

## **G. How can we improve resilience?**

*Moderator: Representative Carolyn Partridge, VT*

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### **Carbon Farming, Assembly Member Didi Barrett, New York**

Chemically intensive farming practices are reducing the soil's ability to sequester carbon dioxide and other greenhouse gases like methane and nitrous oxide which are significant drivers of climate change and the loss of soil health and resilience. Agricultural industries account for at least nine percent of global greenhouse gas emissions.

Carbon farming, like carbon tax and carbon penalties, is a way to mitigate carbon in the atmosphere. Carbon farming is the nexus of agriculture and environmental conservation and climate change that employs traditional regenerative techniques. Simply put, carbon farming takes carbon out of the air and stores it in the soil. It also offers a host of ecological benefits including erosion mitigation, soil remineralization, reduced water runoff and increased water retention by the soil. Carbon farming methods include no or minimum till, cover crops, perennial forages, crop rotation, building biological ecosystem diversity in soil biology, adding manure as fertilizer, managing animal grazing practices, silvopasturing and creating riparian buffers.

The Hudson Valley Carbon Farming Project is a pilot to explore and study the sequestration potential of carbon and other greenhouse gases using on-farm best management practices. (The concept was first introduced in 2017 as the Carbon Farming Act.) It will be conducted on no less than eight diverse commercial farms and orchards. The project is Senate funded at \$400,000 for two years. The pilot is managed by the Soil and Water Conservation Districts in five counties. They are creating a scope of work with the state agriculture department. Farmers will be paid for joining the pilot and compensated for expenses related to implementing the program.

Baseline soil samples will be collected on the selected farms and then likely soil core testing every six months thereafter. Another part of the project is an education campaign to make farmers aware of these practices and their benefits. The districts are planning a producer working group to oversee this. This is a pilot project, not a study, that uses incentives rather than penalties for farmers to practice smart agriculture.

### **State and Local Efforts to Increase Resiliency, Rona Cohen, Senior Policy Analyst, Energy and Environment, CSG-East**

In the years since Tropical Storm Irene (2011) and Superstorm Sandy (2012) there has been a tremendous amount of resilience planning in the northeast, particularly in urban areas. There are also some great examples of proactive policies being implemented at the rural level. All of these policies share three characteristics: leadership, community buy-in and availability of funding.

The one key step that has been associated with resiliency planning is government mandates. Approximately sixteen states have enacted some form of proactive legislation to safeguard infrastructure and communities against the threat of extreme weather, storm surge, inland flooding and sea level rise among other hazards. About five states are in the planning process. These plans vary in terms of their goals, specificity and rate of implementation. Many of the plans require communities to integrate adaptation or resilience plans into existing processes. Communities are required to have hazard mitigation plans to be eligible for hazard mitigation funding through FEMA.

Forward-looking plans appeal to communities when they focus on actions that have multiple benefits over the long term, such as California's approach that includes public health, economic, environmental justice and conservation benefits.

There are some forward-looking policies that are being implemented in rural areas as well. Vermont is the most rural state in the US. Development had straightened the landscape around rivers making building easier but also turning them into 'shoots of destruction' during a major precipitation event. To release overflow into floodplains, development had to be restricted. State agencies insured that road engineers and crews had a shared understanding of fluvial geomorphology to recognize issues critical to the future health of rivers and roads.

Two pieces of legislation placed a premium on flood resilience. The Vermont Economic Resilience Initiative mapped all rivers and streams, identifying 32 communities whose economies and infrastructure would be most at risk to flooding. They chose five to serve as pilot projects for technical assistance. The key here is transferability to other communities and on-line technical assistance such as the Flood Ready Vermont website and by-laws for communities to restrict development in floodplains.

The coastal community of Avalon, New Jersey bought up properties and created no-build zones along the waterfront with a buffer between the sand dunes and the first row of homes, a seawall, bulkhead and jetty, as well as restricting the size of hotels, motels and private homes and raising the minimum elevation for new construction. The sand dunes have become very controversial for homeowners whose ocean views were erased. Avalon addressed this with extensive community education and the creation of a special dune grass that fortifies the dune structure. The grass is grown and planted by students and citizens.

Energy resilience is another major issue in the northeast. Microgrids are being considered to provide resilient energy to critical infrastructure and tier two locations such as grocery stores and gas stations. Microgrids are small-scale integrated electricity generation and distribution systems that can be managed locally and can separate from the macrogrid when it goes down. Connecticut established the nation's first microgrid pilot, allocating \$18 billion in 2013 for its first phase to fund nine small-scale projects. It has since awarded three additional rounds of funding.

### ***Blazing a New Path in Sustainability, Matt Wohlman, Director of State and Industry Affairs, Land O'Lakes***

Land O' Lakes launched a new business unit called Land O'Lakes Sustained in 2016. Sustainability is important for Land O'Lakes because of market access. Consumers are driving change and sustainability. Many companies are developing sustainability outcomes to meet consumer demands.

Land O'Lakes is a farmer owned cooperative. It has a 'farmer to fork' view of agriculture. Sustainability needs to be a farmer driven approach that protects natural resources, meets resource needs and provides profitability on the acre.

The Minnesota Ag Water Quality Certification Program is a pilot program that works on a voluntary basis with producers to enhance sustainability on their farms. It developed a matrix for identifying sustainable outcomes and an index for which, if producers reached a certain index score, they would be certified by the state department of agriculture. They would then receive some branding rights and regulatory certainty for ten years.

The Cedar River Watershed Partnership included non-profits, business entities and the state department of agriculture that work with ag retailers to deploy practices. It started with understanding on an acre-by-acre, farm-by-farm basis the soil, climate, rainfall, crops, cover, nutrient management, tillage and integrated pest management practices. It then dialed down to understanding what conservation practices existed and what was needed.

Land O'Lakes launched a new Comparative Insights Tool that looks at all of the above practices and produces a score that reflects how well a farmer is doing on that acre to protect resources and also understanding the economic impact of implementing those practices.

Land O'Lakes took on California climate legislation that called for forty percent reduction in manure-related methane production by 2030. It worked with producers clustered within forty miles of a biodigester plant to pipe manure to the plant for processing by biodigesters into compressed natural gas which was then tapped into a natural gas pipeline that goes through the area. This 'poop to pipeline' process creates a revenue stream for members while meeting regulatory requirements.

These approaches increase soil productivity while adding to revenue streams. Sustainability needs to be a market-driven approach in the sense of consumers and in incentivizing producers to become involved as well.

### ***Rural Resiliency, MNA Richard Campeau, National Assembly Quebec***

Quebec has been experiencing a steadily increasing frequency of natural disasters, especially flooding. Because of milder spring temperatures in 2017 and 2019, extensive spring run-off forced farmers to postpone planting which meant switching from corn to soybeans, thereby losing income and productivity. They had to go through several steps to obtain compensation for their losses.

In 2013 Canada launched a Climate Change Plan for 2013-2020. It consisted of approximately twenty programs aimed at reducing greenhouse gas emissions and financing adaptations to climate change through the Green Fund that derives its revenues from the fuel market.

Emergency Quebec is an information hub for a compensation and financial assistance program. Quebec has also adopted a civil security policy for disaster management. It prioritizes energy infrastructures and the protection of drinking water.

The Ouranos Think Tank is composed of researchers and users that specializes in adaptation to climate change. It put together a plan especially for agriculture and fisheries between 2014 and 2020.

The Quebec Inter-sectoral Flood Research Network is a group of universities and scientists that research subjects related to flooding and climate change.

Lessons from 2017 and 2019 include flexibility regarding the filing of income tax returns; water level monitoring; financial assistance; and, a partial moratorium on reconstruction in flood-prone zones in Quebec municipalities in June 2019 for whom the Quebec government was better suited to make these types of decisions. Reconstruction is allowed in these special planning zones only for buildings that have lost less than half their value. Homeowners prohibited from re-building will receive a damage settlement of up to \$250,000. The maximum assistance for repair work is \$100,000. A new framework is to be drawn up in October/November of this year.

Enforcing rules becomes emotional for homeowners. It requires courage to set and apply rules that affect citizens who are also paying for them.

### ***California Response, Assembly Member Devon Mathis, California***

California's Cap-and-Trade Program basically set up a carbon market that worked like a stock market to be able to buy carbon credits and trade them on the market to stay in compliance versus a carbon tax.

The first part of cap-and-trade until now wasn't really business friendly. It went after 304 producers such as agriculture, the oil industry and car exhausts.

Instead of a tax based on carbon pollution, California decided to utilize the trade system. In order to keep up with lowering the emission cap businesses have three choices: (1) reduce emissions by changing practices and cutting down, (2) buy permits to pollute – companies can buy and sell allowances, (3) carbon off-sets – companies can pay other organizations to reduce greenhouse gases; each off-set counts towards the firm's compliance obligations.

Manufacturers are concerned that cap-and-trade will put them at a disadvantage to companies outside the state. The costs will eventually be passed on to consumers. The hard part for agriculture is passing on costs to smaller markets than the bigger energy companies. California has taken steps to minimize the impact. Initially all the allowances are free for business. Some of the proceeds will go to communities hardest hit by pollution.

What will California do with that \$1.4 billion in the cap-and-trade market? Unfortunately, most of it went to electric car buyers, solar roof panels and local transit lines. Mathis fought for funding in cap-and-trade to go towards agriculture such as program replacement, dairy digesters, methane capture and pork waste. Anything with a nexus to global warming or climate change can tap the cap-and-trade account to do projects.

In the latest legislation lawmakers wanted to make sure there was a market with a floor and a ceiling on a stable reduction path with a baseline for investment planning. Everyone had to get into the market in a fair and predictable way.

Just recently there has been a nexus between water contamination and climate change. Some of the cap-and-trade dollars are being used for groundwater cleanup because climate change creates droughts which create contaminated water.