E.&J. Gallo Winery

January 20, 2017

Rajinder Sahota
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Proposed Amendments to the California Cap on Greenhouse Gas Emissions Regulation dated December 21st, 2016

Dear Ms. Sahota,

E. & J. Gallo Winery (Gallo) appreciates the opportunity to comment on the proposed amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation.

At Gallo, we have a long history of working collaboratively with the ARB to build a program that delivers greenhouse gas emissions while balancing the needs of our business. Since 2008 we have reduced our GHG footprint from 43,685 MTCO2e to 27,549 MTCO2e through investments to increase the efficiency of our facility, from installing gravity return lines to heat exchangers to preheat liquids to a 1 MW solar array to a 1 MW top cycle Combined Heat and Power steam turbine.

Despite our ongoing commitment to becoming more efficient and reducing our emissions, Gallo believes the new proposed amendments contain oversights in the approach. This letter covers the business and environmental ramifications of the changes to assistance factors (AF) and makes some recommendations around potential pathways forward.

As a note, in some cases, we used business confidential information to inform our analysis but had to generalize the information to share as part of this public comment letter. If as this letter is discussed, you would like to meet with us and can ensure the confidentially of this information, we are available to have further discussions with the ARB.

Assistance Factors

Based on our assessment, we believe there is room for significant improvement in the approach for determining the post-2020 AF. We believe that the proposed AF does not sufficiently account for leakage risk, especially given the competitiveness of the domestic and international markets for wine and spirits, concentrate and related products classified in 6-digit NAICS 312130 (wine industry). Our proposed recommendations would increase the international AF, (based on the raw international market transfer (IMT), from 24 to greater than 45 percent, and support a path toward quantifying a reliable estimate of domestic AF for the California wine industry.

We do not believe the ARB has adequately assessed the potential for domestic leakage risk from the wine industry, and we were particularly surprised to learn the ARB determined the domestic AF to be 0. Wine industry competition from Washington, New York, Oregon, Pennsylvania and elsewhere in the United States has increased dramatically in recent years. As of 2015, these four states now account for 13 percent of domestic wine production.[1] During 2010-2014, production in other states grew 12.1 percent annually, compared with 3.2 percent annual growth in California.[2] Further, E&J Gallo Winery is the only winery required to be enrolled in the cap-and-trade program, and thus the only California winery that bears the financial burden of compliance allowances. This places our operations at a competitive disadvantage relative to other California wineries, and may result in emissions leakage even within California to the extent that other wineries are more carbon-intensive.

We are concerned that the ARB determined the domestic AF using the leakage risk measures generated by Gray, Linn and Morgenstern of Resources for the Future, (RFF 2016). We believe this product to be unreliable because it suffers from significant issues in statistical and econometric modeling, and yields a counter-intuitive result for the wine industry.

In the following we present our concerns with the emissions leakage risk studies and the ARB's determination of the international and domestic AF. Also, we provide recommendations for the ARB's consideration, which we believe will move toward addressing these issues. In summary, our recommendations are:

---

[1] United States Department of the Treasury Alcohol and Tobacco Tax and Trade Bureau (TTB). 2016. Monthly Wine Statistics, Monthly Statistical Release: Summary – Calendar Year 2015. Available at: https://www.ttb.gov/statistics/15winestats.shtml. Accessed January 18, 2017.

[2] Wine Institute. 2016. US / California Wine Production. Available at: http://www.wineinstitute.org/resources/statistics/article83. Accessed January 18, 2017.

1. Extend the scope of the 2016 study of emissions leakage risk from California food processing industries conducted by Hamilton, et al. (Hamilton Study) to include grape processing as a means of

    a. Addressing and correcting the anomalous result derived in RFF 2016 that wine and related production increases as energy prices increase; and

    b. Studying and measuring the potential for emissions leakage risk through market transfer of Gallo's production to other California wineries through marginal compliance costs it faces, but that all other California wineries do not.

2. Develop quantitative methods to incorporate the effects of general price inflation on non-energy inputs through inter-industry purchasing—a feature that is lacking from the market transfer estimates in the Fowlie, Reguant and Ryan of UC Berkeley (FRR 2016) and RFF 2016 studies.

3. Take measures, in implementing the proposed international AF formula, to meet the stated objective of AB 32 to "minimize emissions leakage to the extent feasible" including:

    c. Use the upper limit of the distribution of estimated energy price elasticity ratios; and

    d. Project and use trade shares for the post-2020 period to account for the nature of competition prevailing during that, rather than contemporaneous and historical periods.

Emissions Leakage Risk Studies

Based on our assessment, both the international (FRR 2016) and domestic emissions leakage risk studies (RFF 2016) have statistical and econometric modeling issues that, to our knowledge, have not been addressed. As summarized in a June 10, 2016 letter to Chairman Nichols from Dr. Armando Levy of The Brattle Group, these issues have significant implications for the reliability of the estimated energy price elasticities and marginal compliance cost impacts the ARB uses to determine industry-specific AFs.[3]

In light of these and other issues, the authors of both studies caveat interpreting elasticities for individual industries, and their ability to measure the effect of California-specific cap-and-trade regulation. Instead, the authors

[3] Armando Levy, Ph.D.. Letter to Chair Nichols dated June 10, 2016.

conclude their models demonstrate that leakage risk increases with energy intensity and trade exposure. This conclusion validates the ARB's approach to determining AFs for the previous compliance periods, rather than improves the reliability of emissions leakage risk measures for the post-2020 time period. Despite the authors' caveats, the ARB is using the studies for exactly this purpose. We suspect that this is leading to major omissions, however, we cannot validate this since the study datasets were not made available to other researchers and the regulated community. Furthermore, RFF 2016, which purports to be an econometric study, does not even publish the standard model summary statistics that scientists use to evaluate the reliability of statistically estimated parameters and the degree to which the model can quantify associations between the variable of interest and the variable(s) thought to influence it.

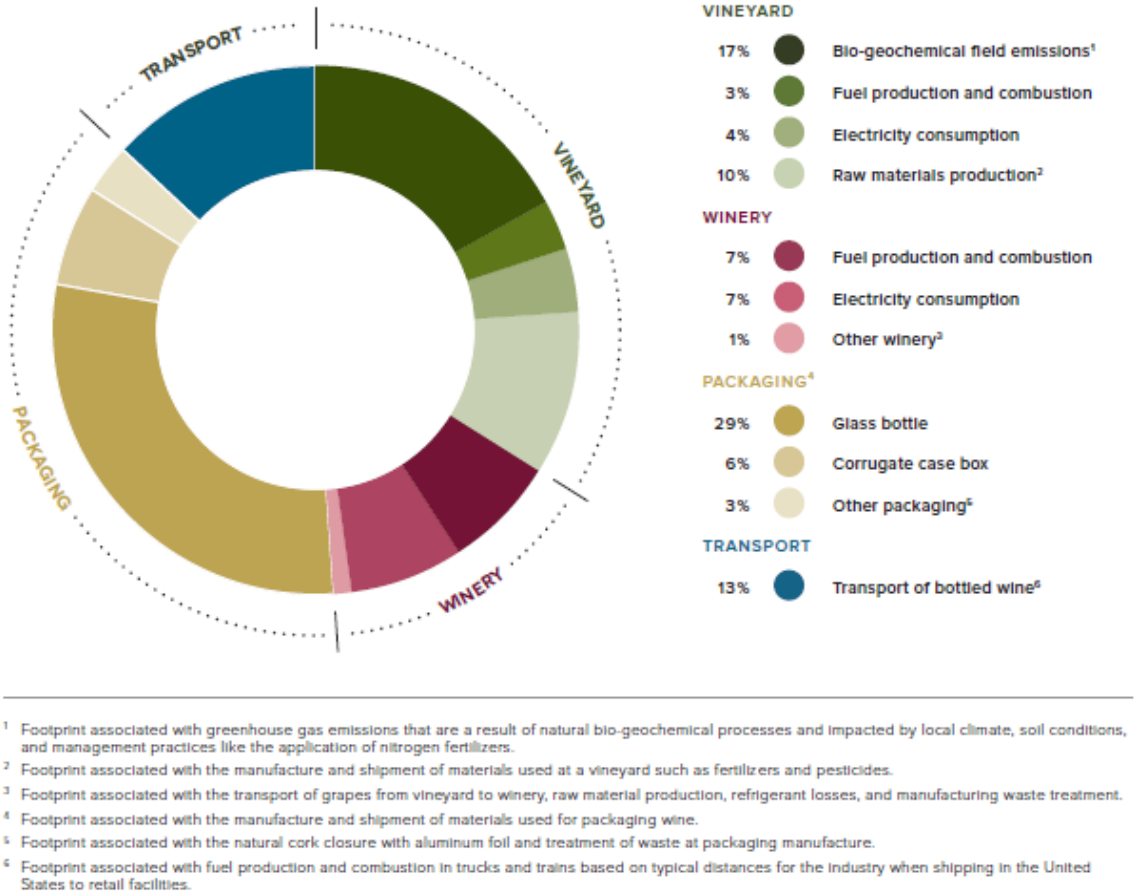
In addition to the statistical and econometric modeling issues highlighted by Dr. Levy, other issues affect the reliability of the industry-specific energy price elasticities, and marginal compliance cost impacts on which they are based. These include basis on extended historical data back to 1993 (FRR 2016) and 1991 (RFF 2016) terminating in 2011 (FRR 2016) and 2009 (RFF 2016), prior to major inflection points in wine industry competition. In addition, the apparent need for a one-size-fits-all industries approach means that the modeling assumptions and specifications are generalized across industries, and that its structure prevents analysis of the full extent of expected compliance costs.

Regarding the latter, the models attempt to measure the reduction in economic output *within individual industries* using changes in relative energy prices between California and the unregulated of region acting as a reference, fails to capture the effect of energy price inflation on the cost of non-energy productive inputs purchased from other industries. As a result, given the complexity of our product, wine has a carbon price applied to intermediate products at multiple points along the supply chain.

Specifically, our wine products experience the effect of carbon prices at the vineyard, winery, and packaging stages. In addition, both the winery and packaging stages are directly covered at our Gallo Glass and Fresno facilities. As Figure 1 demonstrates, the AFs are accounting for 14% (Fresno) and 29% (Gallo Glass) of our emissions in isolation instead of considering the impact of the embedded and compounding cap-and-trade costs from both of these facilities and across the entire value chain. This is in contrast to a product like cement, which does not have intermediary products covered by the cap-and-trade program and is just capped at the cement manufacturing facility.

Therefore, for a product like wine with many intermediary products, the leakage risk and by extension the AF is under projected.

Figure 1: Relative impacts for the carbon footprint of wine from cradle-to-retail



[1] Footprint associated with greenhouse gas emissions that are a result of natural bio-geochemical processes and impacted by local climate, soil conditions, and management practices like the application of nitrogen fertilizers.
[2] Footprint associated with the manufacture and shipment of materials used at a vineyard such as fertilizers and pesticides.
[3] Footprint associated with the transport of grapes from vineyard to winery, raw material production, refrigerant losses, and manufacturing waste treatment.
[4] Footprint associated with the manufacture and shipment of materials used for packaging wine.
[5] Footprint associated with the natural cork closure with aluminum foil and treatment of waste at packaging manufacture.
[6] Footprint associated with fuel production and combustion in trucks and trains based on typical distances for the industry when shipping in the United States to retail facilities.

Source: California Sustainable Winegrowing Alliance (CSWA).[4]

Whether the authors intended for these effects to be captured through simulated carbon price floors is unclear, and irrelevant, given that the price impacts manifest as incremental energy costs in both studies. This omission has potentially significant implications for the reliability of the industry-specific AFs. From our perspective, our operations will face higher costs of glass bottles and grapes which are not accounted for in the modeled energy price elasticities. The higher costs of these inputs will significantly increase our overall product costs and by extension, reduce our profitability.

[4] CSWA. 2011. US / California Wine's Carbon Footprint. Available at: http://www.sustainablewinegrowing.org/docs/California_Wine_Executive_Summary.pdf. Accessed January 18, 2017.

- *Glass Containers.* Our Modesto, California facility produces glass bottles for our winery operations. Glass container manufacturing (NAICS code 327213) is relatively energy intensive and both studies conclude there would be substantial market transfer, even from the mere $10 per MTCO2 carbon price floor they consider. Purchasing glass bottles from third-parties, should it be necessary, would be done at a premium relative to our operations.

- *Grapes.* Fruit is a significant portion of the cost of producing wine, concentrate and related products derived from grapes. While individual vineyards are not subject to AB 32, the regulation will nonetheless raise the cost of production to all vineyards, regardless of ownership or contracting relationship, that consume electricity to power machinery such as groundwater pumps.

Given the potential significance of non-energy compliance costs, we recommend that the ARB determine a method for its quantification and build it into estimates of emissions leakage risk measured by energy price elasticities, or otherwise develop a means for incorporating the impact in the AF determination formula.

Determination of the Domestic AF

We believe RFF 2016 is particularly unreliable for the wine industry, and therefore the ARB's determination of a 0 domestic AF based on its results is not appropriate. The model's result that California plants producing wine and related products classified under NAICS code 312130 would *increase* their output relative to plants in other states as natural gas prices paid by California plants *increase* relative to prices in other states runs counter to economic theory. Based on the model, a 5 percent increase in relative natural gas cost would increase our output by the same percentage. On the contrary, economic theory posits a negative relationship between a firm's output and its input costs, including energy.

While RFF 2016 acknowledged that this result contradicts the very economic theory motivating their model, they offer little in the way of explanation. RFF cite that the industries for which this anomalous result occurs have relatively low natural gas cost shares, and that the model produces the expected negative relationship for most industries. We find that explanation to be less than convincing for three reasons.

1) Absence of robust statistical significance of the estimated negative natural gas price elasticities across industries means that many of the

estimated negative relationships are actually no different from no relationship at all, in a statistical sense.

2) Comparing industries by natural gas cost share (percent of total production cost) is based on the industry-wide averages for the year 1991 the authors used in the study, a full 25 years ago. For NAICS 312130, RFF reports a 0.29 and 0.40 percent electricity and natural gas cost shares, whereas recent cost shares at our Fresno, California facility are significantly higher.

3) According to Figures 4 and 5 in the October 21, 2016 ARB staff proposal for the AF calculations, negative output elasticities with respect to natural gas prices are estimated for several industry sectors with energy intensity (based on energy cost share) similar to NAICS 312130.

Our assessment of the ARB's so-called "demand drop" (DD) methodology for determining the domestic AF revealed a number of issues that render it unreliable in addition to being based on the RFF study results.

1) The $24.88 per MTC02 price used to measure the initial demand (and value-added) drops using the RFF energy price elasticities is far too low. As we understand it, the price represents the 2030 auction price floor, rather than the equilibrium price. Presumably, the ARB projected the floor price into the future because allowances price has not exceeded the floor thus far. However, this was due to the over-allocation of allowances rather than market forces. Since we understand that ARB intends to remove surplus allowances from the market, and due to the increasing demand for California allowances both from California and from other jurisdictions, there is ample reason to expect the 2030 allowance price would approach and exceed $40 per MTC02.[5]

2) The regression models the ARB uses to predict the demand drop with 0 AF for each industry sector as a function of its energy intensity fail to explain 77 percent of the variation in output (and similarly, value added)

---

[5] Lucklow, Patrick, Stanton, Elizabeth A., Fields, Spencer, et al. 2015. 2015 Carbon Dioxide Price Forecast. Available at: http://www.synapse-energy.com/project/synapse-carbon-dioxide-price-forecast. Accessed January 20, 2017.

Lucklow, Patrick, Stanton, Elizabeth A., Fields, Spencer, et al. 2016. Spring 2016 Carbon Dioxide Price Forecast. Available at: http://www.synapse-energy.com/project/synapse-carbon-dioxide-price-forecast. Accessed January 20, 2017.

ICIS. 2015. ICIS launches 2030 Forecast for California Carbon Allowances. Press Release. January 2015. Available at: http://www.icis.com/press-releases/icis-launches-2030-forecast-for-california-carbon-allowances/. Accessed January 20, 2017.

reductions across industry sectors, and the average prediction error is 59 percent. To use a model with such a high prediction error has serious implications for the reliability of the calculated AF.

3) There is no basis for determining the AF in 10 percent increments; there is nothing preventing the ARB from making the determination at 1 percent increments. By the ARB's method, an industry with a 10.2 predicted demand drop (compared to the threshold 10.245 percent) at a 20 percent AF ends up with a 10 percent AF.

4) There is no basis for incorporating value added into the process. Output, specifically physical output, is relevant for emissions—not measures of profit.

As we understand it, the need for the DD methodology is driven by the stringent assumption in the RFF study that all declines in California manufacturing industry output from marginal compliance costs are absorbed by manufacturers in other states. This is not an issue with the FRR study, nor as we understand, with the Hamilton Study. Based on our assessment, the ARB has not cited any prior studies, peer-reviewed or otherwise, using this imputation methodology.

Rather than employ the novel DD methodology that generates and uses weak and imprecise statistical relationships to measure the level of domestic assistance, we recommend that the ARB leverage the resources it has already commissioned and extend the scope of the Hamilton Study to include the California grape processing industry as a means of replacing the results of the RFF domestic emissions leakage study altogether. In addition to allowing for declines in national output, the Hamilton Study overcomes many of the statistical and econometric criticisms of the RFF (and FRR) studies by:

- Measuring the outcome variable as the quantity produced, which has a direct relationship to emissions, and avoids being confounded by contemporaneous, offsetting fluctuations in price and quantity that measure the value-based outcome variables used in RFF and FRR;

- Using recent firm-specific cost, revenue and energy intensity information; and

- Including sufficient variables describing exogenous factors affecting supply and demand that are specific to the industry/product of interest, allowing for statistical identification of the equation describing the model, and unbiased measurement of energy price elasticities.

Determination of the International AF

Certain aspects of the ARB's use of FRR 2016 in developing the IMT ignore feasible means of minimizing potential post-2020 emissions leakage. These shortcomings apply broadly, as well as more specifically to the California wine industry. Key among these include

- The ARB's use of the median import and export energy price elasticity ratios in the international AF formula;

- The ARB's use of contemporaneous import and export shares in the post-2020 international AF formula.

We explain our concern with each of these aspects as they relate to the calculated raw IMT and make recommendations to address them by increasing the international AF for NAICS 312130 based on that factor from 24 to at least 45 percent.

Use of median import and export energy price elasticity ratios

Although measures of central tendency may be appropriate in many contexts, we believe mitigating unintended consequences of environmental policy action require using the upper end of the distribution of metrics describing unintended policy outcomes. By using of the median (50th percentile) estimate for the import and export energy price elasticity ratios, the ARB is only 50 percent confident that it has not underestimated the IMT, and thus the risk of emissions leakage, used to establish the international AF.

Rather than leave the future competitiveness of California industry to a flip of a coin, we recommend that the ARB use the 90th percentile of the distribution. This degree of conservatism is particularly warranted for our industry, as increasing competition from low-cost grape concentrate producers in South America, for example, is only expected to intensify. During 2010-2014, the value of U.S. wine imports increased more than 5 percent annually, compared to just over 1 percent annual growth in the value of domestic shipments from California.[6]

---

[6] ARB 2016. Post-2020 Assistance Factor Calculations Spreadsheet. Available at: https://www.arb.ca.gov/regact/2016/capandtrade16/capandtrade16.htm. Accessed January 14, 2017.

Wine Institute. 2016. California Wine Shipments. Available at: http://www.wineinstitute.org/resources/statistics/article123. Accessed on January 18, 2017.

Using the 75th percentile of the import and export elasticity ratios reported by FRR 2016, the raw IMT calculated for NAICS 312130 would increase from 24 to 33 percent.[7] Using the 90th percentile, as we recommend, would increase the raw IMT above 33 percent.

Use of contemporaneous average import and export shares

There is potential to improve the applicability of the import and export shares in the international AF. Instead of basing their computation on the 2010-2014 average, we recommend that the ARB develop methods to project and extend trends into the post-2020 time period, similar to what it has done with the carbon reserve price (floor price). This can be accomplished through evaluation of historical, industry-specific data, existing forecasts produced by the financial community or other researchers, or through communication with industry representatives. We believe that basing the international AF on import and export shares expected during the time period when the AF will be relevant is more appropriate.

To illustrate the impact of this oversight, we projected import and export trade shares (as calculated by FRR 2016) in the wine industry to 2021-2030 based on the 2010-2014 growth rate. We calculated the raw IMT for 2021-2030 to be 32 percent, based on median energy price elasticity ratios, and 45 percent using the 75th percentile elasticity ratios.

Carbon Leakage

The potential sources of domestic emissions leakage for wine, spirits and grape fruit concentrate include wineries operating in Washington, New York, Oregon and Pennsylvania. Although grapes are produced in almost all states, these are the major wine producing states other than California and the most likely to absorb domestic market transfer. Since the wineries in these states are not operating in a carbon-constrained market, they are not subject to the same increased costs as California wineries.

The potential sources of international emissions leakage for wine, spirits and grape fruit concentrate are wineries operating in France, Italy, Australia, Chile, Argentina, New Zealand and Spain. These are the major sources of imports (by value) of product classified under NAICS code 312130. Similar to the challenges of domestic carbon leakage, these entities are not operating in a

[7] FRR report the 25th, 50th and 75th percentiles of the distribution of estimated domestic, import and export shipment energy price elasticities derived from estimating 192 different model specifications. ARB has access to the entire distribution and can therefore use the 90th percentile. We reviewed the 'results' worksheet in the file 'post-2020-af.xlsx' to determine the raw IMT using the 75th percentile ratio.

carbon-constrained market.[8] As California wine becomes less competitive both domestically and internationally due to the increased costs associated with cap-and-trade, there is the potential that we will lose market share to entities in non-capped regions with higher emissions. For example, we have already seen increasing competition from South America which has reduced our market share in domestic markets. This wine is transported long distances and has a larger carbon footprint.

Long Term Implications

Finally, upon the receipt of the new assistance factors, we plugged these numbers into our cap-and-trade model. What we saw was a steep drop off in free allowances starting in 2020 for our Fresno, California facility. To develop a pathway forward, we have begun to explore options to reduce emissions to drop our footprint below 25,000 MTCO2e through either efficiency or decreased production so that we might opt out of the California Cap-and-trade program. In the case of the latter, the California Cap-and-trade would have curtailed our output because we cannot pass along the marginal costs of the program into all of our products, or to consumers in all segments of a given product market. Ultimately, we believe that reducing output goes against the overall intent of the Cap-and-trade program and hope that we can work towards a mutually acceptable solution.

Thank you for your consideration of these comments. We would welcome the opportunity to provide more specific information on our business going forward. If you have any questions or follow-up items for discussion, please feel free to contact me at John.Nagle@ejgallo.com.

Sincerely,
John J. Nagle

Environmental Manager
E. & J. Gallo Winery

[8] United States Department of Commerce, International Trade Commission. Foreign Trade Data Statistical Program U.S. International Trade Statistics. 2016. Value of Exports, General Imports, and Imports for Consumption by (NAICS - 312130) Wines. Accessible at: https://censtats.census.gov/naic3_6/naics3_6.shtml.