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A MIDWESTERN FRAMEWORK FOR ELECTRIC VEHICLE CREDIT GENERATION IN A CLEAN FUELS POLICY

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This Midwestern framework for electric vehicle (EV) credit generation is a resource for states exploring clean fuels policy implementation. The framework provides guiding principles and policy design recommendations. It was developed by the Electric Vehicle Credit Generation Committee of the Midwestern Clean Fuels Policy Initiative, which the Great Plains Institute facilitates.

Background

A clean fuels policy is a technology-neutral, performance-based policy that reduces the use of high-carbon transportation fuels while providing incentives to deploy lower-carbon alternatives such as electricity, hydrogen, and biofuels.

A Clean Fuels Policy for the Midwest: A White Paper from the Midwestern Clean Fuels Policy Initiative, published in January 2020, underscored the importance of clean fuels policies in scaling electric vehicle (EV) adoption as part of a fuel and technology neutral approach to transportation sector decarbonization. It also highlighted that additional work was needed to determine who can generate credits for EVs and how this credit value can best achieve the goals of the program.

Electric Vehicle Credit Generation Committee

Members of the committee that helped shape this framework and support the principles presented include the following:

- Alliance for Automotive Innovation
- Audi
- BTR Energy
- BioMass Solution
- ChargePoint
- Conservation Minnesota
- Clean Fuels Ohio
- Douglas Karlen
- Ecology Center
- Fresh Energy
- General Motors
- Plug In America
- Rivian
- Tesla
- Union of Concerned Scientists
- Xcel Energy

Electricity as a low-carbon fuel

EVs are fueled from electricity, which is a low-carbon fuel that can participate in clean fuels policies. To generate credits from the program, electricity is assigned a carbon intensity score based on greenhouse gas emissions associated with its production and use. Greenhouse gas emissions from electricity production are dependent on the mix of fuels used to generate electricity. Grid mixes with a higher percentage of low-carbon energy sources like wind and solar emit fewer greenhouse gases. In comparison, grid mixes with a higher percentage of fossil energy sources like coal emit more greenhouse gases.

Guiding principles

When designing a clean fuels policy, the following principles should serve as a guide in how to treat electricity and EVs within the program:

- Accelerate EV adoption and transportation electrification in every category, emphasizing maximum impact in the program's early years.
- Ensure that the credit incentive and revenue is used to further the goals of the clean fuels policy including promoting equitable transportation electrification and greater access for all communities (including low-income communities, communities of color, and rural communities), increasing affordability, and reducing disproportionate air quality impacts from transportation.
- Require that a credit market operates to incentivize electrification by allocating credit generation opportunities and credit revenue to stakeholders in the primary value chain.
- Incentivize and achieve shared benefits for different parts of the transportation electrification value chain—including consumers, electricity providers, EV manufacturers, charging providers, and fleet managers—by engaging a strong and broad coalition of stakeholders.
- Tie EV charging credit generation to carbon reduction performance and maximize available credits by balancing accuracy with practical implementation for credit generators and the regulatory agency.
- Complement and leverage other efforts to support transportation electrification, enhance equity and public health, and decarbonize the electric grid.
- Improve the program over time and learn from predecessor programs.
- Develop a program that might serve as a model beyond the Midwest.

Policy design recommendations

When designing a clean fuels policy, four primary issues guide EV credit generation:

- How credits are calculated
- Who generates credits
- How credit revenue is used
- Who oversees credit revenue spending

Recommendations for each issue are provided based on the source of the EV charging—residential or fleet, public, and workplace.

How credits are calculated

Residential charging

- Allow for the use of base credits for EVs charging with either the state average grid carbon intensity or utility-specific grid carbon intensity.[1]
- Allow for the use of incremental credits for EVs charging with electricity cleaner than the base credit grid mix or for time-of-use charging.
    - Specify how to qualify incremental credits (e.g., voluntary renewable energy tariff, renewable energy certificates, on-site renewable generation, or smart charging)
    - Measure incremental credits through vehicle telematics or a battery management system (BMS) with geofencing, metered charging, or networked charging. A combination of vehicle telematics with geofencing and BMS could be used.
    - Specify a hierarchy to award incremental credit generation. Multiple credit generators should receive incentives for investments.
- Support upfront rebates by allowing for the calculation of credits expected to be generated over the vehicle's

[1] If utilities opt out of the state-wide average and apply for a utility-specific carbon intensity, the state-wide average carbon intensity should be recalculated by excluding the opted-out amount of the actual kilowatt-hours used in EV charging from the utility involved.

lifetime, based upon estimated lifetime carbon savings. This is similar to calculating rebates for energy-efficient appliances based on lifetime energy savings.
- Make credit generation eligible for every application and type of existing and new EV.[2]

Fleet, public, and workplace charging

- Allow for the use of either the state average grid carbon intensity or utility-specific grid carbon intensity in calculating credits.
- Calculate credits through networked charging stations or groups of charging stations, allowing conservative estimation where chargers are non-networked or non-metered.
- Allow for the use of incremental credits for EVs charging with electricity cleaner than the base credit grid mix or for time-of-use charging.
- Congruent with the residential charging recommendation, allow for the calculation of credits expected to be generated over the lifetime of a vehicle, based upon estimated lifetime carbon savings, similar to calculating rebates for energy efficient appliances based on lifetime energy savings.
- Make credit generation eligible for every application and type of existing and new EV.[3]
- Ensure eligibility for both publicly and privately operated charging infrastructure.

Who generates credits

Residential charging

- Have the state determine the eligible base and incremental credit generators to best incentivize program objectives.

Fleet, public, and workplace charging

- Direct base and incremental credit revenue to the owner of the charging station[4], allowing for a charging station owner to delegate to a third-party entity if they choose.

How credit revenue is used

Residential charging

- Require that base credit revenue be used for specific purposes that advance equitable transportation electrification, consistent with the guiding principles above. A significant portion should go towards EV on-the-hood purchase rebates available to all consumers and projects that benefit rural, low-income, under-resourced, and people of color communities.
- Require that base credit revenue support hard-to-fund things that the government, utilities, and the market are not providing on their own, building in flexibility to shift as state needs change over time.
- Require the incremental credit generator to use incremental credit revenue to promote transportation electrification, including marketing and outreach programs, incentives, and infrastructure.

Fleet, public, and workplace charging

- Require credit revenue to be used to promote transportation electrification (including marketing and outreach programs, incentives, and infrastructure) and other EV and infrastructure cost reduction measures.

[2] If needed, issue a conservative default energy efficiency ratio (EER) for types of vehicles that do not have an approved EER.

[3] If needed, issue a conservative default EER for types of vehicles that do not have an approved EER.

[4] A charging station owner is the owner of the charging station itself and not necessarily the owner of the property on which the station is sited.

Who oversees credit revenue spending

Residential charging

- Require that the regulator oversees base credit revenue to ensure accuracy, whether via estimation or data collection of credit generation and carbon intensity.
- Require that base credit revenue for set-asides be overseen by an advisory board representing stakeholder voices consistent with the principles. Because credit generation and credit revenue will impact various stakeholders in the primary value chain, oversight of credit generation and use of credit revenue should be conducted by a single regulatory body with broad jurisdiction.
- Require that the regulator oversees incremental credit revenue to ensure the accuracy of credit generation and carbon intensity.
- Structure verification to leverage existing technologies to reduce compliance costs, which can include auditing of credit generation reports and record retention requirements.

Fleet, public, and workplace charging

- Require the state agency that manages the clean fuels program to oversee the measurement and reporting.
- Structure verification to leverage existing technologies to reduce compliance costs, which can include auditing of credit generation reports and record retention requirements.

Definitions

Base credit: A base credit is a credit generated through EV charging and is calculated with either a statewide average electric grid carbon intensity or utility-specific electric grid carbon intensity.

Geofencing: A geofence establishes a virtual perimeter around an object. Vehicle telematics that employ geofencing trigger a specific action to take place based on its location.

Incremental credit: An incremental credit is a credit generated through EV charging and represents the difference between statewide or utility-specific carbon intensity and lower carbon electricity. It is used to determine the greenhouse gas impact of using electricity that is lower carbon than the state or utility average carbon intensity.

Set-asides: A portion of residential base credit revenue that is directed to specific purposes (e.g., EV on-the-hood purchases, rural or low-income community infrastructure rebates) that advance equitable transportation electrification, consistent with the guiding principles and recommendations above.

Telematics and battery management systems (BMS): Telematics and/or BMS data communicates information like location, speed, idling time, fuel consumption, and more about a vehicle, typically through a device connected to the vehicle's dashboard.

Time-of-use charging: Time-of-use charging means charging an EV during a specified time offered by a utility, generally during overnight or low demand times. These programs incentivize EV owners to charge during the low demand time through lower rates.