ENTERGY 2020 GHG EMISSIONS INVENTORY

Verification Report

March 18, 2021

103 Magnolia Tree Ct
Cary, NC 27518

Statement of Verification

March 18, 2021

Entergy Corporation
Sustainability and Corporate Strategy
Entergy Services, Inc.
639 Loyola Avenue
New Orleans, LA 70113

Scope

Entergy Corporation ("Responsible Party") engaged Cventure LLC ("Verifier") to review Entergy Corporation's 2020 Corporate Greenhouse Gas (GHG) emissions inventory, and supporting evidence including Entergy's Geenhouse Gas Inventory Management Plan and Reporting Document (IMPRD), detailing the GHG emissions and associated source documents, over the period January 1, 2020 to December 31, 2020 inclusive. These components are collectively referred to as the "GHG Assertion" for the purposes of this statement.

The Responsible Party is responsible for the preparation and presentation of the information within the GHG Assertion. The Verifier's responsibility is to express a conclusion as to whether anything has come to our attention that the GHG Assertion is not presented fairly in accordance with generally accepted GHG accounting standards (e.g., *The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard, Revised Edition, WRI/WBCSD, March 2004)*.

Independence

Cventure was not involved in the preparation of Entergy's GHG emissions inventory. It did not participate in any associated GHG emissions data collection, management, and reporting activities, nor the development of associated emissions or usage estimates, and any subsequent assertions made by Entergy. Cventure has not provided any services to Entergy which could compromise Cventure's independence as a third party verifier. Cventure disclaims any liability for any decision made by third parties based on this Verification Statement.

Methodology

We completed our review in accordance with the ISO 14064-3 international standard *Greenhouse Gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions*. We planned and performed our work in order to provide a limited level of assurance with respect to the GHG Assertion, with review criteria based on *The Greenhouse Gas Protocol* and quantification methodologies referenced in Entergy's IMPRD. We reviewed the GHG Assertion and associated documentation, and believe that our work provides a reasonable basis for our conclusion.

Conclusion

Based on our verification review, nothing has come to our attention that causes us to believe that the GHG Assertion is materially misstated. The GHG emissions estimates were calculated in a consistent and transparent manner, and were found to be a fair and accurate representation of Entergy's actual conditions, and were free from material misstatement. Cventure has verified a total of **36,963,693** metric tons of CO_2 equivalent (CO_2e) emissions for calendar year 2020.

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1. Introduction

Entergy Corporation ("Entergy") has prepared a voluntary greenhouse gas ("GHG") inventory for its corporate operations active through the 2020 calendar year. Entergy has engaged Cventure LLC ("Cventure") to provide a third-party verification of the GHG inventory, including Scope 1, Scope 2, and select Scope 3 emissions, the "GHG Assertion", for voluntary GHG reporting purposes for the 2020 calendar year.

The quantification of Entergy's corporate GHG emissions inventory is guided by the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD) *The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard, Revised Edition, March 2004* ("the GHG Protocol"), using an equity share approach to make the GHG inventory's organizational boundaries determination. The 2020 GHG inventory includes the following emissions sources:

Scope 1**:** Stationary combustion in electric generating units and small sources at company facilities; mobile combustion in company fleet vehicles; fugitive methane from natural gas transmission and distribution ("T&D") systems; fugitive sulfur hexafluoride (SF_6) from electric power T&D systems; and fugitive hydrofluorocarbons (HFCs) from building HVAC systems and vehicle air conditioning systems.

Scope 2: Indirect emissions associated with grid purchased power for wholesale generation plants (outside of Entergy's regulated electricity transmission service territory).

Scope 3: Indirect emissions associated with controllable purchased power[1] for resale to end-users; customer consumption of distributed natural gas; and Entergy employee commuting.

The GHG emissions associated with all electricity consumed in the operation of Entergy's generation facilities and in Entergy's various administrative and commercial buildings and operations, in the regulated service territory, are accounted for in the Scope 1 direct emissions from stationary combustion. In addition, emissions associated with line losses through electric power T&D systems are also captured in the Scope 1 emissions associated with stationary combustion. The GHG emissions associated with the full life cycle of the various fuel sources consumed through Entergy's business operations are not included in the inventory. In line with the 2013 through 2019 inventories and Entergy's utility generation portfolio, as described on the company's website[2], emissions associated with Louisiana Station Plant 1 are also not included in the 2020 inventory, as this plant generates electricity for the sole use of ExxonMobil under a long-term lease agreement. Also, Harrison County and NISCO (Nelson Industrial Steam Company)

[1] Controllable purchased power is defined as power for which the originating source (generating plant) is known and for which Entergy has made a direct buying decision.

[2] "Entergy Corporation and Subsidiaries 2019 Annual Report"; and "Entergy Statistical Report and Investor Guide 2019".

GHG emissions are not included in the inventory, as while Entergy personnel operate these two fossil power generation plants, Entergy has no ownership share in either plant.

GHG emissions from stationary combustion and controllable purchased power in aggregate comprise approximately 96% of Entergy's total 2020 corporate GHG emissions.

Product Combustion, comprising approximately 2.4 percent of Entergy's total 2020 corporate GHG emissions, include emissions associated with the combustion of natural gas distributed to Entergy's residential, commercial, and industrial (medium- to small-size) customers (i.e., a Scope 3 GHG emissions source for Entergy, and a Scope 1 GHG emissions source for their gas distribution customers).

Other Small Sources, comprising less than 2% of the inventory, include emissions associated with: mobile combustion, purchased electricity for business operations outside Entergy service territory, fugitive SF_6 (electricity T&D), fugitive CH_4 (natural gas T&D), fugitive HFCs (HVAC systems and vehicles), and employee commuting.

This document describes the terms and scope of this verification. It serves to communicate the findings of the verification.

2. Verification Execution

The scope of the verification was defined during the verification planning stage and is detailed in the Verification Plan, which is appended to this document. The Verification Plan also describes Cventure's verification process that was executed through the course of the verification. The specific verification procedures that were planned and executed through the verification process are described in the appended Plan. The Verification Plan has evolved during the course of the verification exercise; the final version of the Plan is in the Appendix.

The 2020 GHG inventory verification focused on direct emissions associated with fossil fuel consumption at large electric generating facilities using Continuous Emission Monitoring System ("CEMS") data; indirect emissions associated with purchased power; and customer consumption of distributed natural gas. Entergy's 2020 GHG Inventory also includes several small emissions sources, some of which are *de minimus*[3] in nature (small stationary combustion; fugitive emissions of SF_6 associated with electricity T&D; mobile combustion in company fleet vehicles; employee commuting; fugitive CH_4 associated with natural gas T&D; and HFCs from air conditioning/cooling refrigerant systems). All emissions sources in Entergy's corporate 2020 GHG inventory have been reviewed, with a primary focus on stationary combustion from electric generating units and purchased power, given the risk-based approach used in this verification.

[3] Entergy describes emissions sources that have been estimated to be less than 1 percent of the total corporate inventory as *de minimus* in its IMPRD.

2.1 Site Personnel Interviews

Virtual site meetings were conducted during the period of February 9-10, 2021 in Louisiana and Mississippi. These meetings were with Entergy's J. Wayne Leonard and Choctaw County Gas Plants personnel were part of our sampling exercise, to obtain data directly from the plants themselves, and to better understand GHG information and data management systems. This included a review of all GHG emissions sources at the facilities, through photographic evidence provided of the CEMS equipment, CEMS calibration and maintenance logbooks, and the natural gas fuel flow metering systems. A review of metering and data management processes was discussed with plant operations staff, including a review of meter calibration/validation procedures.

These site meetings were an important step in planning and executing the verification. Key Entergy personnel interviewed as part of these meetings included:

- Emily Swindler, Sustainability Analyst, Sustainability and Environmental Policy
- Environmental Managers/Analysts:
    - J. Wayne Leonard:
        - Seth Folse
        - Austin (William) Langley
    - Louisiana Environmental Support: Richie Corvers
    - Choctaw County: Beau Griffin

Other key Entergy staff who provided GHG emissions inventory supporting data and associated documentation included:

- Jeff Turlington and Dan Hintzman, CEMS Information and Small Stationary Combustion Sources, The Woodlands
- Ryan Gay and Helen Schroff, Gas Settlements, Reporting and Analysis, The Woodlands
- Jill Siekmeier and Garrett Branner, Coal Supply and Purchasing/Rail Car Management System (RCMS), The Woodlands
- Grady Kaough, Power Trading Operations, The Woodlands
- Walter Ross, Natural Gas Operations, New Orleans
- Toby Chu, T&D Environmental (SF_6)

2.2 Verification Approach

This section outlines the approach used to review key emissions sources in the 2020 GHG inventory.

Stationary Combustion: Fossil Fuel Usage at Generating Facilities

The entire inventory of Entergy fossil generation units was reviewed at a limited depth, and a significant sample of data from select units was reviewed in greater detail. Generation units were selected for detailed audit trail reviews based primarily on relative contribution to the 2020 corporate GHG emissions inventory, e.g., using the 1% *de minimus* accounting methodology/reporting threshold of Entergy's GHG inventory, as unit selection screening priority. Other considerations in selecting units for detailed review included large, "sister" units at the same selected generation plant, availability of facility fuel usage validation data (for gas-fired facilities, and to account for some overlap with last year's samples (to test for any changes).

The seventeen (17) generation units listed below were selected for this more detailed desktop review included the following 5 coal and 12 natural gas units (in addition to the five [5] total units from the site meeting contacts at J. Wayne Leonard and Choctaw County gas plants):

Coal

- Independence 1
- Independence 2
- RS Nelson 6
- White Bluff 1
- White Bluff 2

Gas

- Baxter Wilson 1
- Gerald Andrus 1
- Hinds H01
- Hinds H02
- Lewis Creek 1
- Ninemile Point 4
- Ninemile Point 5
- Ninemile Point 6A & 6B
- Sabine 3
- Sabine 4
- Sabine 5

As part of this detailed verification review of the Entergy CEMS units, virtual site meeting verification reviews were conducted with personnel at the following gas-fired plants:

- J. Wayne Leonard
- Choctaw County

The following information was requested from Entergy and available data reviewed in relation to the above samples:

- Annual data on CO_2 emissions, electricity generation (MWh), heat input (total MMBtu), and operating time for all sixty-two (62) Entergy electric utility combustion generation units in 2020, from the EPA Clean Air Markets (CAM) Air Monitoring Program Data (AMPD) database;

- EPA emissions collection and monitoring plan system (ECMPS) quarterly feedback reports for seventeen (17) units;

- Annual CO_2 /flue gas flow monitors relative accuracy test audits (RATA's) for the five (5) selected coal units;

- Quarterly CO_2 CEM linearity checks for the five (5) selected coal units;

- Natural gas fuel flow meter CEMS calibration/accuracy checks for the seventeen (17) natural gas units audited in detail, with additional documentation provided from the J. Wayne Leonard and Choctaw County plant environmental analysts for those five (5) respective units, and from Fossil Environmental for the balance of the twelve (12) other natural gas-fired power plants reviewed in this verification program;

- Monthly facility-level gas burn data for all Entergy natural gas-fired electric generation facilities (from Entergy's Gas Burn Accounting database, maintained by the Natural Gas Supply and Purchasing Department);

- Daily facility-level coal delivery, coal usage, and coal burn testing analytical data for all three coal-fired electric generation facilities owned and operated by Entergy (from Entergy's Rail Car Management System database, maintained by the Coal Supply and Purchasing department);

- Hourly CO_2 CEMS data for 2020 obtained directly from the plant's CEMS Data Acquisition and Handling System (DAHS) for the five (5) units at the site meeting facilities (J. Wayne Leonard 1A and 1B, and Choctaw County CTG1, 2, and 3); and

- Multiple days of third-party coal burn independent sampling and testing data for three (3) coal-fired plants (Independence, RS Nelson and White Bluff).

The twenty-two (22) units above that were reviewed in greater detail collectively represent approximately 59% of Entergy's total direct CO_2 emissions from power generation units in 2020.

Organizational boundaries were verified using information contained in Entergy's 2019 Statistical Report and Investor Guide, and Entergy's 2019 Annual Report. As described in Entergy's GHG Inventory Management Planning and Reporting Document, March 2020 (IMPRD), Entergy GHG emissions inventory boundaries are determined on an equity share basis (i.e., the percent equity share of those facilities owned by Entergy) which was used to calculate the GHG emissions in the inventory database for this category. These equity share values in the GHG inventory were cross-checked against the data provided in Entergy's IMPRD, statistical report, and annual report.

CEMS reports supplied by Entergy were checked against both the GHG emissions data in their GHG inventory spreadsheets, and the EPA Clean Air Markets' air monitoring program data (AMPD) database, for the twenty-two (22) selected units above. Monthly and annual CO_2 CEMS reports were generated by the Verifier from queries of the AMPD database; and were checked and confirmed against the data for those twenty-two (22) sampled units as reported in Entergy's GHG emissions inventory spreadsheets. Annual total CO_2 report queries of the EPA AMPD database were made for all sixty-three (63) Entergy acid rain-regulated units; and cross-checked against the Entergy GHG inventory data. (Note: The 2020-start up New Orleans Power Station is not subject to EPA acid rain regulations; as such, its CO_2e emissions are not in the EPA AMPD database. Its emissions were cross-checked against Louisiana state agency data records as part of this Entergy GHG emissions inventory verification program.)

Associated CEM system and natural gas flow meter QA/QC supporting documentation (including relative accuracy test audits, linearity checks, and fuel flow meter calibration tests) were reviewed for the Entergy generating units. These documentary evidence verification checks were performed and confirmed that the reported GHG emissions data, and CO_2 emissions/flue gas flow and natural gas flow monitoring measurements and monitoring calibrations, were accurate, and the associated measurements data were reliable, as reported in the Entergy 2020 GHG inventory.

For each of the units sampled, various error checking tests were performed on the Entergy GHG inventory spreadsheets, and the sampled data to assess the information collected, including some examples such as record counts/missing data, re-computation, and other cross-checks. For each of the selected units, some aggregation calculation checks, and source type and equity share checks, were made and compared against database outputs/reports and the Entergy GHG inventory spreadsheets.

Through the course of the verification program, the data management systems and controls employed in the quantification of emissions were reviewed, as detailed in the Sampling Plan procedures, included in Section 7 of the final Verification Plan. These systems were found to be effective in the calculation of the GHG Assertion.

This source category, stationary combustion in fossil power generation units (including emergency and back-up generators), comprised approximately 87.6% of the total Entergy 2020 GHG Assertion.

Purchased Power (Controllable)

The key emissions factors, sources, and calculations that Entergy used to quantify the emissions associated with its controllable power purchases in the 2020 GHG inventory were checked. This source comprised approximately 8.3% of the total Entergy 2020 GHG Assertion.

Raw data outlining daily (and monthly) purchased power by Entergy operating company and counterparty/long-term contract for 2020 was provided by the Power Trading group and cross-checked against the TRADES database containing controllable purchased power for 2020, as well as the Entergy GHG inventory spreadsheets. They were also checked for correct application of plant-specific emissions factors from EPA's eGRID database (February 2021 release for year-2019 data).

Other Emissions Sources

Entergy has a number of small sources that collectively comprise approximately 4.1% of the total GHG Assertion. These sources include emissions associated with small stationary combustion sources (0.9%); mobile combustion (corporate fleet; 0.1%); fugitive CH_4 (natural gas T&D; 0.1%); fugitive SF_6 (electricity T&D; 0.4%); fugitive HFCs (HVAC and vehicle; <0.1%); purchased electricity for business operations outside Entergy service territory (0.1%); customer consumption of distributed natural gas (2.4%); and employee commuting (0.1%).

Most of those emissions sources are categorized in the *de minimus* category, as defined in the Entergy IMPRD (i.e., sources representing <1% of the total GHG Assertion). These emissions sources, with size relative to total GHG Assertion, were reviewed as part of this verification program, as indicated below.

Scope 1 Emissions Sources:

- small stationary combustion sources – 2019 Subpart C submissions reviewed (0.9% of GHG Assertion, *de minimus*)
- mobile combustion, corporate fleet – 2016 fuel consumption data was used to quantify emissions (0.1% of GHG Assertion, *de minimus*)

- fugitive CH_4, natural gas T&D – 2019 Subpart W submissions reviewed (0.1% of GHG Assertion, *de minimus*)
- fugitive SF_6, electricity T&D – estimate based on 2019 Subpart DD submission (0.4% of GHG Assertion, *de minimus*)
- fugitive HFCs, HVAC and vehicle – quantified from 2016 data, not revised for the 2020 inventory (<0.1% of GHG Assertion, *de minimus*)

Scope 2 Emissions Source:

- purchased electricity for business operations outside Entergy service territory – quantified using 2020 data with eGRID 2019-data emission factors, published in February 2021 (0.1% of GHG Assertion, *de minimus*)

Scope 3 Emissions Sources:

- customer consumption of distributed natural gas – 2019 Subpart NN submissions reviewed (2.4% of GHG Assertion)
- employee commuting– estimates quantified for previous years reviewed (0.1% of GHG Assertion, *de minimus*)

3. Data Management and Control System Review

A critical element of the verification process was for the Verification Team to gain a thorough understanding of the data management systems and controls employed by Entergy. This understanding necessitated a review of:

- The parties involved and their respective responsibilities;
- The data collection and automated data measurement and management systems;
- Post-collection data manipulation;
- Quality assurance procedures employed to detect erroneous or missing data; and
- Changes to the data management system over time or opportunities for improvement.

Testing Internal Controls

The Verification Team developed a sufficient understanding of the GHG information system and internal controls to determine whether the overall data management system is sound, examining it for sources of potential errors, omissions, and misrepresentations. This assessment incorporated

examining three aspects of the company's internal controls: (1) the control environment, (2) the data systems, and (3) the control and maintenance procedures.

The testing procedures documented in the Verification Plan included some procedures to test the effectiveness of the internal controls in place. The results of these tests influence the type and amount of activity data being sampled. Sampling procedures are included in Section 7 of the final Verification Plan.

Conducting Substantive Testing

Substantive testing procedures were used to assess the reasonability and validity of the GHG Assertion where further testing was required to assess internal controls based on the observations and preliminary findings of the Verification Team. The specific procedures are summarized in Section 7 of the final Verification Plan as separate tables for each process or activity involved in the quantification and reporting of the GHG Assertion. Materiality was assessed for each specific procedure and aggregate materiality was determined separately. The details of the testing of internal controls and substantive testing undertaken are described in detail in the final Verification Plan.

The Verification Team developed a thorough knowledge of the data management and control systems utilized in the organization through the review of the IMPRD and interviews with key personnel. The following were the key data systems reviewed:

- CEMS data – for large fossil generating stations.
- Gas purchases data – monthly for all gas-fired electric generating plants – from Ryan Gay.
- Coal purchases data – from Garrett Branner.
- TRADES – controllable power purchases tracking system: hourly/daily purchase amounts from 1/1/2020 to 12/31/2020 inclusive were extracted and sent via Excel to the Verification Team by Grady Kaough.

4. Verification Results

4.1 Discrepancies

The table below details discrepancies found during the verification process for each procedure, a discrepancy title (brief description) and final status.

Procedure	Discrepancy Title	Final Status
B1: Organization Boundaries, Infrastructure and Activities	N/A	No discrepancies detected
B2: Review of Operating Conditions	N/A	No discrepancies detected
C1: True-Up and Re-Performance Calculations	N/A	No discrepancies detected
C2: Minor/*De Minimus* Emissions - Methodology and Documentation	N/A	No discrepancies detected
D1: Data Collection and Quality Controls	N/A	No discrepancies detected
D2: Data Confirmation against External Sources	N/A	No discrepancies detected
D3: Data Migration into Inventory	N/A	No discrepancies detected
A1: Final Verification Assessment	N/A	No discrepancies detected

4.2 Aggregate Materiality

The sum of the immaterial discrepancies identified during the course of this GHG emissions inventory verification program, which were corrected by Entergy at that time, collectively did not result in a breach of materiality (i.e., being greater than 10% of the total GHG Assertion). This is in line with the uncertainty assessment of Entergy's inventory.

4.3 Other Findings

- As part of the verification review of Entergy's stationary combustion CEMS emissions data spreadsheet, during the 2020 unit-specific CO_2 annual GHG emissions data crosschecks with the EPA AMPD database query results for all Entergy fossil power plants, several minor, immaterial discrepancies were identified in that part of the verification review process, and were corrected by Entergy at that time.

- For the twenty-two (22) units identified as targets for more detailed audit sampling, air monitoring program data (AMPD), monthly/annual CO_2 CEMS data from US EPA's Clean Air Markets database system were reviewed. These results were verified against the direct emissions reported in Entergy's GHG emissions inventory spreadsheets. No material discrepancies associated with Entergy's GHG emissions inventory accounting and reporting were identified as part of this EPA CO_2 emissions database and Entergy GHG emissions inventory spreadsheets cross checks.

- Emission factors for CH_4 and N_2O emissions from each of the Entergy fossil generation units were also checked, revealing no discrepancies or omissions.

- Organizational and operational boundary, and equity share, verification checks revealed no discrepancies or omissions.

- For two (2) of the three (3) Entergy-operated coal-fired electric generation plants, comparisons were made by cross-checking the daily total plant coal burn analytical data on total coal fuel heat input MMBtu, as provided by Entergy's Rail Car Management System's (RCMS) plant-level data, against the daily plant total fuel heat input from the EPA AMPD database, for all of 2020. (Note: The third coal plant had significant coal feeder operational and calibration problems during 2020, precluding the use of that dataset as an additional methodology verification crosscheck.) These plant level RCMS data are based on coal feed rate process monitoring data generated by the coal feeders (which feed coal from the boiler's coal feed hoppers to the pulverizers), and coal analytical data generated by chemical analyses of coal samples taken on a daily basis by the Entergy plant personnel. The EPA data on MMBtu fuel heat input are based on in-stack CEMS measurements on flue gas flow rates, and flue gas constituent concentrations (CO_2 or O_2). The results of these cross-checking comparisons between the 2020 datasets of daily burn data showed the two (2) plants having an average deviation of -3.9%, between the RCMS and EPA AMPD plant heat input daily data for 2020. Such a coal feed rate slight

negative bias here would be consistent with coal feeder measurement components' mechanical degradation over time (i.e., from operations in a harsh environment). The results of this cross-check provide an additional degree of confidence in the reliability of Entergy's coal-fired generation GHG emissions inventory reporting. This is especially true when considering the overall measurement accuracy challenges, and other operational & maintenance characteristics, of the coal feed rate measurement process monitoring sensors, as compared to the associated compliance monitoring-based, direct measurement CEMS system data used in this verification cross-check.

- There were six (6) natural gas-fired facilities with generation units audit-sampled under this verification program with monthly and annual natural gas fuel use/total heat input data obtained from the Entergy Gas Burn Accounting database. This Entergy gas burn database tracks gas utility purchases and pipeline deliveries to Entergy's electric generating stations, based on the gas utility's invoice/billing data, with the associated gas volume of the amounts delivered being determined by the gas utility pipeline's natural gas flow meter (i.e., a financial meter, operated and maintained by the natural gas utility, outside the Entergy plants' fence lines). These monthly natural gas delivery/burn data from Entergy's gas burn database were then compared to the EPA AMPD database results. The results of these cross-check comparisons showed the facility-wide deviations between the two datasets had an overall average of +0.4% difference for the six (6) total facilities. This very small positive bias is consistent with Entergy's small, natural gas-fired combustion sources' fuel use at the fossil generation stations being captured in the Gas Burn database data, but not so in the EPA AMPD CEMS units' database.

- For the units with hourly data analyzed from the two (2) Entergy virtual site meetings' data acquisition and handling system (DAHS) (at J. Wayne Leonard and Choctaw County), from the respective plant's on-site DAHS computer database archive systems, these hourly, "raw" data sets (i.e., those not yet QC'd initially by Entergy Fossil Environmental, and subsequently validated/revised/approved by EPA), were compared to the final EPA-approved AMPD database 2020 annual data. All five (5) of the respective units agreed to within ~0.1%, respectively. Such low QA/QC adjustments of raw data throughout the 2020 reporting year is a further indicator of the overall reliability of Entergy's reported CEMS data.

Through the course of this verification program, the data management systems and controls employed in the quantification of emissions for Entergy were reviewed, as detailed in the Verification Plan procedures. These systems were found to be effective in the calculation of the GHG Assertion.

APPENDIX

Verification Plan

1 Introduction

This document provides details on the verification scope and process that is planned to conduct a limited level verification of the 2020 organization-wide GHG inventory ("GHG Assertion") for Entergy Corporation ("Entergy"). The GHG Assertion made by Entergy requires the quantification of the emissions produced during calendar year 2020, and is related primarily to stationary combustion of fossil fuels, and from purchased power, as well as from a number of minor sources. An overview of operations for the organization will be provided in the Verification Report (to be prepared at the completion of this verification project).

A Verification Risk Assessment was conducted during the verification planning stage; the results of which are provided in Section 6 of this document. Additionally, the results of the Risk Assessment informed the development of the Sampling Plan (see Section 7). The verification conclusion was documented in the Verification Statement and the verification findings are further described in the Verification Report. The Verification and Sampling Plans are appended to the Verification Report to provide information related to the verification scope and process.

2 Verification Scope

2.1 Objective

The primary objective of this verification engagement is to provide assurance to Entergy, and any external users of Entergy's public GHG reporting, that the GHG Assertion is reliable, and of sufficient quality for:

- Internal purposes, namely tracking towards internal reduction targets, as well as the preparation of annual reports, corporate social responsibility (CSR) reports, and other disclosures; and
- Other external voluntary reporting, primarily to the Carbon Disclosure Project (CDP), the Dow Jones Sustainability Index (DJSI), and the American Carbon Registry (ACR).

2.2 Parties and Users

The person or persons responsible for the provision of the GHG Assertion and the supporting information, as defined in Section 2.23 of ISO 14064-1:2006, is the "**Responsible Party**". For this verification, Entergy is the Responsible Party. Cventure LLC ("Cventure") has been engaged by Entergy to provide a third-party verification of the GHG Assertion.

The "Intended User" is defined in Section 2.24 of ISO 14064-1:2006 as the individual or organization identified by those reporting GHG-related information that relies on that information to make decisions. Entergy (and the public at large) are the intended users of the information contained within the Verification Statement.

2.3 Scope

The verification will be conducted in accordance with *ISO 14064-3: Specification with guidance for the validation and verification of greenhouse gas assertions.* The verification will be designed to provide a limited level of assurance.

The Verification and Sampling Plans were developed based on the relevant criteria described in the:

- The Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard (WRI/WBCSD Revised Edition, 2004)

The following table defines the scope elements specified for the organization.

Scope Element	ISO 14064-1 Definition
Boundary	The organization's corporate-wide boundary, including legal, financial, operational and geographic boundaries
Infrastructure and Activities	The physical infrastructure, activities, technologies and processes of the organization
GHG Sources	GHG sources to be included
GHG Types	Types of GHGs to be included
Reporting Period	Time period to be covered

Descriptions of each of the scope elements application to Entergy's GHG Assertion are presented below.

Boundaries

During the initial verification planning, the organizational boundaries and the sources which would be required to be included in the emissions inventory quantification are reviewed. The procedures to review the GHG Assertion will be designed to support a limited level of assurance. These procedures systematically review:

- the emissions sources included in the quantification procedures;
- the methodologies employed in the quantification procedures;
- data handling, information and management system and associated controls, and quality assurance/quality control activities;
- any changes in the quantification methodology, or to organizational boundaries due to acquisitions or divestitures, as compared to previous corporate GHG emissions reports; and
- the GHG Assertion.

Entergy has chosen to include all company-owned assets and those under a capital lease consistent with *"equity share"* reporting under EPA and WRI/WBCSD GHG reporting protocols.

Infrastructure and Activities

Based on Entergy's website[4], "Entergy Corporation is an integrated energy company engaged primarily in electric power production and retail distribution operations. Entergy owns and operates power plants with

[4] Accessed on December 21, 2020 at http://www.entergy.com/about_us/

approximately 30,000 megawatts of electric generating capacity, including 8,000 megawatts of nuclear power. Entergy delivers electricity to 2.9 million utility customers in Arkansas, Louisiana, Mississippi and Texas. Entergy has annual revenues of $11 billion and approximately 13,600 employees."

GHG Sources

The following key sources comprise the 2020 GHG inventory categorized by Entergy as follows:

Entergy Category	**Emissions Source Category**	**Corporate Emissions Source**	**GHGs Included**
Direct Emissions	Stationary Combustion	Power Generating Units	CO_2, CH_4, N_2O
		Small Stationary Combustion	CO_2, CH_4, N_2O
	Mobile Combustion	Corporate Fleet	CO_2, CH_4, N_2O
	Fugitive Emissions	Natural Gas Trans. & Dist.	CH_4
		Electricity Trans. & Dist.	SF_6
		Cooling/Air-Conditioning (buildings, mobile sources)	HFCs
Indirect Emissions	Purchased Electricity	Purchased Power for Business Operations Outside Entergy Service Territory	CO_2
	T&D Losses	Entergy Purchased Power Consumed on Entergy T&D System	CO_2, CH_4, N_2O
Optional Emissions Sources	Purchased Power (Controllable)	Controllable Purchased Power Sold to Customers	CO_2, CH_4, N_2O
	Product Combustion	Combustion of Natural Gas Distributed to Entergy Customers	CO_2
	Employee Commuting		CO_2, CH_4, N_2O

GHG Types

The emissions portion of the assertion accounts for the following greenhouse gases:

- Carbon Dioxide (CO_2)
- Methane (CH_4)
- Nitrous Oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Sulphur Hexafluoride (SF_6)

Perfluorocarbons and nitrogen trifluoride are not included in Entergy's inventory given the nature of its business, and that these classes of chemicals are not used in any of Entergy's operations in any sizeable amount.

The final inventory will be expressed in both short tons of CO_2 equivalent emissions ("CO_2e"), as well as in metric tonnes CO_2e.

Reporting Period

The GHG Assertion covers the 2020 calendar year, from 1 January 2020 through 31 December 2020, inclusive.

2.4 Materiality

During the course of the verification, individual errors, omissions, or misrepresentations (collectively referred to as discrepancies), or the aggregate of these discrepancies, will be evaluated both qualitatively and quantitatively. Materiality defines the level at which discrepancies in the GHG Assertion or any underlying supporting information precludes the issuance of a limited level of assurance.

The Verification Team is responsible for applying professional judgment to determine if discrepancies could adversely affect the GHG Assertion, and subsequently influence the decisions of the Intended User, in which case, the discrepancies are deemed to be material. Quantitative discrepancies will be calculated individually to determine the impact of the discrepancy as a percentage of the GHG Assertion.

All discrepancies that are outstanding at the conclusion of the verification will be documented in the Verification Report and classified on an individual basis as either material or immaterial.

Materiality Threshold

In the framework of a corporate entity-wide GHG inventory, the concept of materiality is defined in the context of the overall uncertainty in the reported data. A quantity, in this case errors and/or uncertainties associated with reported results, is typically considered to be "material" if it would influence any decision or action taken by users of the information. This definition of materiality is consistent with verification guidelines and goals for the reliability of reported data.

Materiality is not the same as a *de minimus* emissions threshold, for either the exclusion of specific sources from the inventory, or the use of estimated values without ongoing, annual collection of associated activity data. While a *de minimus* exclusion from the inventory would contribute to overall uncertainty, completeness is only one component contributing to overall uncertainty.

A materiality threshold for this limited level of assurance verification was set at 10% for the corporate GHG inventory. Individual discrepancies and the aggregate of individual discrepancies will be analyzed to determine if the materiality threshold has been breached.

Entergy's current GHG Inventory Management Plan and Reporting Document (IMPRD) states that *"...emissions estimated to be less than 1% of the total inventory are considered de minimus unless they are anticipated to change dramatically and grow above this threshold*." The *de minimus* label for emissions sources <1% of the total inventory was selected by Entergy to delineate a threshold for inventory quantification. Sources which fall within the *de minimus* category can continue to use the original emissions estimate for up to five years before having to re-calculate the emissions. Note that *de minimus* sources, as defined by Entergy, are included in the total inventory quantification; they are just not re-calculated every year.

2.5 Principles

ISO 14064 defines five principles that should be upheld in the development of the GHG Assertion. These principles are intended to ensure a fair representation and a credible and balanced account of GHG-related information. The verification procedures developed and executed during the course of this verification will present evidence such that each of these principles is satisfied.

Relevance

Appropriate data sources are used to quantify, monitor, or estimate GHG sources. Appropriate minimum thresholds associated with emissions levels, i.e., from *de minimus* sources, are used to justify the exclusion or the aggregation of minor GHG sources or the number and/or frequency of data points monitored.

Completeness

All sources within Entergy's GHG inventory boundary are included within an identified source category.

Consistency

Uniform calculations are employed between the base year (i.e., year 2000 emissions, for establishing Entergy's baseline emissions levels from which past, and current, GHG emissions reduction target commitments have been made), and current accounting/reporting periods (e.g., years 2010-2020, and 3rd period reduction target commitments, also defined in terms of a year 2000 baseline). Emissions calculations for each source are calculated uniformly. If more accurate procedures and methodologies become available, documentation should be provided to justify the changes and show that all other principles are upheld.

Accuracy

Measurements and estimates are presented, without bias as far as is practical. Where sufficient accuracy is not possible or practical, measurements and estimates should be used while maintaining the principle of conservativeness.

Transparency

Information is presented in an open, clear, factual, neutral, and coherent matter that facilitates independent review. All assumptions are stated clearly and explicitly, and all calculation methodologies and background material are clearly referenced.

2.6 Limitation of Liability

Due to the complex nature of the operations within the organization and the inherent limitations of the verification procedures employed, it is possible that fraud, error, or non-compliance with laws, regulations, and relevant criteria may occur and not be detected.

3 Verification Team

Kevin Johnson has over 30 years energy and environmental consulting experience, focusing over the last half of his career on verification, greenhouse gas and CO_2 emissions inventories, and sustainability programs. In 2005, he founded Carbon Solutions, Inc., an independent consulting services firm, and in 2007 with Wiley Barbour he co-founded Cventure LLC. While a contractor for ERT-Winrock in 2008-9, he served as project manager for several corporate GHG inventory verification projects, and drafted the verification guidelines for the American Carbon Registry. Along with Mr. Barbour he was also a primary author of the ERT Corporate GHG Verification Guidelines. Mr. Johnson has performed several hundred verification projects over the last fifteen plus years. At Cventure, he has also performed CDP reporting benchmarking, and ISO 14064 and GRI sustainability reporting gap analyses, for several commercial clients. Prior to forming Carbon Solutions, Inc., he previously served as the leader of URS Corporation's corporate GHG/climate change practice. Some of his other project management experience includes corporate strategy development, offset project assessments and feasibility studies, GHG emission inventories, protocols, and verification, environmental management information system implementations, and carbon offsets verification and trading support. Some climate change clients include Entergy, Exelon, Eni, El Paso, Bloomberg LP, NewsCorp, 21st Century Fox, T. Rowe Price, Compuware, Kimco Realty, HCP, Broadridge Financial Solutions, FedEx, BlueSource, Albertsons, US Energy Biogas, U.S. DOE, GRI, and several oil producers. While at Radian Corporation during the first half of his career, he had significant field experience with continuous emissions monitoring systems (CEMS). These field testing projects included serving as project manager for on-site field testing task leader on CEMS testing projects at four electric power generation plants, numerous industrial steam plant boilers, and a cement kiln; two of those field testing projects also included CEMS certification relative accuracy test audit (RATA) testing.

Wiley Barbour has over 25 years of experience providing technical and policy support to corporations on issues related to climate policy, greenhouse gas (GHG) emissions, corporate climate change strategy, carbon markets, and sustainability programs. Prior to co-founding Cventure LLC, Mr. Barbour worked as the Executive Director of Environmental Resources Trust (ERT), providing GHG emissions inventory development, carbon market expertise, and verification services to dozens of corporate clients including Wal-Mart, Nike, and Google. During his time at ERT he managed the GHG Registry, the world's first registry for carbon offset projects, as well as the development/launch of the American Carbon Registry for Winrock. Also while at ERT, Mr. Barbour provided program management and sustainability program consulting services to several corporate clients, including Entergy, Nike, NYMEX, AIG, the World Bank, Environmental Defense Fund, the US EPA, and the US DOE. Previously Mr. Barbour served in the U.S. EPA's Policy Office, managing the U.S. GHG Emissions Inventory Program, and serving as the U.S. representative to the Intergovernmental Panel on Climate Change (IPCC) GHG Emission Inventory Task Force.

4 Verification Process

The approach for conducting this verification of Entergy's 2020 GHG Assertion generally follows the activities outlined in the following table. Although these activities are generally completed sequentially, the order may be modified according to circumstances such as scheduling and data availability.

Pre-Engagement	Approach	Execution of Verification	Completion
1. Selection of Lead Verifier **2.** Pre-Engagement Planning **3.** Contract Execution	**4.** Selection of Verification Team **5.** Communication with Client/ Responsible Party **6.** Kick-off Meeting **7.** Draft Verification and Sampling Plan **8.** Verification Risk Assessment	**9.** Site Visit(s) **10.** Conduct Verification Procedures **11.** Issue Clarification & Data Request **12.** Revise & Finalize Verification and Sampling Plan (if/as needed) **13.** Evaluate & Address Outstanding Issues	**14.** Evaluate Evidence **15.** Draft Verification Report & Statement **16.** Issue Verification Report & Statement

4.1 Pre-Engagement

Prior to submitting a proposal to conduct this verification, the pre-engagement planning activities included reviews of previous business engagements/verifications with the Responsible Party, to determine if any previously unresolved conflicts could prevent Cventure from engaging in the verification. Also, the potential for actual or perceived conflicts of interest was reviewed from the perspectives of advocacy, financial interest, familiarity, self-review, and incentives. No threats of conflicts were identified during that review. Following the acceptance of the proposal and signing of a contract for services, the Verification Team was selected, comprised of the individuals as identified in Section 3.

4.2 Approach

An extensive knowledge of the Responsible Party's business, relevant industry, and details of the Corporation itself are required to conduct a thorough verification that can lead to a conclusion. The initial information collected about the Responsible Party and its facilities formed the basis of the draft Verification Plan. The development of the final Verification Plan is an iterative process through the course of the verification, with the resulting plan being updated as new information becomes available, as applicable. There are three types of risk associated with the GHG Assertion, as defined in ISO 14064-3:

- Inherent Risk
- Control Risk
- Detection Risk

The process of designing the Verification Plan involved the development of Verification Risk Assessment for the Responsible Party. The steps in this process include:

- Reviewing the GHG Assertion, and the methodologies employed by the Responsible Party;
- Assessing the likelihood that a material misstatement might exist in the GHG Assertion, if no controls were used to prevent misstatements in the GHG Assertion (i.e., inherent risk);
- Assessing the control environment and corporate governance process (i.e., control risk); and
- Reviewing each emissions source identified by the Responsible Party, and evaluating the contribution of each source to the GHG Assertion and the associated potential material discrepancy for each.

The results of the Verification Risk Assessment inform the development of the verification procedures, which are documented in Section 7 of the Verification Plan, and a summary of the Verification Risk Assessment is provided in Section 6 of the Verification Plan. The draft Verification Plan was provided to the Responsible Party for review and comment before proceeding with the verification.

4.3 Execution of Verification

With draft Verification and Sampling Plans in place, the verification procedures were executed. This process involves collecting evidence, testing internal controls, and conducting substantive testing. Over the course of the verification, the final Verification and Sampling Plan provided in the Verification Report reflects the verification parameters and procedures that were actually implemented.

Virtual Site Meetings

Due to restrictions due to the coronavirus pandemic, virtual site meetings were conducted via teleconference communications. With ISO verification activities "typically" focusing on gathering three types of evidence; physical evidence that can be "seen or touched", such as fuel meters and emission monitors; and physical evidence is gathered by "direct observation of equipment". Based on that, along with the collection and review of extensive documentary and testimonial evidence, Cventure has determined that such virtual site meetings and associated photographic evidence are adequate in demonstrating that Entergy's GHG emissions monitoring systems are in the practice of collecting relevant and reliable data.

The virtual site meetings were conducted by Cventure on February 9-10, 2021 in Louisiana and Mississippi; and were a key step in the execution of the verification. During the course of the virtual site meetings, Cventure interviewed key operations personnel regarding the operations and data management of the Responsible Party. Cventure interviewed key site operations personnel regarding the operations and data management of two (2) large natural gas-fired generation facilities (J. Wayne Leonard in Louisiana, and Choctaw County in Mississippi); to cross-check GHG data, as well as gain a deeper understanding of GHG information systems and controls at the individual plant level. Key Entergy personnel interviewed as part of the virtual site meetings included:

- Emily Swindler, Sustainability Analyst, Sustainability and Environmental Policy
- Environmental Managers/Analysts:
    - J. Wayne Leonard:
        - Seth Folse
        - Austin (William) Langley
    - Louisiana Environmental Support: Richie Corvers
    - Choctaw County: Beau Griffin

Other key Entergy staff who provided primary GHG emissions inventory development data and supporting associated documentation included:

- Jeff Turlington and Dan Hintzman, CEMS Information and Small Stationary Combustion Sources, The Woodlands
- Ryan Gay and Helen Schroff, Gas Settlements, Reporting and Analysis, The Woodlands
- Jill Siekmeier and Garrett Branner, Coal Supply and Purchasing/Rail Car Management System (RCMS), The Woodlands
- Grady Kaough, Power Trading Operations, The Woodlands
- Walter Ross, Natural Gas Operations, New Orleans
- Toby Chu, T&D Environmental (SF_6)

Collecting Evidence and Review of Documentation

Sufficiency and appropriateness are two interrelated concepts that are fundamental to the collection of verification evidence. The decision as to whether an adequate quantity (sufficiency) of evidence has been obtained is influenced by its quality (appropriateness).

Through the execution of the verification procedures as described in Section 7, the Verification Team reviewed three key forms of evidence including physical, documentary, and testimonial:

- Management documentation: procedures related to the collection, safeguarding, and management of the data supporting the GHG Assertion;
- Records: records comprise time-sensitive data, correspondence, and files;
- Interviews: the interviews will provide information regarding operations and data management and will provide evidence to support the sufficiency of data controls; and
- Computer systems: data systems used to capture/manage GHG-related data and calculate the GHG Assertion, will also be assessed by the Verification Team as part of this review.

The following are the key data systems which were reviewed:

- TRADES – controllable power purchases tracking system: hourly purchase amounts from 1/1/2020 to 12/31/2020 inclusive were extracted and sent provided to Cventure by Grady Kaough (via Emily Swindler).
- CEMS data – for fossil generating stations
- Gas purchases data – monthly for all gas-fired electric generating stations – from Ryan Gay: amounts inputted into Accounting.
- Coal purchases/burn data – from Garrett Branner (solid fuels): amounts inputted into Accounting.

Testing and Assessment of Internal Controls

The Verification Team developed a sufficient understanding of the GHG information system and internal controls to determine whether the overall data management system is sound and if it supports the GHG Assertion. This assessment sought to identify any weakness or gaps in the controls that pose a significant risk of not preventing or correcting problems with the quality of the data and examining it for sources of potential errors, omissions, and misrepresentations. It incorporated an examination of three aspects of the Responsible

Party's internal controls: (1) the control environment, (2) the data systems, and (3) the control and maintenance procedures.

Assessment of Data

Substantive testing procedures were used to assess the reasonability and validity of the GHG Assertion. Both quantitative and qualitative analyses were performed to achieve the desired level of assurance. The verification procedures are described in Section 7, as separate tables for each process or activity involved in the quantification and reporting of the GHG Assertion. The verification procedures include verification activities designed to:

- Review the Responsible Party's GHG inventory boundary, including a review of the completeness of emissions sources identified;
- Review the Responsible Party's data sources to ensure the GHG Assertion is calculated based on metered or estimated data;
- Re-calculate the GHG Assertion, which demonstrates transparency and accuracy; and
- Review the GHG Assertion to ensure the emissions calculated by the Responsible Party have been accurately reported.

4.4 Completion

This engagement formally closed after the verification was executed and the Verification Report finalized.

Preparing the Verification Report

The purpose of the Verification Report is to document the verification findings. All discrepancies are described and compared to the materiality threshold individually and in aggregate. The Verification Statement, which presents Cventure's verification conclusion, is included in the Verification Report.

Closing the Engagement

The verification engagement was closed out upon delivery of the final Verification Report.

5 Verification Schedule

The following schedule was followed for the verification project.

Description	Date
Draft Verification Plan to Responsible Party	December 23, 2020
Data/Documentation Requests Sent: for Site Meetings	January 29
Virtual Site Meetings (2)	February 9 and 10
Cventure Receives Draft GHG Inventory from Entergy	February 19
Cventure Receives All Other Supporting Data from Entergy	February 26
Preliminary Verification Review Checks Completed	March 2
Detailed Reviews/Root Documentation Checks Complete	March 8
Draft Verification Statement and Report	March 10
Final Verification Statement and Report	March 12

6 Verification Risk Assessment

There are three types of risk associated with the GHG data management system and the GHG Assertion defined in ISO 14064-3:

- Inherent Risk
- Control Risk
- Detection Risk

The assessed level of risk for this verification dictates the degree of rigor planned for the verification procedures described in the accompanying Sampling Plan. Our established verification procedures ensure a thorough treatment of any risk identified, including determination of magnitude and sensitivity of that risk, during the assessment process. A qualitative risk assessment was completed based on observations made by reviewing and assessing accompanying documentation, as well as assessing available information such as the Q1-Q3 2020 preliminary CO_2 emissions data for Entergy (obtained from the EPA CAM AMPD database in November 2020), and reviewing some other supporting documents.

The *inherent* risk in Entergy's corporate-wide 2020 GHG Assertion emanates from the large and complex nature of the company, the number of parties involved in managing their emissions inventory and developing their assertion, the number of emission sources, a large number of natural gas, oil and coal plants used in the process, and a smaller amount of controllable power purchases occurring throughout the year. Entergy Corporation is an integrated energy company engaged primarily in electric power production and retail distribution operations. Entergy owns and operates power plants with approximately 30,000 megawatts of electric generating capacity, including nearly 9,000 megawatts of nuclear power.

There are numerous large, CEMS-equipped, fossil generation units within Entergy's system (~52 units with significant operations in 2020; i.e., each contributing >0.5-1% of fossil generation direct CO_2 emissions in 2020, with that entire group collectively contributing ~99% of Entergy's power generation GHG emissions). Given the numbers and size of that fleet, there would have to be multiple, long duration control failures to create errors which could lead to a material misstatement of Entergy's entity-wide corporate GHG inventory, under this limited level of assurance GHG inventory verification project. (Note: For example, in the 2010 case of two, highly unusual CEM system failures, which each went undetected for several months: while they affected 2010 annual GHG emissions of each unit by 5-10%, their collective total impact on Entergy's overall 2010 corporate GHG inventory was still less than 1%.)

Due to these reasons, in particular the sheer magnitude of Entergy's overall GHG emissions footprint, and the rigorous EPA regulatory compliance requirements for utility boiler CEMS and associated reporting systems, the *inherent risk* to Entergy's 2020 GHG emissions inventory has been assessed to be low.

Control risk relates to the likelihood that a material misstatement in the 2020 GHG Assertion will not be prevented or detected by Entergy's internal control and data management systems. Control risks are assessed primarily by reviewing data controls and management systems for large fossil generating units and controllable purchased power, both comprising in aggregate over 97% of total company-wide GHG emissions as noted in the 2020 GHG Assertion. This percentage has remained largely the same over the last few years. The largest control risk in relation to the 2020 GHG Assertion is likely to be the manual transcription method in which the inventory is prepared (i.e., emissions values are extracted from various sources and manually entered into an Excel workbook). This is true for all emissions sources, including the largest ones: namely,

stationary combustion and controllable purchased power. For purchased power, a number of data systems (such as TRADES) feed into Entergy's accounting system.

The individual data systems which comprise data input into Accounting undergo QA/QC checks numerous times, both on a monthly and on an annualized basis. For all of the large, CEMS-equipped fossil fuel power generation units, which contributed approximately 88% of Entergy's total 2020 corporate-wide GHG emissions inventory, there are very rigorous measurement, monitoring, and reporting (MMR) requirements established by the U.S. EPA. These CEMS MMR programs, and their robust associated QA/QC activities, serve as the basis for demonstrating regulatory compliance with various federal Clean Air Act and state air permit compliance requirements. Also, the equipment utilized in these CEM systems are well established technologies with demonstrated, long-term track records of accuracy, precision, and reliability. In light of the abovementioned reasons, the control risk is assessed to be low.

The *detection risk* is a measure of the risk that the verification evidence collected and reviewed will fail to detect material misstatements, should such misstatements exist. Unlike *inherent* and *control risks*, which are typically attributes of the facility types and technologies employed therein, *detection risk* is variable but can be maintained at a low level by designing an appropriate number of verification tests, and collecting adequate sample sizes to support those tests. Cventure will conduct a number of sampling tests, focused on large fossil electric generation units and controllable purchased power. These tests are outlined in the Sampling Plan in Section 7. Overall, the Verification Team's procedures have been designed to minimize *detection risk*. Our initial assessment is that *detection risk* will likely be low (in line with previous years' verification exercises), given the large number and appropriateness of the verification sampling/checking tests which are focused on the largest GHG inventory segments, i.e., CEMS units and controllable power purchases (by relative magnitude), of Entergy's 2020 GHG Assertion.

These tests have been designed and targeted at the greatest risk areas within Entergy's overall GHG inventory information management and data quality control system, namely the manual parts of the process.

7 Verification Procedures (Sampling Plan)

Summary of Procedures:

Organization Boundaries and Definition

B1: Organization Boundaries, Infrastructure, and Activities

B2: Review of Operating Conditions

Calculation

C1: True Up and Re-Performance Calculation

C2: Minor/*De Minimus* Emissions – Methodology and Documentation

Data Sources and Supporting Data

D1: Data Collection and Quality Controls

D2: Data Confirmation against External Sources

D3: Data Migration into Inventory

Assertion

A1: Final Verification Assessment

Z1 – Example Procedure Category – Example Procedure Title	
Introduction: This introduction serves to explain the reason the Verification Team is undertaking the procedures described below. For instance, the inclusion of all emission sources ensures that the quantification of the total direct emissions satisfies the principle of completeness.	
Type of Evidence	The *Type of Evidence* can usually be grouped as: Physical Examination, Confirmation, Documentation, Observation, Inquiries of the Client, Re-performance, or Analytical Procedures.
Data Sources	The *Data Sources* describes the form in which the evidence is presumed or is known to be available to the Verification Team: Specific Documents or Assigned Positions, for example.
Objective (specific principles)	The *Objective* serves to focus the procedure as pursuant to one or more of the audit principles of: *Relevance, Completeness, Consistency, Accuracy, or Transparency*.
Specific Activities	• The *Specific Activities* are outlined here.
Error Conditions	• The anticipated *Error Conditions* are listed here to aid the Verification Team. • As the Sampling Plan is a living document, until the end of the verification process, additional error conditions may be identified during the execution of the procedures.

B1 – Facility Boundaries, Infrastructure and Activities	
Introduction: This procedure evaluates the boundaries as defined by the Responsible Party against the GHG Assertion.	
Type of Evidence	Documentation, Observation, Inquiries of the Client, Physical Examination
Data Sources	GHG Inventory Management Plan and Reporting Document (IMPRD), GHG Assertion, Previous GHG Assertions, Entergy Personnel, SEC 10-K and 8-Q filings, Annual Reports, Corporate Statistical Report
Objective (specific principles)	*Completeness*, *Consistency*
Specific Activities	1. Compare the GHG emission sources listed for the organization in the GHG Assertion against GHG emission sources listed in previous GHG Assertions. 2. Compare the GHG emission sources listed for the organization in the GHG Assertion against relevant Annual Reports, 10-K/8-Q SEC filings, Corporate Statistical Report, Entergy's website regarding operations and assets. 3. Compare the GHG emission sources listed for the organization in the GHG Assertion against observations made during site visits for completeness. 4. Interview Entergy personnel regarding changes to the GHG inventory, or any changes in operation which have occurred in the current reporting period. 5. Interview relevant Entergy personnel regarding completeness of inventory described in the GHG Assertion. 6. Compare total GHG emissions for each GHG emissions source in the current period against prior periods. 7. Evaluate the appropriateness and quantification of any *de minimus* emission sources.
Error Conditions	• GHG emission sources that are not reported in the GHG Assertion.

B2 – Review of Operating Conditions	
Introduction: This procedure utilizes analytical procedures to identify changes in the scope of the GHG Assertion. This procedure is initiated during the verification planning stage.	
Type of Evidence	Analytical Procedures, Inquiries of the Client, Documentation (e.g., IMPRD)
Data Sources	GHG Assertion, Entergy personnel, data from major sources such as fossil generation units and purchased power
Objective (specific principles)	*Consistency, Completeness*
Specific Activities	1. Interview Entergy personnel regarding any operational issues which may have caused a significant change to the reported emissions (e.g., asset acquisitions/divestitures, change in operations/dispatch, etc.). 2. Compare total emissions for each GHG emissions source in the current period against prior periods.
Error Conditions	• Significant changes in emissions (including wide variances between 2020 data vs. earlier years, particularly for fossil units, such as CEMS data, or purchased power amounts through TRADES) do not constitute an error condition, but do warrant further investigation, and clarifications, as applicable.

C1: True Up and Re-Performance Calculations	
Introduction: As part of verification procedures, the calculations for each emissions source type will be checked, with an emphasis on large stationary fossil plants (CEMS units), purchased power, and small stationary units, which together comprised ~97% of total corporate-wide direct GHG emissions for 2020. In order to ensure the accuracy of the GHG Assertion, the objective of this procedure is to re-perform the calculations independent from the calculations performed by Entergy.	
Type of Evidence	Documentation, Re-performance

Data Sources	2020 GHG IMPRD and the following: 1. Purchased power: a. Controllable trades (on daily basis from 1/1/2020 to 12/31/2020 from Grady Kaough) from TRADES (Excel). 2. Large stationary fossil plants: b. Selected CEMS reports, from 22 units in total at 11 plants (out of the 53 total Entergy fossil units with significant operations in 2020), to be provided by the Fossil Environmental-CEMS group; in addition to the 5 total units from the virtual site meeting contacts at J. Wayne Leonard and Choctaw County. Sampling is directed at the larger operational units, corresponding to those each representing greater than 0.5-1% of total Entergy-wide direct GHG emissions each. Collectively, this sampling plan represented in total ~60% of Entergy's total power generation direct GHG emissions. The additional 17 units to be sampled include the following: <u>Coal</u> • Independence 1 • Independence 2 • RS Nelson 6 • White Bluff 1 • White Bluff 2 <u>Gas</u> • Baxter Wilson 1 • Gerald Andrus 1 • Hinds H01 • Hinds H02 • Lewis Creek 1 • Ninemile Point 4 • Ninemile Point 5 • Ninemile Point 6A/6B • Sabine 3 • Sabine 4 • Sabine 5 c. Coal purchasing (Garrett Branner) plant daily coal burn data, and six (6) total short-term test burns data from three (3) coal plants. d. Gas settlements (Ryan Gay) gas burn data – all plants – monthly basis. e. CEMS supporting documentation and QA/QC back-up data for selected audit sample units. 3. Small stationary combustion: 2019 data reported to EPA's GHG Reporting Program (GHGRP) through Subpart C.

Objective (specific principles)	*Accuracy, Transparency*
Specific Activities	General 1. Review documentation for completeness 2. Recalculate emissions numbers 3. Perform checks Emissions Factors 4. Calculate emissions from each emission source category from each sampled Facility 5. Confirm and re-calculate (if applicable) emission factors against independent reference material
Potential Error Conditions	General • Disagreement between calculated and reported values; • Disagreement between allocated values or inconsistent methodology. Emissions Factors • Incorrect or out of date emissions factors

Sample Unit	1. Purchased Power: a. All controllable trades (daily) extract in Excel b. Emissions totals for total purchased power on monthly basis 2. Large Stationary Fossil Plants: a. 22 units selected for sampling in relation to EPA CAM AMPD database, and supporting QA/QC documentation review, checks; representing ~60% of total Entergy power generation direct GHG emission levels, including CEMS reports for the following coal- and gas-fired units; requests were made to the CEMS group in Fossil Environmental, or to the respective Entergy site meeting's Environmental Manager/Analyst. **Coal Units** • Independence 1 • Independence 2 • RS Nelson 6 • White Bluff 1 • White Bluff 2 **Gas Units** • Baxter Wilson 1 • Choctaw County CTG1 • Choctaw County CTG2 • Choctaw County CTG3 • Gerald Andrus 1 • Hinds H01 • Hinds H02 • J. Wayne Leonard 1A • J. Wayne Leonard 1B • Lewis Creek 1 • Ninemile Point 4 • Ninemile Point 5 • Ninemile Point 6A • Ninemile Point 6B • Sabine 3 • Sabine 4 • Sabine 5 Note: EPA AMPD database queries for 2020 total CO_2 emissions data will be made for all Entergy fossil generation units.

	For each of the above CEMS-equipped gas- or coal-fired units, Cventure requested the following information for calendar year 2020: • Gas flow meter accuracy test/CEMS gas flow transmitter calibration analysis • CO_2 and stack gas flow meter CEMS RATA annual test results (coal-fired units) • CO_2 CEMS quarterly linearity checks (coal-fired units) • ECMPS (emissions collection and monitoring plan system) feedback reports: Q4 For the gas units at J. Wayne Leonard and Choctaw County, Cventure requested similar information as above from the respective Environmental Managers/Analysts on site, including hourly CO_2 data for 2020 from the on-site CEMS data acquisition and handling systems ("DAHS"). • Small stationary plants – check "fossil fuel generating stations" emissions against EPA GHGRP data for 2019 for confirmatory checks against data and emissions numbers in the 2020 GHG Assertion.
Sample Size	All emissions sources and values for: - Purchased power (controllable trades) - Large stationary fossil plants listed in Sample Unit section (see above) - Small stationary combustion sources

C2 – Minor/*De Minimus* Emissions - Methodology and Documentation	
Introduction: In order to ensure that all relevant emission sources are included in the GHG Assertion, it is necessary to confirm that any *de minimus* emission sources have been appropriately excluded.	
Type of Evidence	Documentation, Discussions with Entergy's Environmental Reporting and Climate Manager
Data Sources	2020 GHG Assertion, IMPRD
Objective (specific principles)	*Accuracy, Transparency*
Specific Activities	1. Review minor/*de minimus* sources and discuss with Entergy Environmental Reporting and Climate Manager 2. Compare to earlier year inventories (2011-2019)
Potential Error Conditions	Material emission source(s) improperly excluded from GHG Assertion
Sample Unit	N/A
Sample Size	Minor/*de minimus* emission categories and sources

D1 – Data Collection and Quality Controls	
Introduction: This procedure is intended to systematically review the Responsible Party's internal procedures and controls that are used to calculate the GHG Assertion.	
Type of Evidence	Documentation, Confirmation, Observation, Inquiries of the Client, Analytical Procedures
Data Sources	Data systems personnel, Entergy personnel, 2020 GHG IMPRD, Standard Operating Procedures and Manuals
Objective (specific principles)	*Completeness, Consistency, Accuracy, Transparency*
Specific Activities	1. Interview Entergy personnel regarding the operation of data transfer systems, including manual data entry procedures and associated controls; 2. Interview Entergy personnel regarding on-site sampling, laboratory and other analytical procedures, etc.; 3. Compare original data sources to data in calculation systems for consistency;
Error Conditions	• Inconsistency between raw data and data supporting the 2020 GHG Assertion • Inconsistency and/or unclear links between information management systems that are of the most relevance to the underlying data for the 2020 GHG Assertion

D2 – Data Confirmation against External Sources	
Introduction: Where possible, this verification procedure was used to gather external evidence to confirm data sources used to quantify reported emissions.	
Type of Evidence	Confirmation, Analytical Procedures
Data Sources	Inventory Report and supporting external data/information: 1. Large fossil generating stations: a. CEMS data – EPA CAM AMPD emissions database query reports and select ECMPS reports. b. Gas and coal burn data – monthly for all gas plants, and daily data for all coal plants sampled (all 12 months for 2020); one or two sets of select daily coal burn data for RS Nelson, White Bluff, and Independence coal plants. c. All CEMS-related QA/QC documentation for J. Wayne Leonard and Choctaw County units, and hourly CO_2 data for those units. 2. Small Stationary Combustion Sources – 2019 EPA GHG Reporting Program data submitted for all fossil generating stations.
Objective (specific principles)	*Accuracy*
Specific Activities	1. Review use of external data sources in GHG inventory for Appropriateness. 2. Compare reported/metered values to those provided by secondary source.
Potential Error Conditions	Unexplained, major discrepancy between metered/reported values and secondary source.
Sample Unit	Typically monthly or annual data primarily, with some cross-checks on daily data as relevant/applicable.
Sample Size	1. Large fossil generating stations: a. CEMS data and select ECMPS reports – for 22 gas and coal-fired units (representing ~60% of Entergy power generation direct emissions). b. Gas and coal burn data – monthly (all 12 months for 2020) – for all gas plants, and daily data for all coal plants; one or two sets of select daily data for White Bluff and Independence plants, and for RS Nelson 6. c. All CEMS-related QA/QC documentation and hourly DAHS CO_2 emissions data for J. Wayne Leonard and Choctaw County units. 2. Small stationary combustion sources – annual 2019 EPA GHG Reporting Program data submitted for all fossil generating stations.

D3 – Data Migration into Inventory	
Introduction: This procedure is intended to review the transfer of data from calculations into the final GHG Assertion, including any summary calculations that were required.	
Type of Evidence	Documentation, Re-Performance
Data Sources	2020 GHG Emissions Inventory Report, IMPRD, and discussions with Entergy's GHG Emissions Inventory Development Manager
Objective (specific principles)	*Accuracy, Transparency*
Specific Activities	1. Recalculate summary calculations performed by Entergy. 2. Compare calculated values to those in the GHG Assertion for transcription accuracy.
Potential Error Conditions	• Discrepancy between summary totals and individual source/emissions type values reported in the 2020 GHG Assertion
Sample Unit	Data reported in the final 2020 GHG Assertion
Sample Size	All relevant information and emissions values

A1 – Final Verification Assessment	
Introduction: This procedure is intended as a final review check of Entergy's 2020 GHG Assertion to ensure all required information is complete and all relevant documentation is included.	
Type of Evidence	Documentation
Data Sources	GHG Assertion
Objective (specific principles)	*Completeness*
Specific Activities	1. Review each page of the 2020 GHG Assertion and IMPRD for completeness and current information; and 2. Provide Responsible Party with documentation, namely a verification statement and report for voluntary reporting purposes.
Potential Error Conditions	• Incomplete, inaccurate, or missing information in the GHG Assertion
Sample Unit	Data fields in the GHG Assertion
Sample Size	All fields in the GHG Assertion