

Association of Bay Area Governments Publicly Owned Energy Resources

ABAG POWER

Executive Committee

April 20, 2023

Agenda Item 7.b.

Approval of a Framework for Quantification of Carbon Emissions

Subject:

Approval of a framework for quantification of carbon-dioxide equivalent emissions associated with the program's natural gas usage, resulting in 59,948 metric tons of carbon-dioxide equivalent (mt CO₂e) life cycle greenhouse gas (GHG) emissions for fiscal year 2021-22.

Background:

On September 15, 2022, following a competitive procurement, the ABAG POWER Executive Committee authorized a contract award with GPT Secure, LLC (GPT) to assist with the quantification and management of carbon offsets. In alignment with the Strategic Implementation Roadmap, the contract includes the following scope of work:

- Research and analyze methodologies and recommend one or more methodology to quantify each ABAG POWER member's annual (fiscal year) GHG emissions associated with the natural gas usage for enrolled accounts.
- Identify a range of suitable certified carbon offsets aligning with the quantified emissions, including associated project details (i.e., geographic location, emissions reductions, project type, etc.), with an emphasis on supporting the development of new, local, carbon offset projects.
- Assist in the purchase and retirement of certified carbon offsets, including but not limited to registration, participation, and all regulatory and/or legislative compliance reporting.
- Develop a webpage(s) with the capability for member-accessible display (i.e., PDF format) that identifies members' annual carbon emissions and a geospatial listing of relevant carbon offset projects including relevant project and economic information that corresponds to each member's investment in emissions reduction.

This staff report identifies the recommended methodologies for the quantification of GHG emissions associated with natural gas usage for accounts enrolled in ABAG POWER and includes a potential range of costs associated with pursuing a strategy to voluntarily "offset" the emissions through carbon reduction projects.

Quantification of Carbon Emissions

There are various gases (carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), etc.) known to contribute to the greenhouse effect causing global warming and are collectively referred to as GHGs. However, the degree to which they contribute to global warming differs; for

Agenda Item 7.b. – Quantification of Carbon Emissions

April 20, 2023

Page 2 of 4

instance, CH₄, the primary component of natural gas, has a much shorter lifetime in the atmosphere than CO₂, but has far greater heat-trapping potential. Because CO₂ is the most abundant GHG, the quantification of GHG emissions is commonly expressed by calculating the impacts of other gases in carbon dioxide-equivalent emissions. Emissions are measured in mtCO₂e.

For the purposes of quantifying emissions associated with the natural gas usage in ABAG POWER's portfolio, Staff and GPT have considered the following emissions sources:

1. Emissions caused by natural gas ***combustion as measured at the meter.***
2. Emissions caused by ***local distribution of natural gas on the utility system.***
3. Emissions caused by ***producing, processing, storing, and transporting natural gas on the transmission system*** (calculated in low, nominal, and high scenarios).

A number of governmental organizations provide science-based methods for calculating life cycle GHG emissions from each of these emissions sources. To gain an understanding of which methods are currently used by public entities similar to ABAG POWER, staff and GPT met with organizations quantifying, reporting, and/or regulating similar types of emissions, including the California Air Resources Board (CARB), the City of Palo Alto Utilities (CPAU), Department of Energy (DOE), and StopWaste. Input from these conversations, as well as information from publicly available reports from Pacific Gas and Electric Company (PG&E), and the San Francisco Department of Environment (SFE) formed the basis for the methodologies to calculate emissions from these sources. A summarized list of methodologies, relative emissions, and methodology sources is provided in the table below.

Emissions Source	CO₂e Methodology	Approximate Percentage of Overall Emissions	Methodology Source
Combustion as measured at the meter	0.005302 mt CO ₂ / Therm	59.1%	CARB
Local distribution on the utility system	0.005302 mt CO ₂ / Therm & 25x CH ₄ Equivalency	18.8%	CARB; PG&E
Production, processing, storing, and transporting on the transmission system	0.001988 mt CO ₂ / Therm	22.1%	DOE; National Energy Technology Laboratory (NETL) ¹

Overlap with Existing Emissions Reductions Programs

CARB implements the Cap-and-Trade Program (CTP), which promotes GHG reductions by establishing a declining limit on major sources of GHG emissions throughout California.² CTP establishes emissions thresholds that apply to various sectors (e.g., suppliers of natural gas, petroleum refining, glass production, etc.); an organization is deemed a "covered entity" and required to participate in the CTP if the organization's emissions exceed CARB's threshold.

¹ [Life Cycle Analysis of Natural Gas Extraction and Power Generation: DOE/NETL, 2019](#)

² <https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program/about>

Agenda Item 7.b. – Quantification of Carbon Emissions

April 20, 2023

Page 3 of 4

PG&E is a covered entity under the CTP. A “compliance obligations” means the quantity of GHG emissions for which a covered entity must obtain and submit compliance instruments (either allowances or compliance offsets). Each compliance instrument represents one mtCO_{2e}.

Natural gas suppliers, such as PG&E, report their GHG emissions and incur a compliance obligation. ABAG POWER is not a covered entity, therefore, the GHG emissions associated with member usage are included in PG&E’s reporting and compliance obligation. Staff and GPT have confirmed this reporting requirement with CARB, but PG&E did not respond to multiple requests for confirmation that ABAG POWER’s emissions are in fact included in its reporting to CARB.

In addition to metered usage, the CTP also requires reporting of fugitive³ natural gas emissions associated with in-state natural gas supplier distribution systems (e.g., PG&E’s or CPAU’s natural gas distribution system). While these emissions are required to be reported, they do not incur a compliance obligation in CTP, meaning they do not increase the covered entity’s overall obligation.

Upstream out-of-state emissions (production, processing, and interstate transportation) are not reported and do not incur a compliance obligation in CTP. Upstream in-state emissions are reported but do not incur a compliance obligation in CTP.

Recommended Framework for Quantification of Carbon Emissions

Of the three emissions sources previously outlined (combustion, local distribution, and transmission), one (combustion) is currently reported and offset by PG&E through CTP. Because these emissions are already being addressed in CTP, staff recommends adopting a framework that quantifies these emissions but does not currently seek to offset them. As an alternative, the Committee could consider offsetting a portion of the combustion-based emissions (e.g., 25%, 50%, etc.) to offset the life cycle CO_{2e} impact. The combustion-based emissions represent the majority of the portfolio’s emissions profile. The program would incur a relatively significant cost – estimated to be \$885 thousand (at a price of \$25 per mt CO_{2e}) – to offset these emissions which in turn would negatively impact the rate comparison.

Instead, the recommended framework seeks to offset the emissions sources not currently covered by CTP, specifically, local distribution, and upstream production, processing, storing, and transporting of natural gas on the transmission system. These emissions are directly incurred as a result of natural gas consumption by ABAG POWER members, but are not currently being offset. Collectively, these emissions are quantified as 24,552 mt CO_{2e}, or 40.9% of the total emissions from the three identified sources.

³ As defined by CARB’s Mandatory Reporting of Greenhouse Gas Emissions, “Fugitive emissions” means those emissions which are unintentional and could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening.

Agenda Item 7.b. – Quantification of Carbon Emissions

April 20, 2023

Page 4 of 4

Next Steps

Following the approval of a framework to quantify emissions, staff propose:

1. Including \$614 thousand – the approximate estimated cost to offset distribution and upstream emissions using an average cost of \$25 per mt CO₂ – in the fiscal year 2023-24 budget intended to voluntarily purchase verified emissions reductions.
2. Including in the fiscal year 2022-23 true-up a calculation of the fiscal year 2022-23 emissions using the approved framework, with the intent to offset the emissions during fiscal year 2023-24.
3. Identification of a range of suitable certified carbon offsets aligning with the quantified emissions, with an emphasis on supporting the development of new, local, carbon offset projects. The project schedule anticipates this presentation will occur on June 15, 2023.

Issues:

None.

Recommended Action:

The ABAG POWER Executive Committee is requested to approve the recommended framework for quantification of carbon-dioxide equivalent emissions associated with the program's natural gas usage, resulting in 59,948 metric tons of carbon dioxide-equivalent life cycle greenhouse gas emissions for fiscal year 2021-22.

Attachments:

- Quantification of Carbon Emissions (Presentation)

Reviewed:

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