



## Climate Summary

Policy discussions at the state and national level are increasingly focused on climate change. Climate change initiatives focus on reducing the emissions of greenhouse gases<sup>k</sup> and attempting to recapture them from the atmosphere. There are currently a wide variety of options being explored by both public and private sectors in this area.

Agriculture has been a focus in these discussions given the capacity to recapture carbon dioxide from the atmosphere via photosynthesis from growing crops. However, the agriculture sector remains a relatively small net emitter of greenhouse gases, typically only about 10% of US emissions. In addition, scientific understanding of gas emissions or long-term sequestration in diverse farming systems is not well understood and continues to be studied.

Some of the earliest solutions proposed include private-sector contracts for ecosystem services<sup>l</sup>. Michigan Farm Bureau continues to examine this market and its viability to provide additional income to farmers. Caution and legal guidance should be used if entering into these long-term agreements, since contract terms can vary substantially. There are concerns about potential long-term implications of selling ecosystem services credits, what the true market value of the credits is, and if that value is currently being realized for farmers.

Climate change will likely remain an important policy issue for years to come and many proposals are likely to emerge. Michigan Farm Bureau will continue to advocate member policy, while also highlighting the importance of Michigan agriculture in producing food for a growing global population and the equity of providing nutritious and affordable diets for all.

*Topics in this paper are rapidly changing. While every effort was made to provide up-to-date information as of September 2021, it is not guaranteed that after that date information will be accurate. This paper should not be considered legal advice. Consider consulting an attorney prior to signing any contract.*

### **Overview**

Climate and ecosystem service markets continue to be hot topics in the public sector. Governments around the world are considering legislation, regulation, and programs to address greenhouse gas emissions and potential global climate impacts. These efforts vary a great deal, depending on the perceived impacts of climate change and the ability of countries to bear the cost of these programs.

In the United States (US), some states such as California have undertaken aggressive policies to address climate change, while many states have done relatively little. At a national level, the US has made non-binding commitments to climate goals. However, many environmental regulations also have climate implications, such as those for energy efficiency or air pollution, even if that is not their primary objective.

In the private sector, many companies are making climate commitments, often with significant investor encouragement. This has encouraged the rapidly changing and developing private markets for what are called ecosystem services credits. In ecosystem services markets, participants can generate credits not only for sequestering carbon but also for implementing practices that improve water quality, water quantity, biodiversity<sup>b</sup>, and other public benefits.

This white paper provides a general overview of key proposed legislation, markets, and policies on climate as they relate to Michigan agriculture.

### **Context of the Climate Discussion**

In 2019, agricultural activities represented 9.6% of total U.S. greenhouse gas emissions.<sup>1</sup> Most U.S. greenhouse gas emissions come from the energy and transportation sectors. Carbon dioxide, methane, and nitrous oxide<sup>l</sup> are emitted from agricultural activities, with methane and nitrous oxide accounting for the majority of emissions.<sup>2</sup> Methane is primarily released from ruminant livestock and manure management. Nitrous oxide is primarily a byproduct of applying synthetic nitrogen fertilizers, which can be minimized through agricultural soil management, but is nearly impossible to avoid entirely.<sup>3</sup>

It is important to note while carbon dioxide tends to be the greenhouse gas that gets the most attention, methane and nitrous oxide are more potent than carbon dioxide as they are more effective at trapping heat in the atmosphere.<sup>4</sup>

While many look to agriculture for future climate solutions, it is important to note the improvements in efficiency and conservation that have already happened on farms. Compared to 1990, farms are producing 43% more food, fuel, and fiber without using more resources.<sup>5</sup>

This means that agriculture has already decreased its emission intensity<sup>j</sup>. These improvements help conserve water and soil, enhance biodiversity, and conserve energy.<sup>6</sup> In addition, per capita agricultural emissions have declined by 15% since 1990. And more than 140 million acres of farmland are enrolled in USDA Conservation Programs, which does not include acres enrolled in other voluntary or state-led conservation programs.<sup>7</sup>

While the discussion is moving toward being net zero<sup>m</sup> or carbon neutral<sup>f</sup>, it is important to highlight the great strides agriculture has already made in conservation and efficiency, while continuing to produce food, fuel, and fiber.

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<sup>1</sup> <https://www.epa.gov/sites/default/files/2021-04/documents/us-ghg-inventory-2021-main-text.pdf?VersionId=yu89kg1O2qP754CdR8Qmyn4RRWc5iodZ>

<sup>2</sup> <https://extension.missouri.edu/publications/g3>

<sup>3</sup> <https://www.epa.gov/sites/default/files/2021-04/documents/fastfacts-1990-2019.pdf.pdf>

<sup>4</sup> <https://www.epa.gov/ghgemissions/overview-greenhouse-gases#methane>

<sup>5</sup> <https://www.fb.org/market-intel/previewing-2019-agricultural-emissions>

<sup>6</sup> <https://www.fb.org/market-intel/previewing-2019-agricultural-emissions>

<sup>7</sup> [https://www.fb.org/files/FSF-Factsheet\\_3\\_17\\_20\\_r.pdf](https://www.fb.org/files/FSF-Factsheet_3_17_20_r.pdf)

On a broader level, it is also important to know why the conversation on climate smart practices is developing. Agriculture is unique in that it has the capacity to sequester carbon, taking carbon dioxide out of the atmosphere through growing plants and then potentially storing a small percentage in the soil.

### **Ecosystem Services Markets**

While payments for something other than the crop being grown are not a new concept, there has been pressure on the public and private sectors to make new commitments related to climate. This pressure comes from both consumers and shareholders.

Blackstone Group, a private equity firm that manages more than \$7 trillion in assets, recently shared that they view Environmental, Social, and Governance (ESG) as central to delivering strong returns and will be looking for companies to move with urgency to make changes to demonstrate sustainable<sup>P</sup> business models.<sup>8,9</sup> While this is just one example, there have been a slew of commitments to meet a variety of climate and broader sustainability goals.

Potential buyers express demand for a wide array of practices that improve water quality, water quantity, biodiversity, provide greenspace, protect culturally important areas or furnish other societal benefits. These are known as ecosystem services. When these services are quantified and sold, they are referred to as ecosystem services credits. Organizations tend to use ecosystem service credits or offsets<sup>n</sup> when it is cheaper to purchase those instead of reducing their own impacts further.

The value of credits is determined by the Measuring, Reporting, and Verification (often referred to as MRV protocols) rules established by each market. These rules are not currently regulated or standardized and vary by market, which means there is not consistency in what a 'credit' entails across markets. This inconsistency also applies to models used across the private markets to determine how many credits have been generated. Currently, there are a variety of models used.

These rules are important because they dictate how the market shows the 'value' of the credit to potential buyers. In determining impacts of practices implemented to generate an ecosystem service credit, there is a level scientific uncertainty involved (which varies by ecosystem service), which may affect the price paid for specific practice, with credits with greater certainty being more highly valued.<sup>10</sup> This uncertainty is something that is accounted for in how markets manage their risk. Buyers want to ensure through contract mechanisms that the desired impact is realized (i.e. carbon is actually sequestered, emissions are actually reduced, etc.).

#### *Transaction of Credits*

While each market is unique, there tends to be three primary parties involved in the transaction of ecosystem services credits:

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<sup>8</sup> <https://www.reuters.com/business/sustainable-business/moves-blackstone-makes-sustainability-push-with-slew-new-hires-2021-04-27/>

<sup>9</sup> <https://www.cnbc.com/2020/12/16/blackrock-makes-climate-change-central-to-investment-strategy-for-2021.html>

<sup>10</sup> <https://www.edf.org/sites/default/files/content/agricultural-soil-carbon-credits-protocol-synthesis.pdf>

1. The farmer
2. The aggregator
3. The buyer(s) of the credits.

Farmers generally sign a contract with an aggregator agreeing to implement certain practices or achieve specific results. Currently, aggregators tend to be private companies/agribusinesses or non-profits that will aggregate credits generated by the farmer to sell in larger quantities demanded by buyers.

The farmer is sharing their data per the contract and other information with the aggregator that allows the credits to be verified. Depending on who owns the credits (this can be either the farmer or the aggregator depending on the market), the credits are then sold to a buyer.<sup>11</sup>

Let's put this into a fictional example related to a farm selling carbon credits<sup>e</sup>. Here are the fictional players: Smith Farms will be the farmer, Fantasy Carbon will be the aggregator, and Computers Unlimited will be the buyer. Let's say Smith Farms signs a ten-year contract with Fantasy Carbon agreeing to implement cover crops and no-till on 250 acres of their farm.

Fantasy Carbon will determine (through modeling, soil sampling, remote sensing, a combination of methods, etc.) how much carbon dioxide is taken from the atmosphere and put into and stored in the soil, which is the ecosystem service being provided (i.e. carbon sequestration<sup>8</sup>).

In this case, Fantasy Carbon estimates Smith Farms will sequester about half a ton of carbon per acre, per year.<sup>12</sup> Given those numbers, Smith Farms would theoretically sequester 125 tons of carbon dioxide per year, equivalent to 125 carbon credits, with 1250 carbon credits generated over the course of the contract.

With the variety of markets available, there is no standard for how transactions of credits occur among the farmer, the aggregator, and the buyer. The examples below are based on current markets to demonstrate a handful of current options.<sup>13</sup>

- A farm continues to own all the credits they generate and can set their own prices. The aggregator charges the buyer of the credits transaction fee to covers their costs.
- A farm signs a contract to sell their credits for \$25/ton. The aggregator they are contracted with keeps \$5/ton to cover their costs. The farmer receives a total of \$20/ton for their credits (not accounting for the farmer's costs).
- Some contracts will have a vesting schedule. This means farmers will receive ownership of their credits over a multi-year period. Often, farmers receive ownership only of a partial percentage of their credits (i.e. 60%, etc.). Once they receive their portion of credits, farmers can decide when and for how much they sell their credits. Remaining credits are retained by the

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<sup>11</sup> Adopted from: <https://www.truterraag.com/getmedia/2f784735-b827-4a65-8e41-8bfdbd5c3924/Truterra-carbon-credit-v1.pdf>

<sup>12</sup> This is an average based on estimations from existing markets

<sup>13</sup> These examples are based on public information available on currently available markets' websites

aggregator to cover future potential losses of sequestered carbon and some are sold to cover their costs.

Understanding how credits are sold, helps you determine if this would be a good financial fit for your operation. For example, carbon credits are currently selling anywhere from \$2-\$30 per credit. However, transaction fees and your costs must be accounted for to understand the true value or cost to your operation of signing a contract.

It is important to note that once credits are sold, especially in the case of greenhouse gas reductions, you no longer have any ownership over them. This may have future business or regulatory implications, like any long-term private contract.

### *Contracts*

While evaluating the company you work with is important, the most significant factor for a farm looking to participate in an ecosystem services market will likely be the contract. Currently, there are mainly private markets available for farmers to participate in. There is typically very little government involvement in these markets, meaning these contracts are between two private entities.

The contract contains the nuts and bolts of your generation of ecosystem services credits and participation in the market. As with any contract, paying attention to how and when payment occurs is important. There are also other contractual terms that may impact a farm's ability to participate.

For example, many contracts require new practices be adopted beyond a baseline determined by the company, a concept referred to as "additionality<sup>a</sup>." These terms will be very important to understand, especially for early adopters of conservation practices. Some companies do have "lookback clauses" that allow farmers to participate if they have already adopted the practices within a certain number of years, but this not typical.

In addition, the terms of these agreements tend to be long with the contract often being for 10 years, and potentially with clauses that may look for carbon to be stored in the soil for 100 years (referred to as permanence<sup>o</sup>)! Contracts also often have recordkeeping and verification requirements, which may be the financial responsibility of the farmer.

Lastly, there are also data sharing provisions that determine data sharing privileges. All contracts should be evaluated with a lawyer in the context of the participating farm to see if the contract is a good business decision given other commitments and estate plans.

### **National Level**

While there have been many discussions related to climate in Washington D.C., this section reviews legislation and other national efforts.

### *Growing Climate Solutions Act*

The main piece of legislation related to agriculture is the Growing Climate Solutions Act<sup>14</sup>, originally introduced in 2020 by Senators Mike Braun (R-IN), Debbie Stabenow (D-MI), Lindsey Graham (R-SC), and Sheldon Whitehouse (D-RI). The Act was reintroduced in 2021 and passed the Senate 92-8 in June 2021. Farm Bureau supports the legislation.

The Growing Climate Solutions Act aims to address some of the barriers farmers face when trying to participate in ecosystem services credits markets, specifically credits generated from greenhouse gas reductions or carbon sequestration.

It should be noted that this legislation **does not** regulate the ecosystem services credits markets. There are four main parts to the Act.

- **USDA Certification:** It would establish a USDA Certification for third-party, private entities that would work with formers to generate, sell, and/or verify their credits.
- **USDA Website with information on voluntary markets:** The Act directs USDA to create a website that would be a one-stop shop for farmers and foresters interested in participating in voluntary carbon markets. The website would provide details on how interested farmers and foresters can participate in voluntary markets and connect them with USDA-certified parties.
- **Advisory Council:** it would create an advisory council that consists of at least 51% farmers, ranchers, or private forest landowners in addition to representatives from the agricultural & forestry/forest products industry, among other assorted experts and representatives from other federal agencies. The purpose of the Advisory Council is to keep the Agriculture Secretary and USDA updated on new developments in carbon markets.
- **Reports to Congress:** Lastly, the Act orders a regular report to lawmakers on barrier to market entry, producer challenges, market performance, and opportunities for USDA to encourage further adoption of voluntary conservation practices that sequester carbon.

### *Food and Agriculture Climate Alliance*

In November 2020 the Food and Agriculture Climate Alliance (FACA) was founded by eight organizations representing farmers, ranchers, forest owners, the food sector, state governments and environmental advocates with the goal of defining and promoting shared climate policy priorities.<sup>15</sup> The founding organizations include:

- American Farm Bureau Federation
- Environmental Defense Fund
- FMI- The Food Industry Association
- National Alliance of Forest Owners
- National Association of State Departments of Agriculture
- National Council of Farmer Cooperatives

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<sup>14</sup> <https://www.congress.gov/117/bills/s1251/BILLS-117s1251rs.pdf>

<sup>15</sup> [https://agclimatealliance.com/files/2020/11/faca\\_report\\_one-pager.pdf](https://agclimatealliance.com/files/2020/11/faca_report_one-pager.pdf)

- National Farmers Union
- The Nature Conservancy

FACA is committed to three guiding principles:

1. Supporting voluntary, market- and incentive-based policies
2. Advancing science-based outcomes
3. Promoting resilience and helping rural economies better adapt to climate change.

FACA's initial policy recommendations focus on six areas: soil health, livestock and dairy, forests and wood products, energy, research, and food loss and waste.<sup>16</sup> FACA's current recommendations can be found on [their website](#). They continue to work on adding additional details to their recommendations. Michigan Farm Bureau has joined FACA as a general member.

### *Carbon Bank*

While the concept of a carbon bank<sup>d</sup> has been a hot topic, there are not currently any active carbon bank proposals. FACA's most recent proposal centers around USDA starting with pilot projects to inform a future carbon bank that focuses on the four areas below<sup>17</sup>:

- Developing, improving and scaling climate-smart agriculture practices<sup>h</sup>.
- Encouraging widespread adoption of climate-smart practices and critical climate infrastructure.
- Establishing carbon accounting<sup>c</sup> criteria and guidelines for endorsing standards.
- Engaging with and providing equitable opportunities for minority, socially disadvantaged and small-scale producers

FACA is focused on establishing durable and bipartisan solutions to reduce barriers to participation in the voluntary private ecosystem services markets.

### **State Level**

During the summer of 2020, Michigan Governor Gretchen Whitmer issued two directives which established the goal of carbon neutrality by 2050, with an interim goal for Michigan of a 28% reduction below 1999 levels by 2025. The two announcements called for the development of the MI Healthy Climate Plan and created the Council on Climate Solutions.<sup>18</sup>

### *MI Healthy Climate Plan*

The Michigan Department of Environment, Great Lakes, & Energy (MDEGLE) Office of Climate and Energy must develop a MI Healthy Climate Plan by the end of 2021 to achieve the established goals.

<sup>16</sup> [https://agclimatealliance.com/files/2020/11/faca\\_recommendations.pdf](https://agclimatealliance.com/files/2020/11/faca_recommendations.pdf)

<sup>17</sup> [https://agclimatealliance.com/files/2021/05/faca\\_carbon\\_bank\\_rec\\_202105.pdf](https://agclimatealliance.com/files/2021/05/faca_carbon_bank_rec_202105.pdf)

<sup>18</sup> Executive Directive 2020-10: Calls for the development of the MI Healthy Climate Plan, Executive Order 2020-182: Creates the Council on Climate Solutions

This will serve as the working roadmap for how Michigan will achieve these goals and ensure that groups are treated fairly in this transition.

### *Council on Climate Solutions*

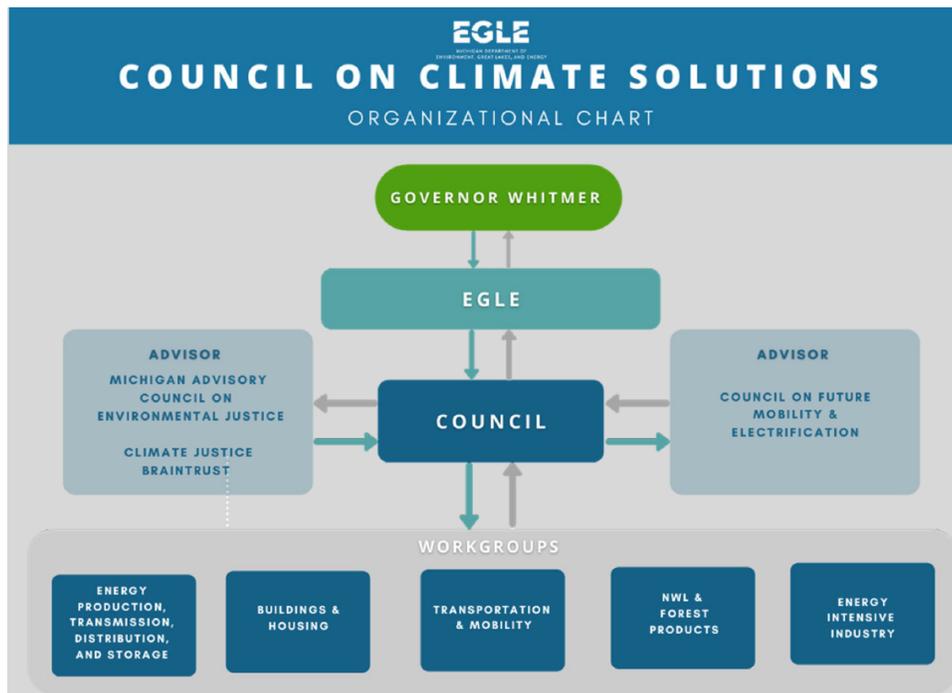
The Council on Climate Solutions consists of 14 members of the public from various sectors and 9 department directors as ex-officio members, but there is not currently any direct agricultural representation on the council.

This council advises MDEGLE on formulating and overseeing implementation of the MI Healthy Climate Plan. The primary focus of the council is in identifying strategies to reduce greenhouse gas emissions and recommending ways to minimize issues of environmental justice and will also provide other information or advice at the request of the governor. This council is purely advisory and does not currently have any legislative authority.

The Council on Climate Solutions utilizes the recommendations of five issue-specific workgroups, which any member of the public can participate in, surrounding the following topics:

- Energy
- Buildings and Housing
- Transportation and Mobility
- Energy Intensive Industry
- Natural Working Lands and Forest Products

These workgroups include both education and discussion of subjects relevant to the workgroups focus. The Council on Climate Solutions is also intended to receive input from several other advisory bodies. The current conceptual schematic for how council will function is provided below.



## **Conclusion**

Agriculture's potential role in climate policy is complex and uncertain. As the science and policy discussions continue to evolve, producers should consult the most current information and legal guidance before making business decisions. Michigan Farm Bureau will continue to monitor proposed policy and regulation at the state and federal levels in addition to developments in private markets, providing more detailed information as it becomes available.

## **Contact**

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## **Glossary of Terms**

- <sup>a</sup> **Additionality**: A practice that is being adopted for participating in an ecosystem services market in reference to some baseline date, which would not have occurred without the incentive provided by the market<sup>19</sup>
- <sup>b</sup> **Biodiversity**: Variety of plants and animals in a specific ecosystem.<sup>20</sup>
- <sup>c</sup> **Carbon accounting**: quantifying greenhouse gas emissions from a specific entity (e.g. a company)<sup>21</sup>
- <sup>d</sup> **Carbon bank**: Would create a price floor for carbon sequestration and greenhouse gas reduction, to prevent prices for carbon credits from going below a certain price by being a buyer of last resort<sup>22</sup>
- <sup>e</sup> **Carbon credit**: Produced by reducing greenhouse gas emissions or storing more carbon in the soil through implementing different practices. Credits are then purchased by other entities. 1 carbon credit typically equals 1 metric ton of carbon dioxide or carbon dioxide equivalent<sup>23</sup>
- <sup>f</sup> **Carbon neutral**: balance between carbon dioxide being emitted into the atmosphere and removal of carbon dioxide from carbon sinks or offsets.<sup>24</sup>
- <sup>g</sup> **Carbon sequestration**: capacity in the agricultural sector of agriculture lands and forests to remove carbon dioxide from the atmosphere. Crops, plants, and trees absorb carbon dioxide through photosynthesis and store it as carbon in tree trunks, branches, foliage and roots, and soils. When plants decompose, carbon is returned to the atmosphere, with a relatively small proportioned trapped in soils.<sup>25</sup>
- <sup>h</sup> **Climate-smart agriculture practices**: Practices suggested to decrease the emission of greenhouse gases or that increase their sequestering. These generally include practices such as

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<sup>19</sup> <https://www.nature.org/content/dam/tnc/nature/en/documents/Carbon-Market-Incentives-Report.pdf> ,

[https://www.ers.usda.gov/webdocs/publications/45244/48525\\_err170.pdf](https://www.ers.usda.gov/webdocs/publications/45244/48525_err170.pdf)

<sup>20</sup> <https://www.nationalgeographic.org/encyclopedia/biodiversity/>

<sup>21</sup> <https://www.ed.ac.uk/sustainability/what-we-do/climate-change/case-studies/climate-research/carbon-accounting>

<sup>22</sup> [https://agclimatealliance.com/files/2020/11/faca\\_recommendations.pdf](https://agclimatealliance.com/files/2020/11/faca_recommendations.pdf)

<sup>23</sup> <https://agecon.unl.edu/ag-carbon-credits>

<sup>24</sup> <https://clear.ucdavis.edu/explainers/carbon-neutral-versus-climate-neutral>

<sup>25</sup> [https://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs141p2\\_002437.pdf](https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs141p2_002437.pdf)

cover crops & livestock grazing, crop rotation, no-till/strip-till/conservation tillage, anaerobic digesters, buffer strips, tree/shrub establishment<sup>26</sup>

- <sup>i</sup> Ecosystem services: measured and quantified environmental assets or social benefits such as soil carbon sequestration, decreased greenhouse gas emissions, water quality improvements, increased water retention, nutrient runoff reduction, increased biodiversity<sup>27</sup>
- <sup>j</sup> Emission intensity: The amount of greenhouse gas emissions per unit of production.
- <sup>k</sup> Greenhouse gasses: Gasses in the earth's atmosphere that trap heat. Sunlight passes through, but heat is prevented from leaving. Greenhouse gases are necessary to regulate the temperature of the planet.<sup>28</sup>
- <sup>l</sup> Main types of greenhouse gasses: carbon dioxide, methane, and nitrous oxide,<sup>29</sup>
  - Carbon dioxide: made up of carbon and oxygen and comes from decaying and living organisms, and volcanoes. It is also released when burning fossil fuels such as coal & oil.
  - Methane: gas made of carbon and hydrogen released from wetlands, growing rice, raising cattle, using natural gas, and mining coal.
  - Nitrous oxide: part of nitrogen cycle made by bacteria in the soil and ocean. It is also released by some types of industry, power plants, and commercial fertilizer. Nitrous oxide can also damage the ozone layer.
- <sup>m</sup> Net zero: Balance between all greenhouse gases being emitted into the atmosphere and removing greenhouses from the atmosphere<sup>30</sup>
- <sup>n</sup> Offset: Broad term for greenhouse gas credit. Used when a company purchases a credit from outside their control or supply chain to cover their own emissions<sup>31</sup>
- <sup>o</sup> Permanence: Long-term storage of sequestered carbon<sup>32</sup>
- <sup>p</sup> Sustainable: Ability of society to continue for an indeterminate period without its exhausting resources.

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<sup>26</sup> <https://www.fb.org/latest/review/sustainability-markets-part-2-common-land-use-practices-under-consideration>

<sup>27</sup> <https://www.fb.org/market-intel/sustainability-markets-part-1-agricultural-ecosystem-credit-markets-the-pri>

<sup>28</sup> <https://climatekids.nasa.gov/greenhouse-cards/>

<sup>29</sup> <https://climatekids.nasa.gov/greenhouse-cards/>

<sup>30</sup> <https://www.wri.org/insights/net-zero-ghg-emissions-questions-answered>

<sup>31</sup> <https://www.edf.org/sites/default/files/content/agricultural-soil-carbon-credits-protocol-synthesis.pdf>

<sup>32</sup> <https://www.nature.org/content/dam/tnc/nature/en/documents/Carbon-Market-Incentives-Report.pdf>