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BAC Comments on E3 Study and Presentation

Additional submitted attachment is included below.



June 18, 2019

The Honorable David Hochschild, Chair
The Honorable Andrew McAllister, Commissioner
California Energy Commission
1516 Ninth Street
Sacramento, CA, 95814

Re: Serious Flaws in E3's Deep Decarbonization Report and Recommendations to the CEC

Dear Chair Hochschild and Commissioner McAllister:

I am writing on behalf of the Bioenergy Association of California (BAC) to point out serious errors and omissions in E3's *Deep Decarbonization Report*, in particular its flawed assessment of in-state biogas potential, as presented at the CEC's workshop on June 6. In addition, the study largely omits consideration of Short-Lived Climate Pollutant reductions, wildfire related costs and emissions, and electricity reliability issues. Given the importance of safe and reliable energy supplies, as well as the urgency of reducing Short-Lived Climate Pollutants, the Commission should not base fundamental energy planning decisions on this report.

BAC strongly supports the state's goals of carbon neutrality and 100 percent renewable energy by mid-century. According to the Intergovernmental Panel on Climate Change and the California Air Resources Board, achieving carbon neutrality requires numerous carbon negative measures. The only carbon negative measures currently available are reductions in Short-Lived Climate Pollutants, such as methane and black carbon, and carbon sequestration. Bioenergy is one of very few tools that can accomplish both. Bioenergy reduces methane emissions from organic waste and black carbon emissions from wildfire, burning of agricultural waste, and diesel-powered vehicles. Bioenergy can also provide long-term carbon sequestration by producing biochar as a byproduct of gasification of organic waste.

Bioenergy can also provide flexible generation power, energy storage, and local energy supplies, all of which are important to balance intermittent renewables and ensure reliable energy supplies as we move toward 100 percent renewable energy. As

California faces more frequent Public Safety Power Shutoffs, and the grid is increasingly vulnerable to climate change impacts, local energy supplies will be important to maintain reliable energy supplies, especially for public safety and essential services. Several studies in recent years have found that bioenergy – and renewable gas in particular – are critical to achieve our climate and clean energy goals.¹

For these reasons and more, it is critical to accurately assess the potential for in-state biogas production from organic waste. Unfortunately, the E3 study presented on June 6 was based on a flawed assessment of in-state biogas potential and omitted several other critical issues. As such, the report should not form the basis for energy planning in California. The most serious flaws are described below.

1. E3 Relied Heavily on a Study that Looked at Only a Small Subset of California's In-state Biogas Potential.

E3's *Deep Decarbonization Report* relies on two data sources to determine California's in-state biogas potential. Both sources are inappropriate for this purpose. The first source was a very limited assessment of biogas production by Dr. Amy Myers Jaffe.² The Jaffe study is not an appropriate basis to determine in-state biogas potential for several reasons:

- The study was intended to assess what was economically feasible based on state and federal incentives in place at the time, not the total in-state biogas potential.
- The study only considered the hundred largest facilities in each of three waste sectors – dairy, landfill, and wastewater - that have a total of more than 2,500 facilities combined.
- The study did not consider forest, agricultural, or urban wood waste.
- The study only considered production of biogas from anaerobic digestion, which excludes $\frac{3}{4}$ of the in-state biogas potential.

Dr. Jaffe stated strongly in a 2017 IEPR workshop that the study was not intended – and should not be used – to assess the total biogas potential in California, yet E3 did just that. We encourage the Commission to review the transcript of that IEPR workshop for Dr. Jaffe's explanation of the study scope and purpose.

The Jaffe study that E3 relied on did not include any biomethane potential from forest waste despite California's tree mortality crisis and state laws requiring forest thinning on

¹ Clack, Christopher T.M. et al, *Evaluation Of A Proposal For Reliable Low-Cost Grid Power With 100% Wind, Water, And Solar*, June 26, 2016. Available at: www.pnas.org/cgi/doi/10.1073/pnas.1610381114. See also, Energy Futures Initiative: *Pathways for Deep Decarbonization in California*, April 2019. Available at: <https://energyfuturesinitiative.org/efi-reports>.

² Jaffe, et al, *Final Draft Report on The Feasibility of Renewable Natural Gas as a Large-Scale, Low Carbon Substitute*, Contract No. 13-307, Prepared for the California Air Resources Board and the California Environmental Protection Agency, June 2016.

half a million acres per year.³ The study also did not consider any biomethane potential from agricultural waste or urban wood waste that goes to landfills. According to the California Biomass Collaborative at UC Davis, forest, agricultural and urban wood waste make up three-quarters of the instate biogas potential, which the Jaffe study did not even consider.

The 2017 IEPR did an excellent job summarizing the differences between Dr. Jaffe's study and the total instate biogas potential. According to the 2017 IEPR, based on data from UC Davis, the total biogas potential from organic waste in California is 351 billion cubic feet of biomethane per year, more than four times the amount that Dr. Jaffe considered economically feasible from dairies, wastewater treatment facilities and landfills based on the incentives in place at the time.⁴

E3 should not have relied on a limited economic feasibility study to determine total instate biogas potential for the next three decades and beyond, particularly when the economic study excluded the largest organic waste sectors and was an assessment based on the policies and incentives in place at that time. Since the Jaffe study was published, several significant policy changes have been adopted, including:

- California has passed legislation requiring increased forest thinning and other vegetation removal around communities and other infrastructure;
- Hundreds of millions of dollars in cap & trade revenues have been allocated to dairy digesters, diverted organic waste to energy projects, and forest fuel removal;
- The CPUC has increased requirements for vegetation removal around power lines;
- CalFire has identified 35 priority projects for forest and vegetation removal;
- ARB has funded a feasibility study to look at converting forest, agricultural and urban wood waste to biomethane;
- The CPUC has proposed a definition of renewable gas that would include the biogas from gasification of organic waste;
- Several new small-scale bioenergy projects under the BioMAT program have accepted Power Purchase Agreements for projects that will convert forest and agricultural waste to biogas using gasification.

2. E3 Used a Nationwide Biomass Assessment Instead of a California Specific Biomass Assessment.

The second method that E3 used to assess California biomass potential is not scientifically valid and ignores much more accurate, California specific data. E3 used a nationwide assessment of biomass potential and then attributed a portion of that

³ SB 901 (Dodd, 2018).

⁴ See 2017 IEPR, Table 20, comparing Jaffe's more limited results based on economic feasibility to the total instate biogas potential.

potential to California based on the state's population. There is no scientific basis for this method since biomass potential is not correlated with population. For example, the state with the smallest population – Alaska – is also the state with the largest forest cover and timber industry. There are states with high agricultural output and small populations and states with large populations and little agriculture. Even among large agricultural states, there are enormous differences in biomass potential between states that produce primarily wheat or corn and states like California that produce a large percentage of the country's grapes, nuts, stone fruits, and other crops that produce significant cellulosic waste from orchard and vineyard pruning, as well as nut shells, rice straw, and other agricultural residues.

It is hard to understand why E3 would use such a non-scientific method for quantifying in-state biomass potential when UC Davis keeps a detailed quantification of technically available biomass from California's forest, agriculture and urban sectors. UC Davis also includes forest waste that is available due to California's tree mortality crisis, which is not included in the nationwide data that E3 used.

The state should not make critical and wide-ranging energy decisions based on this unscientific assessment of in-state biomass potential.

3. E3 Largely Ignores the Urgency of Short-Lived Climate Pollutant Reductions.

The *Deep Decarbonization Report* largely ignores the urgency of reducing Short-Lived Climate Pollutants, even though California's *2030 Climate Change Scoping Plan* relies on SLCP reduction for more than one-third of all the reductions needed to meet the state's 2030 climate goals.⁵ The E3 report acknowledged that it did not consider wildfire emissions or black carbon at all, saying simply that "mitigation of black carbon was not evaluated."⁶ There is no explanation for this decision, which is hard to fathom given the increasing percentage of California's climate emissions caused by black carbon from wildfires. Similarly, when E3 summarized the pillars of decarbonization, it failed to highlight the large role that SLCP reduction must play. The *Deep Decarbonization Report* also fails to note that SLCP reduction is the most urgent step we can take to address climate change since it affects the climate right away, which fossil fuel reduction does not.⁷

The *Deep Decarbonization Report* also minimizes the importance of reducing methane emissions by assuming in the reference case that methane will not be reduced after 2015.⁸ This makes no sense since state law requires a 40 percent reduction in methane emissions – largely from dairies and organic landfill waste – by 2030.⁹

⁵ California's 2030 Climate Change Scoping Plan (Nov. 2017), at page 28, Figure 7.

⁶ E3 *Deep Decarbonization Report* at page 12.

⁷ *Short-Lived Climate Pollution Reduction Strategy*, adopted by the California Air Resources Board in March 2017.

⁸ E3 *Deep Decarbonization Report* at page 14.

⁹ Senate Bill 1383 (Lara, 2016).

Omissions and assumptions like these are inaccurate and skew the report's findings away from biogas – which can reduce SLCP emissions – in favor of electrification which, depending on the technology, may do nothing to reduce SLCP emissions.

4. E3 Did Not Include Wildfire Costs to Ratepayers or the Costs of Climate and Air Pollution from Wildfires.

According to ARB and the Sierra Nevada Conservancy, wildfire emissions now exceed all the reductions California has achieved across all other sectors. In fact, wildfire is now one of the largest sources of climate pollution. Inexplicably, however, E3 did not address wildfire emissions at all in its *Deep Decarbonization Report*. This ignores a large amount of work done by ARB and other agencies to quantify and reduce wildfire emissions, including the findings and recommendations in the *California Forest Carbon Plan*, which states unequivocally that California cannot meet its climate goals without quickly and significantly cutting wildfire emissions.¹⁰ The *California Forest Carbon Plan* also recommends accelerating bioenergy production from forest fuels and developing facilities that can convert forest biomass to biogas for pipeline injection and vehicle fuels. The *Deep Decarbonization Report* completely ignores the significance of carbon losses from wildfire and the opportunity to convert forest biomass to biogas.

The *Deep Decarbonization Report* also ignores the high cost of fires for electricity ratepayers since electric utilities have caused the majority of California's large fires in recent years, including the Rim Fire in 2013, the Thomas Fire and Wine Country Fires in 2017, and the Paradise Fire in 2018. The cost to PG&E alone of the 2017 and 2018 fires is likely to exceed \$30 billion in direct damages. This does not include the increased costs of mitigation going forward such as increased vegetation removal requirements, Public Safety Power Shutoffs, and other operational changes.

E3 also doesn't consider the likelihood that in the future, the electricity sector will have to pay for climate and air pollution from electricity-sparked wildfires, just as SoCalGas had to pay hundreds of millions of dollars to mitigate the methane release from Aliso Canyon (which was a small fraction of the climate pollution caused by electricity sparked wildfires).

E3 also doesn't consider the public health costs of wildfires caused by electricity infrastructure. The Rim Fire alone, which was caused by electricity wires in 2013 and is now the 6th largest fire in the state's history, caused more than \$600 million in health-related costs. The public health costs and impacts of more recent fires is many times higher.

¹⁰ *California Forest Carbon Plan – Managing Our Forest Landscapes in a Changing Climate*,” adopted by the California Environmental Protection Agency, California Natural Resources Agency and CalFire in May 2018. Available at: <http://resources.ca.gov/wp-content/uploads/2018/05/California-Forest-Carbon-Plan-Final-Draft-for-Public-Release-May-2018.pdf>.

None of the wildfire related costs were considered in E3's report which, again, skews the findings in favor of electrification.

5. E3 Did Not Consider the Vulnerability of Electricity Infrastructure to Climate Impacts and Other Disasters.

E3's report largely ignores reliability issues in the electricity sector, particularly the vulnerability of electricity infrastructure compared to gas infrastructure. This is surprising in a report that recommends electrifying most energy end uses. A recent study by ICF that was presented to the CPUC in January found that electricity infrastructure is highly vulnerable to wildfire, severe storms, sea level rise, flooding, storm surges, severe heat, and high winds.¹¹ The report found that severe storms could knock out electricity supplies for weeks at a time, putting essential services like hospitals and wastewater treatment facilities at risk, as well as costing a single county billions of dollars in damages in lost economic activity.

In contrast, the ICF report found that gas infrastructure is not very vulnerable to severe weather and other climate change impacts and where it is vulnerable, is much easier to make more resilient than electricity infrastructure. Using San Diego County as a case study, the ICF report found that less than 1 percent of the county's gas infrastructure is vulnerable to climate impacts and severe weather. The vast majority of the County's electricity infrastructure is vulnerable to those impacts.

Failing to consider vulnerability to climate impacts is inexcusable given the severe fires and other extreme weather that California is already experiencing. The costs of climate impacts and related outages could be enormous and must be factored into any comparison of electrification with other decarbonization strategies. Failure to consider these vulnerabilities is precisely what led to PG&E's current bankruptcy as both the CPUC and PG&E minimized or ignored the link between electricity generation and wildfires until late 2017.

6. E3 Mistakenly Assumes that Battery Materials Will Remain Plentiful and Reliable.

E3 also fails to address a number of cost and reliability issues related to batteries for energy storage. A recent study by UC Irvine found that there are insufficient supplies of cobalt and lithium to provide energy storage if we electrify all of our buildings and transportation energy uses.¹² In addition, most lithium and cobalt comes from countries that are neither democratic nor protective of the environment and civil rights. E3 did not address the possibility that the Congo, China or other sources of these critical materials

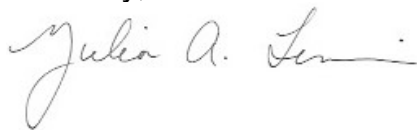
¹¹ http://www.climateassessment.ca.gov/events/docs/20190124-Slides_ICF.pdf.

¹² <https://efiling.energy.ca.gov/GetDocument.aspx?tn+225769>.

could suspend trade with the U.S., as China just threatened to do with rare earth minerals.¹³

These are very serious flaws and omissions that should be corrected. In the meantime, the Commission should not rely on the *Deep Decarbonization Report* as the basis for deciding how best to decarbonize buildings and other energy end uses. That process will be complicated enough without basing it on flawed data and incomplete analysis. We urge the Commission, therefore, to reassess the in-state biogas potential in California and to assess the costs and reliability issues outlined above.

Sincerely,

A handwritten signature in cursive script that reads "Julia A. Levin".

Julia A. Levin
Executive Director

¹³ <https://foreignpolicy.com/2019/06/11/how-china-could-shut-down-americas-defenses-rare-earth/>.