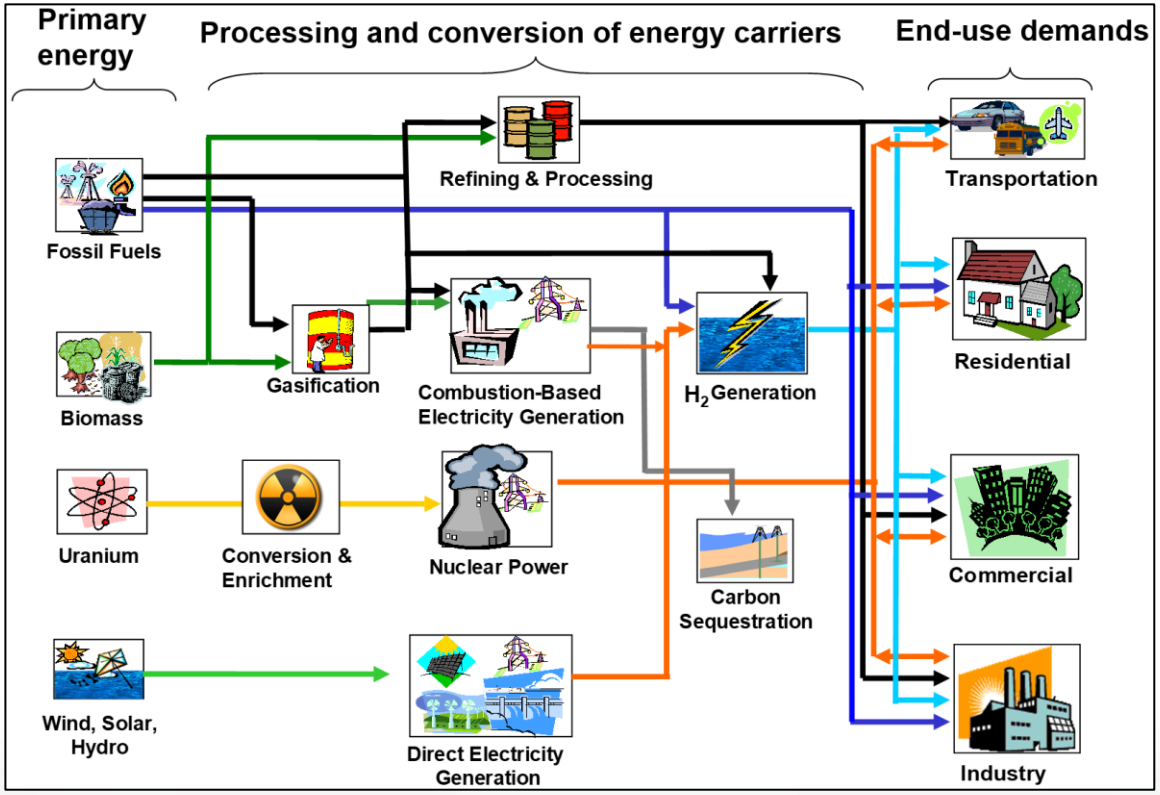
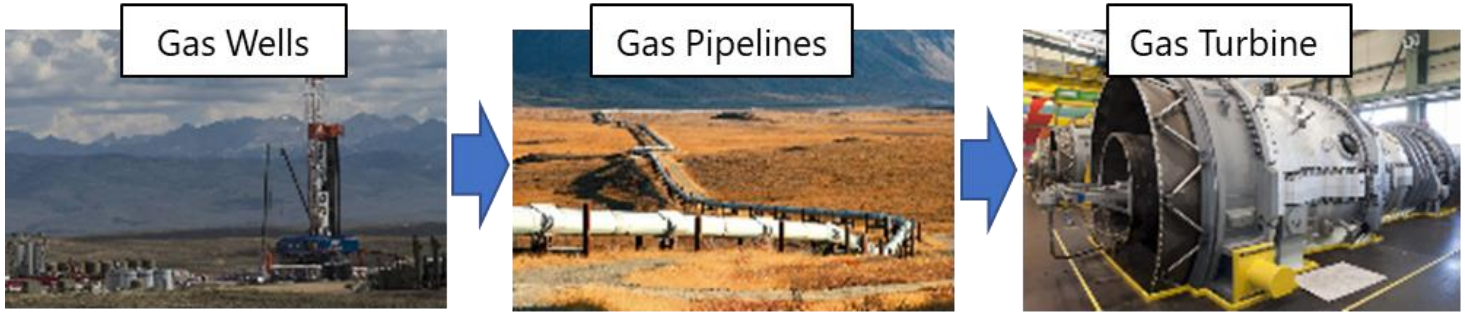


Image credit: Dan Loughlin

ACE Research is...

- Developing and applying energy systems models and databases at the local and national level
- Investigating the impacts of energy systems, transportation, and the use of biofuels on the environment including aquatic and terrestrial ecosystems



Charge Question 3

The Nation's energy and transportation systems are experiencing major transformations in response to economic drivers and to meet the goal of net-zero carbon emissions by 2050. Understanding the dynamic changes in these complex, interconnected systems is important for understanding impacts of policies and technology changes on emissions of greenhouse gases, air pollutants, and other health and environmental impacts.

- **What suggestion(s)/recommendation(s) does the Subcommittee have on ORD's implementation of its research portfolio to gain a better understanding of how energy and transportation systems may evolve and the consequences for emissions and other impacts. [RA5]**

Program Implementation

- ORD scientists from the Center for Public Health and Environmental Assessment (CPHEA) and the Center for Environmental Measurement (CEMM) and Modeling are addressing these scientific challenges.

- Next, a panel of EPA scientists will provide an overview of the Centers' scientific approaches to deliver outputs and products related to the changing energy systems and how their programs are using this work.