Accelerating Effective Reduction of Greenhouse Gas Emissions

January 2024

DRAFT/PRE-DECISIONAL

PCAST Reports

- Established by Executive Order, PCAST is an independent Federal Advisory Committee comprised of individuals from industry, academia, and non-profit sectors

- A PCAST Working Group studies the topic, solicits information from diverse stakeholders, and drafts a report

- To release a report, full Council must make the decision in public, which includes discussion and voting

- Recommendations must reflect the Council's independent judgment, and thus *PCAST reports are not subject to any interagency review or approval process*

- Reports are public, except if classified

PCAST WORKING GROUP

PCAST Members

- Inez Fung (UC Berkeley) – co-lead
- Saul Perlmutter (UC Berkeley) - co-lead
- William Press (University of Texas, Austin) – co-lead
- Cathie Woteki (University of Virginia & Iowa State University) - co-lead
- Frances Colon (Center for American Progress)
- John Dabiri (Caltech)
- Eric Horvitz (Microsoft)
- Steve Pacala (Princeton U)
- Kathy Sullivan (Former NOAA Administrator and Former NASA Astronaut)

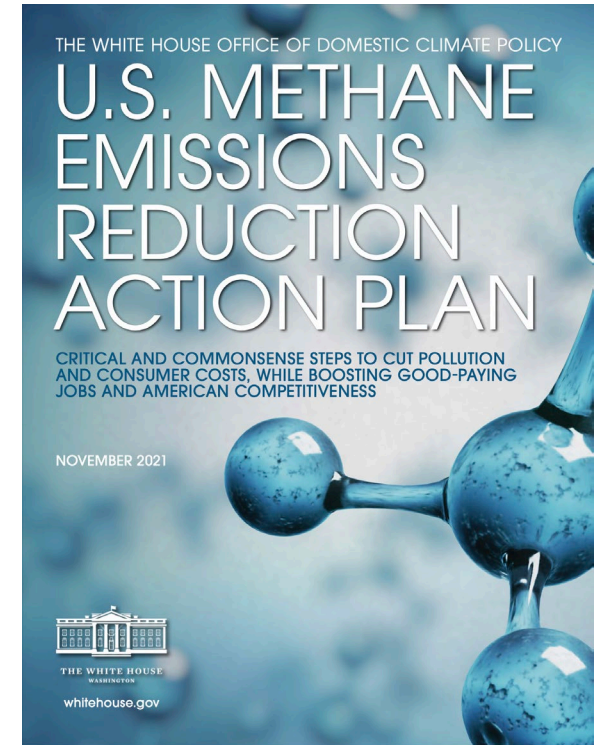# Grand Challenge: Net Zero Emissions by 2050

- Net zero emissions economy by 2050: emissions = removals + sequestration
- Includes all GHG: carbon dioxide, methane, nitrous oxide, HFCs, PFCs, SF6, NF3
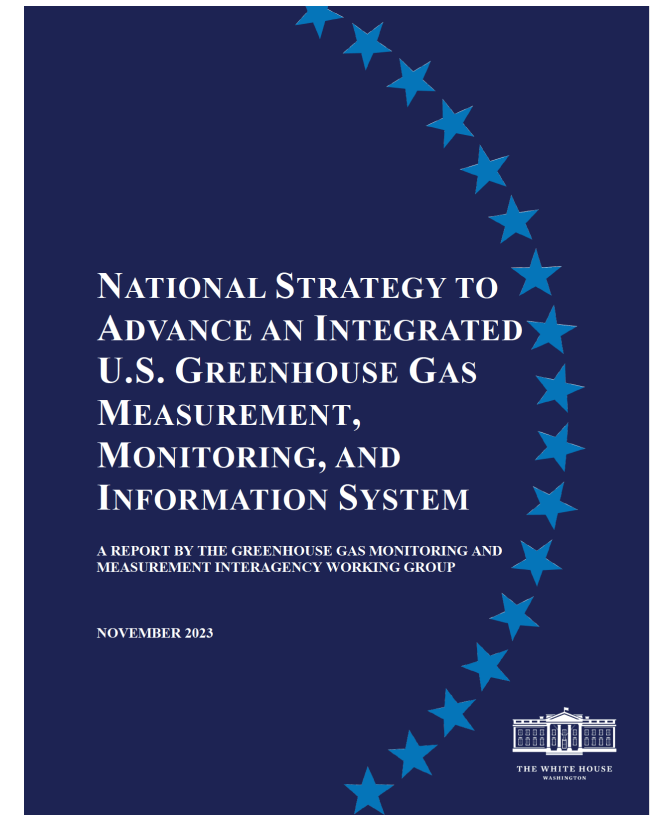- Economy wide
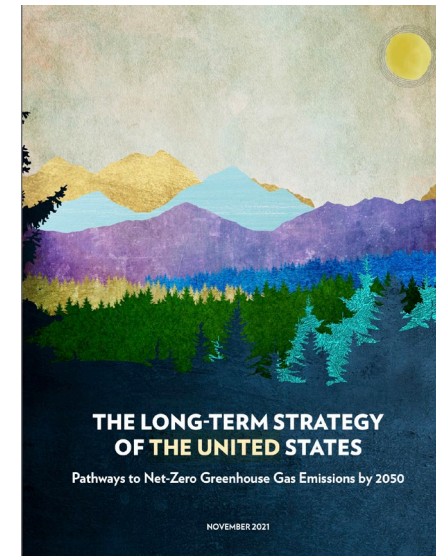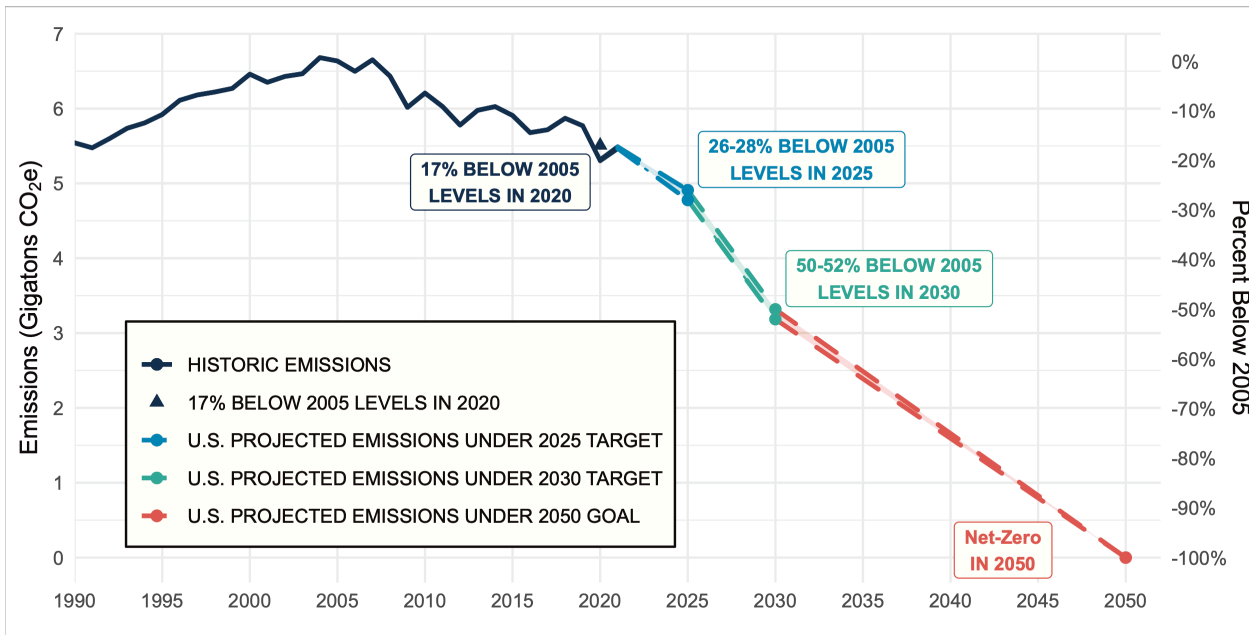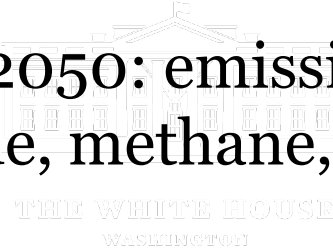
Grand Challenge: Fast Track Methane

2021 (COP26): US-EU led the Global Methane Pledge

- to keep the goal of limiting warming to 1.5C within reach while yielding co-benefits, including improving public health and agricultural productivity

- Reduce global methane emissions at least 30% from 2020 levels by 2030

THE WHITE HOUSE OFFICE OF DOMESTIC CLIMATE POLICY

U.S. METHANE EMISSIONS REDUCTION ACTION PLAN

CRITICAL AND COMMONSENSE STEPS TO CUT POLLUTION AND CONSUMER COSTS, WHILE BOOSTING GOOD-PAYING JOBS AND AMERICAN COMPETITIVENESS

NOVEMBER 2021

THE WHITE HOUSE
WASHINGTON

whitehouse.gov

Meeting the Grand Challenges:

- Historic investments in the Inflation Reduction Act and Bipartisan Infrastructure Law, among others have set the wheels in motion

- Federal agencies, state and local governments, industry, academia, NGO, … have stepped up to meet the challenge

- 2023 November - COP28 Dubai – Agencies announce ambitious plans for emissions reduction

- 2023 November - National Strategy to advance an Integrated US GHG Measurement, Monitoring, and Information System (GHGMMIS)

National Strategy to Advance an Integrated U.S. Greenhouse Gas Measurement, Monitoring, and Information System

A REPORT BY THE GREENHOUSE GAS MONITORING AND MEASUREMENT INTERAGENCY WORKING GROUP

NOVEMBER 2023

THE WHITE HOUSE
WASHINGTON

Each GHG has its own Emission and Removal Mechanisms Complementary Approaches for Estimating Emissions:

Activity-Based

Atmospheric-Based
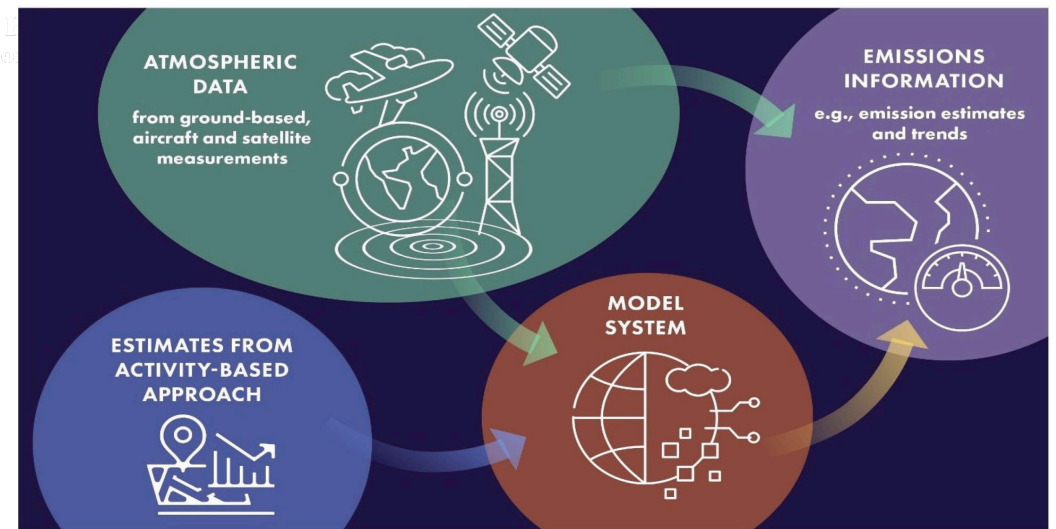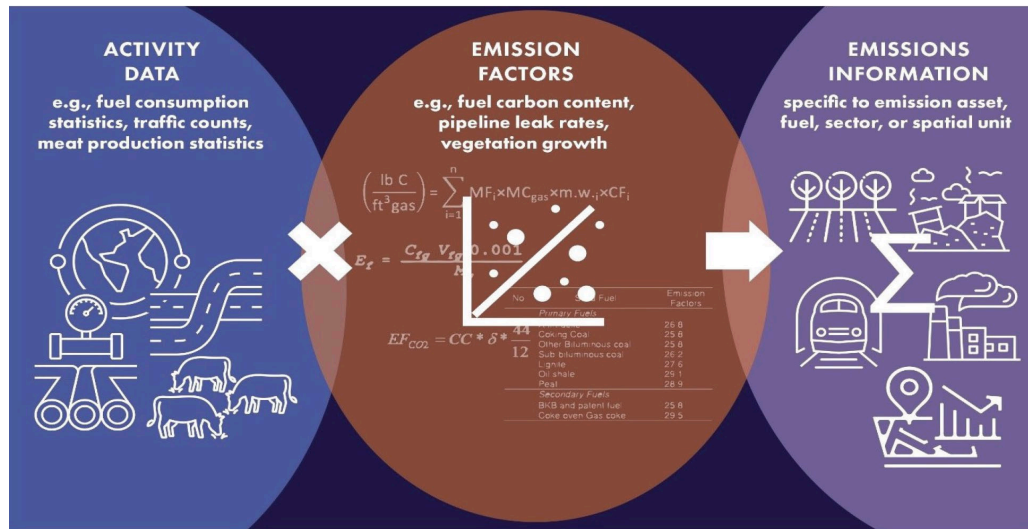
Targeted measurements
Not timely
Often self-report and self-certified

Not granular enough → emissions over coarse area

NASEM GHG Emissions Information for Decision Making: A Framework Going Forward (2022)

Directions Forward

- How can we accelerate emissions reduction by identifying the largest sources in real-time so that we can act promptly?
- How can we provide emission information that can inform and incentivize both voluntary and enforcement-based emissions reduction efforts?
- How do we know which practices are most impactful and cost effective for reducing emission and boosting jobs and American competitiveness?
- How do we verify that our investments have produced the maximum national emissions reduction?
- How do we confirm that the r4ductions are sustained over time?
- How do we determine how best to adjust our course if we veer off path?
- What can we learn in the next 10 years to guide our national strategy for the next 30 years?

ACCELERATING PATH TOWARDS NET ZERO

- The US needs a unified and integrated MMRV program
  - **comprehensive, reliable** measurements of GHG emissions
  - **sustained** monitoring of emissions to 2050 and beyond
  - **integrated and standardized** reporting
  - **rigorous independent** verification
  - **Ongoing engagement** to ensure that data supports the evolving needs of stakeholders to reduce emissions

- Successful emissions reduction depends on having **accurate, granular, timely, and sustained information** on GHG emissions, and on this information being made accessible to those driving mitigation actions.

Recommendations build on the *National Strategy for an Integrated GHGMMIS* and ongoing efforts by agencies, private sector, academia, …

Executive Office of the President | President's Council of Advisors on Science and Technology

Recommendation 1 - **Establish a unified common operating picture for the Nation of emissions measurements, monitoring, reporting, and verification to enable accurate, validated, and timely GHG information at multiple geographic and temporal scales.**

Build on the GHG MMI System to create a durable entity with administrative authorities and budget so that we have the data and resources to understand our GHG successes and challenges through 2050 and beyond.

- We recommend that the President immediately establish a National GHG Monitoring and Information Office that would guide and provide oversight for the development of the U.S. GHGMMIS to 2050 and beyond, as well as host all GHG concentrations and emissions data in the U.S., ensuring a common operating picture and enabling actionable information to facilitate emission reduction.

- Core of the National Office would be the US GHG Center articulated in the US GHGMMIS – but ALL relevant agencies should be included right from the start

Recommendation 2. **Increase the Nation's capacity to track and accelerate progress toward Net Zero in 2050 and beyond by strengthening research and infrastructure to innovate MMRV of GHG emissions.**

2.1 Develop a multi-decadal strategy for satellite observations for GHG MMRV.

2.2 Coordinate interagency research programs to accelerate the innovation of affordable sensors and their calibration, to develop systems that could automate GHG data collection and reporting, and to expand the GHG monitoring efforts across the country.

Recommendation 3. **Expand comprehensive and up-to-date monitoring and reporting of methane emissions from all sectors and incorporate verification using atmospheric approaches.**

3.1 Accelerate and expand the monitoring and timely reporting of data on methane emissions from the entire supply chain of oil and gas industries and the entire life-cycle of fossil methane.   Build on collaborations to identify large emitters, combine activity-based and atmospheric-based measurements

3.2 Expand atmospheric methane monitoring coverage to include neighborhoods in the vicinity of large methane sources, and in urban areas across the country.

3.3. Accelerate the transition from research to operations the integration of atmospheric-based and activity-based emission estimations to produce consistent regional, national, and global scale methane emissions estimates.

Recommendation 4. **Accelerate, expand, modernize, and sustain the MMRV of GHG emissions from the agricultural and forestry sectors, focusing first on methane, in order to assess and enhance the effectiveness and implementation of climate-smart agriculture and forestry practices.**

4.1 Establish protocols and metrics for direct measurement of GHG emissions from systems that are significant but poorly-quantified sources, especially methane emissions from rice cultivation, enteric fermentation, waste management systems, and managed and working wetlands.

4.2 Accelerate the collection, reporting, and dissemination of data on agricultural practices and associated emission factors relevant for assessing our Nation's annual GHG emissions from agriculture. Data latency should be no more than two years.

CONSULTATIONS, BRIEFINGS, AND FEEDBACK
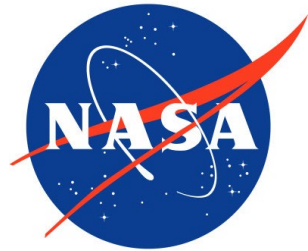
Accelerating Effective Reduction of GHG Emissions

- Recommendations are aimed at supporting and accelerating National Strategy for GHG Measurement, Monitoring, and Information System and agency efforts towards Net Zero. Provide timely, granular, validated information to all engaged in emissions reduction

- Maintain US as the international leader in GHG quantification
    - World Meteorological Organization (WMO)'s global GHG Watch (GHGW)
    - UNEP International Methane Emissions Observatory (IMEO)

- Serve a guide to other nations as they develop their own emissions monitoring systems.