Comments on ARB Cap and Trade Program Leakage Studies

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1) The ethanol manufacturing industry currently faces significant out-of-state (domestic) competition, and, therefore, the costs of the Cap-and-Trade Program have a significant impact on the competitiveness of California ethanol producers with this existing, well developed out-of-state market. It is difficult to tell whether the domestic leakage study accurately reflects this existing level of competition, and the corresponding likelihood for small energy price increases to drive ethanol production out-of-state.

   In order to assess the degree to which the study reflects this current competitive domestic ethanol market, it would be useful to see some intermediate data from the domestic study to get a reality check of the results. For example, the number of competitors identified within each mileage radius for each NAICS category, as well as demand growth index calculations, would provide useful additional information for reviewers.

2) Both the domestic and international leakage studies use data that appears to significantly understate GHG emissions from some manufacturing sectors when compared to four years of real GHG emissions data collected by EPA for the federal Mandatory GHG Reporting Rule.

   The domestic and international leakage studies do not reference specific GHG emission rates that can be compared to EPA's GHG Reporting Program. However, the international study uses the value of energy consumed as reported in Census of Manufacturers (CMF) and Annual Survey of Manufacturers (ASM) data. Both of these data sources use US Census Bureau data to determine energy values. The domestic study references the Manufacturing Energy Consumption Survey (MECS) for natural gas expenditure data. This, again, is based on US Census Bureau data.

   The MECS data used by the domestic study indicates that in 2010 the ethyl alcohol manufacturing sector (NAICS Code 325193) used 245 billion cubic feet of natural gas. This is equivalent to 13.3 million metric tons (MT) of CO_2 emissions using standard EPA emission factors. However, EPA's GHG Reporting

Program listed nationally reported direct GHG emissions for NAICS Code 325193 as follows:

$2011 = 18.3 \times 10^6$ $MTCO_{2e}$
$2012 = 17.5 \times 10^6$ $MTCO_{2e}$
$2013 = 17.1 \times 10^6$ $MTCO_{2e}$
$2014 = 18.7 \times 10^6$ $MTCO_{2e}$

While there is a one year difference in the data (2010 for MECS versus 2011 for GHG Reporting), and EPA is reporting CO_2 equivalent (CO_{2e}) emissions (which include small amounts of methane and nitrous oxide GHG emissions adjusted for global warming potential), the reported EPA emissions are nonetheless significantly higher than the MECS data.

The difference in GHG emissions data is even greater when the EPA Reporting Program results are compared to the 2007 Economic Census data (which is also based on US Census Bureau data) used by ARB in its 2010 and 2013 leakage analyses. This 2007 Economic Census data reported direct GHG emissions from ethyl alcohol manufacturing as 6.2×10^6 $MTCO_{2e}$.

Therefore, given the discrepancies between the Census Bureau GHG emissions data and the real world data collected by EPA between 2011 and 2014, both studies should compare the GHG emissions intensities used by the studies with the GHG Reporting Program data and determine if emissions intensities and energy consumption values are understated in the reports for any industry sectors.

3) Currently ARB uses a combination of the trade exposure (TE) and energy intensity (EI) leakage metrics in order to determine the overall leakage risk assistance factor. However, for these new leakage risk studies it does not appear to be appropriate to use a combined domestic and international leakage risk metric in order to determine overall leakage risk, at least for the "high" risk industry sectors. That is, if either the domestic or international leakage risk metric alone is high, then the particular industry sector is going to have a high leakage risk.

   Conversely, combinations of the "low" and "medium" leakage risk categories could result in a "high" overall leakage risk, since a low or medium exposure to both international and domestic leakage could result in significant total leakage. Thus, the "medium" and "low" leakage risk industry sectors should be combined to determine overall risk, whereas any single "high" leakage risk should be sufficient for the particular industry sector to be deemed an overall "high" leakage risk.

4) Neither the international nor domestic studies considered the effects of GHG emissions intensity outside of California. That is, in general, it takes more GHG emissions to produce a unit of energy outside of California because California utilities are subject to a minimum renewable energy standard and most of the fossil fuel generation is natural gas (a relatively low GHG fossil fuel). So when leakage occurs from California, GHG emissions are not traded at a ratio of one to one. Rather, GHG emissions will generally increase per unit of energy used as leakage occurs, resulting in an understatement of the effects of leakage in the studies. This effect needs to be considered when assigning leakage risk cut-off levels for each study, and should result in a tendency to move industry sectors into higher leakage risk categories in order to achieve the expected results in terms of overall emissions leakage values.