



ENERGY STAR[®] Industrial Plant Certification

Professional Engineers' Guide for Validating Statements of Energy Performance

Introduction

The U.S. Environmental Protection Agency's ENERGY STAR program provides guidance, tools, and recognition to help companies improve the energy performance of their facilities and strengthen the effectiveness of their energy management program. Through ENERGY STAR, the U.S. Environmental Protection Agency (EPA) offers a number of forms of recognition, including certification for facility energy efficiency.

ENERGY STAR certification for industrial plants recognizes individual manufacturing plants whose energy performance is determined to be among the best within their industries in the United States. To identify plants that are achieving best-in-class energy performance, EPA has established the ENERGY STAR energy performance scale that scores plants on a basis of 1 to 100. EPA's benchmark for superior energy performance is a score of 75 or higher on the ENERGY STAR energy performance scale. This scale is offered through a tool called an ENERGY STAR Energy Performance Indicator (EPI), or the Solomon Associates' Energy Intensity Index (*Solomon-EII*[™]) for petroleum refineries.

ENERGY STAR Energy Performance Indicators (EPIs) are sector-specific energy performance benchmarking tools that compare the performance of an industrial plant against similar plants in the United States. Offered in a Microsoft Excel format, EPIs enable the evaluation of the energy performance of existing "whole" plants (not specific manufacturing processes) and consider all energy sources and fuels used at the plant. Energy performance is evaluated in relation to production and other sector-specific factors that affect energy use. Statistical models are used to normalize for key variables between plants, establish a predictive range of energy performance and score energy performance on scale of 1 to 100.

Plants that receive an **ENERGY STAR Energy Performance Score** of 75 or higher are considered by EPA to be efficient and are eligible to apply for ENERGY STAR plant certification. A list of plant types that can be benchmarked and are eligible for ENERGY STAR certification, as well as the EPIs, can be found at www.energystar.gov.

As part of the application process for ENERGY STAR certification, eligible plants must submit a **Statement of Energy Performance** that has been validated by a Professional Engineer. The Statement of Energy Performance is a one-page form generated by the EPI.

Professional Engineers (PE) provide unbiased services and are legally bound to uphold standards of ethics. Because of this high level of professionalism, EPA requires that a PE must validate each Statement of Energy Performance that is used to apply for ENERGY STAR certification.

The PE's primary role is to verify that all the data used to generate the ENERGY STAR Energy Performance Score are accurate and are documented by company records. Additionally, the PE must verify that all information provided in the Statement of Energy Performance is accurate. Services performed by the PE in connection with the ENERGY STAR certification shall in no way diminish or otherwise modify the responsibilities or liability of the owner or operator of the plant.

The PE conducting the verification process for ENERGY STAR certification is permitted to be employed by the company applying for recognition. Additionally, the PE is not required to be licensed in the state where the plant is located. For more information on PE qualifications, see Appendix 1.

This document, the *ENERGY STAR Industrial Plant Certification Professional Engineers' Guide for Validating Statements of Energy Performance*, is intended to assist the PE community in understanding the requirements of validating a Statement of Energy Performance.

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Review and Verification Process Overview

The process for reviewing and validating a Statement of Energy Performance includes:

1. Verify the plant's physical characteristics and eligibility.
2. Verify the plant's operating characteristics and information are accurate.
3. Verify energy consumption and related data are accurate.
4. Verify the Energy Performance Score.
5. Validate the Statement of Energy Performance.

Documentation & Recordkeeping

The PE, or a designee working under the direct supervision of the PE, is expected to visit either the plant or a company office where records and other relevant information can be provided for the data verification process. The PE is not expected to conduct independent measurements or other validations of meters or other measurement devices used to generate data used in the ENERGY STAR Energy Performance Indicator (EPI). The PE is expected to assure that all assumptions and information related to proving eligibility for certification, and all assumptions and data entered into the EPI to generate the plant's Energy Performance Score, are fully documented in the plant's certification file.

Plants seeking ENERGY STAR certification are required to establish a certification file that documents the sources of all data entered into the EPI that are used to generate the plant's Energy Performance Score. This file must be kept at the corporate office for the energy program, and ideally a second copy would be kept on site at the plant. The file may be physical or electronic, but must serve as a static, central repository of all relevant information (e.g., emails discussing assumptions are copied to the official file instead of residing in individual email boxes; data from a company database are copied to the official file in a spreadsheet, screen shot, etc.). The documentation included in this file must be sufficient whereby any person can understand the source of the data used in the EPI. A detailed description of the formal certification file is provided in Appendix 4.

As part of the verification process, the PE will review the certification file to ensure that all the necessary information is present. Lack of information or documentation should be brought to the attention of the plant operator or owner and corporate energy manager who are responsible for ensuring the completion of the file. As a final step of the verification process, the original certified Statement of Energy Performance, the original completed EPI, and the original completed PE Verification Checklist will be added to this file. For EPI's that require an adjustment be made for weather, the source of heating degree day and cooling degree day (HDD/CDD) data, including the website URL and weather station name, must be added to the file as well.

Feedback & Questions

EPA is committed to continually improve the content of this document, and welcomes all comments that may help us do so. All applicable contact information is provided in **Appendix 5**.

EPA thanks you for choosing to take part in the ENERGY STAR plant certification process.

1. Plant Physical Characteristics & Eligibility

Objective

- Verify that the plant applying for ENERGY STAR certification meets the Eligibility and Space Type requirements defined in the ENERGY STAR EPI.
- Verify that the physical characteristics (e.g., address) and any other plant-specific information displayed on a plant's Statement of Energy Performance match those of the plant applying for ENERGY STAR plant certification.

Background

ENERGY STAR certification is only available for specific types of manufacturing plants where EPA has provided an ENERGY STAR EPI to score energy performance from 1 to 100 or where EPA has officially recognized a system such as the Solomon Associates' Energy Intensity Index (*Solomon-EII™*) for petroleum refineries.

EPIs are industry specific and designed for specific types of manufacturing facilities. For petroleum refineries, the scale is integrated into the Solomon Associates' Energy Intensity Index (*Solomon-EII™*). Like the EPIs, *Solomon-EII™* is only applicable to petroleum refineries. Solomon Associates verifies a refinery's energy performance is in the top quartile for the refinery's size.

Requirements of the PE

The PE must verify that the plant meets the definition for the type of plant that can be benchmarked using a specific ENERGY STAR EPI.

The PE must verify the accuracy of the plant's recorded physical characteristics, which include plant name, location, parent company information, and contact names.

The PE must verify that the plant is correctly characterized by the assembled certification file and that the items manufactured at the plant conform to those identified in the "Instructions" section of the EPI. This means a PE must read the "Instructions" section of the relevant EPI to determine the eligibility of a plant for use of an EPI.

Criteria from the EPI

The plant applying for ENERGY STAR certification must meet the eligibility and space type criteria or definition established on the "Instructions" tab of the EPI. For some industries and EPIs, there may also be specific product or floor space requirements that must be met to be eligible for ENERGY STAR certification. Any calculations made to confirm meeting any required minimums must be documented in the certification file.

The plant must be located within the United States of America or its territories. A 5-digit ZIP code must be recorded for plants.

All data used to track energy performance must be associated with and connected to the plant named on the Statement of Energy Performance.

Hints & Tips

For most plants, the eligibility and space type requirements as recorded in an EPI's Instructions section can be demonstrated by reviewing the products made at the plant or the presence of specific manufacturing processes.

For industries and plants where minimum criteria, such as a required product mix, have been established and discussed in the "Instructions" section, the plant operator or owner or corporate energy manager must provide the PE with additional information supporting these calculations (i.e., data beyond that otherwise included in the EPI and documented in the certification file).

2. Plant Operating Characteristics

Objective

- Verify the accuracy of all non-energy plant and production characteristics entered into the EPI, and all data used to calculate the plant's Energy Performance Score reported on the Statement of Energy Performance.
- Review the 12-month period used for benchmarking the plant's annual energy performance to ensure the same period is used consistently for all data inputs for the EPI and application for certification.

Background

The integrity of ENERGY STAR certification is dependent upon the credibility and accuracy of data used to generate the score.

Each EPI requires a variety of data inputs to indicate production activity (e.g., tons, production hours, value of product). Depending on the particular EPI, additional non-production data may be required as well, such as Heating and Cooling Degree Days. For information on the requirements, see the "Instructions" section of the EPI.

Requirements of the PE

The PE must ensure that the production-related data and other required data used in the EPI to calculate the Energy Performance Score are accurate and can be traced to an original record or primary data source. The PE must ensure that the tracking methods used for the primary data source are reasonable; that data from the primary data source were correctly transcribed; that data were converted to the units specified by the EPI; that unit conversions use conversion factors specified in the EPI, and where none are specified, that generally accepted engineering conversion factors are used. When conversion factors are used, the source of the factors must be reported in the certification file.

The PE must also confirm that data used in calculating a plant's score reflect the whole facility and not a single process or individual part of the plant unless that portion of the plant is separately metered to meet the eligibility requirements for that type of plant.

The PE must confirm that the 12-month period used for production and related data is consistent with the period that is used for energy consumption. The ending point of the data period used must also be within 4 months of applying for ENERGY STAR certification.

The PE must confirm that all data, calculations, and assumptions are documented in the certification file.

The PE is not expected to conduct independent measurements, but instead should consult company records and supporting documentation.

Criteria from the EPI

All production and related data entered in the "Plant Characteristics" section of the EPI must accurately reflect the plant's operating and/or physical characteristics. These data must reflect actual production levels and/or the physical conditions that are documented on the original records and source documents contained in the formal certification file.

All production and related data entered into the EPI must be documented to an original record, such as a production report, design document, or to an established data source, such as a production database, accounting system, or other electronic data tracking systems used by the company. Original sources of data include plant production records, accounting systems, site plans, weather stations, and other records or systems that provide reasonable documentation. Copies of relevant source data must be included in the formal certification file.

Hints & Tips

All production and related data used in the EPI are entered in the “Plant Characteristics” section. Definitions of these data types are provided in the “Instructions” section of the EPI.

Original specifications, design documents, and "as-built" drawings can be used to confirm certain operating characteristics.

Electronic data systems, such as accounting systems, energy dash boards, and data historians, are acceptable primary sources of data. Reports from these systems can be used as an original record.

3. Energy Consumption

Objective

- Verify the accuracy of all relevant energy sources used at the plant, that all are entered into the EPI and used to calculate the plant's Energy Performance Score, and that the information reported on the Statement of Energy Performance is accurate.

Background

The integrity of ENERGY STAR certification is dependent upon the credibility and accuracy of data used to generate the score.

Each EPI requires that all energy sources are entered into the Energy Consumption section of the EPI. For information on the requirements, including handling of specific energy sources, see the "Instructions" section of the EPI.

Requirements of the PE

The PE must review energy consumption data and documentation for each energy source used at the plant to ensure that energy numbers entered into the EPI match the actual energy consumption of the plant for the period being benchmarked. The PE must ensure that the tracking methods used for the primary data source are reasonable; that data from the primary data source were correctly transcribed; that data were converted to the units specified by the EPI; that unit conversions use conversion factors specified for the EPI, and where none are specified, that generally accepted engineering conversion factors are used. When conversion factors are used, the source of the factors must be reported in the certification file.

In situations where the plant purchases compressed air, steam, chilled water, etc., the PE must confirm that those energy sources are properly accounted for based on the methods prescribed in the "Instructions" section in the EPI.

In situations involving plants that use electricity produced from on-site renewables, the PE must confirm that those sources were properly accounted for using the methods prescribed in the "Instructions" section of the EPI. For electricity produced from on-site generation, and energy recovered from by-products of the manufacturing process, the PE must confirm that those sources were treated consistent with the methods prescribed in the "Instructions" section of the EPI.

The PE must verify that no fuels were excluded. However, if a plant exports electricity or steam, the quantity of those exports must be subtracted from the plant's energy use total consistent with the methods prescribed in the "Instructions" section of the EPI.

The PE must verify that all energy sources required by the EPI have been entered into the energy consumption section of the EPI and that the 12-month period used to calculate energy consumption is identical to the period used for production and all related data.

The PE must confirm that all data, calculations, and assumptions are documented in the certification file.

The PE is not expected to conduct independent measurements, but instead should consult company records and supporting documentation.

Criteria from the EPI

Plants are expected to account for and include in their EPI computation all forms of energy that are required for operating the plant and manufacturing processes unless specifically stated otherwise. Considerations for the most common sources of fuels are outlined below. For any possible discrepancies between guidance provided below and the Instructions section of the EPI, the “Instructions” section of the EPI will prevail.

- Grid Electricity – When electricity is purchased from the grid, verify that the user tracked the total amount of as-billed electricity consumption. This will typically be found on monthly electric bills.
- Natural Gas – When natural gas is purchased from a supplier, verify that the user tracked the total amount of as-billed natural gas consumption. This will typically be found on monthly gas bills.
- Fuel Oil and Propane – If fuel oil or propane is combusted, then the amount of fuel purchased and combusted must be tracked. Unlike electricity and natural gas, these fuels may not be delivered or measured on a month-to-month billing period.
- Coal – If coal is purchased and consumed on site, the quantities or MMBtu value of the fuel used must be tracked. Like fuel oil, these fuels will likely not be delivered or measured on a monthly billing period.
- District Energy (hot water, chilled water, steam) – If district energy is purchased from the utility, the quantity of annual consumption should be accounted for using the method provided in the “Instructions” section of the EPI. A value in MMBtu (million British thermal units) for these energy sources must be entered into the EPI. Verify that the user has accounted for the annual amount of as-billed district energy consumption. Verify that these purchases of district energy have been converted to MMBtus and are included in the plant’s total energy consumption.
- On-Site Combined Heat and Power (CHP) – CHP systems consume a single input fuel (e.g., natural gas) to produce both heat and electricity. In these situations, the input fuel is the required data point to be included in the EPI, not the thermal and electric outputs. Verify that all input fuels are included in the total energy consumed. This may be found on monthly bills for a fuel such as natural gas, or from other irregular billing periods for diesel oil or coal. The user should not include the amount of heat and electricity generated from the CHP system in their total energy calculations.
- On-Site Solar and Wind Electricity –The amount of electricity that is generated from on-site solar or wind energy sources and used on site is required to be included in the EPI. This requirement is discussed in the “Instructions” section in the EPI under Energy Accounting. Plants should account for and subtract out any energy sold to the grid as such energy was not used to power operations at the plant. Confirm that all energy generated and used on-site from these sources is accounted for in full.
- Wood and Biomass – If wood or biomass fuels are purchased primarily for fuel and are consumed on site, the quantities or energy value of these fuels must be accounted for. Like fuel oil, these fuels will likely not be delivered or measured in a month-to-month billing period. Internal company records are considered acceptable records for documenting fuel use.
- Waste fuels – If waste fuels, such as municipal solid waste, animal by-products, tire-derived fuels (TDF), and other non-production by-products are combusted as fuel, either quantity or MMBtu value of these fuels must be accounted for. Like fuel oil or biomass, these fuels may not be delivered or measured on a month-to-month billing period and thus monthly billing may not be available. Internal company records are considered acceptable records for documenting fuel use.

- Process gases –In general, gases created by certain industrial processes that are combusted as fuel are not counted and entered into the EPI since recovery of these gases represents an efficiency measure.

Hints & Tips

It is the responsibility of the plant to provide the reviewing PE with sufficient information and documentation to verify energy consumption. If sufficient information is not provided, then a PE must not place his/her seal on the Statement of Energy Performance. It is important for the PE to make sure that the plant has prepared their certification file and can easily explain how energy consumption is calculated.

Energy cost information is not required to be entered into the EPI.

It is not necessary for the PE to independently obtain monthly bills from utility companies to verify energy consumption. The PE is permitted to use records provided by the company. If the PE is confident based on his/her review of plant data for energy sources and meters that all of the energy is accounted for, then independently obtained monthly utility bills are not required.

Monthly utility bills also are not always needed to verify and calculate the annual energy use for each fuel type. The PE should use his/her professional judgment to determine if a plant-wide energy tracking system that fully tracks consumption of all fuels may be used instead of utility bills, particularly if that tool is integrated with an electronic billing system.

Electric outputs from co-generation units should not be included as part of the plant's annual energy consumption, however the fuel inputs required by the co-generation system must be accounted for and included in the EPI.

4. The ENERGY STAR Energy Performance Score

Objective

- Confirm that the plant's energy and non-energy data inputs have been correctly entered into the EPI and that an ENERGY STAR Energy Performance Score of 75 or higher has been achieved.

Background

ENERGY STAR certification is dependent on a plant achieving an Energy Performance Score of 75 or higher for its plant type using the relevant EPI. The score is calculated using energy, production, and other data.

The ENERGY STAR EPI generates an Energy Performance Score and other metrics. These outputs of the tool are provided in the "Results" section of the EPI. In addition to the plant's score and other metrics, the EPI provides example metrics for an "Average Plant" (i.e., energy performance at the 50th percentile) and "Efficient Plant" (i.e., energy performance at the 75th percentile).

Requirements of the PE

For purposes of ENERGY STAR certification, the PE must verify the numbers used in the EPI are accurate and have been correctly entered into the tool. The PE is not asked to calculate an independent Energy Performance Score or conduct additional analysis to confirm the plant's energy performance.

The PE must ensure that the data entered into the EPI:

- ✓ Are in the right field.
- ✓ Are in the correct units.
- ✓ Are the correct numbers.
- ✓ Reflect all necessary data that must be entered.
- ✓ Have not been specifically omitted or altered for the purpose of increasing the Energy Performance Score.

The PE must confirm that the plant has not omitted or altered data to increase their Energy Performance Score.

The PE must verify that the plant has achieved a score of 75 or higher.

Criteria from the EPI

All data entered into ENERGY STAR EPI tool must be consistent with the data records and documentation established for the plant during the benchmarking period. These data must be entered into the tool correctly and cover a consecutive 12 month period.

Hints & Tips

Some PEs prefer to use a blank Energy Performance Indicator and enter the plant's data independently based on the annualized data provided in the documentation files. This step can provide a cross check since the EPI should provide the same results.

5. Validating the Statement of Energy Performance

Objective

- Complete the verification of the plant's energy performance and validate the Statement of Energy Performance.

Background

The Statement of Energy Performance is a stand-alone document designed to communicate the plant's energy performance. The Statement of Energy Performance contains the plant's address, owner's address, contact information for the corporate energy manager and the PE, the Energy Performance Score, and estimates of greenhouse gas and energy savings.

The Statement of Energy Performance must be validated by the PE who stamps and signs the document. When all information is validated by a licensed PE, the Statement of Energy Performance becomes an official document that can be used to apply for ENERGY STAR certification. The role of the licensed professional is to certify the accuracy of the data supporting a score of 75 or greater using an EPI to evaluate the energy performance of a plant.

PEs provide unbiased services and are legally bound to uphold standards of ethics. Because of this high level of professionalism, experience, and expertise, a licensed professional is required to validate each Statement of Energy Performance that is used to apply for the ENERGY STAR certification.

Requirements of the PE

The licensed professional must verify that the data entered into the EPI to produce an ENERGY STAR Energy Performance Score of 75 or greater are accurate. This includes verifying the plant's physical characteristics, operating characteristics, and energy consumption as discussed in the previous sections of this guide. It also includes verifying the plant's location and address. When the PE is satisfied that the data used in the EPI are accurate, documented in the certification file, and represent the plant for which ENERGY STAR certification is being sought, the PE must stamp and sign a hard copy of the Statement of Energy Performance and indicate on the Statement of Energy Performance if the PE stamp is embossed.

To complete the verification process, the PE must provide a stamped/signed Statement of Energy Performance containing all required license information, and completed "PE Verification Checklist," which both become part of the certification file. The PE Verification Checklist is included as Appendix 3 of this Guide.

Hints & Tips

The EPI produces estimates of energy and CO₂ emissions savings. These are provided to illustrate the difference between the benchmarked plant's energy use and estimated CO₂ emissions as compared to an "average plant" that is defined as having an energy performance score at the 50th percentile. The PE is not asked to verify these numbers.

It is the responsibility of the owner / operator of the plant to determine whether to use an internal PE employed by the company or to hire an outside PE (third party) to conduct the review. Further, the PE does not have to be licensed in the same state in which the plant is located.

Appendix 1: Qualifications for Professional Engineers

A Professional Engineer must possess a current license in any U.S. state, Canadian Province, or territory of the U.S. or Canada and be in good standing with any applicable licensing authorities. The PE need not necessarily be licensed in the state in which the subject plant is located. The PE should be familiar with industrial processes and energy management.

The PE may be employed by the company owning or operating the plant seeking certification, or may be a third party contracted for verification purposes.

While not required, it is helpful for the PE hold a Certified Energy Manager (CEM) certification from the Association of Energy Engineering.

Appendix 2: Recognition Application Process

Applying for ENERGY STAR plant certification is the responsibility of the corporate energy manager. The following information is provided for informational purposes. .

Background

Select manufacturing plants located within the U.S. and its territories are eligible to receive ENERGY STAR certification from the U.S. Environmental Protection Agency (EPA) when they score within the top quartile of energy performance. Industrial plants that are eligible include:

- Auto Assembly Plants
- Cement Manufacturing Plants
- Cookie and Cracker Baking Plants
- Container Glass Manufacturing Plants
- Flat Glass Manufacturing Plants
- Frozen Fried Potato Processing Plants
- Integrated Paper Mills
- Juice Processing Plants
- Petroleum Refineries (*Solomon-EII*[™] scoring system)
- Pharmaceutical Manufacturing Plants
- Pulp Mills
- Wet Corn Mills

Energy performance for plants in these industries is determined using an Energy Performance Indicator (EPI). EPIs, industry-specific benchmarking tools, score a plant's energy performance and compare it to that of similar plants in its U.S. industry and generate an Energy Performance Score on a scale of 1 to 100. EPA defines a plant to be energy-efficient when its Energy Performance Score is at the 75th percentile or higher (equivalent to a minimum score of 75 on the EPIs).

Definition of a plant type and relevancy of an EPI to a specific plant is discussed in the EPI tool. Current EPIs may be downloaded for use at www.energystar.gov/industrybenchmarkingtools.

Determining Eligibility

Plants eligible for the ENERGY STAR certification must meet the following criteria:

1. Score 75 or better using the current version of the EPI for the plant type utilizing data that are current for the operation of the plant (defined as within 4 months of the period ending date on the Statement of Energy Performance). For petroleum refineries, scoring within the top 25 percent of refineries for similar crude capacity in the U.S. using *Solomon-EII*[™] scoring system.
2. Satisfy the specific eligibility criteria on the "Instructions" sheet of the applicable EPI.
3. Satisfy the following environmental compliance criteria:
 - a. No unresolved high priority violations of the Clean Air Act (CAA) within the past 3 years,
 - b. No CAA Consent Decrees within the last year or noncompliance of an existing CAA Consent Decree, and,
 - c. No CAA criminal convictions or pleas within the past 5 years or current criminal investigations involving an employee(s) or corporate officer(s).

For questions regarding a plant's compliance standing, please send an email to certifiedplants@energystar.gov.

Before Applying

The corporate energy manager must ensure that all eligibility criteria are met for the plant. To meet criteria 1 and 2 in the "Determining Eligibility" section above, the following steps must be performed (criteria 3 will be determined by EPA through an internal compliance screen):

1. *Establish a Formal Certification File:* The corporate energy manager must establish and maintain for five years, a formal certification file that incorporates the energy- and plant-related data required for the EPI. This formal certification file must contain copies of all documents that provide the necessary information for computing an EPI plant score and proving plant eligibility. The information contained in this file will be reviewed by the Professional Engineer (PE) who must verify its accuracy prior to validating the Statement of Energy Performance. Examples of this information include raw data used to compute a score in the EPI along with supporting records such as fuel purchases, utility bills, other specific inputs as used in the EPI, internal records of production for the period of application, conversion factors, calculations, and related assumptions.

The formal certification file is a stand-alone, self-explanatory file and must be maintained for five years after certification. All source material, assumptions, communications, etc., are documented such that anyone reviewing the file would not need the corporate energy manager to explain why or how any aspect was executed.

The file may be physical (e.g., a three-ring binder), electronic (e.g., a specific “folder” or directory saved on a corporate file server), or some combination. Regardless of format, it is necessary all information is compiled in a centrally accessible location so an auditor can obtain immediate access to the formal certification file upon notification of an audit. For example, emails exchanged within the company or with EPA during the application process would be archived to the formal certification file, not maintained in a corporate email box. Centralizing all information helps assure that the formal certification file would not be lost when personnel change jobs.

The formal certification file contains all information submitted to EPA (or its designated reviewer in the case of proprietary data claims – currently Duke University, and, in the case of petroleum refineries, Solomon Associates) as part of the certification application. This includes the completed original Energy Performance Indicator, the original PE-stamped Statement of Energy Performance, and copies of any communications exchanged with EPA regarding questions, clarifications, and exceptions related to certification instructions and requirements. It will also include the original PE Verification Checklist at the conclusion of PE verification.

The formal certification file contains all source data underlying numbers entered into the EPI. This means:

- ✓ All energy data are supported by utility invoices or a download from a company database. Any conversion factors, calculations, or assumptions are documented.
- ✓ All measures of production (e.g., units produced, material inputs, labor hours) are supported by company records. Any conversion factors, calculations, or assumptions are documented along with the sources of all such information.
- ✓ Any metrics affecting eligibility to use the EPI are supported by calculations. For example, if a minimum of 50% of production must be from specific production categories in order to use the EPI, the documentation would include detailed records of products produced, how those products are mapped to the categories specified in the EPI, and the calculated total share of production from the relevant categories.
- ✓ All other characteristics unique to a specific type of EPI (e.g., maximum daily throughput, number of kilns, automobile wheelbase) are documented using types of records appropriate to the specific characteristic.
- ✓ Where required, all weather data (heating/cooling degree days) are supported by the underlying data and calculations.

Note: It is not adequate to document source data by referring to the company database from which it was derived. Company databases are often revised due to utility adjustments, and internal and external audits and reconciliations. If data are taken from a database, some static record of the source data (e.g., monthly data downloaded into a non-linked spreadsheet, a screen-shot of the data from the date on which the data were used to populate the EPI) must be maintained in the formal certification file to show that the source data matched the values entered into the EPI on the date of EPI preparation.

Lastly, the formal certification file contains all non-data background information supporting the plant's eligibility for certification, and the preparation of submitted materials.

2. *Complete the EPI:* Download the most current version of the correct EPI for your industry and input the necessary data identified on the EPI. The dataset must include 12 months of continuous data ending within four months of when the application is submitted.

Petroleum Refineries are scored by a separate system operated by Solomon Associates. For further information, please contact Celia He at Celia.He@SolomonOnline.com.

3. *Have a PE Review EPI and Validate the Statement of Energy Performance:* When the correct data are entered into the EPI and the plant scores 75 or higher, a PE must verify that all information used to generate an Energy Performance Score is accurate and documented in company records. The PE must sign and stamp the Statement of Energy Performance attached to the EPI. In providing his/her stamp upon the Statement of Energy Performance, a PE validates that the data entered into the EPI are accurate. To do this, the PE may visit the plant or may engage a representative to conduct all or part of the site visit while under his/her direction and control. However, the Statement of Energy Performance must still bear the seal and signature of the licensed PE who remains responsible for all work performed by others under his/her direction and control.

The PE validating the Statement of Energy Performance is not required to be licensed in the same state where the plant is located, and may be licensed within any Canadian Province, or territory of the U.S. or Canada. The PE may also be employed by the company.

For more information regarding the PE verification process, please refer to the *ENERGY STAR Industrial Plant Certification Professional Engineers' Guide for Validating Statements of Energy Performance*.

For Petroleum Refineries, Solomon Associates performs the PE verification. For further information, please contact Celia He at Celia.He@SolomonOnline.com.

4. *Determine EPI Third Party Verification Option:* The EPI score must be verified by EPA by replicating the results using the same plant data used by the corporate energy manager. There are two options for verification. Applicants will choose an option based on whether they consider the information used to generate an EPI score proprietary.
 - a. Non-Proprietary: If data used to calculate the EPI are not considered proprietary information, send a print out of the EPI along with the Statement of Energy Performance to EPA as part of the application.
 - b. Proprietary: If any information used to generate an EPI score is deemed proprietary, a copy of the EPI should be sent to Dr. Gale Boyd, the EPA-designated EPI reviewer. **Prior to sending the EPI, the applicant must notify EPA and receive approval to send the EPI to Dr. Boyd.** Dr. Boyd will recalculate the score using the propriety inputs and notify EPA of the outcome. Dr. Boyd's communication with EPA will become part of the official EPA file for this plant if EPA awards it with the ENERGY STAR plant certification. Additionally, the applicant

must indicate on the Statement of Energy Performance that this option will be used to verify the EPI results.

Upon request, Dr. Boyd will provide a non-disclosure agreement between Duke University and the applicant for this purpose. Company-provided non-disclosure agreements will not be considered.

Dr. Gale Boyd's may be contacted at gab7@econ.duke.edu or (919) 660-6892.

For Petroleum Refineries, Solomon Associates performs the third party verification. For further information, please contact Celia He at Celia.He@SolomonOnline.com.

5. Complete the additional application forms which include the Plant Award Application Letter and the Plant Award Specification Sheet. These forms may be found on the ENERGY STAR website or upon request from the applicant.

Application and Materials

After the corporate energy manager has determined eligibility and completed the requirements discussed in the "Before Applying" section above, copies of the following application documents will need to be sent via email to EPA at the address listed below under the "Where to Apply" section. The information that must be received by EPA in order to process applications for the ENERGY STAR plant certification includes:

1. Plant Award Application Letter printed on company letterhead and signed by the corporate energy manager. Applicant should keep the original on hand for their formal certification file.
2. Statement of Energy Performance validated by the PE. Applicant should keep the original on hand for their formal certification file.
3. EPI if data are non-proprietary. If proprietary, the EPI should not be submitted with the application. Upon the request from EPA, the proprietary EPI should be sent to the EPA-designated EPI reviewer (Dr. Gale Boyd), who will then send a signed review letter to EPA. For Petroleum Refineries, the Solomon Associates PE certification letter serves as the EPI and should be submitted with the application. For EPIs that adjust for weather, use the [Degree Days Calculator](#) to determine the HDD and CDD, and include a copy in the application. Applicant should keep original EPI on hand for their formal certification file.
4. Plant Award Specification Sheet.
5. PE Verification Checklist. Applicant should keep the original on hand for their formal certification file.

All application material can be found on the ENERGY STAR website, or you may request them from EPA.

EPA Application Review

Upon receipt of an application, EPA will conduct a review and make the decision on whether the plant is eligible for the ENERGY STAR plant certification. EPA will follow this procedure:

1. Review application for completeness. Contact applicant if any information is missing.
2. Perform a compliance screen to ensure the plant meets the compliance criteria in the "Determining Eligibility" section above.
3. Ensure any other industry-specific requirements have been met.
4. Verify that an EPI score of 75 or higher is produced by the current EPI tool by using the data contained in the EPI printout, or upon receipt of a confirmation letter from an EPA-designated EPI reviewer.
5. If a plant meets all requirements and has a favorable EPA review, EPA will inform the corporate energy manager of the award of the ENERGY STAR plant certification.

Award of the ENERGY STAR Plant Certification

Award of the ENERGY STAR plant certification represents plant energy performance at the time of the application. Certified plants are awarded a congratulatory letter to the company's CEO and corporate energy manager, a certificate of achievement, decals for identifying the plant's certification, the option to

obtain flags/banners/plaques, and listing in the ENERGY STAR certified plant [registry](#). The certification year is dated with the year the application is approved, regardless of the period ending date on the Statement of Energy Performance. Therefore, corporate energy managers are encouraged to reapply in subsequent years to earn the ENERGY STAR plant certification.

EPA Review of Records

The integrity of ENERGY STAR, its representation of energy efficiency at a national level, and the expectation of the U.S. public that EPA must uphold the impartiality of any environmental labeling effort it undertakes requires that the process for awarding the ENERGY STAR plant certification be public and transparent.

EPA reserves the right to request and review any records which support the data used to produce the energy performance score for a plant. Therefore, corporate energy managers must maintain a formal certification file for each plant for which EPA has awarded the ENERGY STAR certification. The formal certification file must be maintained for five years.

When to Apply

A plant is welcome to apply any time during the year. However, the EPA will certify a plant with the year its application is approved, regardless of the period ending date found on the plant's Statement of Energy Performance and the receipt of application.

Please note that the application must be received within 4 months of the Statement of Energy Performance period ending date.

Note: If this is your first time applying for plant certification, we recommend contacting EPA prior to beginning the application process.

Reapplication for the ENERGY STAR Plant Certification

Plants that have been awarded with the ENERGY STAR certification are eligible to reapply one year after the ending date of their period of performance used for the prior year application, and must use 12 months of continuous non-overlapping data.

Where to Apply

Corporate energy managers should submit application packages via email to certifiedplants@energystar.gov.

Additional Information

For further information and/or questions, please send an email to certifiedplants@energystar.gov.

Appendix 3: PE Verification Checklist

Plant: _____

Date: _____

PE: _____

Review location: ___ Corporate Office ___ Site Visit

Plant Physical Characteristics and Eligibility

- The plant has established a formal certification file. Yes___ No___ If so, where?

- The plant's activities conform to the eligibility description in the EPI Instructions. Yes___ No___
 - These plant activities are described in the certification file. Yes___ No___
- Relevant calculations of plant activities (e.g., space requirements) meet specified minimums in the EPI Instructions. Yes___ No___
 - These plant calculations supporting eligibility are documented in the certification file. Yes___ No___

Plant Operating Characteristics

- All data are confirmed to belong to the plant named in the EPI and plant certification documents. Yes___ No___
- All data are confirmed to match the same 12-month time period specified on the Statement of Energy Performance. Yes___ No___
- The plant's data is current (defined as within 4 months of the Period Ending Date on the Statement of Energy Performance). Yes___ No___
- All original source data (e.g., production records) has been reviewed to assure all data were correctly transcribed into a spreadsheet, database, etc. Yes___ No___
 - If original source data are not available for review, it can be verified that appropriate internal verification procedures are applied to any company databases used for applicable data. Yes___ No___
- All calculations made using the original source data have been reviewed to assure accuracy, correct conversion of units, and use of generally accepted and uniformly applied conversion factors. Yes___ No___
- Annual totals resulting from all calculations match the values entered into the EPI. Yes___ No___
- Annual totals resulting from all calculations match the units specified in the EPI. Yes___ No___
- Inputs or calculations for other required plant physical characteristics (e.g., square footage, kilns) are consistent with source documents provided in the certification file. Yes___ No___
- All source data, calculations, and assumptions have been documented in the formal certification file. Yes___ No___

Note that referral to a company database is not adequate; the file must include a static record of data drawn from the database on the date of EPI completion (i.e., the date the EPI score and Statement of Energy Performance were produced).
- All production metrics (e.g., quantities, capacities, labor hours) follow the procedure specified in the EPI instructions. Yes___ No___

- Source data, calculations, and documentation for all other data types (e.g. HDD/CDD) have been reviewed and documented in the formal certification file. Yes___ No___

Energy Data

- All data confirmed to belong to the plant are named in the EPI and plant certification documents. Yes___ No___
- All data confirmed to match the same 12-month time period are specified on the Statement of Energy Performance. Yes___ No___
- The plant's data are current (defined as within 4 months of the Period Ending Date on the Statement of Energy Performance. Yes___ No___
- All original source data (e.g., utility invoices) have been reviewed to assure all data were correctly transcribed into a spreadsheet, database, etc. Yes___ No___
 - If original source data are not available for review, it can be verified that appropriate internal verification procedures are applied to any company databases used for applicable data. Yes___ No___
- All calculations made using the original source data have been reviewed to assure accuracy, correct conversion of units, and use of generally accepted and uniformly applied conversion factors. Yes___ No___
- Annual totals resulting from all calculations match the values entered into the EPI. Yes___ No___
- All source data, calculations, and assumptions have been documented in the formal certification file. Yes___ No___

Note that referral to a company database is not adequate; the file must include a static record of data drawn from the database on the date of EPI completion (i.e., the date the EPI score and Statement of Energy Performance were produced).

- Annual totals resulting from all calculations match the units specified in the EPI. Yes___ No___
- All energy sources used at the plant are included in the EPI. Yes___ No___
- All energy sources follow the energy accounting procedure specified in the EPI instructions. Yes___ No___
- Calculations for energy transfers (purchased steam, compressed air) have been reviewed for accuracy. Yes___ No___

ENERGY STAR Energy Performance Score

- All the required data have been entered into the EPI. Yes___ No___
- The data have been properly entered into the EPI. Yes___ No___
- The plant's EPI score is 75 or higher. Yes___ No___

PE Verification

- The PE review of the plant has been documented (e.g., site visit vs. corporate office, date, personnel met with, findings/corrections/recommendations from the review). Yes___ No___
- The PE completed the Verification Checklist for submission to EPA, and added the original document to the formal certification file. Yes___ No___
- The PE signed, stamped – indicating if embossed, and provided the required license information on the Statement of Energy Performance for submission to EPA, and added the original document to the formal certification file. Yes___ No___

Please note any company personnel involved in review:

Please note any findings, corrections, or recommendations from the review:

Appendix 4: Formal Certification File

The formal certification file is a stand-alone, self-explanatory file and must be maintained for five years after certification. All source material, assumptions, communications, etc., are documented such that anyone reviewing the file would not need the corporate energy manager to explain why or how any aspect was executed.

The file may be physical (e.g., a three-ring binder), electronic (e.g., a specific “folder” or directory saved on a corporate file server), or some combination. Regardless of format, it is necessary all information is compiled in a centrally accessible location so an auditor can obtain immediate access to the formal certification file upon notification of an audit. For example, emails exchanged within the company or with EPA during the application process would be archived to the formal certification file, not maintained in a corporate email box. Centralizing all information helps assure that the formal certification file would not be lost when personnel change jobs.

The formal certification file contains all information submitted to EPA (or its designated reviewer in the case of proprietary data claims – currently Duke University, and, in the case of petroleum refineries, Solomon Associates) as part of the certification application. This includes the completed original Energy Performance Indicator, the original PE-stamped Statement of Energy Performance, and copies of any communications exchanged with EPA regarding questions, clarifications, and exceptions related to certification instructions and requirements. It will also include the original PE Verification Checklist at the conclusion of PE verification.

The formal certification file contains all source data underlying numbers entered into the EPI. This means:

- ✓ All energy data are supported by utility invoices or a download from a company database. Any conversion factors, calculations, or assumptions are documented.
- ✓ All measures of production (e.g., units produced, material inputs, labor hours) are supported by company records. Any conversion factors, calculations, or assumptions are documented along with the sources of all such information.
- ✓ Any metrics affecting eligibility to use the EPI are supported by calculations. For example, if a minimum of 50% of production must be from specific production categories in order to use the EPI, the documentation would include detailed records of products produced, how those products are mapped to the categories specified in the EPI, and the calculated total share of production from the relevant categories.
- ✓ All other characteristics unique to a specific type of EPI (e.g., maximum daily throughput, number of kilns, automobile wheelbase) are documented using types of records appropriate to the specific characteristic.
- ✓ Where required, all weather data (heating/cooling degree days) are supported by the underlying data and calculations.

Note: It is not adequate to document source data by referring to the company database from which it was derived. Company databases are often revised due to utility adjustments, and internal and external audits and reconciliations. If data are taken from a database, some static record of the source data (e.g., monthly data downloaded into a non-linked spreadsheet, a screen-shot of the data from the date on which the data were used to populate the EPI) must be maintained in the formal certification file to show that the source data matched the values entered into the EPI on the date of EPI preparation.

Lastly, the formal certification file contains all non-data background information supporting the plant's eligibility for certification, and the preparation of submitted materials.

Appendix 5: Contact Information

Contact information for questions:

- **E-mail:** certifiedplants@energystar.gov
- **Website:** www.energystar.gov/industry