Nebraska Priority Climate Action Plan – Implications for Nebraska Agriculture

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Center for Ag Profitability webinar

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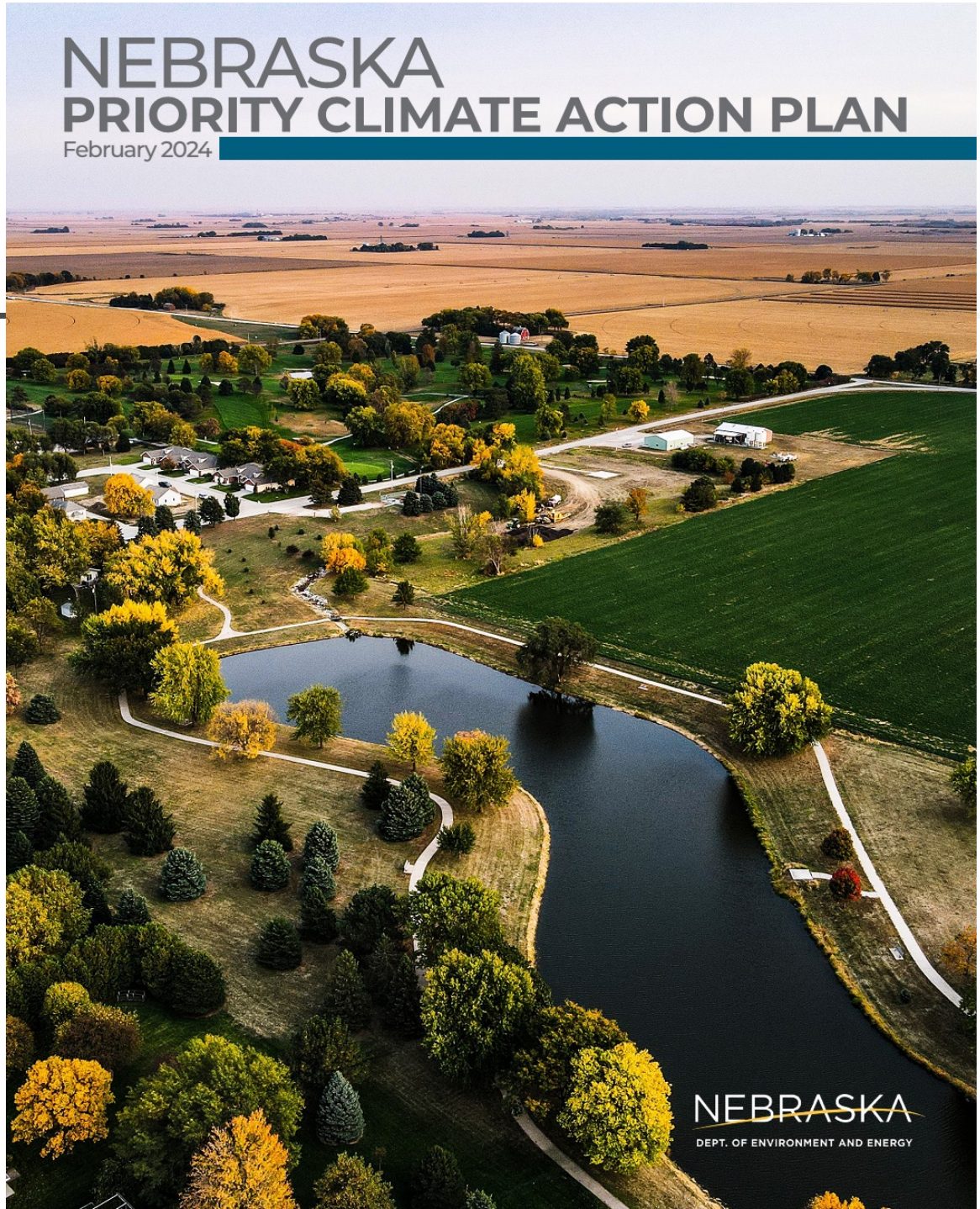
overview

- state climate plans
  - adaptation plans & GHG reduction plans
- IRA Climate Pollution Reduction Grants program
  - state climate action plans
- Nebraska Priority Climate Action Plan
  - plan on how to spend EPA $$ if we get any to reduce GHG emissions
  - Neb plan is 100% incentive based $$ 0% regulatory
- how could the plan affect Nebraska agriculture?
  - regenerative ag practices $ incentives
  - precision ag equipment $ incentives
  - carbon intensity registry $ incentives
- conclusion

state climate plans

- before 2024, maybe half of the US states had some type of climate action plan
- usually either a plan regarding (1) how to **adapt** to climate changes (how to deal with more intense storms, heat, precipitation changes etc.) or
- (2) how to **reduce** greenhouse gas (GHG) emissions within the state
- coastal states are adopting adaptation plans because of increasing flooding from worsening hurricanes, rising home insurance, etc.
- some states adopted programs to reduce instate GHG emissions
- some have done both: IA, CA, NY
- Nebraska one of many states that did neither type of climate plan


NEBRASKA
PRIORITY CLIMATE ACTION PLAN
February 2024
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what is the Nebraska Priority Climate Action Plan (NPCAP)?

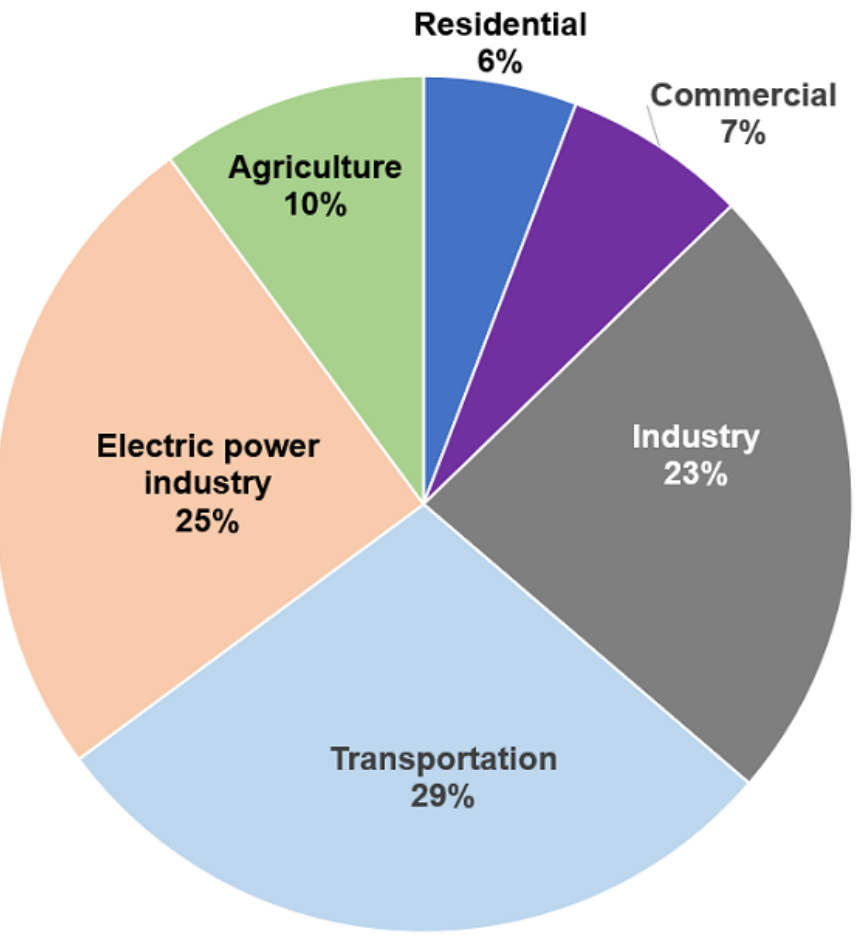
- federal funding from 2022 Inflation Reduction Act
  - $5 billion EPA Climate Pollution Reduction Grant program
- participating states eligible for EPA $$ to fund recommendations coming out of the state GHG reduction plan
  - spring 2023: states submit workplans to EPA 4/28/23
  - state Priority Climate Action Plans submitted to EPA 3/1/24
  - states apply for implementation grants (competitive) 4/1/24
  - 45 states participating, WY SD IA KY FL didn't
  - basically 10 months to prepare the plan

what is the NPCAP, con't?

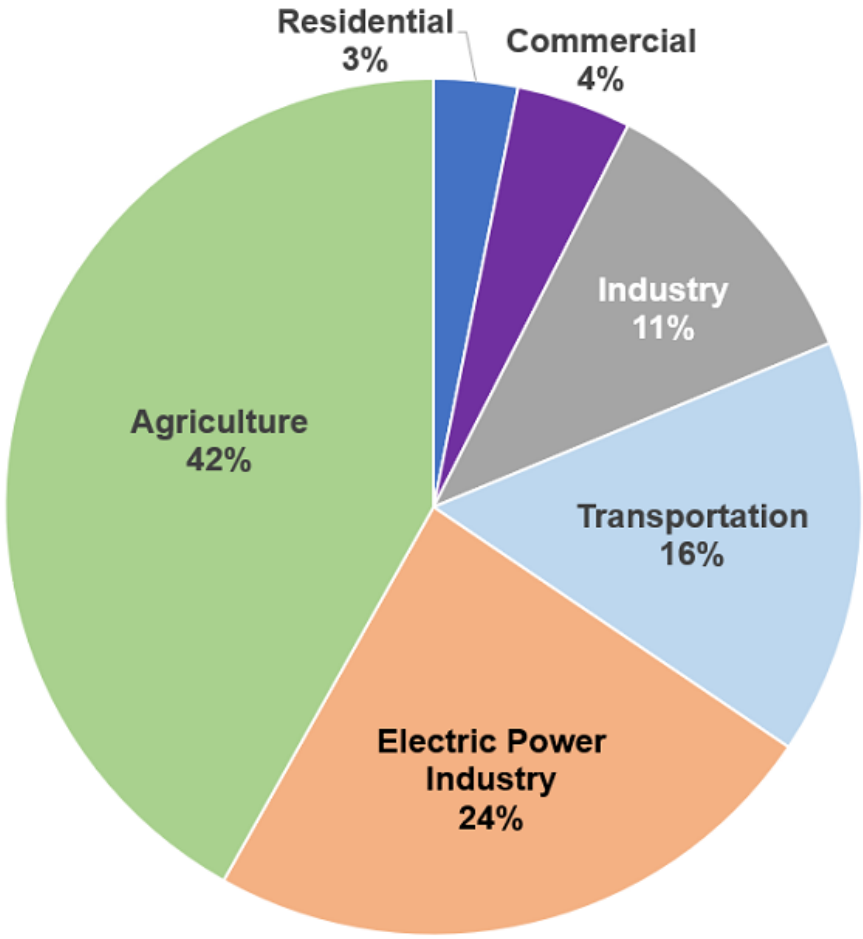
- Neb Dep't of Environment & Energy (NDEE) kicked off planning process Oct 2023
- online stakeholder work group meetings Nov & Dec 2023
  - 5 sectoral workgroups, two meetings each
  - recommendations developed in work group meetings
- 5 public meetings (Alliance, North Platte, Grand Island, Norfolk & Lincoln) Jan & Feb 2024
  - proposed recommendations developed
- final plan presented to EPA March 1, 2024
- online comments could be submitted to NDEE throughout
- the plan focuses on reducing GHG emissions, not on adapting to climate change

2021 Greenhouse Gas Emissions by Sector

National



Nebraska



Nebraska GHG emissions

- nationally Nebraska #6 in per capita GHG emissions
  - large ag emissions get us up there
- 42% agriculture (fertilizer & enteric emissions)
- 24% electricity (coal, natural gas combustion)
- 16% transportation (oil combustion)
- 11% industry
- 4% residential
- 3% commercial
- Neb #5 state in US ag GHG emissions (TX IA CA KS)

Measure	Cumulative GHG Emissions Reductions through 2030 (MMT CO_2e)
Energy Efficiency and Electrification	**1.085**
Promote Energy Efficiency and Electrification Upgrades for Non-Residential Facilities	0.989
Incentives for Home Energy Efficiency Equipment Upgrades for Low- and Middle-Income Homeowners	0.074
Residential Pre-Weatherization Program	0.007
Incentives for Irrigation Well Conversion from Diesel to Electric	0.015
Solar Projects	**0.398**
Incentives for Micro-Solar Arrays for Critical Infrastructure in Low-Income Rural Communities	0.008
Funding for Solar Projects on Unused/Contaminated Land, Ag & Industrial Facilities, and Parking Lot/Feedlot Solar Canopies	0.390
Agriculture	**22.13**
Measures to Reduce Emissions in Agricultural Production: • Establish a Carbon Intensity Score Registry • Provide Incentives for Regenerative Agriculture Practices • Provide Incentives for Precision Agriculture Equipment	22.13
Transportation	**0.096**
Incentives for Alternative-Fuel and Electric Replacement of Diesel Vehicles	0.096
Incentives for New Public Electric Vehicle Charging Stations	Not determined.
Waste Management	**1.996**
Establish Hub-and-Spoke Anaerobic Digester/Biogas Hubs for Agricultural Waste	1.037
Incentives to Reduce Food Waste	0.946
Incentives for Production and Use of Biochar to Reduce Organic Waste and Sequester Carbon in Soil	0.013
Total	**25.705**

Table 5. Proposed Greenhouse Gas Reduction Measures and their Estimated Cumulative Greenhouse Gas Emissions Reductions through 2030

plan recommendations

- 86% of proposed plan GHG emission reductions are ag
  - not including incentives for (1) diesel irrigation well conversion (2) diesel vehicle replacement (3) anaerobic digester-biogas hubs & (4) biochar
- emission reductions may occur (1) if the plan is fully funded by EPA & (2) if the financial incentives are high enough to get good producer participation
- ag emission reduction measures [all are voluntary]:
  - establish a [voluntary] carbon intensity score registry
  - provide $$ incentives for regenerative ag practices
  - provide $$ incentives for precision ag equipment

major ag GHG emissions

- ag soil management 49.2% of total Neb ag emissions
- enteric fermentation 35.6% of total Neb ag emissions
- manure management 9.7% of total Neb ag emissions
- top 3 are 94.5% of total Neb ag emissions
- Neb climate action plan identifies (1) reduced tillage, (2) cover cropping & (3) nitrogen management: regenerative ag practices, cornerstones for ag GHG reduction.
- Precision ag tracks crop nutrient & pest control needs & minimizes fertilizer & pesticides applications
- implementing these practices will reduce producers' carbon intensity score & reduce GHG emissions

ag soil management practices

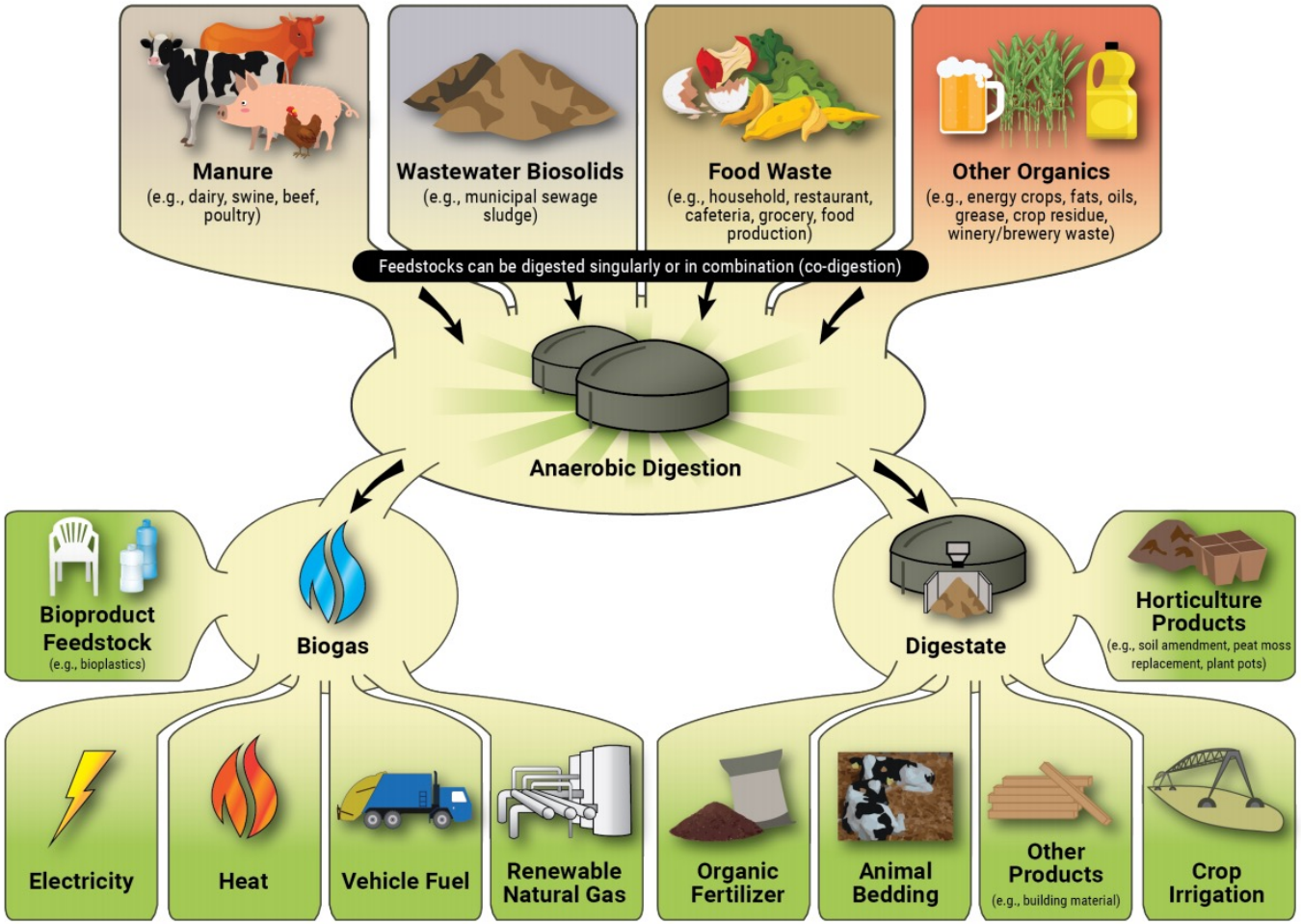
- 1. avoid excessive N [nitrogen] application
- 2. application of N at less than economically optimal N rate
- 3. in-season [split] & variable rate N application [precision ag]
- 4. full crediting of manure N
- 5. timely use of nitrification inhibitors & specialty fertilizer-N products for soils prone to water logging
- 6. double cropping with non-leguminous, unincorporated cover crop
- Source: NebGuide 2322 (2020), *Crop Management to Reduce Soil Nitrous Oxide Emissions in Nebraska*.

enteric fermentation
(cow methane burps)

- one promising possibility: feed additives, such as seaweed
  - 50%+ emission reductions
  - licensed for commercial use in Canada; coming to USA soon?
  - in the future: vaccines that reduce methane emissions?
- **livestock manure management—anaerobic digesters**: capture & process methane emissions from manure & convert it to "biogas"
  - generate electricity or sell the biogas from the methane
  - widespread use in dairy industry – Schuyler dairy example
  - swine confinements & cattle feedlots also good possibilities
  - plan would develop regional AD hubs near natural gas pipelines so producers could deliver manure to regional hub for processing into biogas & pipe it into the natural gas distribution system

Regional Digester Hubs

Establish regional hub-and-spoke anaerobic digester/ biogas hubs to process animal manure and generate renewable biogas.



regenerative ag

- improving soil health (including increased soil carbon storage) a major regenerative ag focus
  - also many traditional soil & water conservation practices
- NPCAP proposes pilot project in south-central Neb, then extended to other regions
- plan to provide technical assistance for reduced tillage, cover cropping, & reduced fertilizer use
- significant community engagement
- other regenerative practices: composting, conservation buffers, diversified cropping, rotational grazing, silvopasture, solar panels (for on farm/ranch electricity generation)

precision ag

- precision ag: uses soil sampling, yield & soil maps, satellite imagery & real time field sensors to track growing conditions, and provide inputs at variable rates to meet plant growth stage & site-specific crop needs.
- precision ag practices:
  - GPS guidance systems, yield monitors & soil mapping;
  - variable rate input applications; &
  - drones for field scouting & livestock monitoring

Precision Agriculture

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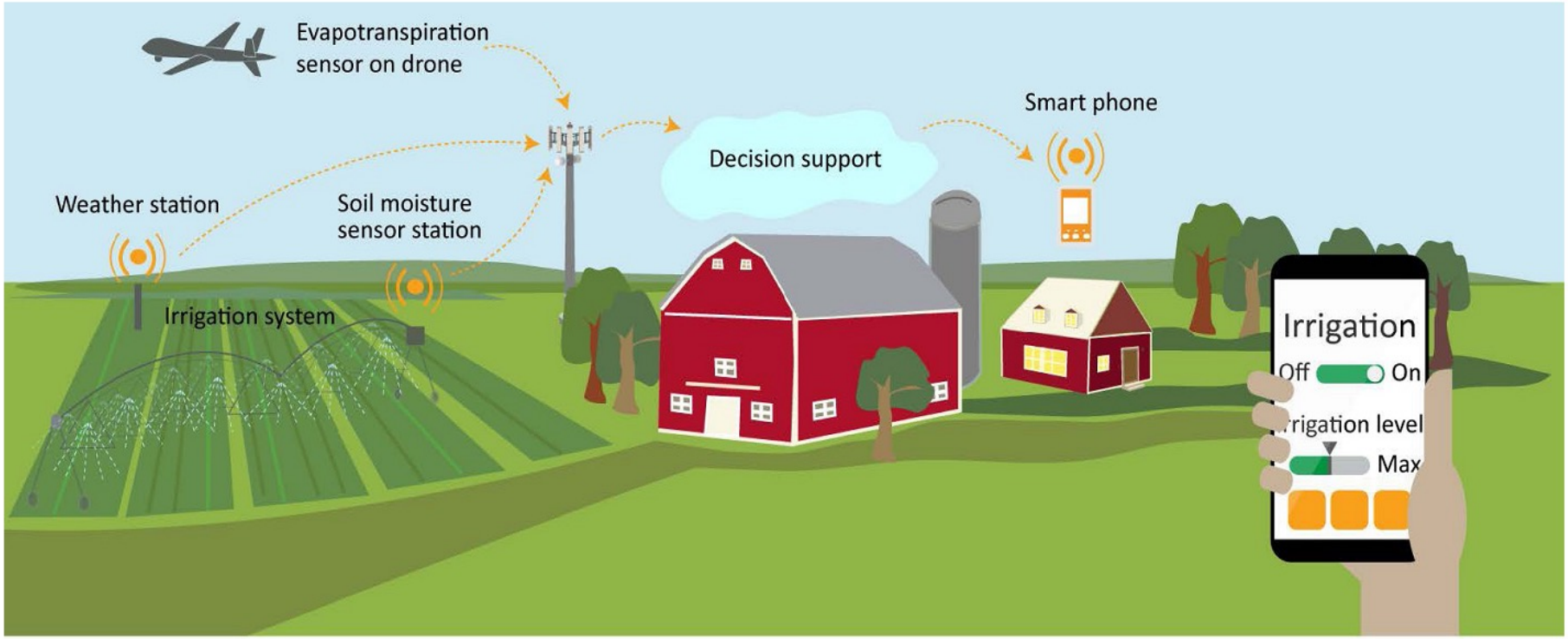
Provide funding to producers to acquire precision agriculture equipment and technology, and training to analyze the data for highest impact.



Source: GAO. | GAO-20-128SP

carbon intensity (CI) score registry

- GREET Model: 1995 US Dept of Energy model that is used to evaluate fuels for state, federal alternative fuels programs
- widely used in the alternative/clean transportation energy field
  - Greenhouse Gases, Regulated Emissions & Energy Tool
  - developed 1994-95 at Argonne National Laboratory
  - used California ethanol program (corn, soybeans)
  - to be used for federal clean hydrogen, sustainable aviation fuel (SAF) programs, new sec. **45Z clean fuels tax credit**
- model estimates lifetime GHG emissions associated with energy consumption in producing e.g. ethanol, other clean fuels
- model adapted to meet needs of varying clean fuels programs
- used worldwide – plan would provide $$ to register

CI score registry, con't

- in the NPCAP, CI scoring will be used to keep track of how changing ag practices are reducing GHG emissions.
- apart from the NPCAP, some corn & soybean producers will be cooperating with alternative fuel producers and/or grain merchandisers sourcing low CI feedstock crops to qualify for clean alternative fuel benefits in California, or for the new section 45Z clean fuels tax credit
- climate smart ag/commodities connection: nationally CIs are used to score e.g. low carbon meat production, low carbon food production, etc.

Final Observations

- 1. NPCAP recommendations are 100% voluntary and incentive based, & based on being funded by EPA $$.
  - No state regulation of ag producers.
- 2. NCPAP funding to come from EPA
- 3. EPA funding is to be determined.
  - intense national competition for these $$
  - EPA says anticipated notification of successful states in July and notice of grant amounts in October 2024.
  - if Nebraska is funded, minimum grant $2 million but no guaranteed grants.

observations, con't

- 4. implementing the NPCAP will begin reducing ag GHG emissions
  - help move Nebraska agriculture in the general direction of being "climate smart," "low carbon" or "climate friendly."
- 5. the CI scoring will facilitate more Nebraska producers being able to participate in the emerging "climate friendly" or low-carbon food supply chain.
- 6. positive additional benefit: potential improved long-term drinking water quality (surface water and ground water)
- http://dee.ne.gov/ndeqprog.nsf/onweb/cprg
- Questions? Thank you ☺