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California Independent Petroleum Association Comments
on
OPGEE Model Update Workshop (April 26, 2022)

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Via electronic submittal to: Comment Docket

Thank you for the opportunity to again share comments on behalf of the members of the California Independent Petroleum Association (CIPA)[1]. CIPA represents nearly 400 crude oil and natural gas producers, royalty owners, and service and supply companies who all operate in California under the toughest regulations on the planet. Getting the OPGEE model update correct is a key policy pillar for the upcoming LCFS rulemaking.

Our members are committed to innovation and investment to help the state reach its statutory emission reduction targets. CIPA's member companies have the assets and knowledge to play a significant role in helping reduce the carbon intensity of California's transportation sector. To enable these investments to be made here in California, the regulatory playing field needs to accurately assess and document the differences between in-state production and out-of-state and foreign regimes—anything less will lead to false solutions.

CIPA appreciates the focus of the recent OPGEE workshop—presenting updates that highlight California-produced crude oil is a highly regulated industry. Though CIPA appreciates the proposed corrections, the focus of the effort was too narrow. The main take away from the recent workshop was that the previous iteration of the OPGEE model (v2.0c) overestimated in-state production emissions. Correcting California model input defaults and adjusting for the greening of the California electrical grid is a positive step in the right direction, but it falls short as the latest effort still didn't acknowledge the uncertainty or attempt to correct inputs for foreign crude.

[1] CIPA previously submitted LCFS and OPGEE comments both on November 5, 2020, and August 25, 2021 in response to earlier OPGEE update workshops. We continue to stand by those comments.
https://www.arb.ca.gov/lists/com-attach/53-lcfs-wkshp-oct20-ws-WjldMgBxUmACWwVp.pdf
https://www.arb.ca.gov/lists/com-attach/4-opgee-general-ws-AGMBbgNyVmQAWVI9.pdf

It has been eight months since the last OPGEE focused workshop and while CIPA appreciated the brief workshop material lead time, the updates and back-up materials presented were extensive. CIPA is still reviewing this material, and may have additional input for CARB, but in the spirit of timely comments we submit these initial thoughts.

Key Comments:

- CIPA appreciates the direction the OPGEE v3.0b is headed by recognizing California's regulatory regime for oil/gas methane control[2].
- The workshop was silent on any updates of non-California production.
    - International data sources are not as robust and verified as California's data sets, therefore, the LCFS program should explicitly reflect this difference.
    - Marine tanker emissions from imported crude are underestimated.
- The discussion related to California crude CI scores being unable to be reproduced and validated with real, verified and reported Mandatory Reporting data and other state-submitted production data was cursory. CIPA would request addition discussion on this issue.
- Slide 22 highlights that the process of converting OPGEE results into LCFS crude CI scores is still TBD[3]. CIPA reiterates that the process ahead needs to be a fully transparent and open to stakeholder input and review.

OPGEE's updates highlight the previous overestimation of California's crude CI's.

CIPA firmly believes in science and the use of real-world data. Our producers, royalty owners, and service and supply companies all operate in California under the toughest regulations on the planet. This fact had been left out of the equation in the past LCFS carbon intensity calculations. We would like to recognize and appreciate CARB's effort to bring the next version of OPGEE in line with the California reality. We will be reviewing the material presented and following up with CARB as this informal regulatory update continues forward toward the formal rulemaking.

A central tenet of the OPGEE update from v2.0c to v3.0x is that methane leaks and fugitive emissions are increasing due to observed non-California industry practices. Given the recognition that in-state production is becoming less emissive, CIPA anticipates the final CI scores reflecting this divergence as well. We look forward to working with CARB to update the Crude CI Table in the regulation.

CIPA previously commented that there are a number of California operators who employ "behind-the-meter" solar electricity. It was confirmed at the previous workshop that these renewable energy investments were not considered in the v3.0a OPGEE update. There was no mention that this discrepancy was now accounted for in v3.0b. If not, we ask that it be incorporated given the individual projects are known to CARB.

In addition to individual renewable energy projects, the California electricity grid is getting 'greener', as was recognized in the presentation. CIPA appreciates the recognition of this fact in the latest OPGEE update, but is concerned that this one- time update/adjustment is inconsistent within the LCFS regulation. The LCFS currently recognizes the California electrical grid is

[2] https://www.arb.ca.gov/regact/2016/oilandgas2016/oilandgas2016.htm
[3] https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/lcfs_meetings/opgee-carb-presentation.pdf

getting cleaner and is required to update annually the *California Average Grid Electricity Pathway*[4].

> *"In order to reflect the rapidly evolving portfolio of electricity generating resources in California, the Executive Officer will update the "California Average Grid Electricity Used as a Transportation Fuel in California" Lookup Table pathway CI value on an annual basis."*

CIPA requests equal treatment within the OPGEE model. The goal of SB 100 is to have carbon free energy grid by 2040. This shift has already started to occur as California's load serving entities are adding more renewable power each year, and the California crude CI's should reflect this in a similarly timely manner as is recognized for EV pathways.

International data sources are not as robust and verified as California's data sets. The LCFS program should explicitly reflect this difference.

CIPA again would like to highlight the differences in data robustness between in-state and foreign produced crude. The workshop briefly touched on the issue by stating that MRR data could not be used as it wasn't a precise match for the data used in OPGEE, but that is only a partial response to previous CIPA comments.

In the LCFS regulation, Table 9 - Carbon Intensity Lookup Table for Crude Oil Production and Transport – is used to present the OPGEE outputs for various oil fields around the world. It is also used as tool to argue for policy shifts by those opposed to in-state production. What it doesn't present is a score, scale or other footnote or reference on the certainty of the score itself. This is a fundamental flaw that leads to incorrect advocacy and inaccurate public policy discussions.

California operator primary carbon intensity data sets (energy inputs and production outputs), along with other secondary data sets (leak detection and repair reports, additional monitoring, flaring records) are publicly available, verifiable and robust. The same cannot be said for other jurisdictional data. This fact was stated as such during the workshop. International flaring data, as an example, is hard to get, let alone verify for accuracy. Therefore, OPGEE necessarily relies on assumptions and defaults.

OPGEE data entry and built-in constants rely heavily on public datasets, yet these datasets have lower confidence than CARB required data in California, particularly for the major countries supplying crude oil to California: Saudi Arabia and Ecuador. Moreover, the majority of datasets that satisfy OPGEE entries are not publicly disclosed information due to proprietary reasons, reducing how well OPGEE represents different oil fields and impacting the potential accuracy of the calculated CIs reported for oil fields in the LCFS regulation. The compounding of these errors leads to spurious results that hinder good decision making (for example, significantly undercounting the CI of crude oil delivered to California from Saudi Arabia and Ecuador).

In addition to U.S. field CI averages, CARB LCFS also reports CI projections for international fields. In order to provide these values for OPGEE, CARB must rely on data reported from foreign agencies, but this further diminishes confidence in international comparisons due to

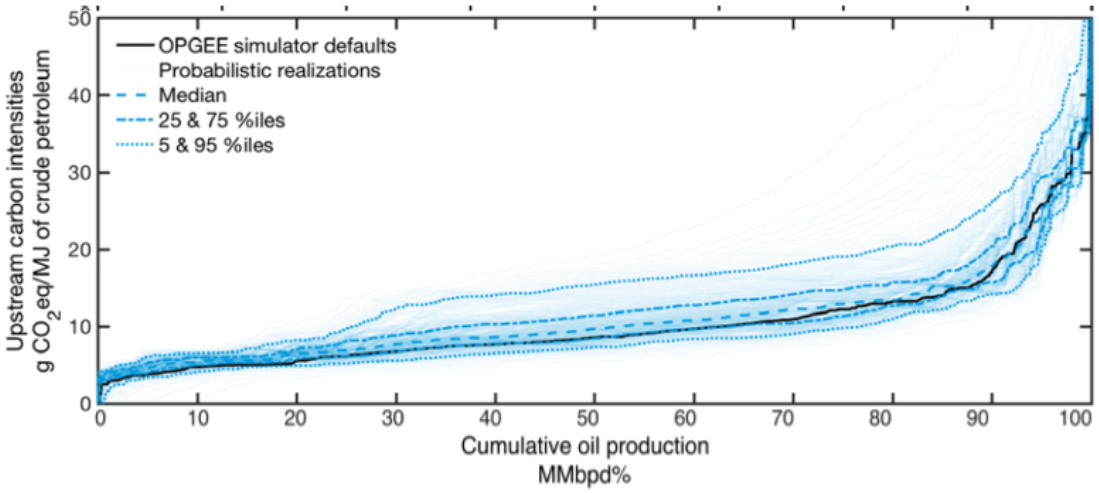
[4] https://ww2.arb.ca.gov/sites/default/files/2020-07/2020_lcfs_fro_oal-approved_unofficial_06302020.pdf (section 95488.5(d)

different reporting standards, as well as a lack of data availability from oil and gas producers. Specifically, one of the significant constraints on data availability and quality is that most foreign oil production supplied to California is produced by national petroleum companies with a history of not sharing operational data.

Overall, the absence of publicly available oil and gas production data of sufficient quality adds more uncertainties rooted in these issues.[5] Upon introduction of OPGEE version 3.0a, the developer team at Stanford expressed their intent to expand the data set, integrating over 1,000 data points tied to measured leaks across the U.S. into the OPGEE VFF emission factors[6]. While the intention to expand the data set is critical, there is still much to be done when attempting to apply the same standards to foreign oil producers.

Looking at the larger field perspective, whole fields have gaps in publicly available datasets, such as Saudi Arabia and Ecuador, leaving wide gaps in regional data that could be built into the model.[7] Since proprietary data necessary for OPGEE to process are mostly unavailable for public access, international CI values may be underestimated for foreign entities. Figure 1 illustrates the uncertainty associated with the results derived with current defaults against public datasets, concluding that OPGEE CI estimates with higher dependance on default settings are more likely to generate low values near the 25th percentile due to the lack of accessibility to high-quality data.[8]

Figure 1: Uncertainty of OPGEE Default Calculations



[5] El-Houjeiri, H.M., Masnadi, M., Vafi, K., Duffy, J., and Brandt, A. (2018), Oil Production Greenhouse Gas Emissions Estimator OPGEE v2.0c User Guide & Technical Documentation. June 2018.

[6] Brandt, Adam R, et al. "OPGEE v3.0a Candidate Model versus OPGEE v2.0c." Updates to OPGEE.

[7] ICCT (2014). Upstream Emissions of Fossil Fuel Feedstocks for Transport Fuels Consumed in the European Union. Authors: Chris Malins, Sebastian Galarza, Anil Baral, Adam Brandt, Hassan El-Houjeiri, Gary Howorth, Tim Grabiel, Drew Kodjak. Washington D.C.: The International Council on Clean Transportation (ICCT).

[8] Masnadi, M. S., El-Houjeiri, H. M., Schunack, D., Li, Y., Englander, J. G., Badahdah, A., Monfort, J., Anderson, J. E., Wallington, T. J., Bergerson, J. A., Gordon, D., Koomey, J., Przesmitzki, S., Azevedo, I. L., Bi, X. T., Duffy, J. E., Heath, G. A., Keoleian, G. A., McGlade, C., … Brandt, A. R. (2018). Global carbon intensity of crude oil production. Science, 361(6405), 851-853. https://doi.org/10.1126/science.aar6859

Lower dispersion occurring around the 5th percentile is attributed to more readily available, high quality data from fields such as California, highlighting the significance of accurate, comprehensive data availability on CI estimates for OPGEE.

CARB has already acknowledged that this is an issue. CARB has conducted reviews of the utility of the OPGEE model for application to the LCFS and posted their statement of reasons and responses to comments in 2011, 2014, and 2018. When OPGEE version 1.0 was implemented in the 2011 revisions, CARB does not appear to have compared the utility of OPGEE to other methods used to calculate carbon intensity. The method appears to have been accepted without comparative analysis. Even in the 2011 final statement of reasons CARB staff acknowledge: "We agree that the lack of accurate data on crude production parameters for many imported crudes is a problem." Based on the review of the most recent data inputs used by CARB for OPGEE, it is apparent the lack of accurate data still exists to this day, 11 years later.

With several subsequent reviews of OPGEE for the LCFS standard and updates to OPGEE model and improvements to the tool, there are still admitted concerns related to a lack of accurate source data for imported oil. This raises serious concerns about the accuracy of the data, especially considering that the inputs for OPGEE use demonstrably misleading assumptions. However, the data for foreign sources, particularly the major sources to California, Saudi Arabia and Ecuador, are a data-free zone. OPGEE developers at Stanford acknowledge that the current version of the model lacks broader applicability to oil and gas production outside California. Consequently, there is an ongoing effort by the team at Stanford to address the shortfall. As of August 2021, the research and development team at Stanford introduced OPGEE version 3.0a as the future replacement for version 2.0c. In version 3.0a, Stanford has proposed the introduction of a broader methane dataset to expand the applicability of analysis. The new dataset for VFF emissions utilizes bottom-up databases and studies such as the EPA Greenhouse Gas Inventory to represent U.S.-wide emissions (Brandt, et al., 2021). This improvement helps to improve CI estimates in the other oil producing states in the US. However, even in version 3.0a there are little or no reliable emissions data with which to develop comparable CI estimates. Specifically, OPGEE will continue to struggle with the uncertainties of bottom-up inventories it uses and the lack of applicability to foreign crude oil.

Bottom-up methodologies for estimating emissions play a key role in the central functionality of OPGEE, providing the basis for estimate calculations. The bottom-up approach is often represented by greenhouse gas inventories, scaling up measurements from component-level activities to estimate overall emissions. However, it has been found that GHG inventories and bottom-up estimates tend to underestimate emissions by up to 50% when compared with top-down methods such as satellite measurements (Rutherford, et al., 2021; Shen, et al., 2021). The discrepancies found in bottom-up datasets related to methane have so far been attributed to unaccounted fugitive emissions from sources such as leaking pipelines, equipment, and liquid storage tanks (Pultarova, 2021). Consequently, integration of bottom-up methods can potentially skew the accuracy of OPGEE results. Despite the lack of applicability to foreign oil production, OPGEE is still used to represent international production processes.

CIPA requests that a confidence score, or other mechanism be developed, such that when looking at the CI score table in the LCFS it can be readily seen that the values are not equal in underlying data confidence. CIPA would be willing to work with Stanford and/or CARB on such an effort, and believe it is necessary to end the reckless abuse of the LCFS as an advocacy tool against in-state oil production.

Marine shipping emissions underestimated

The 63 OPGEE default values have the potential to underrepresent the greenhouse gas emissions from marine tanker ships. OPGEE includes default parameters where data are unavailable and default settings for process sensitivity when considering applicable characteristics. For instance, the model uses default values for marine tankering distance to California, when the data is available for which to enter actual values. Much of the imported oil to California comes from Saudi Arabia and the default tanker transport distance in OPGEE (5,082 miles) is **half** the actual transport distance from Saudi Arabia (more than 10,000 miles). In addition, OPGEE does not appear to account for the return trip of the tanker, or for emissions while the tanker is idling near the port[9] , or for indirect emissions from other non-oil cargo ships that have increased idling emissions. The continued use of default parameters increases uncertainty in the results output from this complex model, and in the case of marine tankering produces highly misleading results for oil used in California. OPGEE default values should be reviewed and updated with accurate and current information in order to improve the functionality of the model and increase the accuracy of its outputs.

The process of converting OPGEE results into LCFS crude CI scores needs to be a fully transparent process open to stakeholder input and review.

CIPA appreciated an area that was discussed at the previous workshop related to the transition from OPGEE to the LCFS regulation. It was clearly stated that the OPGEE model has to functionality that may be incorporated to better reflect California operations, an example being the existence of a 'vapor recovery' toggle that was stated to be defaulted as "off". Many California operators employ vapor recovery systems on their tanks. This one example shows the need for a transparent transition between OPGEE outputs and LCFS regulatory CI scores.

CIPA again requests a stakeholder process to review and discuss the conversion from OPGEE outputs to LCFS scores that is in addition to the general workshop format. We also look forward to the promised 'policy' workshop on the impacts of the proposed OPGEE updated. CIPA welcomes such a workshop. Ensuring the CI score conversion (from OPGEE to LCFS table) correctly reflects California operating regimes and is fully understood and agreed upon is the next necessary (and overdue) step, prior to any policy discussion.

Conclusion

Owing to the sheer size of its demand and California's continued reliance on energy imports, state policies (or changes to those policies) can have wide ranging impacts around the U.S. and the world as a whole. Unfortunately, other energy producing regions of the world do not share California's values for labor, health and safety or the environment. Exporting our energy needs, including the jobs and tax base they support, is a very real form of "leakage" which AB 32 sought to avoid. Rather than exporting our industry, California should embrace an energy portfolio that prioritizes California produced energy, which benefits both state and local economies as well as the environment.

California will need petroleum and natural gas fuels for through 2045 and longer, even if the state's GHG targets are met. Until we, as a state, stop using liquid and gaseous fuels, we should

[9] For example, see CARB's evaluation at: https://ww2.arb.ca.gov/sites/default/files/2021-06/ogvcongestion_ada.pdf

prioritize in-state supply that is produced under California's stringent regulations. Anything short of that is the true definition of "leakage" and is not just or justifiable. It is foreign crude which should be targeted for reduction first. Further restricting California production means that our state will get even more oil from countries that do not share our humanitarian or environmental values. Importing more oil mean more ships at our ports, and their associated pollution.

California is an energy island and growing our reliance on foreign oil also creates an energy security issue. All of the oil produced in California is used in California. We do not export California produced crude. The vast majority of the State's remaining supply is imported from foreign countries, with the largest amounts of imports coming from Saudi Arabia. Saudi oil isn't produced under the Cap-and-Trade program, the Methane rule, local district flaring permits, or the myriad of water quality requirements imposed on California producers. Californian's pay over $25 billion per year to countries that do not honor human rights or environmental protection. Instead of making the Saudi royal family richer, we Californians should be focused on keeping more Californians working and using money here. **The last barrel of oil used in this state, should be produced in this state with all of our environmental regulations and carbon capture and sequestration.**

CIPA members embrace an inclusive energy portfolio utilizing new and traditional energy sources working together. The LCFS's Innovative Crude provisions have rightly incented innovation, and our members have responded by invested in solar and cogeneration to lower the overall carbon intensity of our operations, invested in CCS and other innovations that can be used to further decarbonize the grid or exported to other states and countries. Exporting technology is a positive ancillary benefit of California's efforts. Exporting wealth, jobs, tax base is not. A reasonable review shows a need for gasoline and diesel for decades to come to support the world's fifth largest economy. Reducing the carbon footprint of that fuel pool is the goal of the LCFS, and CIPA members are working with CARB toward that goal.

Thank you for continuing the dialogue with us. We look forward to working with CARB staff and Stanford to improve LCFS and implement updates to OPGEE under this process.

Sincerely,

Rock Zierman
Chief Executive Officer
California Independent Petroleum Association

cc: Carolyn Lozo
Rui Chen