May 12, 2010

Northeast States for Coordinated Air Use Management (NESCAUM)
89 South Street, Suite 602
Boston, MA 02111

RE: Low Carbon Fuel Standard Coalition Comments on NESCAUM's Draft Data and Assumptions for the Economic Analysis of a Northeast/Mid-Atlantic Low Carbon Fuel Standard

This letter provides the Low Carbon Fuel Standard Coalition's[1] (LCFS Coalition) comments on NESCAUM's Draft Data and Assumptions, Part 1 for the economic impact analysis of implementing a LCFS in the Northeast and Mid-Atlantic States (LCFS States).

The LCFS Coalition is a collection of utilities and electric generators that are stakeholders to the development of a regional LCFS. Members of the LCFS Coalition have been active in shaping state and regional greenhouse gas policy for a number of years and are interested in working with the LCFS States to develop a regional program that achieves cost-effective emission reductions and drives investment in innovative technologies and low carbon fuels in a responsible manner.

Introduction and General Comments

The LCFS Coalition appreciates the opportunity to provide comments on the Draft Data and Assumptions. The LCFS Coalition understands that NESCAUM has been charged with the difficult task of completing a comprehensive impact analysis of the proposed LCFS in an abbreviated timeframe and we applaud the LCFS States and NESCAUM for their excellent work to date. In order to produce a robust analysis and achieve the LCFS States' goals, the economic analysis should be as accurate, reasonable and transparent as possible. We understand that the economic analysis will not technically bind the LCFS States' hands as they develop a policy framework. We are also mindful, however, that leaving out assumptions and policy scenarios may make it difficult to include those assumptions later, since they may be subject to claims that their economic impacts have not been analyzed.

The LCFS Coalition offers the following specific comments to help bolster the analysis.

Policy Scenarios

In general, the LCFS Coalition requests greater clarity regarding the specific assumptions that will be used to estimate the impacts under each scenario. One straightforward and helpful way to present this information would be a matrix containing the value assumed for each variable under each scenario. This matrix should include both the "high" and "low" variables that NESCAUM identifies as defining each scenario, including assumptions for: technology penetration rates, fuel price, infrastructure costs, carbon intensity (CI) value, and availability of in-region fuel.

[1] The LCFS Coalition members are: Dominion Energy New England, National Grid, the New York Power Authority, and Northeast Utilities.

Accompanying the matrix, the analysis should provide an explanation of each assumption, along with sources and methodologies used to arrive at each. Such a detailed account of the process behind the assumptions will help ensure that the analysis is transparent. The LCFS Coalition understands that the analysis is a bounding exercise not designed to predict the future or the likelihood of any particular outcome. Nonetheless, the analysis should be as realistic as possible by relying on assumptions and data that are reasonable and defensible.

While the policy scenarios selected in the draft encompass a reasonable variety of potential compliance options, the LCFS Coalition does not believe the selected scenarios are directly analogous due to differences in the respective technologies. For example, low-carbon, advanced biofuels might be able to be blended with petroleum-based fuels for use by conventional vehicles. Alternatively, CNG vehicles are likely to be better suited for commercial applications than for use as personal vehicles, given technology acceptance rates. The opposite might be true for EVs, which could be better suited for personal use than commercial fleets. The analysis should clearly address these dynamics by explaining not only the total volume of vehicles needed to meet the natural gas and electric vehicle scenarios, but the breakdown between commercial and personal vehicles.

The analysis should also model the costs and benefits of alternative technologies, including fuel cells. The LCFS Coalition acknowledges that the widespread deployment of fuel cell vehicles (FCVs) within the next decade is unlikely. However, vehicle manufacturers continue to work on improving FCV technology and see this as a potentially viable transportation technology.[2] NESCAUM might also consider modeling the early introduction of fuel cell vehicles as a sensitivity case for proposed policy scenarios, specifically the CNG Future. Especially during the initial phase of deployment, much of the hydrogen for FCVs is likely to be derived from natural gas and may even utilize existing natural gas and CNG fueling infrastructure.

Finally, we agree that well-designed policies can spur innovation and drive markets. Certainly that is one of the aims of the LCFS. The analysis should clearly indicate the magnitude of innovation that is needed to achieve each scenario so that policymakers and stakeholders understand the level of incentives that will be required. For example, the "EV Future" scenario assumes substantial penetration rates for EVs. It would be helpful to have a discussion surrounding the difference between current projections for EVs (presumably included in the reference cases) and the EV policy scenario that focuses on what kind of financial drivers would be necessary to bridge the difference and whether it is reasonable to assume that an LCFS could provide that on its own. If not, additional policies and incentive programs targeted at specific technologies may be necessary to meet the LCFS targets.

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[2] For example, Toyota recently announced that it has reduced FCV costs by 90% and is on track to sell its first mid-sized hydrogen FCV by 2015. http://www.environmentalleader.com/2010/05/10/toyota-wants-to-sell-affordable-fuel-cell-car-by-2015/

CNG Future

The LCFS Coalition appreciates that NESCAUM is considering CNG as a viable option for reducing the carbon intensity of the transportation sector. However, as noted above, NESCAUM should be careful not to assume the applications for CNG vehicles would be the same as biofuels or EVs. For instance, CNG vehicles may readily replace conventional medium- and heavy-duty vehicles, thus displacing significant quantities of diesel fuel. The potential for similar penetration in the light-duty, personal vehicle market is lower. Assuming credits could be traded across the standards, CNG vehicles might still be able to meet 60 percent of the overall LCFS reduction target, but the analysis will have to explain how this will be done.

The Draft Data and Assumptions include a placeholder for the projected cost of CNG in 2012, as estimated by the California Air Resources Board (CARB). As prices can fluctuate by region and jurisdiction, NESCAUM should conduct further research in this area to determine the appropriate pricing structure for CNG in the LCFS States. A major factor is the CNG price is the current motor fuel tax credit of $0.50 per gallon. An assumption about its future is needed. We expect that commodity prices for CNG will stay substantially below gasoline (e.g. $10 per DTH gas delivered, which is equivalent to $1.27 per gallon).

The LCFS Coalition believes that the CNG infrastructure costs in the draft are in the appropriate range. The actual costs will depend on the type of technology used – fast fill stations are significantly more expensive than slow fill stations. Accordingly, the analysis should be clear about what technology is assumed. While the figures may be on the low end, CNG fueling stations tend to compare favorably to traditional gas stations in terms of infrastructure costs. However, the analysis should account for the probability that owners of commercial fleets that convert to CNG vehicles may choose to construct their own fueling station and provide access for other vehicles. These stations would be more expensive on a per-vehicle-served-basis, but would have lower total capital costs. In the near term, we expect that fueling of private CNG vehicles would occur at commercial facilities and not in homes, since the only product that was available for home fueling is no longer on the market. To the extent the analysis does include home fueling, our experience suggests that the cost of a home CNG refueling station would be approximately $10,000.

EV Future

The EV Future scenario features aggressive deployment of EVs over the next decade. While the LCFS Coalition believes that EVs have enormous potential, we are concerned that the market penetration rates in the EV Future scenario are overly ambitious. As discussed above, using realistic assumptions is necessary for maintaining the integrity of the analysis. The final Data and Assumptions report should address the market penetration rates for EVs under each scenario and any evidence to support that this is a reasonable parameter for the analysis. The analysis should also be clear about time of day charging assumptions (e.g. peak vs. non-peak) and provide an explanation of why the assumptions are realistic.

The projected electricity prices presented in the Draft Data and Assumptions rely on a variety of sources. Each source may make differing assumptions about future electric load growth and other factors, resulting in projected electricity prices that are not comparable. For the sake of internal consistency, the LCFS Coalition recommends using a single source for projected electricity prices. The Energy Information Administration's (EIA's) Annual Energy Outlook (AEO) is probably the best option for this purpose since it incorporates current policies, including RPS compliance. However, the extent that the analysis assumes compliance with state or regional standards not captured in the AEO, the price should be adjusted. The method for any such deviations should be explained.

The LCFS Coalition believes that the estimates for EV charging infrastructure costs should be revised. Most notably, the infrastructure costs associated with Level 1 home charging capability seem unjustified. Level 1 or "slow" charging utilizes a standard electrical outlet, and therefore residential consumers typically do not have to incur any added infrastructure costs. If new wiring is required, the EV owner would likely opt for installing advanced, Level 2 charging equipment. The LCFS Coalition suggests the following cost estimates for home EV charging infrastructure:

- Home chargers, Level 1 = $0
- Home chargers, Level 1, with new wiring = $1,500
- Home chargers, Level 2, with new wiring and EVSE = $2,000

The assumed cost of $4,500 for a public EV charging station is an acceptable figure. However, the LCFS Coalition suggests adding an additional infrastructure category for charging equipment installed at commercial operations, but not necessarily accessible to the general public. These business charging stations would likely be intended for a smaller number of vehicles and therefore total capital costs would be less. The LCFS Coalition recommends using $3,000 for this class of infrastructure.

While home charging infrastructure typically only serves a single vehicle, public or business charging stations will serve considerably more, although not as many as a typical gas station. A reasonable assumption for public charging station is that each installation could serve approximately 100 EVs. Smaller business stations might serve 10 vehicles.

The Draft Data and Assumptions also limit the infrastructure costs for EVs to the expenses associated with the charging equipment. Other local electricity distribution infrastructure costs that could arise from EV deployment include upgrades to:

- Meters,
- Circuits and wiring,
- Circuit breakers, and
- Transformers

These costs should be considered to ensure a robust analysis. The Coalition is developing rough estimates for these costs and will provide them to NESCAUM for consideration when they are complete.

Based on the preliminary estimates of the increase in electricity demand, as presented on Slide 53 of the Draft Data and Assumptions, the analysis should also consider the costs of

any upgrades to the electricity transmission infrastructure or added generating capacity that might be required to meet the new demand, particularly in load constrained areas. The Coalition would be willing to work with the LCFS States, NESCAUM and other interested stakeholders in developing reasonable estimates for these costs.

Carbon Intensity of Electricity

The LCFS Coalition supports the use of average emission rates for determining the CI of electricity rather than marginal emission rates. However, rather than a single weighted-average value for all the LCFS States, the LCFS Coalition would prefer separate values for at each electricity control region (ISO New England, New York ISO, and the appropriate portion of the PJM Interconnection). This information is readily available and will provide a better indication of the effect that lower carbon electricity generation may have on compliance and costs and will allow a more detailed look at the state-by-state impacts. For example, lower emission rates in the ISO New England and New York ISO regions could make compliance easier and less costly for the states in those regions, particularly under the EV Future scenario. By assigning more location-specific carbon intensities, NESCAUM may also be able to better estimate any electricity transmission issues that might arise for large-scale deployment of EVs. If NESCAUM chooses to use a weighted average for the CI of electricity, the LCFS Coalition suggests providing at least a qualitative, directional analysis of the impacts of using differentiated CIs on the regional compliance and overall cost.

Energy Economy Ratio

The LCFS Coalition acknowledges that there are currently limited data available on real-world performance of EVs, which makes selecting an accurate energy economy ratio (EER) for modeling purposes a difficult proposition. The LCFS Coalition is aware of several ongoing studies in this area, but the results are not expected until later in the year. Therefore, although the LCFS Coalition believes that the EER for EVs is substantially higher than 3.0, the use of 3.0 as a conservative value for the limited purpose of the economic analysis is reasonable.

However, the LCFS Coalition strongly recommends that NESCAUM model the effect of various EERs to demonstrate how higher EERs could impact the overall costs of the program. Depending on the level of effort required, changes to the EER could be modeled as a sensitivity analysis for the EV Future policy scenario. Given that the EER for EVs is likely to be at least 4.0 or even close to 5.0, marginal adjustments to the carbon intensity would not appropriately reflect the impact of changes to the EER and would obscure the importance of focusing on the EER when the policy decisions are being weighed. For example, assuming a CI of 170 g/MJ for electricity, an EER of 3.0 would result in an adjusted CI of about 56.7 g/MJ. EERs of 3.5, 4.0, and 5.0 would return adjusted CIs of 48.8, 42.5, and 34 g/MJ. Using an EER of 3.0, the unadjusted CIs of electricity would have to be 145.7, 127.5, and 102 g/MJ respectively to achieve the same adjusted CI. These figures may be substantially lower than those being considered for NESCAUM's modeling, and varying the EER would likely be more informative for policymakers.

Heating Oil
The LCFS Coalition supports the concept of allowing heating oil to opt-in to the LCFS program, rather than having a separate reduction requirement. However, the LCFS Coalition remains concerned over the effect of the LCFS on supplies of unblended fuels for use in commercial and industrial boilers, emergency engines and auxiliary boilers. Modeling efforts should account for potentially having to rotate inventory non-economically and the costs of additional maintenance and equipment upgrades in commercial and industrial boilers, emergency engines and auxiliary boilers. Any modeling of the LCFS that allows for bio-blended heating fuels to generate credits should also consider the implication on the commercial and industrial oil use, including the related electric generation markets. Such an analysis should include the volumes of heating oil that might face blending relative to business-as-usual scenarios and the total market.

If reductions in the carbon intensity of heating oil are eligible to generate credits under the LCFS, the LCFS Coalition believes it is imperative to include calculations for fuel-switching as a reduction method in the Economic Analysis. Switching from oil to natural gas represents a significant carbon intensity reduction and should be recognized as such under the LCFS. Including fuel-switching options in the Economic Analysis will provide policy makers with the necessary tools to make informed decisions relative to home heating fuel in the LCFS. Failure to do so would go against the goal of developing a fuel neutral standard and unfairly burden natural gas as an alternative. Other carbon-saving technologies, such as geothermal heat pumps and solar thermal, should also be considered. The analysis should include fuel-switching as an option in its sensitivity analysis with credit value based on the volume of fuel oil displaced and the difference in CI between fuel oil and the alternative heating source. Any consideration of fuel-switching should also address the interaction with RGGI as such projects may be eligible to generate offset credits under that program.

Benefits
NESCAUM should estimate the expected health impacts associated with any changes in air quality resulting from the LCFS.

We appreciate this opportunity to comment on the first draft of Data and Assumptions for the Economic Analysis and we look forward to working with the LCFS States and the other stakeholders as the LCFS process moves forward.

Sincerely,

/s/

T.J. Roskelley
M.J. Bradley & Associates LLC
on behalf of the LCFS Coalition