

Nitrous Oxide: No Longer the Forgotten Super Pollutant



Why Nitrous Oxide MMRV Matters

**Carbon Markets Rely
on Accurate Nitrous
Oxide Measurements**

**Maximizing Farmer Profit
Means Understanding
Nitrogen Losses**

**Global Corporations
Need To Track
Emissions**

**Tracking The
Environmental Impacts
Of Nitrogen Pollution**



Long Term Nitrous Oxide Goals



1

Develop Scientific Consensus

2

Identify High Value Scientific Questions

3

Build National MMRV Community

4

Identify Areas of Policy Innovation

5

Develop Long Term Science Strategies



Implementing the Roadmap Through Policy



Take Lessons from the Carbon and Methane Measurement Initiatives

Success involves tracking long term goals, creating scope three measurement technologies, fostering industry investment and marketplace adoption of measurement techniques.

Coordinate Nitrous Oxide Research

Inform funding decisions with roadmap conclusions

Unpack the Roadmap for Policy Makers

Marshalling State and Federal Science Infrastructure

The Different Levers for Policy Making

Federal Science Policy

Federal Agency Research Budgets and Funding Mechanisms

State Policy

Governors, State Agencies, State Land Grants, State Innovation Agenda

Philanthropy

Independent Research and Policy Making Functions

Business

Regulatory Compliance, Research and Development, Implementation

Federal Policy Goals



Research Coordination and Funding

Coordinating between primary funding agencies, data coordination, priority technologies, common modeling tools

Strategic Partnerships

Integrating science policy making by the Office of Science Technology Policy (OSTP) and facilitated by the National Academies or in partnership with National Laboratories.

Integrated Business and Farmer Stakeholder Engagement

Bringing in multinational food companies, philanthropies and non-profits active in agriculture, food systems, climate resilience

Bringing the Roadmap to Federal Policy Makers



U.S. DEPARTMENT
of ENERGY



Coordinate Research and Funding Among Federal Agencies

Department of
Energy

National Science
Foundation

Department of
Agriculture

Office of Science
and Technology

NIST
(Commerce)

Integrate Policy Changes Into Funding Decisions

Coordinating Federal Science Policy around nitrogen through funding MMRV science (**annual appropriations**) and through **annual authorizations** e.g., Farm Bill, NSF, DOE,

Examples of Funded MMRV Programs

- NASA Farm Flux
- ARPA-E ITAR Network
- National Science Foundation (e.g. NEON, quantum network, Internet of Things)
- Department of Agriculture, Agricultural Research Service (e.g. LTAR Sites)

What Do We Need: State Policy



Create an Innovation Pipeline

Utilizing state innovation and technology hubs to create a business ecosystem for N₂O measurement; industry depends on sensors, measurement and modeling tools

Marshal State Resource and Research Agencies

Marshalling state agencies (Departments of Agriculture and Natural Resources) to fund and utilize high value N₂O research tools

Coordinate Among States

Developing N₂O research collaboration tools for state legislatures, governors and state participants in climate negotiations

Bringing the Roadmap to State Policy Makers



Engage with State-Level Policy Makers

State-level engagement, targeting agricultural and environmental agencies in key states where conditions are ripe for action on data coordination.

Broad Interest Across Numerous State Agencies

- Departments of Natural Resources
- Departments of Environment
- Departments of Agriculture
- Climate Policy Office
- Office of Job Creation/Innovation

Develop policy briefs for individual states

Policy briefs tailored to individual state contexts are in development to support these conversations.

[California](#)[Maryland](#)[Delaware](#)[Wisconsin](#)[Minnesota](#)



Conclusion

Share the Roadmap: Connect the Nitrous Oxide MMRV Research Community to Policy Makers, Philanthropy and the Private Sector

Volunteer: Tailor Nitrous Oxide Roadmap Recommendations to your State, Local or Federal Policy Contexts

Activate the Private Sector: Connect with Industry Organizations in your State, Local or Federal contexts to share their needs

Thank You

Access the Roadmap:

<https://doi.org/10.17605/OSF.IO/RT63B>

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