

Cornell CALS

Life-Changing Research, Education and Outreach

Cornell University is located on the traditional homelands of the Gayogohó:nq' (the Cayuga Nation). The Gayogohó:nq' are members of the Haudenosaunee Confederacy, an alliance of six sovereign Nations with a historic and contemporary presence on this land. The Confederacy precedes the establishment of Cornell University, New York state, and the United States of America. We acknowledge the painful history of Gayogohó:nq' dispossession, and honor the ongoing connection of Gayogohó:nq' people, past and present, to these lands and waters.

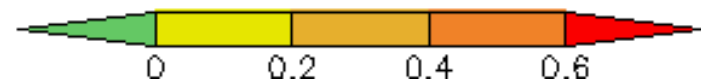
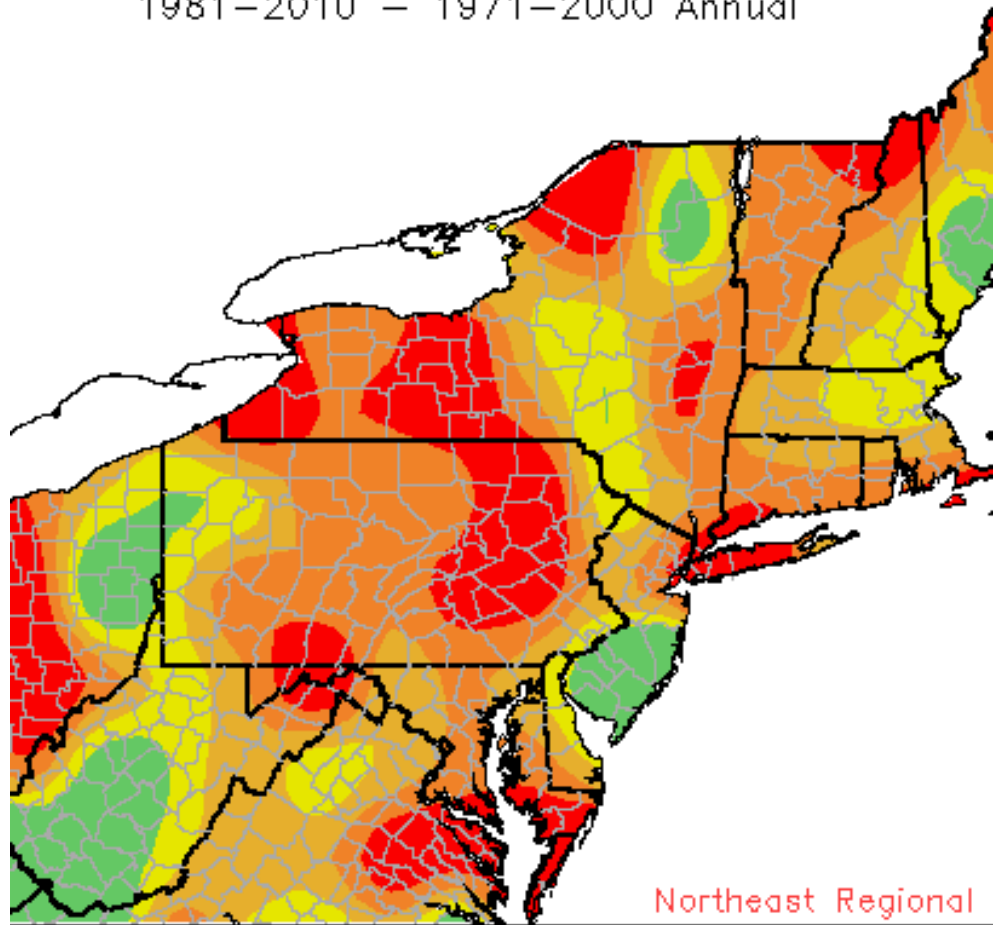
Julie C. Suarez, Associate Dean, Land Grant Affairs

Context

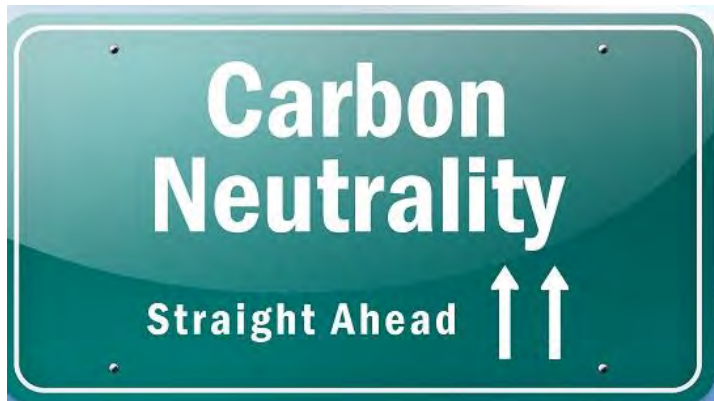
Goals:

- 1) Basic understanding of NYS's climate goals; touching upon federal vision
- 2) Context on evolving policy framework
- 3) Facilitate thought on how extension helps farmers prepare for new policies

Difference in Normal Max Temp (Deg F)
1981–2010 – 1971–2000 Annual



CLCPA – Driving Towards Net Zero by 2050



New York's Nation-Leading Climate Targets

85% Reduction in GHG Emissions by 2050

100% Zero-emission Electricity by 2040

70% Renewable Energy by 2030

9,000 MW of Offshore Wind by 2035

3,000 MW of Energy Storage by 2030

6,000 MW of Solar by 2025

22 Million Tons of Carbon Reduction through
Energy Efficiency and Electrification

CLCPA Framework

- **What it isn't!**
- Not a govt. mandate (yet)
- **Doesn't end cows burping, i.e. doesn't end animal ag**
- **Doesn't set up a payment structure for farmers (yet)**



- What it is!
- Sets up an overarching Advisory Council
 - Bob Howarth, Cornell CALS/CAS
- Sets up an Climate Justice Working Group
 - Mary Beth McEwan, Oneida CCE
- Sets up a series of 6 committees
 - Peter Woodbury, Myself, CALS
 - Lara Skinner Cornell ILR
- Requires the development of recommendations, folded into the scoping process, for eventual adoption by DEC as regulations

CLCPA Timeline



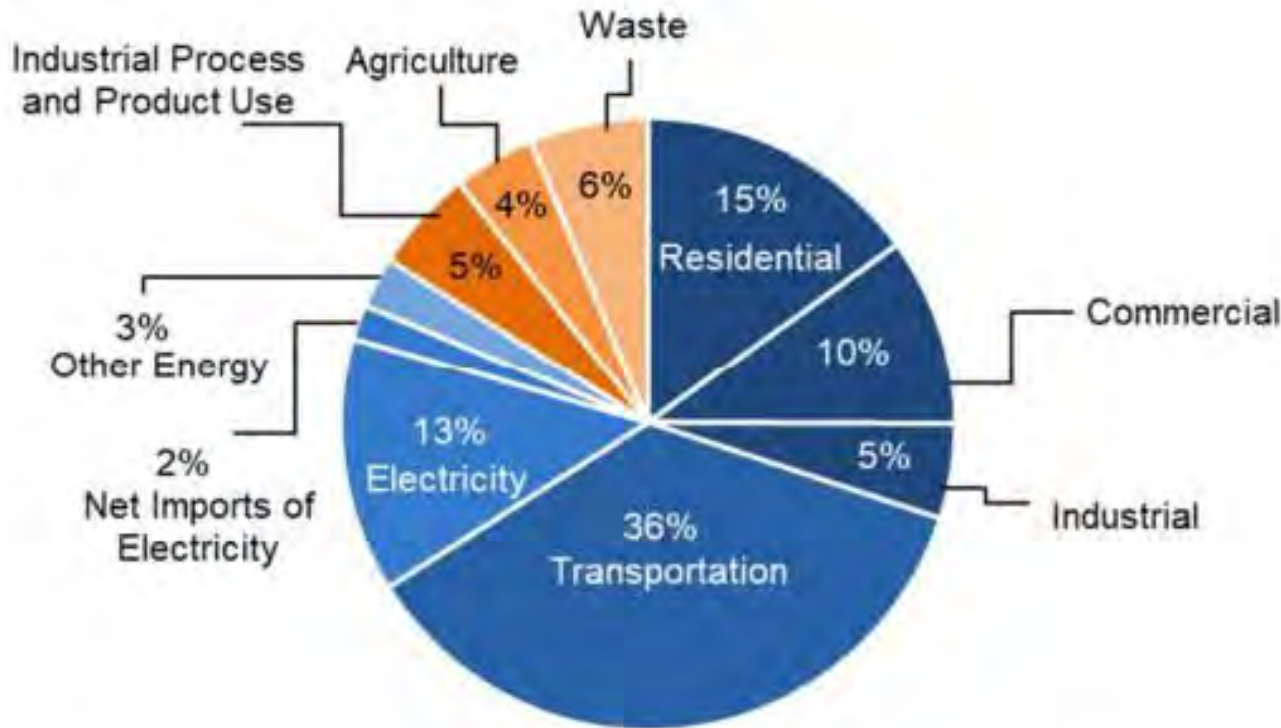
Source: NYSERDA

Scoping Plan Requirements

- Performance based standards for GHG sources
- Reduction of electricity sector emissions
- Achievement of clean energy requirements
- Limiting usage of synthetic GHGs
- Land Use and Transportation planning
- Reducing energy use in existing buildings
- *Achieving Long Term Carbon Sequestration*
- *Promoting Best Management practices in land use*
- Aiding in state workforce transition to clean energy economy
- Limiting methane leakage

Where are NY's emissions

Figure 2. 2016 New York State GHG Emissions by Sector



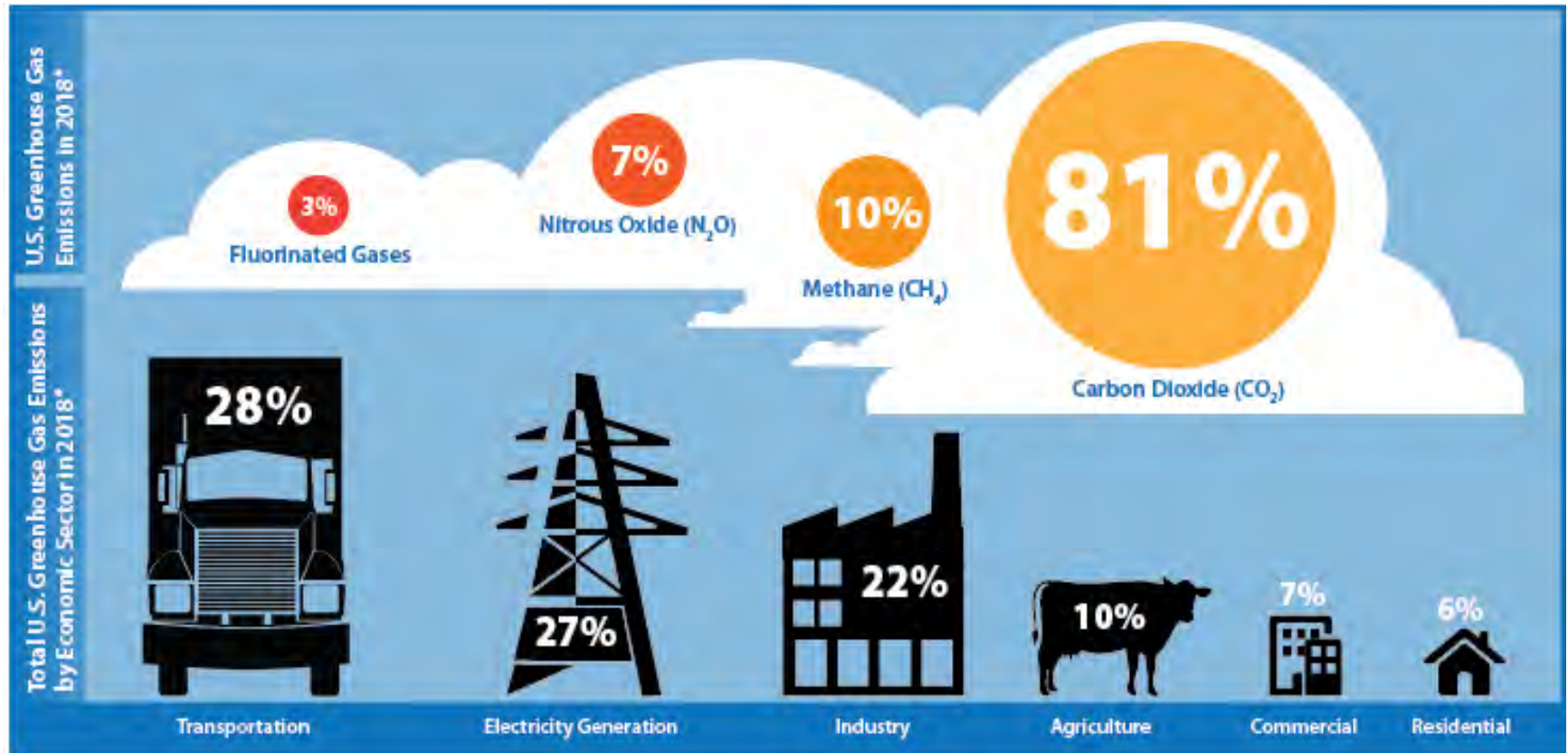
Note: The combined contribution from all waste-related activities is approximately 8%.

Emissions Reduction From 1990 levels:
51% GHG decrease from electricity generation

13% GHG decrease in total

Source: NYS GHG Inventory; DEC

United States GHG Emissions – where does ag fall?



Source: EPA GHG Inventory - 2018 data

2 interesting wrinkles re: Emissions

- If we can't decarbonize “hard to decarbonize” industries, how do we get to net zero?
- CLCPA envisions an “alternative compliance” mechanism to eventually be developed but:
 - It excludes Pyrolysis
 - It excludes Anaerobic Digesters
 - It excludes biofuels
 - It's questionable whether it will ever be adopted
- **NY's CLCPA requires our** emissions to be calculated in 2 different ways
 - 1) We have to account for emissions associated with fossil fuels brought into the state of NY and
 - 2) We have to calculate GWP, i.e. a 20 year time frame of short lived climate pollutants like methane into our GHG emissions

Why this matters?

Agriculture & Forestry Committee

- This is the only Committee that generates negative emissions – or carbon sequestration.
- That makes ag and forestry sectors **INCREDIBLY COOL!**
- For once, Ag and Forestry are coming into their own!
- Co-benefits to sustainable **practices; and there's a** mission to embed economic growth into each sector
- Informing CALS vision: **PES**



Agriculture & Forestry Committee Goals

- 15% reduction in methane and nitrous oxide from livestock & crop land operations by 2030 from current levels
- 30% reduction in methane and nitrous oxide emissions from livestock and crop land emissions by 2050 – return to baseline 1990 equivalency of emissions
- Reduce fossil fuel usage in ag and forestry sectors
- **Subcommittees!**
 - Agroforestry
 - Forestry
 - Land Use
 - Bioeconomy
 - Soil health
 - Nutrient Management
- <https://climate.ny.gov/Climate-Action-Council>
- April 12th presentation to CAC

Resources you can use

<http://blogs.cornell.edu.Woodbury/publications>

New York Agriculture and Climate Change: Key Opportunities for Mitigation, Resilience, and Adaptation

**Final Report on Carbon Farming project for the
New York State Department of Agriculture and Markets**

1 May 2020

**Jenifer L. Wightman and Peter B. Woodbury
Cornell University**

This project was supported by the State of New York.

The opinions, results, findings and/or interpretations of data contained herein are the responsibility of the authors and do not necessarily represent the opinions, interpretations or policy of the State.



So what can farmers expect?

- Soil Health

- PES concepts for c. sequestration
- More peer to peer networking/on-farm discussion group approaches
- Engagement between SWCD/CCE/Other partners
- AEM focus on soil health & “carbon farming” plan modules
- Potential for soil “quality” goals
- Urban soils!

- AgroForestry



So what can farmers expect?

- **Nutrient Management**

- Focus on precision feeding & adoption of more digital technologies, precision fertilizer usage to reduce crop land N₂O
- Focus on methane – enteric fermentation, cover & flare, & AD systems
- CNCPS & NMB approaches
- Encouragement of innovation; what are the new technologies we need to manage nutrients & deploy where needed?

- **BioEconomy**

- Transition to a non-fossil fuel based economy; encouragement of wood based products & continual forest regeneration through economic and sustainable usage of forest economy
- Transition to a low-carbon economy by developing bio-based fuels, low carbon products, tech etc., that can re-purpose waste
- Encompasses tech like biochar, RNG, etc.

Overall Themes

- R&D
- Human Capacity
- “Tried & True” Programs
- Benchmarking
- Land use planning (read Land use conflicts....)
- Beneficial electrification strategies down the road
- At some point; we will need a greater emphasis on agricultural resiliency, i.e. crop adaptation strategies for farmers as well



Federal Harmonization

BRIEFING ROOM

FACT SHEET: President Biden Takes Executive Actions to Tackle the Climate Crisis at Home and Abroad, Create Jobs, and Restore Scientific Integrity Across Federal Government

JANUARY 27, 2021 • STATEMENTS AND RELEASES

Biden climate order will wipe agriculture, manufacturing industries out of business: Missouri AG

EXPERT BLOG • ALLISON JOHNSON & ANDREA SPACHT COLLINS

Biden Sets Stage for Climate Resilient Food & Agriculture

January 29, 2021 | Allison Johnson & Andrea Spacht Collins

SAYS A CARBON BANK FITS INTO PORTFOLIO

USDA HAS THE AUTHORITY TO CREATE A SO-CALLED CARBON BANK TO ENCOURAGE CLIMATE MITIGATION ON THE FARM, SAID AGRICULTURE SECRETARY TOM VILSACK ON MONDAY, BUT HE IS WAITING FOR FARMERS' IDEAS ON HOW THE BANK SHOULD OPERATE.

By **Chuck Abbott**
3/23/2021

The USDA has the authority to create a so-called carbon bank to encourage climate mitigation on the farm, said Agriculture Secretary Tom Vilsack on Monday, but he is waiting for farmers' ideas on how the bank should operate. Speaking at a farm conference, Vilsack said he was open to an increase in USDA spending power, if needed, to prevent a squeeze on money needed for the farm program.

President Biden has a goal of seeing American agriculture as the first in the world to achieve net-zero emissions of greenhouse gases. There are recurrent suggestions that a USDA carbon bank could help farmers adopt climate-smart practices or even set a floor price for each ton of carbon sequestered into the soil or trees.



Conclusion



Additional Resources You Can Use

- Wolfe, D. W., DeGaetano, A., Peck, G., et. al(2018). Unique challenges and opportunities for NE crop production in a changing climate. *Climatic Change*. 146:231-245.
- Lehmann et. al; Towards a global-scale soil climate mitigation strategy
www.nature.com/articles/s41467-020-18887-7
- Lehmann, et. al: The concept & future prospects for soil health
www.nature.com/articles/s43017-020-0080-8
- <https://lehmannlab.cals.cornell.edu/research/biochar/>
- <https://www.atkinson.cornell.edu/events/ClimateChangeSem.php> (video recordings of Atkinson climate change seminars)
- https://ecommons.cornell.edu/bitstream/handle/1813/44744/14Chase_Manuscript.pdf?sequence=1&isAllowed=y
- <http://ny-idf-projections.nrcc.cornell.edu/>



Questions? Life. Changing