

ACCOUNTING AND REPORTING GUIDELINES FOR EXECUTIVE ORDER 1

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INTRODUCTION

Governor Lamont’s Executive Order 1 (EO 1)¹ sets ambitious goals to improve the efficiency and sustainability of state government. Within these goals, several implementation questions are left open for the Steering Committee to interpret, including: which operations are included in EO 1? Which leased spaces should be included or excluded? How are the aggregate goals of EO 1 translated down to individual agencies? The EO 1 Co-Chairs (Department of Energy and Environmental Protection (DEEP), Department of Administrative Services (DAS), and the Office of Policy and Management (OPM)), have created a list of these "accounting" and reporting questions.

- "Accounting" here is a term used in sustainability reporting to mean what is measured and how it is measured. It comes from the idea that one goal of sustainability reporting should be to mirror financial reporting – I.e., a set of rules and principles set so that anyone can pick up another agency or organization's report and understand the metrics.
- "Reporting" here includes what is presented internally and externally, and how it is presented so stakeholders understand what is relevant.

¹ <https://portal.ct.gov/-/media/Office-of-the-Governor/Executive-Orders/Lamont-Executive-Orders/Executive-Order-No-1.pdf>

The international sustainability framework referenced here originates from greenhouse gas accounting specifically, via the *Greenhouse Gas Protocol*² run by the international standards setting organization, World Resources Institute. This family of standards is used by the private sector, municipalities, federal government and many state initiatives, as well as reporting recognition programs like CDP, C40 Cities and The Climate Registry. Having a consistent, transparent way to account for impacts and set targets ensures that double counting within and between organizations (within the same impact categories) can be avoided, that relevant environmental impacts associated with organizational operations are captured, and that organizations' progress and achievements can be meaningfully evaluated and compared.

The EO does not require the use of any particular accounting and reporting framework, but drawing on the best practices of the *Greenhouse Gas Protocol* will help ensure that the EO 1 effort addresses key questions, maintains consistency with the national and international best practice, and that Connecticut sustainability officers develop reliable sustainability knowledge and skills.

For each accounting and reporting question on this draft list, a **proposed approach** with **background and rationale** are provided. These decisions are not yet final. The Co-Chairs are looking for the Steering Committee and the public's feedback on what additional questions need to be addressed, as well as the proposed decisions on these issues.

The Co-Chairs aim to memorialize these policies in March 2020, so that EO 1 Project Teams can have clarity on overall direction before developing their guidance.

1. BASE YEAR FOR TARGETS IN EXECUTIVE ORDER 1

PROPOSED APPROACH

1. **Fiscal year 2020 (July 1, 2019-June 30, 2020) will serve as the water and waste base year for target tracking.**
2. **Fiscal year 2019 (July 1, 2018-June 30, 2019) will serve as the GHG base year for target tracking.** Because the EO 1 GHG target mirrors the state-wide target, the EO 1 GHG target will be translated into a percent reduction from FY19 once the 2018 state-wide Connecticut annual GHG inventory is available.
3. **FY 2030 (July 1, 2030-June 30, 2031) will serve as the target year for progress tracking.**

BACKGROUND AND RATIONALE

EO 1 calls for action across Connecticut state government operations in order to achieve the following environmental sustainability goals by 2030:

- a. 45 percent reduction in greenhouse gas (GHG) emissions below 2001 levels, equivalent to a 34 percent reduction below 2014 levels;
- b. 25 percent reduction in waste disposal from a 2020 statewide baseline;
- c. 10 percent reduction in water consumption by from a 2020 statewide baseline inventory, or alternatively such goals as shall be established in coordination with the state Water Planning Council in furtherance of the State Water Plan; and
- d. Subordinate goals established pursuant to section 3(a) of this Order, provided that such goals shall support the long-term reduction in operating and maintenance costs for state government facilities and operations, and shall be developed in recognition of the need to carefully manage the state's fiscal resources.

However, these goals leave open certain questions:

1. **Fiscal or calendar year?** EO 1 does not specify whether the base years and 2030 target years are measured in calendar or fiscal year. Fiscal year tracking aligns well with state budgetary planning and allows for completion of data collection and reporting in time for January legislative reports and action. In addition, the state's vehicle fuel data is compiled on a fiscal

² <http://ghgprotocol.org/>

year basis. By contrast, the annual Connecticut-wide GHG inventory compiled by the Office of Climate Change, Technology, & Research³ tracks emissions on a calendar year basis.

2. **Alternative years for the GHG goal in the absence of earlier years' data?** The GHG goal for the executive branch in EO 1 reflects the same percentage reductions and base year as the state-wide statutory target in the 2018 Act Concerning Climate Change Planning and Resiliency⁴ (45% below 2001 levels by 2030). However, most state agencies do not have complete electric or building heating utility bills or information for either of the two base years indicated for the GHG goal (2001 or 2014). Through individual agency reporting and utility electronic data transfer, DEEP and agencies are in the process of compiling energy utility data dating back to January 2018. Utility bills prior to January 2018 are not automatically transferrable from the utilities, and purchasing large volumes of earlier data is not feasible at this time due to resource constraints.

In short, based on agencies' data availability, a later base year for the GHG goal must be identified, with additional translation needed to determine the equivalent percentage reduction by 2030. This assumes that the trajectory of state agency emissions since 2001 essentially follows the same path as emissions state-wide during that same timeframe.

Connecticut state-wide calendar year 2018 serves as a reasonable proxy for FY19 (July 1, 2018-June 30, 2019). However, the most recent Connecticut state-wide inventory is calendar year 2016. Once the state-wide calendar year 2018 GHG inventory becomes available, a more precise reduction target percentage from 2018 (proxy for FY19) to 2030 will be identified and applied to the EO 1 FY19 GHG base year.

2. AGENCY INCLUSION IN THE TARGET

PROPOSED APPROACH

Voluntary participants are not subject to the EO 1 goals for 2030, nor are their activities or environmental impacts included in the base year. Voluntary participants are encouraged to set their own targets to match or exceed those in EO 1. Voluntary participants may opt-in (or opt-out) to develop Sustainability Performance Plans reflecting progress towards the EO targets or their own more stringent targets.

BACKGROUND AND RATIONALE

EO 1 indicates that all designated Executive Branch agencies, and the Executive Branch as a whole, must achieve the goals listed in Issue #1 above. EO 1 calls for the Co-Chairs to designate participating Executive Agencies, and the Co-Chairs designated all Executive Agencies and offices to participate.

In addition, state organizations outside of the Executive Branch designees, including Constitutional Offices, quasi-governmental agencies and state educational institutions, were invited to participate voluntarily. These organizations still reflect state expenditures that go towards energy, water, transportation and waste management. Several state organizations outside of the Executive Branch, including institutions of higher education like UCONN or Connecticut State Colleges and Universities, have extensive experience setting sustainability targets and implementing high-impact projects. Their participation in the EO 1 Steering Committee is vital to help inform the Executive Branch agencies of successful sustainability strategies and partnership opportunities.

³ Connecticut Greenhouse Gas Reduction Progress Reports. https://www.ct.gov/deep/cwp/view.asp?a=4423&Q=568752&deepNav_GID=2121

⁴ The Public Act N. 08-98 refers to the 2020 and 2050 targets. <https://www.cga.ct.gov/2008/ACT/PA/2008PA-00098-R00HB-05600-PA.htm>

Public Act N. 18-82 refers to the 2030 target.

https://www.cga.ct.gov/asp/cgabillstatus/cgabillstatus.asp?selBillType=Bill&which_year=2018&bill_num=7

3. ORGANIZATIONAL BOUNDARIES AND INCLUSION OF LEASED SPACES IN THE EO 1 TARGETS

For the purpose of accounting and reporting GHG emissions, organizations must select an approach for consolidating or “grouping” together the activities or the GHG-emitting sources that fall under the organization’s responsibility. This grouping is known as the organizational boundary.⁵

PROPOSED APPROACH

EO 1 should take the most inclusive approach to sustainability targets and apply the target to activities in buildings or assets that the state owns as well as those the state uses as a tenant/lessee (e.g. leased from a 3rd party). This approach fully captures all operations and activities supporting the work of Executive Branch agencies as well as the capital, budgetary resources tax payers spend on state-owned assets.

- a. GHG, water and waste impacts from State owned assets, owned/occupied by the landlord agency or leased out to another state agency or agencies will be included in the EO 1 targets.
- b. The one category of assets excluded from this approach are state-owned assets leased out to a non-state 3rd party organization.

The Sustainability in Leased Spaces Project Team should work with DEEP and lessee agencies to determine:

- a. Which proxies to use for estimating agency-specific energy, water and waste impacts in a shared space with only single building-specific data (e.g. dividing building energy use on a square footage or per capita basis).
- b. Any exceptions for the base year tracking and 2030 target for the Co-Chairs to confirm.

Whether lessee or lessor, agencies have responsibility for the targets associated with energy and water used, and waste generated, by their staff in the spaces they occupy, as well as spaces they own or manage. However, only the lessor/owner’s data will be rolled up to evaluate the aggregate Executive Branch progress.

BACKGROUND AND RATIONALE

EO 1 references multiple agency facilities and operations, but does not specify whether and which leased assets are included in an agency’ base year data and target tracking. Consistent treatment of leased spaces both from the perspective of a lessor/landlord and lessee/tenant are critical to ensure complete accounting of environmental impacts and avoiding double counting in state-wide progress tracking.

Given EO 1’s intention to reduce operational expenses in state facilities and assets, EO 1’s organizational footprint should at a minimum include all state-owned buildings and vehicles where the state is presumably the primary decision-maker on the asset. It should ideally include operations where the state does not own the asset but uses it for agency operations as a “tenant/lessee” and pays for utilities, fuel or other commodities directly or indirectly, even if the state can only *indirectly* influence these costs.

The following factors should not determine inclusion of leased spaces in EO 1 goals:

1. Data availability should not be the primary driver for this determination of goal applicability; estimates may be used to determine energy use and emissions from agencies that occupy a floor of a leased space that is not sub-metered. Near-term data limitations can be overcome.
2. Direct bill payment is also not a determination of goal applicability: 11 agencies don’t pay bills, 29 agencies do, but all agencies use electricity and can have some degree of behavioral or managerial influence on measures to reduce its usage.
3. “Decision-making” to reduce emissions in a leased space will always go in both directions: a landlord/lessor typically has financial and operational control over capital improvements, HVAC and lighting settings. Tenants can influence

⁵ U.S. Public Sector Protocol, p. 17.

behavioral usage of energy and resources and are strong voices for change that landlords/lessors benefit from hearing.

4. DATA MANAGEMENT AND REPORTING IN LEASED/SHARED SPACES

Seven scenarios outline various cases that have been documented by state agencies as ways in which utility billing occurs. This section establishes common practices for dealing with most of these scenarios.

PROPOSED APPROACH

The following seven scenarios outline various cases that have been documented by state agencies as ways in which utility billing occurs. Each of these seven scenarios has a corresponding data management protocol for uploading utility invoices to prevent duplicative data management efforts. An agency may have bills for separate utilities in more than one of the scenarios listed below.

Scenario 1: An agency owns a building. That agency receives the utility bills and submits payment for bills to the utility company.

Protocol: The **agency** scans and uploads invoices into EnergyCAP BillCAPture and data will be compiled from the buildings associated with the agency-owned buildings.

Scenario 2: A landlord agency leases/loans out a space to a tenant agency. The landlord agency submits payments for bills to the utility company (and bills the tenant agency afterwards).

Protocol: 1) The **landlord agency** scans and uploads invoices into EnergyCAP BillCAPture; 2) The **tenant agency** scans and uploads the Transfer Invoices into EnergyCAP Bill CAPture. EnergyCAP liaisons will ensure no double-counting occurs in aggregate reporting. Data will be compiled from the landlord-owned buildings.

Scenario 3: A landlord agency leases/loans out a space to a tenant agency. The landlord agency submits payments for bills to the utility company (and does not bill the tenant agency afterwards).

Protocol: The **landlord agency** scans and uploads invoices into EnergyCAP BillCAPture. Data will be compiled from the landlord-owned buildings.

Scenario 4: A landlord agency leases/loans space to a tenant agency and the tenant agency receives utility bills. The tenant agency submits payments for bills to the utility company.

Protocol: The **tenant agency** scans and uploads invoices into EnergyCAP BillCAPture. Data will be compiled from the landlord-owned buildings.

Scenario 5: A 3rd party landlord leases space to a tenant agency. The 3rd party landlord submits payments for bills to the utility company and bills the tenant agency for one or more utilities).

Protocol: The **tenant agency** scans and uploads the landlord's invoices into EnergyCAP BillCAPture. The tenant agency should request that invoices from the landlord contain both cost and consumption amounts. Data will be compiled from the tenant-occupied buildings.

Scenario 6: A 3rd party landlord leases space to a tenant agency. The tenant agency does not receive bills from either the landlord or utility company for a utility. For instance, an estimated utility cost may be built into the agency's rent agreement.

Protocol: The **tenant agency** should attempt to acquire the utility bills (cost and consumption) from the 3rd party landlord and enter these into EnergyCAP. When this is not possible, please contact your EnergyCAP liaison. If available, data will be compiled from the tenant-occupied buildings.

Scenario 7: A state agency leases space to a 3rd party. The 3rd party tenant receives and pays the utilities and the agency does not see the bills.

Protocol: The **state agency** reports these properties on the Level 2 Buildings and Accounts Inventory spreadsheet and notes that the agency does not have access to the utility bills at the present time. This data will not be included in the aggregate reporting.

If an agency’s particular scenario does not match one of the seven scenarios, that agency should address their unique situation with their agency’s EnergyCAP liaison in order to troubleshoot the issue with any applicable parties.

BACKGROUND AND RATIONALE

The DEEP team has informally been directing agencies on the protocol and responsibility for uploading utility data under different scenarios. Formalizing these protocols will ensure clarity especially as building ownership/occupation may change over time.

5. TRACKING PROGRESS TOWARDS THE AGGREGATE TARGET

PROPOSED APPROACH

- a. DEEP and OPM will work together to compile all agency reports in EnergyCAP and elsewhere to generate a single Executive Branch total for each impact’s respective base year, and compile information by October of each year (3-4 months after the end of the fiscal year) to assess progress.
- b. More detail on how to store and share waste data will be developed by the Co-Chairs and the Project Teams.

BACKGROUND AND RATIONALE

While some data may be originally available in aggregate (ex: fuel data across the Executive Branch), for each EO 1 impact area, agencies will be responsible for collecting and refining agency-specific data. Tracking aggregate progress “bottom up” rather than “top down” will be most comprehensive and accurate.

6. AGENCY-SPECIFIC GOALS AND SUBORDINATE GOALS

PROPOSED APPROACH

- a. The progress towards the three primary environmental targets of the EO will be determined based on aggregate reductions across Executive Branch state agencies.
- b. This will include agencies who are occupants in a leased or other-agency-owned space (only the lessor/owner’s data will be rolled up to evaluate the aggregate Executive Branch progress).
- c. Agencies may request from the Co-Chairs exceptions or special considerations, with exceptions primarily limited to early action prior to the base year or state security, evaluated on the basis of their impact on the aggregate state target and justification. Requests will be presented to the Steering Committee for final evaluation (*addressing item 3(d) in EO 1*).
- d. Starting no later than the Fall of 2020, the Steering Committee should begin evaluating additional goals associated with product procurement and environmental impacts of land use/grounds management, as well as interim (pre-2030) goals for the primary EO 1 targets and even more stringent targets for 2030. By this time, all base year information for energy, water and waste impacts should be compiled as a basis for evaluating progress.

BACKGROUND AND RATIONALE

Under Section 3, EO 1 requires the Steering Committee, comprised of the Co-Chairs and Senior Sustainability Officers designated by participating Executive Branch agencies, to make several decisions with respect to goals, including:

3(a). Creating “specific subordinate goals and targets to meet the overall goals identified in Section 1 of this Order, which goals and targets may include base year, percent reduction, near-term targets, and 2030 targets, and which may address:

- a. GHG emissions from onsite heating and cooling;
- b. GHG emissions from purchased electricity, and/or energy-intensity;
- c. GHG emissions from vehicle fleet;
- d. Materials management;
- e. Water use;
- f. GHG emissions and other impacts from product procurement; and
- g. Environmental impacts of land use and grounds management.”

3(b). A strategy to meet more stringent targets than the EO 1 requires, including “a strategy for state operations to achieve a 70 percent reduction in GHG emissions from 2016 levels by 2040 and net zero GHG emissions by 2050.”

3(d). How the goals apply to agencies, including “applicability of or exemption from specific goals and targets as a result of the unique circumstances of agency operations.”

Some agencies have taken early action to reduce environmental impacts of their operations prior to the base years of the EO, including reduction measures prior to FY2020 for water or waste and before FY19 for GHG emissions. In the case of GHG emissions, the target translation from 2001 to FY19 will reflect in aggregate the progress made since 2001 by the state as a whole.

7. OPERATIONAL BOUNDARIES

“Once an organization has established its organizational boundaries [...] it then sets its operational boundaries [...] Such categorization improves the transparency, eliminates the risk of double counting, and facilitates more effective management of GHG risks and opportunities along an organization’s “value chain,” encompassing all of its upstream and downstream activities. Even without any policy drivers, accounting for GHG emissions along the value chain may reveal potential for greater efficiency and lower costs.”⁶

PROPOSED APPROACH

The GHG operational boundary will entail the following:

Carbon dioxide, methane and nitrous oxide will be included as the greenhouse gases in the EO 1 base years and target tracking, along with reporting all of these numbers in “CO₂ equivalent” that incorporates global warming potential. EnergyCAP currently provides this conversion for all fuels documented in state operations.

1. **For direct emissions (scope 1),** only stationary combustion and mobile GHG emissions will be included in the EO 1 baseline. Process/chemical will be reported optionally by applicable facilities.
2. **For indirect emissions from purchased electricity (scope 2),** all usage will be included in the EO 1 base year. If an agency on a shared campus/site purchases electricity from directed generated another agency (e.g. through a combined heat and power facility), these emissions should not be included in the Executive Branch aggregate target tracking as they will be included as stationary combustion emissions from the generating agency.
3. **For indirect emissions from the broader supply chain (scope 3),** leased asset emissions (as a lessee and lessor) will be included in EO 1 base year and target tracking, though any leasing occurring between state

⁶ U.S. Public Sector Protocol, p. 24-25

agencies will only be rolled up once in the Executive Branch aggregation. No other scope 3 emissions will be included in the Executive Branch base year and target tracking.

Agencies are encouraged to collect data and eventually set their own targets over time for emissions generated in the following six supply chain categories (a subset of the broader scope 3 list):

- Purchased goods/services (The Co-Chairs recommend that this be evaluated as part of a broader focus on multiple environmental impacts and sustainable procurement principles);
- Capital goods;
- Fuel and energy-related activities not included in scope 1 or 2;
- Waste generated in operations;
- Employee business travel outside of state-owned/operated vehicles (e.g. bus, trains and flights taken by employees for state business purposes); and
- Employee commuting.

The water operational boundary will include all water usage measured in gallons consumed directly in state owned/operated/occupied facilities.

The waste operational boundary will include all waste generated in state owned/operated/occupied facilities, subject to the definition of “waste” defined by the Sustainable Materials Management Team over the course of developing an FY20 baseline.

BACKGROUND AND RATIONALE

EO 1 creates accountability for environmental impacts associated with state government facilities and operations, but does not specify:

1. Which gases to include. The internationally-accepted *Greenhouse Gas Protocol Corporate Standard (2004)* for GHG accounting and reporting requires organizations to account for the six gases identified in the Kyoto Protocol, including: carbon dioxide (CO₂), methane (CH₄), Nitrous oxide (N₂O), hydrofluorocarbon (HFC), perfluorocarbon (PFC), and nitrogen trifluoride (NF₃). At this time, EnergyCAP provides calculation factors and carbon dioxide equivalent (e.g. the heat-trapping impact of different gases in the atmosphere) for CO₂, CH₄, and N₂O. Based on data feasibility and the predominance of these three gases, the GHGs included in the EO 1 base year and goals will be limited to these three.

2. Whether to include direct facility GHG emissions in the state target beyond those listed in 3(a). The *Greenhouse Gas Protocol Corporate Standard (2004)* and *U.S. Public Sector Protocol (2010)* identify four sources of direct GHG emissions (e.g. emissions that occur onsite in a facility or asset owned/operated) that are termed “scope 1,” including:

- Stationary combustion, including fuels combusted in boilers, furnaces, emergency generators;
- Mobile combustion, from fuels used in transportation vehicles;
- Chemical production from owned or controlled process equipment; and
- Fugitive emissions, including leaks or unintended releases of GHG’s.

3. How far upstream or downstream the GHG boundary should extend. For greenhouse gases, the internationally-accepted *Greenhouse Gas Protocol Scope 3 Standard* provides a framework for accounting and estimating emissions associated with fifteen upstream and downstream activities related to an organization’s operation (called “scope 3” emissions)⁷. Organizations can assess their impacts in these areas with minimal data

⁷ As noted in the *Scope 3 Standard*: “For these categories, reported emissions have not yet happened, but are expected to happen as a result of the waste generated, investments made, and products sold in the reporting year. For these categories, the reported data should not be interpreted to mean that emissions have already occurred, but that emissions are expected to occur as a result of activities that occurred in the reporting year.”

needed upfront using screening tools like the *Greenhouse Gas Protocol Scope 3 Evaluator*:
<https://ghgprotocol.org/scope-3-evaluator>.

4. The water operational boundary, and how far up/downstream the water boundary should extend. Applying the GHG accounting terminology to water, the “operational boundary” for water use will include all water usage measured in gallons consumed directly in state owned/operated/occupied facilities. Upstream and downstream indirect water uses, including water use associated with the production of electricity, vehicle fuels, purchased materials or waste/wastewater treatment, may be estimated separately starting after FY20 and subject to Sustainable Water Use Project Team capacity and data availability. For further context, the *Global Reporting Initiative*⁸ calls on organizations to disclose a broader set of metrics related to water withdraw, consumption and re-use. The Sustainable Water Use Project Team may evaluate gathering data on these additional metrics over time.

5. The waste operational boundary, and how far upstream the waste/materials boundary should extend. Subject to the definition of “waste” defined by the Sustainable Materials Management Project Team over the course of developing an FY20 baseline, the baseline will include all waste generated in state owned/operated/occupied facilities. Upstream and downstream indirect waste production, including waste association with production of electricity, vehicle fuels or purchased materials, will be assessed separately after FY20 in conjunction with a broader evaluation of procurement practices and opportunities across state government.

8. BASELINE RECALCULATION POLICY

PROPOSED APPROACH

Agencies must individually develop and monitor internal processes for comparing annual emissions in the occurrence of structural changes. If any comparisons warrant a significant need to recalculate base year and subsequent years’ emissions, agencies must identify the need and provide reasoned support for agency-specific recalculation of its baseline emissions to the Steering Committee for approval.

BACKGROUND AND RATIONALE

To ensure reliable and consistent data that matches the variability of state agency operations, recalculations of base year and other subsequent years’ inventories may be necessary. DEEP and DAS may direct a recalculation policy in the event of significant improvements in emission calculation, data collection methodologies or in the event that the state agency GHG reduction goals can be re-normalized to better fit the state-wide greenhouse gas reduction goals.

A procedure for building inventory management will be specified by the Co-Chairs annually, agencies will receive copies of their Building Inventory Sheet from DEEP to update any changes in square footage, occupancy, building-meter correlations, primary uses, and all other pertinent information found in the Building Inventory Sheet.

9. DATA QUALITY MANAGEMENT PROTOCOL

PROPOSED APPROACH

On a continual basis, state agencies in coordination with DEEP EnergyCAP liaisons, should implement the following quality control methods for energy and water utility bills:

1. Ensure consistent scanning of utility bills via reminders and tracking of regular agency invoice uploads;
2. Scrub database for duplicate bills and investigate outlier utility bills;
3. Investigate any default emission factors to ensure that they properly represent the emissions of the given source. These emission factors should be compared with any available site-specific emission factors;

⁸ GRI 303: Water and Effluents: <https://www.globalreporting.org/standards/gri-standards-download-center/?g=f9488c98-2d52-41e3-97a9-06624030bb20>

4. Assess database for data and asset completeness along with plan and timeline for mitigating data incompleteness;
5. Perform year-to-year comparisons of the activity data to identify any quality issues; and
6. Confirm the activity data units of measure are consistent with data inputs and corresponding emission factors.

In addition, by the end of FY2020, data quality standards for waste and waste metrics and vehicle fuel will be identified.

BACKGROUND AND RATIONALE

To improve consistency and transparency of data collection and documentation over time and improve data quality, the Steering Committee should identify a standard process for data capture and compilation for buildings and fleet.

10. GHG ACCOUNTING OF EMISSIONS FROM USE OF RENEWABLE ELECTRICITY

PROPOSED APPROACH

The reporting goal approach for electricity should eventually allow for emissions to be reported according to both the location-based method (the default in EnergyCAP) and a market-based method that includes any voluntary or compliance renewable energy credit (REC), attributes or supplier-specific emissions factors associated with state agency purchases or contracts, including RECs retired by the state’s competitive energy supplier (on the state’s behalf) to meet the state’s Renewable Portfolio Standard. Methods used here should be consistent with the state-wide GHG inventory and *Scope 2 Guidance* best practices.

1. In the near-term, if information on REC purchases distinguished by fuel type are not available for any state purchases or from the state’s electricity supplier, electricity emissions will only be estimated using the location-based method to reflect the default eGRID emission factor in EnergyCAP.
 - a. EnergyCAP cannot currently accommodate building-specific REC purchases or electric supply for the purpose of GHG accounting. Any building-specific renewable energy generation, consumption and REC transactions will be manually adjusted in annual reporting and goal tracking for those agencies, following REC accounting best practices.
 - b. Once REC, attribute or supplier-specific data becomes available for state electricity use, EO 1 GHG goals related to electricity use will be tracked based on the market-based method, consistent with the state-wide GHG inventory.
 - c. The DEEP team will analyze the potential of a custom emissions factor applicable to all Executive Branch agencies that allows for incorporating more specific REC or other attribute accounting.
2. If an agency sells the RECs associated with its renewable energy project, it would need to:
 - a. Buy replacement RECs –called REC arbitrage—to fulfill its zero-emissions claim, or
 - b. Apply an adjusted regional average grid emissions factor to the electricity use, as though it were purchased from the utility.

BACKGROUND AND RATIONALE

The *GHG Protocol* defines “scope 2” as indirect emissions associated with purchased and consumed electricity, steam, heating and cooling. These emissions do not physically occur in assets owned/operated by the reporting organization, but they occur elsewhere on the electric grid or by another organization. Any fuel combusted to create electricity is considered scope 1 for the entity producing the electricity, and scope 2 for the entity purchasing and consuming it.

The *GHG Protocol Scope 2 Guidance*⁹ document notes that organizations should report scope 2 emissions in two ways: a location-based method that uses a grid average emissions factor (regardless of supplier or other purchases), and a

⁹ GHG Protocol Scope 2 Guidance: https://ghgprotocol.org/scope_2_guidance

market-based method that reflects contractual purchases, RECs, attributes and supplier-specific information. For any electricity consumption not associated with a specific purchase, the market-based method calls for using an *adjusted* grid average emissions factor that removes any RECs or attributes claimed by other consumers (including RECs retired for other states' RPS's), in order to minimize double counting.

EnergyCAP automatically calculates electricity emissions based on the most regional grid average emissions factor for New England calculated by the EPA in their eGRID database¹⁰, fulfilling the requirements of the location-based method. However, this number does not take into account any REC or other attribute purchases specifically attributable to state agency energy supply or that have been retired on the state's behalf for compliance with the RPS. Additional calculations would need to be performed to report a market-based figure that includes any additional REC purchases or attributes acquired by state agencies or the state of Connecticut on behalf of all customers.

Including both the location-based and market-based method totals in an organization's GHG reporting provides a more complete and transparent picture of an agency's purchasing decisions, any electric-sector policies of the state where the operations occur, as well as the dynamics of the overall shared grid. Beyond simply reporting emissions, most organizations also have goals to *reduce* emissions. Consumers have an opportunity to change overall grid emissions over time through their procurement actions directly (e.g. entering into a contract that supports a new zero-emissions renewable energy facility) or indirectly (purchasing attributes from an existing facility that enables facility retention or upkeep). Therefore, most organizations set GHG reduction goals associated with electricity use based on the market-based method that reflects their RECs, attributes, or electricity suppliers' retirement of RECs or attributes on their behalf. This provides a more organizational or state-specific footprint than a regional grid emissions factor associated with the location-based method, and shows the energy procurement actions the state has taken to support more zero-carbon electricity and reduce emissions on the grid over time.

The calculation and reporting should be consistent with the approach used for the state-wide GHG inventory. **The state-wide GHG inventory currently uses a market-based method to account for electricity GHG emissions.** To fully complete market-based method accounting, information on the quantity and fuel type of RECs or other attributes associated with state agency electric supply should be gathered from the state's competitive electric supplier or the electric distribution companies. The emissions rate associated with each REC/attribute (note: fuel cells or biomass RECs will convey emissions, while solar, wind and nuclear have a zero-emissions rate) should be applied on a kilowatt-hour basis to the state's supply, and an adjusted regional grid average emissions factor should be applied to any remaining kilowatt hours. However, at this stage, the state does not have complete information on the RECs/attributes associated with state supply, nor is a reliable adjusted grid average emissions factor been fully vetted. Therefore, in the near-term, electricity emissions will only be estimated using the location-based method to reflect the default eGRID emission factor in EnergyCAP. The DEEP team will analyze the potential of a custom emissions factor applicable to all Executive Branch agencies that allows for incorporating more specific REC or other attribute accounting.

Accounting for RECs from onsite projects:

The *Greenhouse Gas Protocol Scope 2 Guidance* and best practices established by the Green-e certification for renewable energy credits (RECs) requires an organization must hold and retire RECs or attributes in order to make claims about the emissions or renewable attributes of the electricity it consumes. Normally, onsite-generation of electricity (whether diesel generation, fuel cells or solar power) would be counted in scope 1. For solar energy, these emissions would be "zero" and would reduce the need to purchase grid electricity (thereby lowering scope 2 emissions). But organizations that install on-site renewable energy and sell any RECs associated with the generation *cannot make claims about using zero-carbon, renewable energy*. That claim follows the REC and the customer that retires it.

¹⁰ <https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid>

If a utility purchases the REC from the onsite system and retires it on behalf of all customers as part of a Renewable Portfolio Standard (RPS) requirement, the host organization may *indirectly* experience a lower GHG emission rate but cannot make a specific claim to the zero-emissions associated with kilowatt hours of electricity it has consumed. An agency could claim that it is advancing the state’s progress in meeting the RPS and spurring the market for solar—but it could not claim that it is using renewable, zero-emissions electricity or *directly* reducing its electricity-related emissions due to the project.

State agencies that build and intend to use zero-carbon renewable electricity may be required to forfeit the RECs associated with the project under new tariff designs: for instance, to have access to net metering compensation under PA 18-50, agencies would need to bid in the energy and RECs associated with their project to a utility-run auction (the utilities would select up to 50 MW solar per year to receive contracts). Under net metering or virtual net metering prior to the start of new tariffs, agencies may be able to retain project RECs, but the financing structure of the project may require bidding and selling the RECs in a REC-only auction.

EnergyCAP cannot currently accommodate building-specific purchases or supply for the purpose of GHG accounting. Therefore, any building-specific renewable energy generation, consumption and REC transactions will be manually adjusted in annual reporting and goal tracking for those agencies. Specifically:

- a. If RECs are sold for the entirety of the renewable energy system’s output, the agency’s kilowatt hour electric consumption must be adjusted *upwards* and an eGRID emissions factor applied to it.
- b. If RECs are retained for some or all of the renewable energy system’s output under net metering, the agency’s kilowatt hour consumption reflected on the utility bill shows a decrease (‘netting’) from the production over the course of the month. No additional adjustments are needed.
- c. If RECS are retained under Connecticut’s virtual net metering program or from a stand-alone project, an agency’s kilowatt hour usage from the grid will not be reduced on the electric bill, but a monetary credit on the bill may be applied. Therefore, the emissions rate associated with the RECs should be manually applied on a kilowatt-hour basis to match the quantity of consumption.

11. ACCOUNTING AND REPORTING FOR BIOGENIC EMISSIONS

PROPOSED APPROACH

As practicable, biogenic emissions should be included at the point of combustion in both agency and Executive Branch base year and target tracking in the GHG emissions target, and not treated as “zero carbon” or exempted from the target. The default EPA emission factors in EnergyCAP for vehicle fuels already include combustion emissions from the average biofuel blend; however, the regional eGRID factor for the electric grid excludes biogenic emissions from biomass power generation. This means the state’s electricity emissions in the location-based method will be slightly under-represented while biogenic emissions in the market-based total may be more fully represented if biomass-based RECs are retired on behalf of the state’s load.

Any 100% biofuels used in operations, such as wood pellets or ethanol, should be associated with utility receipts or invoices in EnergyCAP and tracked as a separate fuel, with default emission factors being added. To date, any use of 100% bio-based fuels has been negligible and excluded from state agency accounting.

BACKGROUND AND RATIONALE

In the *Greenhouse Gas Protocol* family of standards, biogenic emissions as defined as “those that result from the combustion of materials that naturally sequester CO₂- biomass- including those materials used to make biofuels (e.g. crops, vegetable oils, or animal fats).”¹¹ The *Protocol* requires that all biogenic emissions be quantified based on emissions at the point of combustion and reported separately from scope 1, 2 and 3 in (e.g. in a fourth category called

¹¹ U.S. *Public Sector Protocol*, p. 26

Biogenic emissions). This may require “splitting” emissions from a single gallon of bio-blended fuel into those from fossil-based emissions (scope 1) and those from biogenic sources, as well as separately accounting for the biogenic scope 2 emissions associated with biomass used to generate purchased and consumed electricity. Neither the *Protocol* nor EO 1 specify whether biogenic emissions should be included in base year and target-year emissions.

Biogenic emissions are automatically included in the eGRID regional electric sector emission factors used in EnergyCAP. To date, the default emission factors for vehicle fuel include an average blend of bio-content that is reflected in a lower emissions factor.

Options include:

- a. Biogenic emissions are included at the point of combustion (same as fossil-fuel emissions) in both agency and Executive Branch base year and target tracking as part of the overall GHG emissions target.
- b. Biogenic emissions are separately tracked in the base year and target year and are excluded from EO 1 goals.
- c. Separately estimate and report lifecycle emissions, with emissions not counting towards EO 1 base year or target year. Lifecycle methodology is not yet standardized, and existing methodologies require researching and making assumptions about the upstream life of the fuel (where it came from, how it was grown, etc.). Connecticut has not conducted this type of analysis at a state-wide level yet.

Separately from GHG emissions accounting implications, DEEP will continue examining the role of strategic biofuel uses across state operations as part of achieving in-state forest management goals while balancing climate and air quality requirements.