European Alternative and Renewable Transport Fuels (ART Fuels) Forum

FUTURE FUELS GROUP

THOUGHTS ON LIFE CYCLE STRATEGIES FOR RECYCLED CARBON FUELS GASES

To advance broader EU climate objectives, strategies for assessing impacts of Recycled Carbon Fuels (RCFs) should consider the principles and anticipated impacts of other policy goals, including decarbonization of electricity generation, electrification of road transport, and preference for material re-use and recycling over energy recovery from wastes. The transition to a fully decarbonized grid combined with zero emission vehicles is underway but low carbon fuels will continue to be required. A successful energy transition may entail a period in which carbon is prioritized for transport and away from power to support grid decarbonization. Then, as technologies and production capacities continue to develop, the most appropriate low-carbon solutions can be deployed in each transport sector.

This paper suggests strategies to support the transition to a decarbonized grid with recycled carbon fuels. The key is adopting a methodology for calculating the life cycle emissions of recycled carbon fuels that aligns with future context for their deployment, based on forward-looking policy objectives and commitments. Careful methodological choices will encourage investment in projects today promote the most efficient and high priority uses of carbon-rich waste gases.

Recycled carbon fuels capture and reuse emissions that are too dilute for CCS and usually burned for power at low efficiency (< 40%) or flared. RCFs avoid combustion and, at facilities where power is produced, divert carbon-based power from the electricity grid, creating additional demand for electricity from other sources, which are increasingly renewable. Approximately 85% of new EU power generation capacity came from renewable sources in 2017. As a result, RCFs reduce transport emissions with only a modest increase in electricity generation emissions, which will drop over time as the electricity grid is decarbonized in line with policy targets.

First, it is essential to ensure that the CO_2 emissions burden of waste gas inputs are allocated to the primary product, not RCFs, as for other wastes and residues. Second, ‘displacement’ or ‘indirect’ emissions requires careful consideration, which begins by determining the project baseline. If gases are currently flared or if continuing a current use requires investment that cannot be economically justified, the baseline is flaring and there is no displacement.

Although biofuels are expected in many cases to have significant indirect emissions, indirect emissions are not assigned to biofuels in the REDII lifecycle analysis. The omission of displacement (e.g. indirect emissions) for biofuels is an argument for setting a high GHG emissions savings threshold for these fuels. In contrast, once displacement emissions for fuels from CCU have been appropriately assessed, no other significant indirect emissions are expected. The absence of such indirect emissions justifies the adoption of a less stringent minimum emissions saving threshold for recycled carbon fuels than for traditional biofuels.

More generally, an alternative use baseline, such as power production, should be evaluated against multiple criteria: (1) is it currently in use; (2) will that use require significant capital expenditure now or in the future to continue; and (3) is its continuation consistent with a transition to desired policy outcomes. In the case of electricity as the alternate use, one approach to such an evaluation is to first identify the time before investments will be required ("displacement period"). Then set the baseline as electricity production during the displacement period, calculating displacement emissions by one of the methods outlined below. After the displacement period, the baseline reverts to flaring with no displacement. To provide uniform displacement through a project lifetime, an average could be calculated instead.

We have identified four options for assessing the displacement emissions: (1) average carbon intensity of the most recent documented electricity generation; (2) average carbon generation intensity during project life; (3) average carbon intensity of current electricity generation capacity additions; (4) carbon intensity of expected future electricity generation capacity additions during project lifetime. Option 3 is suitable for situations in which it is not possible to rely on detailed modeling. Option 4 more accurately characterizes the direct impact of a CCU project when enough data are available.

In order not to prematurely preclude any policy options available, The AFF encourages EU co-legislators to: Ensure the development of a calculation methodology that takes into account the expected reduction of the grid's carbon intensity, as well as avoids potential negative or unintended consequences from the inclusion of a displacement or alternative use penalty for recycled carbon fuels.