California Air Resources Board: California Low-Carbon Fuel Standard (LCFS)
Comments on Proposed Regulations

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1. ARB Should Reject the Goals Established for the LCFS, and the Resulting Policy Based Characterization of the Carbon Intensities of Transportation Fuels

At first glance, the documentation presented with the proposed regulation gives the impression that the LCFS was developed on the basis of a scientific research program. However, even a brief review of the collected documents shows very clearly that the calculations used to determine the relative "carbon intensities" of the energy sources are not in fact based on empirical data sets or well-documented and tested models.

Instead, it is very clear that the LCFS is a specific policy instrument that goes against the energy policy of the United States. And, the information included in Volumes I and II of the Staff Report was selected for their ability to support this policy direction and not to present a data based evaluation of the production and deployment of all available transportation fuels.

The actual purpose of the LCFS and how the resulting carbon intensities would be calculated is stated on page ES-31 of the Staff Report under the section:

> ***Evaluation of Alternatives***
>
> *1. Take no action at the State level, and instead defer to the Federal Renewable Fuel Standard.*

In rejecting this option, ARB staff makes clear that the purpose of the LCFC is not to expand upon the GHG benefits of renewable fuels but rather,

> ***"[the RFS] does little to incentivize the development of fuels such as natural gas, electricity, or hydrogen."***

This statement makes clear the entire purpose of the California LCFC. The LCFC is to increase the use of:

1. Natural gas: a non-renewable, imported fuel;
2. Electricity: the majority of which is produced from non-renewable fuels, and is currently in short supply in California, and
3. Hydrogen: a fuel with theoretical benefits but no current energy-efficient means of production.

The use of these fuels is in direct opposition to the two overarching goals of United States energy policy:

- Reduce the US's dependence on imported energy sources, and
- Reduce the use of non-renewable fuels.

Therefore, I strongly urge the Board to reject the current policy and technical direction of the LCFS and instead replace it with an approach that does not rely on imported and non-renewable sources.

2. ARB Should Remove the Global Trade Analysis Project (GTAP) Model from Carbon Intensity Calculations

In addition, I strongly urge the Board to remove the GTAP (Global Trade Analysis Project) Model from use in calculating carbon intensities. I think everyone agrees that land-use changes occur in response to transportation and energy system changes. These include destroying mountaintops and stream systems in West Virginia for coal for electrical production, cutting down trees and damaging sensitive ecosystems for high-tension power lines, and roadways, expanding waste storage areas for hybrid and electric vehicle batteries (over 500 lbs/vehicle), and increasing the carbon-capture ability of grasslands and forests with the planting of native "energy" grasses and trees.

However, the calculation of the relative land-use effects of different energy sources is very complex and is very data intensive. Data from such sources as Landsat and other satellites, carbon flux-towers and soil sensors located in a variety of growing conditions, and land transfer and taxation offices needs to be collected and calibrated. A number of different data-rich models need to be written, tested, and calibrated against real-world data sets before they can be used for policy purposes.

Anyone familiar with the history of couple climate change models knows that this effort takes time. It has taken researchers over twenty years to achieve the level of

confidence needed in these models to produce the 5th round of IPCC Climate Change projections. And, even after all this work, these models are not used to enforce regulations to level of detail that is being proposed for the GTAP model.

As for the GTAP model, it is not anywhere near meeting these requirements. In fact, it is hardly a model at all in the formal sense of that term. It is simply a collection of equations based on some assumptions that have not been tested with real-world data. Therefore, ARB would be placing itself in a very precarious position by adopting it for regulatory purposes.

Instead, ARB should join with EPA and the National Academy of Sciences to develop a work program that would produce models capable of evaluating complex energy land use scenarios based on empirical data sets. While this may take awhile, the fight to regulate GHGs and to mitigate climate change will be a long and earth-changing one. It is more important to get the decisions on future fuels right than to support a short-term policy decision.