Part III - Administrative, Procedural, and Miscellaneous

Additional Guidance for the Qualifying Advanced Energy Project Credit Allocation Program under Section 48C(e)

Notice 2023-44

SECTION 1. PURPOSE

.01 This notice provides additional guidance to clarify and modify Notice 2023-18, 2023-10 I.R.B. 508, which established the program under § 48C(e)(1) of the Internal Revenue Code (Code)[1] to allocate $10 billion of credits ($4 billion of which may be allocated only to projects located in § 48C(e) Energy Communities Census Tracts[2]) for qualified investments in eligible qualifying advanced energy projects (§ 48C(e) program). The Department of the Treasury (Treasury Department) and the Internal Revenue Service (IRS) released Notice 2023-18 on February 13, 2023, to establish the § 48C(e) program and to provide initial program guidance.

.02 The additional guidance contained in this notice provides general guidance for the § 48C(e) program, including (1) definitions of the term “facility” for purposes of

[1] Unless otherwise specified, all “section” or “§” references are to sections of the Code.

[2] The term “§ 48C(e) Energy Communities Census Tracts” is defined in section 5.06 of Notice 2023-18.

§§ 48C and 45X, (2) clarification regarding projects placed in service prior to being awarded an allocation of qualifying advanced energy project credits (§ 48C credits), (3) the process for submitting concept papers and joint applications for Department of Energy (DOE) recommendations and for IRS § 48C(e) certifications (§ 48C(e) applications), (4) information regarding § 48C(e) Energy Communities Census Tracts, (5) the selection criteria used to evaluate whether a project merits a DOE recommendation, (6) the procedure for informing the IRS and the DOE of a significant change in plans for a project that has received an allocation of § 48C credits, and (7) the disclosure of certain information. In addition, this notice provides information regarding when the DOE eXCHANGE portal, an online application portal available at *https://48C-exchange.energy.gov/* (or any successor interface) and referred to in this notice and its appendices as the "eXCHANGE portal," will begin accepting concept papers and the timeline for submitting a § 48C(e) application.

.03 This notice republishes Appendices A and B included in Notice 2023-18 with certain modifications. Appendix A is modified to provide minor clarifications to definitions and examples. Appendix B is modified to provide technical review criteria, and application content requirements. This notice also includes a new Appendix C that provides a list of § 48C(e) Energy Communities Census Tracts.

.04 As stated in section 1.03 of Notice 2023-18, the Treasury Department and the IRS anticipate providing at least two allocation rounds under the § 48C(e) program. For the first allocation round (Round 1) of the § 48C(e) program, the Treasury Department and the IRS anticipate allocating up to $4 billion of § 48C credits with approximately $1.6 billion in § 48C credits to be allocated to projects located in § 48C(e)

Energy Communities Census Tracts. Although the Treasury Department and the IRS intend to allocate a total of $10 billion of § 48C credits with not less than $4 billion of § 48C credits to projects located in § 48C(e) Energy Communities Census Tracts over the duration of the § 48C(e) program, depending upon applications received, the Treasury Department and the IRS may not allocate exactly 40 percent of the total § 48C credits allocated in Round 1 to projects located in § 48C(e) Energy Communities Census Tracts. To be considered for an allocation of § 48C credits in the § 48C(e) program for Round 1, taxpayers must first submit concept papers to the IRS through the eXCHANGE portal. Following submission of a concept paper, DOE will provide a letter encouraging or discouraging the taxpayer's submission of a § 48C(e) application. DOE begins the acceptance process for a taxpayer's § 48C(e) application 7 days after the date of the letter of encouragement or discouragement. To be considered for the § 48C(e) program, a taxpayer's § 48C(e) application must be submitted no later than 45 days after DOE begins the acceptance process for the taxpayer's § 48C(e) application. The IRS will make all Round 1 allocation decisions by March 31, 2024.

SECTION 2. BACKGROUND

.01 For purposes of the § 38 general business credit, § 46 provides that the amount of the investment credit for any taxable year is the sum of the credits listed in § 46. That list includes the § 48C credit, which was originally enacted by § 1302(b) of the American Recovery and Reinvestment Act of 2009 (2009 Act), Public Law 111-5, Division B, Title I, Subtitle D, 123 Stat. 115, 345 (February 17, 2009), to provide an allocated credit for qualified investments in qualifying advanced energy projects.

.02 In addition to certain amendments made by the Tax Increase Prevention Act

of 2014, Public Law 113-295, 128 Stat. 4010 (December 19, 2014), § 48C was amended most recently by § 13501 of Public Law 117-169, 136 Stat. 1818 (August 16, 2022), commonly known as the Inflation Reduction Act of 2022 (IRA). Section 13501(a) of the IRA added § 48C(e) to the Code to extend the § 48C credit and to provide an additional credit allocation of $10 billion. Section 13501(b) of the IRA modified the definition of a "qualifying advanced energy project" contained in § 48C(c)(1)(A). Section 13501(c) and (d) of the IRA made conforming amendments to § 48C(c)(2)(A) and (f). The amendments made by § 13501 of the IRA became effective on January 1, 2023. See § 13501(e) of the IRA.

.03 Notice 2023-18 established the § 48C(e) program and provided initial program guidance. Section 3 of Notice 2023-18 provided definitions for purposes of the § 48C(e) program of the following terms: "qualifying advanced energy project," "specified advanced energy property," "eligible property," "placed in service," "industrial facility," "manufacturing facility," and "recycling facility." Section 4 of Notice 2023-18 described how the prevailing wage and apprenticeship requirements that apply under § 48C(e)(5) and (6) impact the rate of § 48C credits allocated under the § 48C(e) program. Section 5 of Notice 2023-18 provided a general description of the § 48C(e) program and section 6 of Notice 2023-18 provided initial information regarding the procedures for concept papers and § 48C(e) applications.

.04 Section 5 of Notice 2023-18 states that the IRS will consider a project under the § 48C(e) program only if DOE provides a recommendation and ranking to the IRS. As stated in section 5 of Notice 2023-18, DOE will provide a recommendation only if it determines that the project has a reasonable expectation of commercial viability and

merits a recommendation based on the criteria provided in additional § 48C(e) program guidance intended to be issued by May 31, 2023. This guidance comprises the additional § 48C(e) program guidance referred to in Notice 2023-18.

SECTION 3. SECTION 48C AND SECTION 45X FACILITIES

.01 Section 48C Facility. For purposes of § 48C, a "facility" is the eligible property that makes up the qualified investment that is part of the qualifying advanced energy project (§ 48C Facility). Section 48C(c)(2) defines the term "eligible property" to mean any property that—

(1) Is necessary for the production or recycling of property described in § 48C(c)(1)(A)(i), re-equipping an industrial or manufacturing facility described in § 48C(c)(1)(A)(ii), or re-equipping, expanding, or establishing an industrial facility described in § 48C(c)(1)(A)(iii),

(2) Is tangible personal property, or other tangible property (not including a building or its structural components), but only if such property is used as an integral part of the qualified investment credit facility, and

(3) With respect to which depreciation (or amortization in lieu of depreciation) is allowable.

.02 Section 45X Facility. For purposes of the § 38 general business credit, the advanced manufacturing production credit determined under § 45X(a) (§ 45X credit) for any taxable year is an amount equal to the sum of the credit amounts determined under § 45X(b) with respect to each eligible component (as defined in § 45X(c)(1)) that is produced by a taxpayer and, during the taxable year, sold by the taxpayer to an unrelated person. Section 45X(c)(1)(B) provides that the term "eligible component"

does not include any property which is produced at a facility if the basis of any property which is part of such facility is taken into account for purposes of the credit allowed under § 48C after August 16, 2022 (the date of enactment of the IRA). For purposes of the § 45X credit, all tangible property that comprises an independently functioning production unit that produces one or more eligible components will be treated as a single facility (§ 45X Facility). The Treasury Department and the IRS intend to further define the term "production unit" for purposes of the § 45X credit in forthcoming guidance addressing various § 45X issues.

.03 Interaction between Sections 48C and 45X. For purposes of evaluating the interaction between §§ 48C and 45X, the eligible component is defined as provided in § 45X(c)(1). A § 45X Facility cannot produce an eligible component for purposes of the § 45X credit if such facility includes eligible property that has been taken into account for purposes of the credit allowed under § 48C after August 16, 2022.

.04 Example. Taxpayer owns and operates a manufacturing site that contains Production Unit A and Production Unit B. Production Unit A manufactures photovoltaic wafers and Production Unit B manufactures photovoltaic cells. Production Unit A and Production Unit B are arranged in serial fashion, in that the wafer produced by Production Unit A is utilized in Production Unit B. Production Unit A and Production Unit B function independently and produce eligible components. Taxpayer was allocated a § 48C credit for Production Unit A under the § 48C(e) program and subsequently placed it in service in taxable year 2024. Production Unit A is eligible property that is part of Taxpayer's § 48C Facility and Taxpayer claimed a § 48C credit for Production Unit A in taxable year 2024. Therefore, Production Unit A fails to qualify as § 45X Facility under

§ 45X(c)(1)(B). Production Unit B is tangible property that comprises an independently functioning production unit that produces eligible components. Production Unit B can be treated as a § 45X Facility because the tangible property comprising Production Unit B is not eligible property that is part of a § 48C Facility.

SECTION 4. PLACED IN SERVICE REQUIREMENT

.01 In General. Eligible property (as defined in § 48C(c)(2)) is placed in service for purposes of the § 48C(e) program in the earlier of the following taxable years:

(1) The taxable year in which, under the taxpayer's depreciation practice, the period for depreciation with respect to such eligible property begins; or

(2) The taxable year in which the eligible property is placed in a condition or state of readiness and availability for a specifically assigned function, whether in a trade or business or in the production of income.

.02 No Section 48C(e) Allocation if Placed in Service Prior to Allocation Award. Eligible property placed in service prior to being awarded an allocation of § 48C credits under the § 48C(e) program is not eligible to receive such an allocation.

SECTION 5. CONCEPT PAPERS AND § 48C(e) APPLICATIONS

.01 In General. For each project for which a taxpayer seeks a § 48C(e) allocation for Round 1, the taxpayer must use the eXCHANGE portal to submit to the IRS (1) a concept paper for DOE consideration and (2) the § 48C(e) application. If a § 48C(e) application does not (1) propose a qualifying advanced energy project (as described in Appendix A) or (2) include all of the information required in Notice 2023-18 and this notice (including the additional § 48C(e) program guidance contained in the appendices), DOE may either decline to consider the § 48C(e) application or request

that the applicant resubmit its § 48C(e) application with the missing information. If DOE does not provide a recommendation to the IRS on the § 48C(e) application, the IRS will not consider the § 48C(e) application.

.02 Taxpayer submissions. Notice 2023-18 requires taxpayers to submit their concept papers and § 48C(e) applications through the eXCHANGE portal. See Appendix B for additional information regarding the application process.

.03 Program Timeline. Generally, the § 48C(e) program will proceed as follows:

(1) A taxpayer submits a concept paper through the eXCHANGE portal. The eXCHANGE portal will open no later than June 30, 2023. Taxpayers must submit concept papers prior to 12:00 PM (noon) Eastern Time on July 31, 2023.

(2) DOE reviews the concept paper and sends the taxpayer a letter encouraging or discouraging the submission of a § 48C(e) application. After receiving a letter of encouragement or discouragement from DOE, the taxpayer determines whether to submit a § 48C(e) application. All taxpayers who submit concept papers are eligible to submit a § 48C(e) application, regardless of DOE's response to its concept paper.

(3) Taxpayers submit § 48C(e) applications through the eXCHANGE portal. See Appendix B for additional information.

(4) DOE reviews the § 48C(e) applications for compliance with eligibility and other threshold requirements.

(5) If the § 48C(e) application complies with all eligibility and threshold requirements, DOE conducts a technical review of the application to form a DOE recommendation.

(6) DOE provides a recommendation to the IRS regarding the acceptance or

rejection of each § 48C(e) application and a ranking of all § 48C(e) applications.

(7) The IRS makes a decision regarding the acceptance or rejection of each § 48C(e) application based on DOE's recommendation and ranking. The IRS notifies each taxpayer that submitted a § 48C(e) application of the outcome by sending a letter allocating § 48C credits in the case of an acceptance (Allocation Letter) or letter denying the requested allocation in the case of a rejection (Denial Letter). The IRS will make all Round 1 allocation decisions by March 31, 2024. In the case of an acceptance, the amount of § 48C credits allocated to a project will be based on the taxpayer's qualified investment in the qualifying advanced energy project and whether the taxpayer intends to apply for and receive an allocation of § 48C credits calculated at the 30 percent credit rate (see Notice 2023-18, section 5.07). In the case of a denial, a taxpayer may request a debriefing with DOE regarding its review of the taxpayer's § 48C(e) application. The Denial Letter will include instructions for requesting a DOE debriefing.

(8) To be eligible to claim a § 48C credit allocated under the § 48C(e) program with respect to a taxpayer's § 48C Facility, the earliest that the taxpayer may place in service the § 48C Facility is after receiving the Allocation Letter with respect to that § 48C Facility. See section 4 of this notice.

(9) Within 2 years of receiving an Allocation Letter, a taxpayer must notify DOE that the certification requirements have been met by submitting this information through the eXCHANGE portal. See Appendix B for additional information.

(10) DOE notifies the taxpayer and the IRS that it has received the taxpayer's notification that the certification requirements have been met.

(11) The IRS certifies the § 48C Facility by sending a letter (Certification Letter).

(12) Within 2 years of receiving the Certification Letter, the taxpayer notifies DOE that the § 48C Facility has been placed in service by submitting such information through the eXCHANGE portal. See Appendix B for additional information. If the taxpayer has not placed the § 48C Facility in service within the required 2-year period or has not notified DOE that the § 48C Facility has been placed in service within the required 2-year period, then the § 48C credit allocated to the taxpayer's project is forfeited.

(13) DOE notifies the taxpayer and the IRS that it has received the taxpayer's notification that the § 48C Facility has been placed in service or notification that the taxpayer will not place the § 48C Facility in service within the required 2-year period. See Section 5.09 of Notice 2023-18.

(14) If the taxpayer has placed the § 48C Facility in service within the required 2-year period and has notified DOE, then the taxpayer claims the § 48C credit on its Federal income tax return for the taxable year in which the § 48C Facility was placed in service.

(15) If the taxpayer chooses to withdraw a submission at any phase of the § 48C(e) program (whether at the concept paper phase, the § 48C(e) application phase, the post-Allocation Letter phase, or the post-Certification Letter phase), the taxpayer must provide a formal withdrawal notification through the eXCHANGE portal.

SECTION 6. SECTION 48C ENERGY COMMUNITIES CENSUS TRACTS

.01 In General. Section 48C(e)(2) provides that the total amount of § 48C credits which may be allocated under the § 48C(e) program may not exceed $10 billion (National § 48C(e) Limitation), of which not greater than $6 billion may be allocated to

qualified investments that are not located within § 48C(e) Energy Communities Census Tracts. This notice refers to the aggregate amount of § 48C credits that will be allocated to § 48C(e) Energy Communities Census Tracts from the National § 48C(e) Limitation as the § 48C(e) Energy Community Allocation.

.02 Timing. The determination of whether a project is located in a § 48C(e) Energy Communities Census Tract will be made at the time that DOE provides recommendations to the IRS and will not be redetermined.

.03 Location. A § 48C Facility is treated as located within a § 48C(e) Energy Communities Census Tract, if the § 48C Facility satisfies the square footage test (Footprint Test). The Footprint Test provides that a § 48C Facility is considered located within a § 48C(e) Energy Communities Census Tract if 50 percent or more of its square footage is in an area that qualifies as a § 48C(e) Energy Communities Census Tract. This percentage is determined by dividing the square footage of the § 48C Facility that is located in a § 48C(e) Energy Communities Census Tract by the total square footage of the § 48C Facility.

.04 Resources to Determine Whether a § 48C Facility is Located Within a § 48C(e) Energy Communities Census Tract. A taxpayer can determine whether its project is located within a § 48C(e) Energy Communities Census Tract by referring to the list of Section 48C(e) Energy Communities Census Tracts provided by Appendix C. Additionally, a map of § 48C(e) Energy Communities Census Tracts has been provided by the DOE and is available at *www.energy.gov/infrastructure/48C*.

SECTION 7. SELECTION CRITERIA

.01 In General. Section 48C(d)(3) lists the selection criteria used to determine

which qualifying advanced energy projects merit a DOE recommendation. Section 48C(d)(3)(A) provides that in determining which qualifying advanced energy projects to certify under this section the Secretary of the Treasury or her delegate (Secretary) is to take into consideration only those projects where there is a reasonable expectation of commercial viability. Further, § 48C(d)(3)(B) provides that in determining which qualifying advanced energy projects to certify under this section the Secretary is to take into consideration projects that—

(1) Will provide the greatest domestic job creation (both direct and indirect) during the credit period,

(2) Will provide the greatest net impact in avoiding or reducing air pollutants or anthropogenic emissions of greenhouse gases,

(3) Have the greatest potential for technological innovation and commercial deployment,

(4) Have the lowest levelized cost of generated or stored energy, or of measured reduction in energy consumption or greenhouse gas emission (based on costs of the full supply chain), and

(5) Have the shortest project time from certification to completion.

.02 Technical Review Criteria Generally. DOE will implement the selection criteria and evaluate whether a project merits a DOE recommendation based on the following four technical review criteria, as described further in Appendix B:

(1) Commercial viability,

(2) Greenhouse gas emissions impacts,

(3) Strengthening U.S. supply chains and domestic manufacturing for a net-zero

economy, and

(4) Workforce and community engagement.

.03 Description of Technical Review Criteria. These four technical review criteria—described in more detail in Appendix B—are based on § 48C(d)(3), which originally applied to earlier allocations made under the 2009 Act, and are intended to further the overall purposes of the IRA.

(1) Commercial Viability. The first criterion of commercial viability is a key criterion for determining which qualifying advanced energy projects merit consideration based on § 48C(d)(3)(A) and, consistent with § 48C(d)(3)(B)(iv) and (v), will help to identify projects with the lowest levelized cost and shortest time frame for completion.

(2) Greenhouse gas emissions impacts. The second criterion of greenhouse gas emissions impacts, consistent with § 48C(d)(3)(B)(ii), will help to identify projects with the greatest net impacts in avoiding or reducing anthropogenic emissions of greenhouse gases.

(3) Strengthening U.S. supply chains and domestic manufacturing for a net-zero economy. The third criterion of strengthening U.S. supply chains and domestic manufacturing for a net-zero economy is consistent with § 48C(d)(3)(B)(ii) and (iii), and will help to identify impacts on domestic job creation and the potential for technological innovation and commercial deployment.

(4) Workforce and community engagement. The fourth criterion of workforce and community engagement, consistent with § 48C(d)(3)(B)(i), (ii), and (v), will look to additional facts that can inform how and to what extent projects will lead to domestic job creation, reduce barriers that might otherwise increase project completion time, and

have an impact on avoiding or reducing local pollution, including non-greenhouse gas air pollution.

(5) Interrelationship of criteria. The four technical review criteria are also interrelated and work together to help further multiple goals under the statute, and they are consistent with the IRA's broader goals of increasing the deployment of renewable energy resources, increasing energy security and domestic investment in the renewable energy supply chain, and helping to ensure that benefits of the clean energy economy are shared broadly.

SECTION 8. SIGNIFICANT CHANGE IN PLANS

.01 In General. As provided in section 8.01 of Notice 2023-18, any taxpayer that submits a concept paper or a § 48C(e) application must inform DOE and the IRS if the plans for the project change in any significant respect from the plans set forth in the concept paper and the § 48C(e) application. A significant change is any change that a reasonable taxpayer would conclude might have negatively influenced DOE in recommending or ranking the project or the IRS in issuing the Allocation Letter had the taxpayer described the change when submitting the § 48C(e) application. See section 8.01 of Notice 2023-18 for how a significant change in plans affects a § 48C(e) application.

.02 Change in Plan Procedure. If a project has a significant change in plans:

(1) The taxpayer must upload a letter to the eXCHANGE portal as an appendix informing DOE and the IRS that the project has a significant change in plans as compared to the description of the project included in the concept paper or § 48C(e) application.

(2) If the taxpayer submits a letter informing DOE and the IRS that the project has a significant change in plans, the submitted letter constitutes an acknowledgment that the project no longer qualifies as a qualifying advanced energy project or is no longer located within a § 48C(e) Energy Communities Census Tract, and if submitted after the taxpayer receives an Allocation Letter, that the taxpayer forfeits its § 48C credit allocation.

SECTION 9. DISCLOSURE OF INFORMATION

.01 Section 48C(e)(7) provides that upon making a certification under § 48C(e), the Secretary is required to disclose publicly the identity of the applicant and the amount of the credit certified with respect to such applicant. Accordingly, the IRS will publish the results of Round 1 of the § 48C(e) program and will disclose the identity of the taxpayer and the amount of the § 48C credits allocated to the taxpayer with respect to projects that have been allocated a § 48C credit and have received a certification.

.02 After a taxpayer receives an allocation through the § 48C(e) program, the eXCHANGE portal will ask the recipient-taxpayer if the taxpayer consents to disclosure of information in addition to information that is required by statute to be disclosed. The additional information may include the location of the taxpayer's § 48C Facility and a brief description. A taxpayer's decision to authorize or not to authorize the disclosure of any additional information will not impact the taxpayer's § 48C credit allocation.

SECTION10. PAPERWORK REDUCTION ACT

Any collection burden associated with this notice is accounted for in OMB Control Number 1545-2151.

This notice does not alter any previously accounted for information collection

requirements and does not create new collection requirements not already approved by the Office of Management and Budget.

SECTION 11. EFFECT ON OTHER DOCUMENTS

Notice 2023-18 is clarified and modified.

SECTION 12. DRAFTING INFORMATION

.01 The principal author of this notice is John M. Deininger of the Office of Associate Chief Counsel (Passthroughs & Special Industries). For further information regarding this notice contact Mr. Deininger on (202) 317-6853 (not a toll-free call).

.02 Any questions or comments regarding the non-tax aspects of this notice can be submitted to the Department of Energy at *48CQuestions@hq.doe.gov*. DOE may post questions and answers related to this notice on the eXCHANGE portal at *https://48C-exchange.energy.gov* (select 48C from the list of options to view questions and answers specific to notice). Any questions or comments received under this notice are subject to public release pursuant to the Freedom of Information Act. DOE is under no obligation to respond to, or acknowledge receipt of, any questions or comments submitted under this notice and any responses provided do not constitute legal advice provided by either DOE or the IRS.

APPENDIX A
Qualifying Advanced Energy Projects

THIS APPENDIX A SUPERSEDES APPENDIX A OF NOTICE 2023-18.

For the purposes of determining eligibility for the § 48C credit, a "qualifying advanced energy project" means:

1. Clean Energy Manufacturing and Recycling Projects

A qualifying advanced energy project in this category re-equips, expands, or establishes an industrial or manufacturing facility for the production or recycling of specified advanced energy property:

a. Property designed to be used to produce energy from the sun, water, wind, geothermal deposits (within the meaning of § 613(e)(2)), or other renewable resources.

(i) Examples of eligible property include solar panels and their specialized support structures; wind turbines, towers, floating offshore platforms, and related equipment; power electronics designed for use with eligible solar or wind property; equipment to concentrate sunlight to generate heat for industrial processes or to convert it to electricity; geothermal turbines and heat pumps; hydropower turbines; and other products directly used to generate electrical and/or thermal energy from renewable resources, as well as the specialized components, subcomponents, and materials incorporated into any such eligible property, including equipment for sensing, communication, and control.

(ii) Examples of ineligible property include equipment for applications other than the conversion of energy from renewable resources for delivering electricity, building heat, or industrial process heat such as a gas turbine generator set which burns natural gas, or a building that houses a boiler to heat water from fossil fuel.

b. Fuel cells, microturbines, or energy storage systems and components.

(i) Examples of eligible property include stationary batteries; stationary hydrogen fuel cells; hydrogen storage vessels; microturbines for combined heat and power systems; pumps and turbines for pumped hydropower storage systems; and the specialized components of any such equipment, including equipment for sensing, communication, and control.

(ii) Examples of ineligible property include heavy gas turbines.

(iii) **Note:** For electric vehicle batteries and fuel cells for vehicles see the "light-, medium-, or heavy-duty electric or fuel cell vehicles" project class.

c. Electric grid modernization equipment or components.

(i) Examples of eligible property include grid equipment for electricity delivery; power flow, control, and conversion, such as transformers, power electronics, advanced cables and conductors, advanced meters, breakers, switchgears, composite poles, converters, medium-voltage direct current (MVDC) and high-voltage direct current (HVDC) lines, grid-enhancing technologies, and electrical steel or alloys used in transformer cores. Examples of eligible property also include the specialized components of any such grid modernization equipment, including components for sensing communication, and control.

(ii) Electric vehicle supply equipment qualifies under the "light-, medium-, or heavy-duty electric or fuel cell vehicles" project class. Storage technologies for grid applications qualify under the "fuel cells, microturbines, or energy storage systems and components" project class.

d. Property designed to capture, remove, use, or sequester carbon oxide emissions.

(i) Examples of eligible property include carbon capture equipment or other property necessary to compress, treat, process, liquefy, pump or perform some other physical action to capture carbon oxide emissions, including solvents; membranes; sorbents; chemical processing equipment; compressors; monitoring equipment; and injection equipment; and well components such as packers, casing strings, CO_2-resistant concrete, steel tubulars, wellhead, valves, and sensors suitable for use in Underground Injection Control (UIC) Class VI wells. Eligible property also includes transportation equipment, as in a system of gathering and distribution infrastructure. These include pipelines, temporary or transportation-related carbon oxide storage tanks, valves, sensors, and control panels that serve in collecting carbon oxides captured from an industrial facility or multiple facilities for the purpose of transporting that carbon oxide. Additional examples include equipment to convert carbon oxides through mineralization, thermochemical, electrochemical, photochemical, plasma-assisted, or other catalytic process approaches to carbon-based products such as synthetic fuels, chemicals, solid carbon products, and inorganic materials.

(ii) Examples of ineligible property include scrubbers for conventional air pollutants (except those that are required to remove pollutants upstream of carbon capture equipment for technical performance reasons), energy generation equipment (except as related to energy recovery at carbon capture systems), and refining equipment.

e. Equipment designed to refine, electrolyze, or blend any fuel, chemical, or

product which is renewable, or low-carbon and low-emission. For the purposes of Round 1 of the § 48C(e) program, such fuels, chemicals, and products include:

(i) Renewable transportation fuel which:
(A) is suitable for use as a fuel in a vehicle, marine vessel, or aircraft,
(B) is derived from or co-processed with:
(I) a biomass feedstock, or
(II) hydrogen produced from renewable energy and inputs, and
(C) is not derived from palm fatty acid distillates or fossil fuels, including coal, natural gas, and petroleum.

A qualifying advanced energy project does not include any portion of a project for the production of any property which is used in the refining or blending of any transportation fuel (other than renewable fuels, as described herein).

(ii) Clean hydrogen produced with a well-to-gate lifecycle greenhouse gas (GHG) emissions rate of not greater than 4 kg CO_{2e} per kg H_2, in accordance with the definition of qualified clean hydrogen for purposes of the credit under § 45V.

(iii) Other fuel which:
(A) is derived from or co-processed with a renewable feedstock or achieves at least a 50 percent reduction in lifecycle GHG emissions in comparison with the conventional alternative,
(B) is not a transportation fuel, and
(C) is not derived from palm fatty acid distillates or fossil fuels, including coal, natural gas, and petroleum.

(iv) Product or chemical which:
(A) is derived from or co-processed with a renewable feedstock or achieves at least a 50 percent reduction in lifecycle GHG emissions in comparison with the conventional alternative,
(B) is suitable for use as an industrial feedstock, and
(C) is not derived from palm fatty acid distillates or fossil fuels, including coal, natural gas, and petroleum.

(v) Examples of eligible property include electrolyzers, mixing devices, pumps, separation devices, bioprocessing equipment, biomass preprocessing equipment, and reactors, so long as they are intended for use to produce eligible fuels, chemicals, and products, as demonstrated through engineering specifications or offtake agreements.

(vi) Examples of eligible fuels, chemicals, and products produced by eligible equipment include hydrogen produced through electrolysis powered by low- or zero-emission energy; low-emissions ammonia; renewable biofuels, including sustainable aviation fuel and fuels intended to displace petroleum fuel in on-road and off-road applications; and low-emissions chemicals, basic organic chemicals, polymers, and resins.

(vii) Examples of ineligible fuels and chemicals would include those derived solely from fossil resources produced through conventional petroleum and natural gas refining.

Instructions for calculating well-to-gate lifecycle GHG emissions rates are provided in Appendix B, Section V: Additional Instructions on the Data Sheet Submission.

f. Property designed to produce energy conservation technologies (including residential, commercial, and industrial applications).

(i) Examples of eligible energy conservation property include technologies and grid-interactive devices eligible for residential or commercial efficiency improvements for purposes of the § 25C credit or the § 179D tax deduction, as well as equipment that directly reduces net energy use in industrial applications, such as ultra-efficient heat pumps, insulation, ultra-efficient hot water systems, sensors, controls, and similar advanced efficiency technologies.

(ii) Examples of ineligible energy conservation property includes those that reduce electricity usage by increasing direct natural gas or other fossil fuel use and/or lead to increased system-level emissions.

g. Light-, medium-, or heavy-duty electric or fuel cell vehicles, as well as technologies, components, or materials for such vehicles, and associated charging or refueling infrastructure.

(i) Examples of eligible property include battery electric, plug-in hybrid electric, or fuel cell cars, trucks, and buses, as well as the specialized components of those vehicles, such as batteries, anode and cathode components and materials, electric drive systems, fuel cells, and other materials and subcomponents.

(ii) Examples of eligible charging or refueling infrastructure include electric vehicle supply equipment (EVSE), components from the grid connection to the vehicle, bidirectional charging equipment, and components used in hydrogen refueling stations (e.g., hydrogen compressors, pumps, storage vessels, and dispensing equipment).

(iii) Examples of ineligible property include internal combustion engine vehicles of all sizes, non-plug-in hybrid vehicles of less than 14,000 pounds gross vehicle weight rating, and their components, as well as associated refueling infrastructure, such as petroleum gas, liquefied or compressed natural gas, or ethanol refueling stations. Examples of ineligible property also include electrical components upstream of the EVSE connection to the grid and components of charging or refueling stations, such as

signage, that are not directly involved in the transfer of fuel or power to the vehicle.

h. Hybrid vehicles with a gross vehicle weight rating of not less than 14,000 pounds, as well as technologies, components, or materials for such vehicles.

(i) Examples of eligible property include traction batteries, converters, power electronics, and assembled hybrid vehicles of not less than 14,000 pounds themselves, but components and materials must be designed for large hybrid vehicles with a gross vehicle weight rating of not less than 14,000 pounds, as demonstrated through engineering specifications and/or offtake agreements.

i. Other advanced energy property designed to reduce greenhouse gas emissions as may be determined by the Secretary.

(i) Examples of eligible advanced energy property include specialized components and equipment for nuclear power reactors or their fuels (e.g., including fabrication of fuels, and manufacturing of equipment for conversion, enrichment, and deconversion), and equipment used to reduce the emissions of industrial facilities, such as heat and process emissions. Property may be determined to be designed to reduce GHG emissions either through published guidance or in the letter notifying an applicant that the IRS has accepted the applicant's application for § 48C(e) certification with respect to the property.

(ii) Advanced energy property that is designed to reduce greenhouse gas emissions by enabling the production of other greenhouse gas emission-reducing advanced energy property may be eligible under this category. For such "other advanced energy property," which is not designed to directly reduce GHG emissions, the applicant must demonstrate that the advanced energy property is highly specialized equipment necessary to strengthen U.S. resilience of critical domestic energy supply chains and the reduction of GHG emissions is a necessary ultimate outcome from the production of the advanced energy property. This can be demonstrated through the applicant's proposed business plan, including offtake agreements and any additional market analysis or other technical specialization, to show the advanced energy property that is produced or recycled by the applicant's industrial or manufacturing facility will primarily contribute toward reduction of GHG emissions. An example of such "other advanced energy property" that may be eligible is diamond wire saws necessary in the solar technology supply chain, so long as the applicant demonstrates the project's output will be used primarily for the purpose of manufacturing property designed to produce energy from the sun.

Note: This section 1.i. on "other advanced energy property" has been updated with additional clarifying language since the publication of Notice 2023-18.

2. Greenhouse Gas Emission Reduction Projects

A qualifying advanced energy project in this category re-equips an industrial or manufacturing facility, including in energy-intensive manufacturing sectors, such as cement, iron and steel, aluminum, chemicals, and other sectors, with equipment designed to reduce greenhouse gas emissions by at least 20 percent through the installation of one of more of the following:

a. Low- or zero-carbon process heat systems.

Examples of eligible equipment include electric heat pumps, combined heat and power (CHP) systems, thermal storage technologies, and other heating systems based on electricity, clean hydrogen, biomass, or waste heat recovery.

b. Carbon capture, transport, utilization, and storage systems.

(i) Examples of eligible equipment include carbon capture equipment necessary to compress, treat, process, liquefy, pump, or perform some other physical action to capture carbon oxides, and specialized equipment and materials needed for the transport and storage of carbon oxides, including carbon dioxide pipelines, monitoring equipment, and injection equipment and well components such as packers, casing strings, CO_2-resistant cement, steel tubulars, well heads, valves, and sensors suitable for use in Underground Injection Control Class VI wells. Additional examples include equipment to convert carbon oxides through mineralization, thermochemical, electrochemical, photochemical, plasma-assisted, or other catalytic process approaches to carbon-based products such as synthetic fuels, chemicals, solid carbon products, and inorganic materials.

(ii) Examples of ineligible property include scrubbers for conventional air pollutants, except those that are required to remove pollutants upstream of carbon capture equipment for technical performance reasons; energy generation equipment, except as related to energy recovery at carbon capture systems; and refining equipment.

c. Energy efficiency and reduction in waste from industrial processes.

Examples of eligible equipment include technologies that reduce direct fuel use, electricity use, or waste in industrial applications, such as industrial heat pumps, CHP systems, insulation, sensors, controls, advanced recycling approaches, smart energy management, and similar advanced efficiency technologies.

d. Any other industrial technology designed to reduce greenhouse gas emissions, as determined by the Secretary.

(i) Examples of other eligible industrial technologies include electrification of direct fuel use processes, adoption of renewable or low-emissions fuels and feedstocks, and other equipment replacement or process redesigns that reduce process- or fuel-related emissions or otherwise contribute to reducing GHG emissions by at least 20 percent.

(ii) Projects in this category may qualify by installing equipment designed to achieve a minimum of a 20 percent reduction in GHG emissions in one or more of the following ways:

- Achieve a direct (Scope 1) GHG emissions reduction of 20 percent facility-wide
- Achieve an indirect fuel- or energy-related (Scope 2) GHG emissions reduction of 20 percent facility-wide
- Achieve a direct or indirect fuel- or energy-related GHG emissions reduction of 20 percent at a facility subunit, such as a particular process step or fuel combustion unit

(iii) While facilities may be eligible under this project category by achieving a 20 percent reduction threshold within a particular element of their process or emissions profile, overall combined Scope 1 and Scope 2 GHG emissions impacts for the full qualifying facility will be taken into account when evaluating each project for the purposes of application scoring. Scope 1 and Scope 2 GHG emissions are further defined in Appendix B, Section III.

Instructions for calculating and demonstrating an emissions reduction of 20 percent is provided in Appendix B, Section V: Additional Instructions on the Data Sheet Submission.

3. Critical Material Projects

A qualifying advanced energy project in this category re-equips, expands, or establishes an industrial facility for the processing, refining, or recycling of critical materials (as defined in § 7002(a) of the Energy Act of 2020 (30 U.S.C. § 1606(a)). For purposes of this Round 1, critical materials will consist of:

a. The currently effective final list of critical minerals as determined by the U.S. Geological Survey (see 2022 Final List of Critical Minerals for the list published in 2022 available at: *https://www.federalregister.gov/documents/2022/02/24/2022-04027/2022-final-list-of-critical-minerals*); and

b. Any additional critical materials as determined by the Secretary of Energy and for which a final determination is posted on the DOE's critical materials page on or before July 31, 2023, available at: *http://www.energy.gov/criticalmaterials*. A proposed

determination was posted at this web address prior to the publication of this notice. **Note:** DOE reserves the right to extend the deadline for concept paper submissions based on any changes included in the final determination.

Examples of eligible projects in this project category include the processing of raw ore, brines, mine tailings, end-of-life products, waste streams, and other source materials into critical materials. **Note:** These examples have been updated with additional clarifying language since the publication of Notice 2023-18.

Examples of ineligible projects under this project category include the subsequent physical or chemical transformation of critical materials into derivative products, including metals manufacturing such as aluminum extrusion and chemical manufacturing such as anode and cathode materials production. However, projects involving such derivative products may be eligible under the Clean Energy Manufacturing and Recycling Projects category. **Note:** These examples have been updated with additional clarifying language since the publication of Notice 2023-18.

APPENDIX B
DOE Application Process

THIS APPENDIX B SUPERSEDES APPENDIX B OF NOTICE 2023-18.

I. DOE Review Process

A. Overview

i. Program Process

A two-stage technical evaluation process will be used for submissions:

- Stage 1: Concept Paper.
- Stage 2: § 48C(e) Application.

In Stage 1, concept paper application materials will be available for applicants to download from the eXCHANGE portal on May 31, 2023, and concept paper submissions will be accepted in the eXCHANGE portal beginning no later than June 30, 2023. **DOE will only consider concept papers that are submitted by 12:00 PM (noon) Eastern Time on July 31, 2023.** Section 48C(e) applications for Round 1 allocations will not be considered by DOE unless a concept paper submission is received from an applicant by the specified deadline. Potential applicants will not be able to begin or submit concept papers for Round 1 after the deadline.

For Critical Materials Projects, a proposed critical materials determination was posted at the website specified in Appendix A(3) prior to the publication of this notice. DOE reserves the right to extend the deadline for concept paper submissions based on any changes included in DOE's final critical materials determination.

In Stage 2, following DOE's review of concept papers and transmission of letters encouraging or discouraging the applicant to continue in the process, the eXCHANGE portal will reopen to receive § 48C(e) application submissions for subsequent evaluation by DOE. The date on which DOE will begin accepting § 48C(e) applications and the deadline by which they must be submitted will be conveyed to applicants through the eXCHANGE portal on a later date.

In each stage, DOE will review the submitted materials for compliance and eligibility, and perform a thorough, consistent, and objective examination based on technical review criteria and other factors, as described below.

After Stage 2 evaluations of § 48C(e) applications are complete, DOE will transmit allocation recommendations to the IRS for final consideration. **The IRS will notify applicants of final allocation decisions for Round 1 no later than March 31, 2024.**

In conducting its review, DOE may utilize assistance and advice from qualified personnel from other federal agencies and/or contractors. DOE will obtain conflict of interest/non-disclosure acknowledgements from and administer required trainings in advance for all reviewers to assure that application information will be kept confidential and shall be used only for reviewing purposes, in accordance with applicable requirements. Reviewers will be required to report all personal and organizational

conflicts of interest.

DOE reserves the right to request clarifications and/or supplemental information from some or all applicants submitting applications through written submissions.

DOE may determine whether to recommend or not recommend an application to the IRS at any time after the § 48C(e) application has been received, without further exchanges or discussions with the applicant.

ii. Program Key Dates

Table: Program Key Dates

Initial Guidance Issue Date	02/13/2023
DOE posts proposed list of critical materials	No later than 5/31/2023
Additional Guidance Issue Date	05/31/2023
Informational Webinar	No later than 06/30/2023
DOE eXCHANGE Portal Opens for registration and concept paper submission	No later than 06/30/2023
DOE posts final list of critical materials	No later than 07/31/2023
Submission Deadline for Concept Papers	07/31/2023 by 12:00 PM (noon) Eastern
Submission Deadline for § 48C(e) Applications	Fall 2023 - Winter 2023/2024
IRS Allocation Decision Notifications	No later than 03/31/2024

iii. Program Priorities

Eligible applications will be evaluated by DOE against technical review criteria reflecting four major priority measures for the program:

- Criterion 1: Commercial Viability
- Criterion 2: Greenhouse Gas Emissions Impacts
- Criterion 3: Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy
- Criterion 4: Workforce and Community Engagement

A taxpayer with a qualified investment in any of the projects described as eligible in Appendix A of this guidance may apply for a § 48C(e) allocation. In determining whether to recommend a project for an allocation, DOE will take into consideration in § 48C(e) Round 1 various factors, including whether the project addresses specific **energy supply chain and manufacturing priority areas** identified by this guidance when evaluating the extent to which Clean Energy Manufacturing and Recycling Projects and Critical Materials Projects contribute to strengthening U.S. supply chains

and domestic manufacturing for a net-zero economy.

For more details on the energy supply chain and manufacturing priority areas identified by this guidance **for Clean Energy Manufacturing and Recycling Projects, see Section III(A)** of this appendix. For more details on the supply chain and manufacturing priority areas identified by this guidance **for Critical Materials Projects, see Section III(C)** of this appendix.

In determining whether to recommend a project for an allocation, DOE will also consider whether the proposed project is located in § 48C(e) Energy Communities Census Tracts, as defined in section 5.06 of Notice 2023-18. In Round 1, DOE anticipates recommending approximately $1.6 billion in § 48C credits to projects located in these communities.

iv. Glossary of Terms

The following terms may be used throughout this appendix describing the DOE application process.

Disadvantaged Community:	A disadvantaged community may be either (1) a group of individuals living in geographic proximity (e.g., such as a census tract identified using the Climate and Economic Justice Screening Tool), or (2) a geographically dispersed set of individuals, where either type of group experiences common conditions.
Scope 1 Emissions:	Direct greenhouse gas emissions that occur from sources at the facility associated with the proposed project (e.g., emissions from fuel combustion or chemical processes).
Scope 2 Emissions:	Indirect greenhouse gas emissions that are associated with the use of energy or fuel at the facility, but do not occur at the facility (e.g., emissions from a power plant that generates electricity for the facility).
Scope 3 Emissions:	Indirect greenhouse gas emissions that are associated with the facility's activities and products but are not covered in Scope 1 or 2, including emissions from the products themselves in their ultimate use, transportation, or other aspects of the value chain upstream or downstream from the facility. In the case of clean energy products, these may also be referred to as "lifecycle emissions."

Specified Advanced Energy Property: A specific category of property listed in 48C(c)(1)(A) and described in further detail in Appendix A(1). Clean Energy Manufacturing and Recycling Projects under § 48C(e) must either produce or recycle one or more specified advanced energy properties. For example, solar glass would be considered a specified advanced energy property covered under Appendix A(1)(a).

Facility Product: The direct output of a facility that is sold or leased. A facility product may be a specified advanced energy property, but facility products could also include specialized components, materials, equipment, or other tangible assets that are not considered specified advanced energy properties under § 48C(e). For instance, recycling projects under Clean Energy Manufacturing and Recycling, and Greenhouse Gas Emission Reduction projects, may produce outputs that are not specified advanced energy properties. Facilities may have more than one facility product.

B. Concept Paper

The first stage of DOE review requires applicants to submit concept papers describing the proposed project. Sections II and III of this appendix describe the information applicants must include in concept papers and the format of the submission. Concept papers will undergo a multi-step evaluation by DOE.

i. Compliance and Eligibility Review

DOE will carry out an initial compliance review for concept papers to determine that (1) eligibility requirements have been met, (2) the required information has been submitted, (3) the proposed project is technically valid, and (4) all mandatory requirements of this notice are satisfied. As part of this review, DOE will determine whether the proposed project meets the definition of a qualifying advanced energy project, as described in Appendix A.

If a concept paper fails to meet compliance or eligibility requirements or fails to provide sufficient information for evaluation, DOE reserves the right to request clarifications and/or missing information from some or all applicants through written submissions provided to DOE in a timely manner. Concept papers that fail to meet the compliance

or eligibility requirements or do not provide sufficient information for evaluation will be considered non-responsive and will receive a discouragement letter.

ii. Technical Review

Subsequent to the concept paper compliance and eligibility review, DOE will perform a technical review process based on four technical review criteria:

- Criterion 1: Commercial Viability.
- Criterion 2: Greenhouse Gas Emissions Impacts.
- Criterion 3: Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy.
- Criterion 4: Workforce and Community Engagement.

See complete details of the technical review criteria in Section III of this appendix. All technical review criteria will be used in a thorough, consistent, and objective examination to develop scores for ranking applications and determining merit of each proposed project. The review of the Commercial Viability criterion will additionally inform eligibility by determining whether the project has a reasonable expectation of commercial viability, as described in § 48C(d)(3)(A). The information requested for each criterion will vary based on the qualifying advanced energy project category, as detailed in Section III.

iii. Final Outcome for Concept Papers

Following the compliance, eligibility, and technical reviews, DOE may also consider program policy factors when determining the final portfolio of recommendations (see Section IV of this appendix).

Subsequent to this review, DOE will issue a letter to applicants either encouraging them to submit a § 48C(e) application or discouraging them from submitting a § 48C(e) application.

An applicant that receives a discouragement letter may still submit a § 48C(e) application in accordance with the § 48C(e) program and additional guidance. Receiving a discouragement letter in response to a submitted concept paper does not disqualify a taxpayer from submitting a § 48C(e) application but represents DOE's feedback that the project, as proposed, is unlikely to receive a recommendation based on the information provided in the concept paper. DOE expects to transmit encouragement and discouragement letters to applicants in the fall of 2023.

In the encouragement and discouragement notifications, DOE will provide feedback to all applicants on areas needing improvement.

C. § 48C(e) Application

The second evaluation stage will consist of a review of § 48C(e) applications submitted after the concept paper stage. Sections II and III of this appendix describe the

information applicants must include in a § 48C(e) application and the format of the submission. Applicants may not submit a § 48C(e) application unless they submitted a concept paper by the specified deadline.

The deadline for § 48C(e) applications will be communicated to applicants in the encouragement and discouragement letters and posted on the eXCHANGE portal.

i. Compliance and Eligibility Review

DOE will carry out an initial compliance review for § 48C(e) applications to determine that (1) the eligibility requirements have been met, (2) the required information has been submitted, (3) the proposed project is technically valid, and (4) all mandatory requirements of this notice are satisfied. As part of this review, DOE will determine whether the proposed project meets the definition of a qualifying advanced energy project, as described in Appendix A.

If a § 48C(e) application fails to meet compliance or eligibility requirements or fails to provide sufficient information for evaluation, DOE reserves the right to request clarifications and/or missing information from some or all applicants through written submissions provided to DOE in a timely manner. Section 48C(e) applications that fail to meet the compliance and eligibility requirements or do not provide sufficient information for evaluation will be considered non-responsive, and DOE will recommend a denial of allocation without proceeding to technical review.

The qualifying advanced energy project category, the specified advanced energy property, and the scope of the overall project must be consistent between the applicant's concept paper and § 48C(e) application. Applicants who wish to change the scope of the project, based on the feedback in a discouragement letter or for any other reason, may consider participating in a future round of this program.

ii. Technical Review

After the § 48C(e) application compliance and eligibility review, DOE will perform a technical review process based on four technical review criteria:

- Criterion 1: Commercial Viability
- Criterion 2: Greenhouse Gas Emissions Impacts
- Criterion 3: Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy
- Criterion 4: Workforce and Community Engagement

See complete details of the technical review criteria for § 48C(e) applications in Section III of this appendix. All technical review criteria will be used in a thorough, consistent, and objective examination to develop scores for ranking applications and determining merit of each proposed project. The review of the Commercial Viability criterion will additionally inform eligibility by determining whether the project has a reasonable

expectation of commercial viability, as described in § 48C(d)(3)(A). The information requested for each criterion will vary based on the qualifying advanced energy project category, as detailed in Section III.

iii. Due Diligence Review

To ensure the § 48C(e) program supports strengthening and securing U.S. supply chains and domestic manufacturing to the greatest extent possible, DOE may conduct a due diligence review to determine if an applicant has a connection with a country of risk that could put these goals at risk.

iv. Final Recommendation for § 48C(e) Applications

Following the compliance, eligibility, and technical reviews, DOE may also consider program policy factors and the results of the due diligence review when determining the final portfolio of recommendations (see Section IV of this appendix).

After this determination of recommendations, DOE will transmit to the IRS its recommendations for allocations and denials of applications, as detailed in the initial § 48C(e) program guidance (Notice 2023-18) and this notice.

v. Requirements for Certification

As described in this notice, applications receiving allocation letters must provide evidence that they have met the requirements for certification, such as all permits necessary to commence construction. Applicants will upload documents providing this evidence to the eXCHANGE portal not later than 2 years from the date the IRS notified the applicant that they have received an allocation.

DOE's recommendation is based in part on commitments and other claims stated by the applicant in the § 48C(e) application. The evidence provided by the applicant for certification must therefore also include documents demonstrating that any commitments or other claims in the § 48C(e) application have been met. These documents could include Community Benefits Agreements, collective bargaining agreements, contracts, offtake agreements, or any other commitments or arrangements claimed in the § 48C(e) applications that may have had an impact on the evaluation of the application. Documents already provided as appendices in the § 48C(e) application do not need to be submitted again for certification.

vi. Request for Debriefing

Upon receiving a denial letter from the IRS, applicants can request a debriefing with DOE on its review of the § 48C(e) application. The denial letter will include instructions for requesting a debriefing.

II. Submission and Registration Information for DOE Recommendation Process

A. General Application Requirements

Applicants must submit a concept paper at Stage 1 and a § 48C(e) application at Stage 2 as described below. All submitted materials must be prepared in accordance with the guidance in this notice to provide a standard basis for review and to ensure that each application will be uniform as to format and sequence.

Concept papers and § 48C(e) applications should clearly address each of the eligibility requirements and applicable technical review criteria to demonstrate the applicant's capability, knowledge, and experience regarding the requirements described herein.

Applicants should fully address the requirements of Notice 2023-18 and this notice and not rely on any presumed background knowledge. DOE will discourage a concept paper or recommend the rejection of a § 48C(e) application that does not follow the instructions regarding the organization and content when the nature of the deviation and/or omission precludes meaningful review of the project.

All concept papers and § 48C(e) applications must be submitted through the eXCHANGE portal to be considered for DOE recommendation under this notice.

Concept papers and § 48C(e) applications received after the stated deadlines will not be reviewed or considered for DOE recommendation.

B. Determining an Application's Project Category

Eligible projects under the § 48C(e) program, as described in Appendix A, are classified into three overarching project categories: Clean Energy Manufacturing and Recycling Projects, Greenhouse Gas Emission Reduction Projects, and Critical Material Projects. Before developing application materials, an applicant must determine which qualifying advanced energy project category is most applicable to their project.

Section III of this guidance contains instructions for content requirements and technical review criteria specific to each project category. Applicants should only complete their application package using the appropriate guidance in Section III, corresponding to the applicant's self-determined qualifying advanced energy project category. It is incumbent upon the applicant to adequately justify their determination of project category through application narratives.

The following table may assist applicants in determining the qualifying advanced energy project category most appropriate for their proposed project.

Project Category	This Category Includes…	Application Materials

Clean Energy Manufacturing and Recycling	• Facilities that produce one or more specified advanced energy properties, or its components or materials, described in Appendix A(1); or • Facilities that recycle one or more specified advanced energy properties described in Appendix A(1).	Section III(A)
Greenhouse Gas Emission Reduction	• Projects at existing industrial or manufacturing facilities that reduce GHG emissions by at least 20%. • Note: Facilities are not required to produce products or materials with energy applications or those described in Appendix A(1) and Appendix A(3).	Section III(B)
Critical Materials	• Facilities that process, refine, or recycle one or more **critical materials described in Appendix A(3)**.	Section III(C)

C. eXCHANGE Portal for Submission of Application

The eXCHANGE portal, and its successor portal (see Section iv, *Portal Migration*,) will provide a single interface for applicants through all steps of the § 48C(e) application process, including concept paper submission, receipt of concept paper feedback, § 48C(e) application submission, receipt of an allocation or denial letter from the IRS, submission of evidence documents to DOE for certification, receipt of a certification letter from the IRS, submission of notification to DOE that the project has been placed in service or otherwise disposed, and receipt of notification from the IRS that the applicant may claim the credit.

Files required for submission of concept papers, including concept paper templates and data sheets, are available for applicants at *https://48C-exchange.energy.gov* on the date of this notice. The eXCHANGE portal will be open for registration and submission of concept papers no later than June 30, 2023.

i. Submission of Application

All § 48C(e) application materials must be submitted through the eXCHANGE portal at *https://48C-exchange.energy.gov* to be considered by DOE. Section 48C(e)

applications submitted by any other means will not be accepted. **Note:** The eXCHANGE portal website address has been modified since Notice 2023-18 was published, and the address specified in this guidance must be used.

The applicant will receive an automated response when the concept paper or § 48C(e) application is received. This will serve as confirmation of receipt. Do not reply to the automated response. For more information, refer to the 48C eXCHANGE Login Guide, which will be available in the Manuals section of the eXCHANGE portal at *https://48C-exchange.energy.gov/* no later than June 30, 2023.

It is the responsibility of the applicant to verify successful transmission prior to the concept paper and § 48C(e) application deadlines.

ii. eXCHANGE Portal Registration Process

In order to submit concept papers and § 48C(e) applications, all applicants must register an account in the eXCHANGE portal at *https://48C-exchange.energy.gov*. It is recommended that each applicant organization designate a primary contact point responsible for each submission. The primary user may specify an additional contact within their organization who may register in the portal as a backup user.

Potential applicants will be required to have a Login.gov account to access the eXCHANGE portal. As part of the eXCHANGE portal registration process, new users will be directed to create an account in Login.gov. **Note:** The email address associated with Login.gov must match the email address associated with the eXCHANGE portal account. For more information, refer to the 48C eXCHANGE Login Guide, which will be available in the Manuals section of the eXCHANGE portal at *https://48C-exchange.energy.gov/* no later than June 30, 2023.

Due to final configuration changes for the eXCHANGE portal, applicants who registered on the eXCHANGE portal prior to May 31, 2023, must register again *at https://48C-exchange.energy.gov, on or after the date the portal opens for registration and submission of concept papers*.

iii. Help with eXCHANGE Portal

Applicants may email *InfrastructureExchangeSupport@hq.doe.gov* for questions regarding the registration process or submitting your application on the eXCHANGE portal.

For questions regarding other non-tax aspects of the § 48C(e) program unrelated to the eXCHANGE portal, see Section VII.

iv. Portal Migration

DOE intends to migrate all § 48C(e) applicants to a successor portal in the future. Detailed timing and instructions for migrating to the new portal will be conveyed to all applicants through the eXCHANGE portal no earlier than the submission deadline for

concept papers.

Any reference in this guidance to the applicant portal, and any reference to the eXCHANGE portal, means the eXCHANGE portal or its successor.

D. Application Forms and Format of Submissions

Applicants must log in to the eXCHANGE portal to download all required forms and submit concept papers and § 48C(e) applications to be considered for a § 48C(e) credit allocation. The applicant will have the opportunity to re-submit revised application materials for any reason as long as the revision is submitted by the specified deadline.

i. Format of Concept Paper Submissions

This section outlines the format of the concept paper submission. See Appendix A for a description of the eligibility requirements for the § 48C credit under this notice. See Section III for content requirements and a description of the technical review criteria that will be used to evaluate submitted concept papers.

The applicant's Control Number is used throughout the submitted files. The control number is a unique identifier generated by the eXCHANGE portal for your application and will be determined by the system when the applicant first begins their application process.

The purpose of the concept paper stage is to save applicants the considerable time and expense of preparing § 48C(e) applications for proposed projects that are unlikely to be selected for recommendation. The concept paper must conform to the following requirements:

1. The concept paper must be written in English.
2. All pages must be formatted to fit on 8-1/2 by 11-inch paper with margins not less than one inch on every side. Use Times New Roman typeface, a black font, and a font size of 11 points or larger (except in figures and tables). A symbol font may be used to insert Greek letters or special characters; the font size requirement still applies.
3. References must be included as footnotes or endnotes in a font size of 10 or larger. Footnotes and endnotes are counted toward the maximum page requirement.
4. The control number must be prominently displayed on the upper right corner of the header of every page. Page numbers must be included in the footer of every page.
5. Each must be submitted in Adobe PDF format unless stated otherwise.

Each concept paper should be limited to unique property within a distinct qualifying advanced energy project that does not overlap with a qualifying advanced energy project in any other application submitted by the same applicant:

- For applicants applying under the Clean Energy Manufacturing and Recycling Project category, or the Critical Materials Project category, the applicant may submit more than one application involving the same facility. However, the qualified investment for each project at the same facility may not overlap in Round 1.
- For applicants applying under the Greenhouse Gas Emission Reductions Project Category, the applicant may submit only one application at the same facility in Round 1.

If projects involve more than one qualifying advanced energy project listed in Appendix A, then applicants must choose a primary specified advanced energy property for their project. The entire concept paper submission includes three components: a narrative, a workforce and community engagement plan, and a data sheet.

The concept paper narrative must not exceed 4 pages when printed using the formatting requirements set forth above and single spaced. Pages in excess of the page limitation will not be considered for review. No material may be incorporated by reference as a means to circumvent the page limitation. The concept paper narrative should be submitted in Adobe PDF format with the title ***[ControlNumber]-ConceptPaper.pdf***. For example, for a control number of 1234, the file would be named, "1234-ConceptPaper.pdf".

The workforce and community engagement portion of the concept paper will be submitted in a separate file and must not exceed 1 page when printed using the formatting requirements set forth above and single spaced. Pages in excess of the page limitation will not be considered for review. No material may be incorporated by reference as a means to circumvent the page limitation. The concept paper workforce and community engagement plan should be submitted as separate file in Adobe PDF format with the title ***[ControlNumber]*-CP-WCE.pdf**.

The Concept Paper Data Sheet should be completed and submitted as a separate Excel document with the title ***[ControlNumber]*-CP-DataSheet.xlsx**. Additional instructions for completing the Concept Paper Data Sheet submissions are included in Section V.

Note: The maximum file size that can be uploaded to the eXCHANGE portal is 10 MB. Files in excess of 10 MB cannot be uploaded, and hence cannot be submitted for review. If a file exceeds 10 MB but is still within the maximum page limit, it must be broken into parts and denoted to that effect in the naming convention of the file. For example: "[ControlNumber]-ConceptPaper_Part_1.pdf", "[ControlNumber]-ConceptPaper_Part_2.pdf".

The full list of required files for concept paper submission is illustrated in the following table.

Table: Files Required for Concept Paper Submission

Component	File Format	Maximum Pages	File Name
Concept Paper	PDF	4	[ControlNumber]-ConceptPaper.pdf
Concept Paper Workforce and Community Engagement Plan	PDF	1	[ControlNumber]-CP-WCE.pdf
Concept Paper Data Sheet	MS Excel	N/A	[ControlNumber]-CP-DataSheet.xlsx

For all files, "[ControlNumber]" should be replaced by the application's control number. For example, for a control number of 1234, the file would be named, "1234-ConceptPaper.pdf".

ii. Format of § 48C(e) Application Submission

This section outlines the format of the § 48C(e) application submission. Section 48C(e) applications should be formatted and arranged as described in this section. Strict adherence is required. Content requirements for § 48C(e) applications and the technical review criteria used by DOE to evaluate them are listed in Section III.

The applicant's Control Number is used throughout the submitted files. The control number is a unique identifier generated by the eXCHANGE portal for your application and will be determined by the system when the applicant first begins your application process.

Section 48C(e) applications must conform to the following requirements:

1. All § 48C(e) applications must be written in English.
2. All pages must be formatted to fit on 8-1/2 by 11-inch paper with margins not less than one inch on every side. Use Times New Roman typeface, a black font, and a font size of 11 points or larger (except in figures and tables). A symbol font may be used to insert Greek letters or special characters; the font size requirement still applies.
3. References must be included as footnotes or endnotes in a font size of 10 or larger. Footnotes and endnotes are counted toward the maximum page requirement.
4. The Control Number, which is the same number used for the concept paper, must be prominently displayed on the upper right corner of the header of every page. Page numbers must be included in the footer of every page.
5. Cash flow models should be submitted as a Microsoft ® Excel spreadsheet and must include calculation formulas and assumptions.
6. All § 48C(e) applications must be submitted in Adobe PDF format unless stated

otherwise.

Each § 48C(e) application should be limited to a unique project with a distinct qualified investment. If projects involve more than one specified advanced energy property listed in Appendix A, then applicants must choose a primary specified advanced energy property for their project. The entire § 48C(e) application submission includes five components: a narrative, a workforce and community engagement plan, a business entity certification, a data sheet, and appendices.

The § 48C(e) application narrative must not exceed 30 pages when printed using the formatting requirements set forth above and single spaced. Pages in excess of the page limitation will not be considered for review. No material may be incorporated by reference as a means to circumvent the page limitation. Section 48C(e) application narratives should be submitted in Adobe PDF format with the file name ***[ControlNumber]*-48CApplication.pdf**.

The workforce and community engagement portion of the § 48C(e) application will be submitted in a separate file and must not exceed 5 pages when printed using the formatting requirements set forth above and single spaced. Pages in excess of the page limitation will not be considered for review. No material may be incorporated by reference as a means to circumvent the page limitation. The § 48C(e) application workforce and community engagement plan should be submitted as a separate file in Adobe PDF format with the file name ***[ControlNumber]*-App-WCE.pdf**.

The 48C Business Entity Certification, which supports DOE's Due Diligence Review, should be completed and submitted as a separate file using the provided template or a comparable format including the same substantive information. Applicants must submit the file as a PDF with the file name ***[ControlNumber]*-BusinessEntityCertification.pdf**.

The 48C Application Data Sheet should be completed and submitted as a separate Excel document with the file name ***[ControlNumber]*-App-DataSheet.xlsx**. Additional instructions for completing the 48C Application Data Sheet are included in Section V.

Any supporting documents should be uploaded as separate, individual files, preferably in Adobe PDF format. Content provided as appendices do not count towards any page limits described above.

Note: The maximum file size that can be uploaded to the eXCHANGE portal is 10 MB. Files in excess of 10 MB cannot be uploaded, and hence cannot be submitted for review. If a file exceeds 10 MB but is still within the maximum page limit, it must be broken into parts and denoted to that effect. For example: "48CApplication _Part_1.pdf", "48CApplication_Part_2.pdf".

The full list of required files for § 48C(e) application submission is illustrated in the following table.

Table: Files Required for § 48C(e) Application Submission

Component	File Format	Maximum Pages	File Name
Section 48C(e) Application	PDF	30	[ControlNumber]-48CApplication.pdf
Section 48C(e) Application Workforce and Community Engagement Plan	PDF	5	[ControlNumber]-App-WCE.pdf
Business Entity Certification	PDF	N/A	[ControlNumber]-BusinessEntityCertification.pdf
48C Application Data Sheet	MS Excel	N/A	[ControlNumber]-App-DataSheet.xlsx
Appendix Files	Various	N/A	[ControlNumber]-Appendix-[FileNumber].[format] (e.g. 1234-Appendix-1.pdf)

For all files, "[ControlNumber]" should be replaced by the application's control number. For example, for a control number of 1234, the file would be named, "1234-ConceptPaper.pdf".

See Section VI for information on which supporting documents should be submitted as appendix materials.

E. Electronic Authorization of Applications

Submission of § 48C(e) application materials through electronic systems used by DOE, including the eXCHANGE portal or its successor, will constitute the authorized representative's approval and electronic signature.

F. Markings of Confidential Information

If elements of a § 48C(e) application contain information the taxpayer considers to be trade secrets, confidential, privileged, or otherwise exempt from disclosure under the Freedom of Information Act (FOIA, 5 U.S.C. § 552), the taxpayer may assert a claim of exemption at the time of application by placing the following text on the first page of the § 48C(e) application, and specifying the page or pages of the § 48C(e) application to be restricted:

> "Pages [list applicable pages] of this document may contain trade secrets, confidential, proprietary, or privileged information that is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source. [End of Notice]"

The header and footer of every page that contains confidential, proprietary, or privileged information must be marked as follows: “Contains Trade Secrets, Confidential, Proprietary, or Privileged Information Exempt from Public Disclosure.” In addition, each line or paragraph containing proprietary, privileged, or trade secret information must be clearly marked with double brackets or highlighting.

III. Specific Content Requirements and Technical Review Criteria

The following subsections contain detailed guidance for content requirements and technical review criteria for each respective project category—Clean Energy Manufacturing and Recycling Projects, Greenhouse Gas Reduction Projects, and Critical Material Projects—for both the concept paper stage and § 48C(e) application stages.

It is the applicant’s responsibility to determine the most applicable qualifying advanced energy project category (defined in Appendix A), according to the guidance in Section II(B), *Determining an Application’s Project Category*. Applicants should complete their application package using only the guidance in this section for their application’s project category.

Applicants proposing Clean Energy Manufacturing and Recycling Projects, or Critical Materials Projects will be asked to discuss both their project’s specified advanced energy property and their project’s “facility products/outputs.” Facility products/outputs include the equipment, materials, or other products produced in the facility associated with the proposed project, and which are typically sold or leased after production.

Applicants should note that “facility products/outputs” may or may not be the project’s specified advanced energy property. For example, under the Clean Energy Manufacturing and Recycling Project category, the specified advanced energy property of a clean energy **manufacturing** project is likely to be the facility’s primary product/output. In contrast, the specified advanced energy property of a clean energy **recycling** project is an input to the proposed facility, while the facility product/output is typically one or more materials extracted in the recycling process. A **Critical Materials Recycling Project**’s facility product/output is typically also the project’s specified advanced energy property.

A. Clean Energy Manufacturing and Recycling Projects

Priority Areas for Clean Energy Manufacturing and Recycling Projects

All Clean Energy Manufacturing and Recycling Projects described in Appendix A(1) of this guidance are eligible to apply for a § 48C(e) allocation and will be evaluated by DOE against the four technical review criteria reflecting overall program objectives:

- Criterion 1: Commercial Viability
- Criterion 2: Greenhouse Gas Emissions Impacts

- Criterion 3: Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy
- Criterion 4: Workforce and Community Engagement

When evaluating the Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy criterion, DOE will take into consideration whether the project addresses the following energy supply chain and manufacturing priority areas. These priority areas have been identified based on analytical criteria including an assessment of current and anticipated supply chain gaps in areas eligible under § 48C(e):

Round 1 Priority Areas *(in alphabetical order):*

- Clean Hydrogen: Manufacturing of electrolyzers, fuel cells, and associated components (including gas diffusion layers, bipolar plates, and power electronics).
- Electric Grid: Manufacturing of transformers, materials (including electrical steel, amorphous alloy), power electronics, and other grid components and equipment (including MVDC/HVDC converter station components and switchgears).
- Electric Heat Pumps: Manufacturing of air-source or ground-source heat pump components and infrastructure, particularly reversing valves, control circuits, compressors, and heat exchangers.
- Electric Vehicles**: Manufacturing of power electronics (including semiconductors, modules, and circuits for EV motor traction drives, on-board EV chargers, DC/DC converters, and EV charging stations), permanent magnets, and battery components for use in electric vehicle motors.
- Nuclear Energy: Manufacturing of specialized components and equipment for nuclear power reactors or their fuels (including fabrication of fuels, and manufacturing of equipment for conversion, enrichment, and deconversion), for both existing reactors and new reactor deployments.
- Solar Energy**: Polysilicon, wafer production facilities, ingot and wafer production tools, and solar glass production facilities.
- Sustainable Aviation Fuels: Manufacturing of equipment needed for low-carbon aviation fuel production (including feedstock handling equipment and pre-treatment reactors).
- Wind Energy**: Component production facilities and specialized steel production, particularly for offshore wind, such as monopile-grade steel and towers; recycling of wind components, particularly blades.

*** The production of some products under this section may be eligible for tax credits under § 45X and receiving an allocation under § 48C(e) may preclude an applicant from receiving tax credits under that program. Applicants are encouraged to evaluate which program may be most beneficial to their project before submitting a concept paper for consideration under § 48C(e).*

These priority areas apply to Round 1, and guidance for future rounds under § 48C(e)

may include different priority areas.

i. Concept Papers for Clean Energy Manufacturing and Recycling Projects

a) Concept Paper Content for Clean Energy Manufacturing and Recycling Projects

This section describes the specific content that applicants must provide in the concept paper files for applications proposing Clean Energy Manufacturing and Recycling Projects. Template files for submitting this information will be provided through the eXCHANGE portal.

Table: Concept Paper Content Requirements for Clean Energy Manufacturing and Recycling Projects

Section	Information Required
Project Overview	Provide an overview of the proposed project. At a minimum, include: • **Company Overview:** Describe your company, including prior experience manufacturing or recycling qualifying advanced energy technologies relevant to the proposed project. • **Project Summary:** Describe the eligible manufacturing or recycling facility, including size, location, and other relevant information. Indicate what the investment will accomplish, including the specified advanced energy property detailed in Appendix A(1), whether the facility will manufacture or recycle the specified advanced energy property, and whether the project will establish, re-equip, or expand a facility. If the project involves more than one specified advanced energy property, indicate the project's primary advanced energy property, and any additional advanced energy properties the project will produce or recycle. In the case of a recycling project, describe the facility's products and any clean energy supply chains they will support. Summarize the equipment and processes employed in the proposed facility, and for projects that re-equip or expand facilities, summarize what will be added or changed in the facility.

Commercial Viability	**Project Plan:** At a minimum, include: • *Project Timeline*: Provide planned dates to begin construction and operation of the project, and how many months the project will take to commence production and achieve full production capacity once certified. • *Siting and Permitting*: Explain the rationale for selection of the project site, including motivating factors such as suppliers, offtakers, and co-located industries. Indicate the current status of any required siting and permitting. • *Risk Management Plan*: Identify project risks or challenges and any relevant strategies for risk mitigation and management, such as legal, financial, engineering, procurement, construction, physical climate, and environmental risks. **Business Plan:** • *Financial Information*: Describe sources of financing for the proposed project, including the amount and strength of funding sources that will provide the equity to be invested in the project, the amount of total debt obligations that will be incurred and the funding sources of all such debt, and the dollar amount of incentives or funds pursued or awarded from local and state governments, as well as other federal incentives pursued or awarded. • *Market Information*: Describe the market your product will serve and its growth potential, as well as your product's anticipated market share and target consumers. • *Cost Information*: Provide the estimated cost of your facility's product and how it compares to similar technologies or materials in the same market segment. **Management Plan:** • Describe the key management team members who will design, construct, permit, and operate the facility. Include a description of relevant industry experience of the top-tier executives responsible for the success of the project. • Describe any corporate health indicators, including legal claims or liabilities, planned debt restructuring, planned corporate actions, and other factors that could negatively affect the likelihood of project completion.

Greenhouse Gas Emissions Impacts	**GHG Emissions Impacts of the Facility's Products:** At a minimum, include:
	• **End Product Impacts:** Describe the end-use application of facility's products and how their use, whether that is independently (e.g., energy efficiency equipment) or as part of a larger specified advanced energy product (e.g., blade in wind tower) will avoid or reduce GHG emissions. Provide product specifications to verify these claims.
	  ○ In the case of specified advanced energy property that provides GHG reduction or avoidance over incumbent technologies or systems, such as clean energy, clean vehicle, or efficiency products, applicants should describe the product's typical use in the narrative and provide quantitative information in the Data Sheet.
	  ○ In the case of carbon capture or removal equipment, applicants should quantify direct GHG reductions enabled by the product in typical use in the Data Sheet.
	  ○ In the case of electrolyzing, refining, or blending equipment, applicants should describe the fuel, chemical, or product and its production process, including feedstocks, in the narrative and Data Sheet.
	  ○ In the case of specified advanced energy property that provides indirect GHG reduction or avoidance, applicants may wish to qualitatively describe how the facility's products could contribute to emissions reductions by reducing energy or fuel demand or accelerating adoption of low-emissions technologies (e.g., for enabling technology such as grid components, storage, or charging infrastructure).
	  ○ In the case of recycling projects, applicants should qualitatively describe how the facility's products are expected to reduce emissions through their use and by reducing raw material needs or emissions associated with end-of-life.
	• **Product Performance:** Provide any details about the innovation and performance of the end product (e.g., efficiency, range, and economic life) that indicate its ability to facilitate deeper GHG emissions reductions than leading competitors or incumbents. This may not be applicable for facilities whose outputs are materials.
	
	Note: For applicants applying for other advanced energy projects under Appendix A(1)(i), "Other advanced energy property designed to reduce greenhouse gas emissions as may be determined by the Secretary", applicants must

	demonstrate the reduction of GHG emissions is a necessary ultimate outcome from the manufacture of the advanced energy property. **GHG Emissions from the Facility:** Describe the GHG emissions associated with the facility. At a minimum, include: • *Direct Emissions*: Qualitatively and, where possible, quantitatively characterize the anticipated sources of GHG emissions in the manufacturing or recycling process (e.g., fuel use, process emissions). • *Facility Performance*: Provide any details about the manufacturing process (e.g., efficiency and lifetime) that indicate its potential to result in lower emissions than leading competitors or incumbents. • *Mitigation Efforts*: Describe any planned efforts to mitigate GHG emissions at the proposed facility, including the use of best-in-class or innovative manufacturing or recycling approaches and/or low-carbon fuels, processes, or materials.

Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy	At a minimum, include:
	• **Output of Your Facility:** Describe the facility's products and associated quantities. Indicate whether production from your facility covers multiple supply chain segments—processed material, subcomponents, components, system/end products—and how those segments interact. In the Concept Paper Data Sheet, submit the relevant production capacity information for the facility's outputs (see Section V for a description of these terms):
	  ○ Annual Production.
	  ○ Manufacturing Contribution.
	  ○ Share of Facility Output.
	  ○ Real-World Annual Performance.
	  ○ Product Lifetime.
	• **Inputs to Your Facility:** Describe key inputs to your manufacturing or recycling process. In the case of recycling facilities, this should include the qualifying energy property being recycled. Describe any known sources for your inputs, including indicating domestic sources and any current or anticipated supply chain vulnerabilities.
	• **Supply Chain Resilience:** Describe how your facility's products will help build resilience of domestic supply chains that are critical for energy products that facilitate progress towards a net-zero economy, from raw materials to end-of-life.
	• **End-Use Applications:** Indicate whether the facility's products will be used in multiple qualifying advanced energy technologies (e.g., wind, solar, and electric grid) or multiple sectors (e.g., transportation, industry, and electricity). Describe any offtake or sales arrangements that help to justify the indicated end-use applications.

Workforce and Community Engagement (submitted as a separate PDF document)	Describe your plan for contributing to job creation and ensuring project viability, timely completion, and ultimate success by fostering a stable and supportive workforce and host community. At a minimum, include: ○ Job Creation and Workforce Continuity: ▪ Briefly characterize the jobs (both direct and indirect) your project will create (e.g., mechanics and construction workers), including (a) during completion of the project and (b) after the project is placed in service, and any indicators of job quality. ▪ Describe partnerships with apprenticeship readiness programs, or community-based workforce training and support organizations serving displaced industrial workers, including in the coal, other energy, and automotive sectors, and others facing systematic barriers to employment to facilitate participation in the project's construction and operations. ○ Ensuring Timely Project Completion Through Workforce and Community Engagement: ▪ Describe current and planned efforts to engage with community and labor stakeholders, including as it relates to the ability to complete the project in the shortest time and with adequate workforce. ▪ Describe current and planned efforts to ensure availability of the workforce needed to successfully complete the project and place it in service in a timely manner, including through training programs that serve workers currently underrepresented in the sector. ▪ Describe any activities to strengthen support of the community such as through benefit-sharing agreements, consideration of environmental impact, and use of local resources. ○ Energy Community Transition: ▪ Describe the extent to which the project will support energy communities, through transition opportunities for workers in the coal, other energy, and automotive sectors, and through the use of existing infrastructure in energy transition communities. ○ Local Environmental Impacts: ▪ Describe the impact of your project on local air, water, and/or land quality, as well as any efforts to mitigate local pollution and waste. Determine whether the location or community qualifies as a

	disadvantaged community according to the Climate and Economic Justice Screening Tool (CEJST).

b) Concept Paper Technical Review Criteria for Clean Energy Manufacturing and Recycling Projects

This section describes the technical review criteria that DOE will use to evaluate concept papers proposing Clean Energy Manufacturing and Recycling Projects.

Criterion 1: Commercial Viability

- Project schedule and time from certification to completion, based on readiness to proceed with the proposed project and reasonableness of the timeframe required for construction and commissioning of the project.
- The extent to which risk management issues and mitigation strategies are identified and addressed.
    - Strength of the proposed business plan, including market size and growth potential, market share and price competitiveness of the facility's product, strength of existing or prospective offtake arrangements, and the source and certainty of funding that will be invested in the project, including equity, private financing, DOE funding, state and local incentives, and other sources.
- Strength of the proposed management plan, including the management team's track record of success in areas relevant to the project and corporate health of the applicant.

Criterion 2: Greenhouse Gas Emissions Impacts

- End products impact on avoidance or reduction in anthropogenic emissions of GHGs, based on:
    - Potential GHG improvement over higher-emitting incumbent technologies or systems.
    - Potential to capture or remove carbon oxides or other GHGs.
    - Potential to provide indirect emissions reductions or avoidance by enabling a reduction in energy or fuel use or the manufacturing or adoption of other low-emissions technologies (e.g., charging infrastructure to enable the adoption of electric vehicles).
    - Potential of recycling projects to avoid or reduce emissions associated with raw materials, use, or end-of life of advanced energy property
- The extent to which the efficiency, lifetime, recyclability, or other characteristics that reduce overall GHG emissions of the facility's products exceed those of incumbents or competitors.
- Efforts to mitigate GHG emissions from the proposed manufacturing or recycling facility:
    - The extent to which the project involves current best-in-class manufacturing or recycling approaches, including the use of innovative equipment,

processes, and low-carbon fuels, as demonstrated through project planning documents or front-end engineering and design studies.
    - The extent to which the project aligns with the long-term strategy of the United States to achieve net-zero emissions.

Criterion 3: Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy

- The extent to which the proposed project addresses current and anticipated supply chain vulnerabilities for clean energy products that facilitate progress in line with the long-term strategy of the United States to achieve net-zero emissions.
- The extent to which the project would increase domestic production capacity and availability of clean energy products that facilitate progress towards a net-zero economy, including a qualifying clean energy product itself or associated components or materials.
- The extent to which the proposed project addresses current and anticipated supply chain vulnerabilities for clean energy products that facilitate progress towards a net-zero economy, based on a comparison of the production capacity and the current and anticipated gap between domestic manufacturing capacity and demand for the specified advanced energy property or materials produced by the proposed project.

In the case of recycling projects, these technical review criteria will be evaluated based on which materials are produced at the recycling facility and evidence that those produced materials will serve as inputs to clean energy supply chains.

Criterion 4: Workforce and Community Engagement

- Job Creation and Workforce Continuity:
    - The number of domestic jobs created (both direct and indirect) (a) during completion of the project (the credit period) and (b) during operations of the facility after it is placed in service, including jobs within energy communities (if applicable) attained by locals or individuals previously employed by the local or regional coal industry.
    - The quality and manner in which the proposed project will create and/or retain high-quality, good-paying jobs (both direct and indirect) with employer-sponsored benefits for all classifications and phases of work.
    - The extent to which the applicant engaged key stakeholders to develop partnerships to better serve local and diverse workforce through training and support.
- Ensuring Timely Project Completion Through Workforce and Community Engagement:
    - The extent of current and planned efforts to engage community and labor stakeholders, including as it relates to the ability to execute the project on

schedule and with adequate workforce.
    - The extent to which workforce recruitment and support of the community for the project have been strengthened through benefit-sharing agreements, consideration of environmental impact, use of local resources, and improved access to employment opportunities for the local workforce.
- Energy Community Transition:
    - The extent to which the application includes specific and high-quality actions to support energy communities, including transition opportunities for workers in the coal, other energy, and automotive sectors.
    - The extent to which a project will utilize existing resources or infrastructure that previously supported the local or regional coal industry.
- Local Environmental Impacts:
    - The extent to which the proposed project accounts for its environmental impact to the surrounding community by having clear plans to avoid or reduce local air pollution, land contamination, and/or water contamination.
    - The extent to which the application identifies specific, measurable benefits for disadvantaged communities, including energy communities.

ii. Section 48C(e) Application for Clean Energy Manufacturing and Recycling Projects

a) Section 48C(e) Application Content for Clean Energy Manufacturing and Recycling Projects

This section describes the specific content that applicants must provide in the § 48C(e) application files and appendices for applications proposing Clean Energy Manufacturing and Recycling Projects. Template files for submitting this information will be provided through the eXCHANGE portal.

Table: Section 48C(e) Application Content Requirements for Clean Energy Manufacturing and Recycling Projects

Section	Information Required

Project Overview	Provide an overview of the proposed project. At a minimum, include:
	• **Company Overview:**
	  ○ Describe your company, including prior experience manufacturing or recycling clean energy technologies relevant to the proposed project.
	• **Project Summary:**
	  ○ Describe the proposed manufacturing or recycling facility, including size, location, and other relevant information.
	  ○ Indicate what the investment will accomplish, including:
	  ▪ Whether the project will establish, re-equip, or expand a facility.
	  ▪ The specified advanced energy property, and whether the facility will manufacture or recycle the specified advanced energy property. If the project involves more than one specified advanced energy property, indicate the project's primary advanced energy property, and any additional advanced energy properties the project will produce or recycle.
	  ▪ In the case of a recycling project, describe the facility's products and the clean energy supply chains they will support.
	  ○ Describe in detail the equipment and processes employed at the proposed facility to manufacture or recycle the proposed advanced energy property.
	  ▪ If the proposed project re-equips or expands an existing facility, describe clearly what the proposed project will add or change in the existing facility.
	  ▪ To clearly illustrate the proposed facility or proposed changes to an existing facility, applicants are encouraged to submit diagrams and/or images (e.g., a detailed process flow diagram) as appendix materials.
	  ▪ Provide a list of the anticipated eligible property that will make up the qualified investment of the qualifying advanced energy project.
	  ○ Describe any significant changes to the project that have occurred since the concept paper stage.

Commercial Viability	**Project Plan:**
	• Project Management and Timeline:
	  ○ Provide a project schedule through operation and achieving full production capacity, which demonstrates how certification requirements will be met within two (2) years of receiving an allocation decision from the IRS, and how the project will be placed in service within two (2) years of such certification. Documentation supporting the project schedule should be submitted as separate appendix materials.
	  ○ Describe plans to ensure an adequate supply of essential inputs needed for successful operation of the project.
	  ○ For the following contracts and agreements, summarize key terms and conditions in the narrative and submit copies as appendix materials. A Professional Engineer must inspect and certify the project documents for feasibility and may be an employee of the applicant.
	  ▪ Operations and Maintenance Agreement.
	  ▪ Shareholders Agreement.
	  ▪ Engineering, Procurement and Construction Agreement, including firm price, liquidated damages, holdbacks, and performance guarantees, for example.
	• Siting and Permitting: Explain the rationale for selection of the project site and provide documentation supporting the applicant's conclusion that the proposed site can fully meet all environmental, water supply, transmission interconnection, and other necessary requirements. Include a complete list of all federal, state, and local permits, including environmental authorizations (if applicable) or reviews necessary to commence construction of the project. Additional documentation that supports key claims may be provided as appendix materials, such as regulatory approvals and signed agreements, letters of intent, or term sheets for supply and product transportation.
	• Risk Management Plan: Identify project risks or challenges and any relevant strategies for risk mitigation and management, including legal, financial, engineering, procurement, construction, and risks. Include a discussion of natural disasters (e.g., earthquakes), climate impacts and extreme weather patterns (e.g., tornadoes, hurricanes, heat and freezing temperatures, drought, wildfire, and floods) that may impact the resilience/sustainability of the project.
	
	Business Plan: Provide the following financial information for the proposed project, and market and cost information for the facility's products.

	• *Financial Information:*
	  ○ Submit a cash flow model detailing investments in and cash flows anticipated over the facility's expected lifetime, including a description of the methodology and all assumptions used.
	  ○ Describe the payback period, net present value (NPV), adjusted present value (APV) and break-even analysis for the project and other financial metrics including return on investment and return on assets.
	  ○ Estimate the project's amount that will be treated as a qualified investment (as determined under § 48C) if the project is certified to receive a credit. The applicant may use any reasonable methodology and assumptions in estimating this amount.
	  ○ Describe the amount of equity that will be invested in the project, including the sources of such equity and their strengths. Provide any existing equity funding commitments or expressions of interest from equity funding sources for the project as separate appendix materials.
	  ○ Describe the amount of total debt obligations that will be incurred and the funding sources of all such debt. Include any existing debt funding commitments or expressions of interest from debt funding sources for the project as separate appendix materials.
	  ○ Describe any local, state, or other federal incentives or funds that are being pursued or have been awarded for the proposed project, such as grants, loan guarantees, or tax credits. Also include a description of any instances where any federal agencies or non-federal governmental entities have entered into an arrangement as a customer or offtaker of the project's products or services, or other federal contracts, including acquisitions, leases, and other arrangements, that may indirectly support the applicant's proposed project.
	• *Market Information:*
	  ○ Describe the markets your products will serve, including the existing market size, dollar volume, and growth potential. If the product can be sold in multiple market segments, describe each one.
	  ○ Discuss the current and anticipated competitiveness of your market, including current competing products and competitors.
	  ○ Discuss your sales forecast, including details of any offtake agreements you may have to support your project. Identify confirmed or potential customers who will purchase, lease, or otherwise use the facility's product. Offtake agreements and

	other documents provided as evidence may be included as appendix materials. ○ Based on the above information, summarize your product's projected market share for the next five years including trends and projections for demand and price, growth potential (short-term and long-term), and strategies to expand your market share (e.g., ways to circumvent market barriers). • *Cost Information:* ○ Provide the estimated cost of your facility's product and how it compares to similar technologies or materials in the same market segment, including new and recycled products. This should be expressed in the same units as annual production (e.g., $/watt, $/kilowatt-hour, and $/ton) per the instructions in the 48C Application Data Sheet. Applicants should include the absolute difference and percentage change from a reasonable domestic industry average. ○ Calculate the levelized cost of generated or stored energy, or of measured reduction in energy consumption or GHG emissions (based on costs of the full supply chain). Instructions for calculating levelized cost metrics are provided in Section V. Explain the methodology and assumptions used in the § 48C(e) application narrative. **Management Plan:** Provide the following information for the company and key management team members: • Describe the ownership structure of the company, including all beneficiaries. • List key management and senior personnel for the project, including the names, positions or titles, qualifications, and relevant experience. Resumes may be included as combined appendix materials, preferably in an Adobe PDF document labeled Resumes.pdf. • Describe the unique capabilities and expertise of the applicant and any major project partners, including debt or equity sponsors, contractors/vendors (if known), and any other counterparty that the applicant believes will enable the project to be successful, as well as the prior experience of the applicant and any major project partners in similar undertakings to the proposed project. • Summarize any pending or threatened (in writing) action, suit, proceeding, or investigation, including any action or proceeding by or before any governmental authority, that relates to the senior/key personnel, and the status of any appeals. • Describe any corporate health indicators, including legal claims

	or liabilities, planned debt restructuring, planned corporate actions, and other factors that could negatively affect the likelihood of project completion. Provide a copy of audited financial statements for the applicant and other projected funding sources for the most recently ended three (3) fiscal years, and the unaudited quarterly interim financial statements for the current fiscal year, as separate appendix materials. If all three years of audited statements are not available, provide all available statements and any additional information or appendices that provide similar evidence of corporate health.

Greenhouse Gas Emissions Impacts	**Greenhouse Gas Emissions Impacts of the Facility's Products:** At a minimum, include: • *End Product Impacts:* Describe the end-use application of facility's products and how their use, whether that is independently (e.g., energy efficiency equipment) or as part of a larger specified advanced energy product (e.g., blade in wind tower) will avoid or reduce GHG emissions. Provide product specifications to verify these claims. ○ In the case of specified advanced energy property that provides GHG reduction or avoidance over incumbent technologies or systems, such as clean energy, clean vehicle, or efficiency products, applicants should describe the product's typical use in the narrative and provide quantitative information in the Data Sheet. ○ In the case of carbon capture or removal equipment, applicants should quantify direct GHG reductions enabled by the product in typical use in the Data Sheet. ○ In the case of electrolyzing, refining, or blending equipment, applicants should describe the fuel, chemical, or product and its production process, including feedstocks, in the narrative and Data Sheet. ○ In the case of specified advanced energy property that provides indirect GHG reduction or avoidance, applicants may wish to qualitatively describe how the facility's products could contribute to emissions reductions by reducing energy or fuel demand or accelerating adoption of low-emissions technologies (e.g., for enabling technology such as grid components, storage, or charging infrastructure). ○ In the case of recycling projects, applicants should qualitatively describe how the facility's products are expected to reduce emissions through their use and by reducing raw material needs or emissions associated with end-of-life. • *Product Performance:* Provide any details about the innovation and performance of the end product (e.g., efficiency, range, and economic life) that indicate its ability to facilitate deeper GHG emissions reductions than leading competitors or incumbents. Applicants should substantiate such claims using the product warranty or related information, which should be described in the narrative and may be submitted as separate appendix materials. **Note:** For applicants applying for other advanced energy projects under Appendix A(1)(i), "*Other advanced energy property designed to reduce greenhouse gas emissions as may be determined by the Secretary*", applicants must demonstrate

	the reduction of GHG emissions is a necessary ultimate outcome from the manufacture of the advanced energy property. **Greenhouse Gas Emissions from the Facility:** At a minimum, include: • *Direct Emissions:* Qualitatively and quantitatively characterize the anticipated sources of direct (Scope 1) or indirect fuel- and energy-related (Scope 2) GHG emissions in the manufacturing or recycling process. Emissions estimates should be provided in the 48C Application Data Sheet using the methodology described in Section V; where available, input assumptions should be justified with publicly available data and engineering studies. Explain any significant differences between direct emissions from the facility and industry averages. • *Facility Performance:* Provide any details about the manufacturing or recycling process (e.g., efficiency, lifetime, electrification, low-carbon fuels, etc.) that indicate its potential to result in lower emissions than leading competitors or incumbents. Wherever possible, the applicant should substantiate assessments of process improvements with analysis or engineering studies, which should be described in the narrative and may be submitted as separate appendix materials, which may be submitted as separate appendix materials. • *Mitigation Efforts:* Describe any planned efforts to mitigate GHG emissions of the proposed facility. • *Company Commitments and Track Record:* Describe any company commitments or experience reducing GHG emissions of manufacturing or recycling facilities.

Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy	• **Output of Your Facility:** Describe the proposed facility's products and projected annual output for each product. In the case of retrofitting, re-equipping, or expanding an existing facility, indicate how the project will alter the facility's annual output. Indicate whether production from the facility covers multiple supply chain segments—processed material, subcomponents, components, systems/end products—and how those segments interact. In the 48C Application Data Sheet, submit the relevant production capacity information for the facility's outputs (see Section V for a description of these terms) and then justify each in the § 48C(e) Application narrative: o Annual Production. o Manufacturing Contribution. o Share of Facility Output. o Real-World Annual Performance. o Product Lifetime. • **Supply Chain Resilience:** Describe how your facility's products will help build resilience of domestic supply chains that are critical for energy products that facilitate progress towards a net-zero economy, from raw materials to end-of-life. • **Inputs to Your Facility:** Describe key inputs needed for your manufacturing or recycling process. Describe any known sources for your inputs, including indicating domestic sources and any current or anticipated supply chain vulnerabilities. • **End-Use Applications:** Indicate whether the facility's products will be used in multiple specified advanced energy technologies (e.g., wind, solar, and electric grid) or multiple sectors (e.g., transportation, industry, and electricity). Reference any offtake or sales arrangements provided in the Commercial Viability section to justify the end-use applications and, where possible, include these in the appendix.

Workforce and Community Engagement (Submitted as a separate PDF document)	Describe your plan for contributing to job creation and ensuring project viability, timely completion, and ultimate success by fostering a stable and supportive workforce and host community. Applicants are encouraged to use Specific, Measurable, Achievable, Relevant, and Timely (SMART) milestones wherever possible and where relevant. At a minimum, include:
	
	Job Creation and Workforce Continuity: Describe the applicant's approach to creating and maintaining high-quality jobs for both new and incumbent workers.
	
	• Characterize and estimate the number of jobs your project will create (e.g., mechanics and construction workers), including both direct and indirect jobs both during completion of the project (the credit period) and during operation of the facility after it is placed in service and any indicators of job quality.
	• Describe partnerships with apprenticeship readiness programs, or community-based workforce training and support organizations serving displaced industrial workers, including in the coal, other energy, and automotive sectors, and others facing systematic barriers to employment to facilitate participation in the project's construction and operations.
	• Summarize the applicant's plan to attract, train, and retain a skilled and well-qualified workforce both during completion of the project (the credit period) and during operation of the facility after it is placed in service. A collective bargaining agreement, labor-management partnership, or other similar agreement would provide evidence of such a plan. Alternatively, applicants may describe:
	  ○ Wages, benefits, and other worker supports to be provided as benchmarking against prevailing wages for construction and local median wages for other occupations;
	  ○ Commitments to invest in workforce education and training, including measures to reduce attrition, increase productivity from a committed and engaged workforce, and support the development of a resilient, skilled, and stable workforce for the project; and
	  ○ Efforts to engage employees in the design and execution of workplace safety and health plans.
	• Describe employees' ability to organize, bargain collectively, and participate, through labor organizations of their choosing, in decisions that affect them. This contributes to the effective conduct of business and facilitates amicable settlements of any potential disputes between employees and employers, providing

	assurances of project efficiency, continuity, and multiple public benefits. In the description, explain whether workers can form and join unions of their choosing, and how they will have the opportunity to organize with the purposes of exercising collective voice in the workplace. **Ensuring Timely Project Completion Through Workforce and Community Engagement:** Describe current and planned efforts to engage with community and labor stakeholders, including as it relates to strengthening support of the community, workforce recruitment, and the ability to execute the project on schedule and with adequate workforce. • Provide a comprehensive list of stakeholders that the project plans to engage from local governments, Tribal governments, labor unions, and community-based organizations. • Describe current and planned efforts to engage with listed stakeholders, including as it relates to the ability to complete the project in the shortest time and with adequate workforce. • Describe current and planned efforts to ensure availability of the workforce needed to successfully complete the project and place it in service in a timely manner, including through training programs that serve workers currently underrepresented in the sector. • Describe any activities to strengthen support of the community such as through benefit-sharing agreements, consideration of environmental impact, and use of local resources. Discussions should reference Workforce and Community Engagement Agreements, or any plans to develop such agreements, from representative organizations reflecting substantive engagement and feedback on applicant's approach to community and labor engagement. Examples of such agreements are Good Neighbor Agreements/Community Benefits Agreements, Collective Bargaining Agreements, Project Labor Agreements or Community Workforce Agreements. Actual agreements must be provided in the submission package as appendix files. **Energy Community Transition:** Describe the extent to which the project will support energy communities. • Describe plans to utilize existing local and regional resources that previously supported the local or regional coal, other energy, or automotive industries, including through transition opportunities for workers in the coal, other energy, and automotive sectors into clean energy industries.

	• If applicable, include discussion on plans to repurpose existing infrastructure/assets that have been abandoned due to the closing of a coal mine or coal plant.
	
	Local Environmental Impacts: Describe the impact of your project on local air, water, and/or land quality, as well as any efforts to mitigate local pollution and waste.
	
	• Discuss any anticipated negative and cumulative environmental impacts of the project, including impacts on local air, water, and/or land quality. Describe any efforts to mitigate local pollution and waste.
	• Determine whether the location or community qualifies as a disadvantaged community according to the Climate and Economic Justice Screening Tool (CEJST).
	• Within the context of cumulative environmental impacts, applicants should use the U.S. Environmental Protection Agency's Environmental Justice Screening and Mapping (EJSCREEN) tool (*https://www.epa.gov/ejscreen*) to quantitatively discuss existing environmental impacts in the project area.
	• If anticipated project benefits will flow to an applicable disadvantaged community, identify applicable benefits that are quantifiable, measurable, and trackable, such as:
	  ○ (1) A decrease in energy burden;
	  ○ (2) A decrease in environmental exposure and burdens;
	  ○ (3) An increase in access to low-cost capital;
	  ○ (4) An increase in high-quality job creation, the clean energy job pipeline, and job training for individuals;
	  ○ (5) Increases in clean energy enterprise creation and contracting (e.g., through investment in underserved and underrepresented businesses);
	  ○ (6) Increases in energy democracy, including community ownership;
	  ○ (7) Increased parity in clean energy technology access and adoption; and
	  ○ (8) An increase in energy resilience.
	• In addition, applicants should also discuss how the project will maximize all of the benefits listed above. Describe how and when anticipated benefits are expected to flow to the disadvantaged community. For example, will the benefits be provided directly within the disadvantaged communities identified, or are the benefits expected to flow in another way? Further, will the benefits flow during project development or after project completion, and how will applicant track benefits

	delivered?

b) Section 48C(e) Application Technical Review Criteria for Clean Energy Manufacturing and Recycling Projects

This section describes the technical review criteria that DOE will use to evaluate § 48C(e) applications proposing Clean Energy Manufacturing and Recycling Projects.

Criterion 1: Commercial Viability

- Project schedule and time from certification to completion:
    - Readiness to proceed with the proposed project as evidenced by firmness of site selection and progress towards securing required permits, contracts, reviews, and agreements; and
    - Reasonableness of the timeframe required for construction and commissioning of the project, including interim milestones and overall timeline.
- The extent to which risk management issues and mitigation strategies are identified and addressed, including the level of contingency proposed to address risk.
- Strength of the proposed business plan, including:
    - The potential for commercial deployment, based on estimates of market share, market growth potential, and price competitiveness of the product.
    - The source and certainty of funding for the equity that will be invested in the project, including private financing, DOE funding, state and local incentives, and other sources.
    - The strength of key arrangements, such as financing, acquisition/supply strategy, and power purchase agreements for the proposed project, as well as offtake (sales) arrangements for the facility's products.
    - The degree to which the application justifies the proposed project's economic viability, sustainability, and potential growth.
    - The degree to which the investment is profitable, based on the proposed budget and spend plan, as well as described cash flow analysis of the project.
    - The levelized cost of generated or stored energy, or of measured reduction in energy consumption or GHG emission (or similar metric) for the facility's products, compared to similar technologies or materials within the same market segment.
- Strength of the proposed management plan, including the management team's track record of success in areas relevant to the project and corporate health of the applicant.

In assessing each item above, the following will be considered: (a) the comprehensiveness, specificity, and accuracy of the information and plans provided, (b) the reasonableness of assumptions used in making estimations and projections, and (c)

the extent to which the applicant demonstrates an understanding of relevant risks and the quality of the strategies put forward to mitigate and manage those risks.

Criterion 2: Greenhouse Gas Emissions Impacts

- The potential for the facility's products to facilitate a reduction in anthropogenic emissions of GHGs, based on: Emissions reductions associated with the potential to displace higher-emitting incumbent technologies, fuels, or materials, or to capture carbon dioxide that would otherwise enter or remain in the atmosphere. The extent to which the product enables the manufacturing or adoption of other low-emissions technologies (e.g., charging infrastructure to enable the adoption of electric vehicles, critical materials to enable the manufacturing of other clean energy technologies, or electric grid modernization equipment to advanced aspects of the clean energy transition). End products impact on avoidance or reduction in anthropogenic emissions of GHGs, based on:
    - Potential GHG improvement over higher-emitting incumbent technologies or systems.
    - Potential to capture or remove carbon oxides.
    - Potential to provide indirect emissions reductions or avoidance by enabling a reduction in energy or fuel use or manufacturing or adoption of other low-emissions technologies (e.g., charging infrastructure to enable the adoption of electric vehicles).
    - Potential of recycling projects to avoid or reduce emissions associated with raw materials, use, or end-of life of advanced energy property
- The extent to which technological innovation in the efficiency, economic life, recyclability, or other characteristics that reduce overall GHG emissions of the facility's products exceed those of incumbents or competitors.
- The extent to which the project involves current best-in-class manufacturing or recycling approaches, including the use of innovative equipment, processes, and low-carbon fuels, as demonstrated through project planning documents, front-end engineering and design studies, or otherwise.
- Plans to align with the national target of net-zero emissions by 2050, including efforts to reduce both direct (Scope 1) and indirect, upstream fuel- and energy-related (Scope 2) emissions over the lifetime of the facility.
- Efforts to reduce emissions in the upstream supply chain (e.g., through contracts with low-emissions suppliers).
- Activities to monitor facility emissions and energy use, including through any relevant voluntary or required reporting protocols (e.g., EPA's Greenhouse Gas Reporting Program).

Criterion 3: Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy

- The extent to which the proposed project addresses current and anticipated supply

chain vulnerabilities for clean energy products that facilitate progress towards a net-zero economy.

- The extent to which the project would increase domestic production capacity and availability of clean energy products that facilitate progress towards a net-zero economy, including a qualifying clean energy product itself or associated components or materials. The extent to which the proposed project addresses current and anticipated supply chain vulnerabilities for clean energy products that facilitate progress towards a net-zero economy, based on a comparison of the production capacity and the current and anticipated gap between domestic manufacturing capacity and demand for the specified advanced energy property or materials produced by the proposed project.
- The extent to which the project will support and encourage follow-on supply chain investments in the region.
- The extent to which the project supports the development of U.S. capacity to meet federal, state, or local domestic content requirements or incentives, such as those in the §§ 30D, 45/45Y, or 48/48E federal tax credits.
- The extent to which the project promotes long-term U.S. manufacturing competitiveness or technology leadership in the transition to a net-zero economy, based on the projected commercial deployment of the facility's products; the feasibility of delivering market-ready products at the stated annual production levels; the efficiency, emissions, or productivity of the facility beyond the state-of-the-art; and the potential to avoid or reduce end-of-life waste from the facility or final product through the use of alternative processes, technologies, or materials.

Criterion 4: Workforce and Community Engagement

- **Job Creation and Workforce Continuity:**
    - The number of domestic jobs created (both direct and indirect) (a) during completion of the project (the credit period) and (b) during operation of the facility after it is placed in service, including jobs within energy communities (if applicable) attained by locals or individuals previously employed by the local or regional coal industry.
    - The quality and manner in which the proposed project will create and/or retain high- quality, good-paying jobs (both direct and indirect) with employer-sponsored benefits for all classifications and phases of work.
    - The extent to which the applicant engaged key stakeholders to develop partnerships to better serve local and diverse workforce through training and support.
    - The extent to which the project provides employees with the ability to organize, bargain collectively, and participate, through labor organizations of their choosing, in decisions that affect them and that contribute to the effective conduct of business and facilitates amicable settlements of any potential disputes between employees and employers, providing assurances

of project efficiency, continuity, and multiple public benefits.
    - The extent to which applicant demonstrates that they are a responsible employer, with ready access to a sufficient supply of appropriately skilled labor, and an effective plan to minimize the risk of labor disputes or disruptions.

- **Ensuring Timely Project Completion Through Workforce and Community Engagement:**
    - The extent of current and planned efforts to engage community and labor stakeholders, including as it relates to the ability to execute the project on schedule and with adequate workforce.
    - The extent to which workforce recruitment and support of the community for the project have been strengthened through benefit-sharing agreements, consideration of environmental impact, use of local resources, and improved access to employment opportunities for the local workforce.
    - The extent to which the applicant demonstrates community and labor engagement to date that results in support of the community for the proposed project and availability and maintenance of the necessary workforce.
    - The extent to which the applicant has a clear and appropriately robust plan to engage—ideally through a clear commitment to negotiate an enforceable Workforce and Community Agreements—with labor unions, Tribal entities, and community-based organizations that support or work with disadvantaged communities and other affected stakeholders.
    - The extent to which the applicant has considered accountability to affected workers and community stakeholders, including those most vulnerable to project activities with a plan to publicly share Workforce and Community Engagement plan commitments.
    - Extent to which a project will generate economic prosperity in the local community.
- **Energy Community Transition:**
    - The extent to which the application includes specific and high-quality actions to support energy communities, including through transition opportunities for workers in the coal, other energy, and automotive sectors into clean energy transition opportunities.
    - The extent to which a project will utilize existing local and regional resources that previously supported the local or regional coal industry or repurpose existing infrastructure/assets that have been abandoned due to closing of a coal mines or coal plant.
- **Local Environmental Impacts:**
    - The extent to which the proposed project accounts for its environmental impact to the surrounding community by having clear plans to avoid or reduce local air pollution, land contamination, and/or water contamination.
    - The extent to which the applicant identifies specific, measurable benefits for

disadvantaged communities, how the benefits will flow to disadvantaged communities, and how negative environmental impacts affecting disadvantaged communities would be mitigated.

B. Greenhouse Gas Emission Reduction Projects

Priority Areas for Greenhouse Gas Emission Reduction Projects

All Greenhouse Gas Emission Reduction Projects described in Appendix A(2) of this guidance are eligible to apply for a § 48C allocation and will be evaluated by DOE against the four technical review criteria reflecting overall program objectives:

- Criterion 1: Commercial Viability
- Criterion 2: Greenhouse Gas Emissions Impacts
- Criterion 3: Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy
- Criterion 4: Workforce and Community Engagement

When evaluating the Greenhouse Gas Emissions Impacts criterion, DOE will give priority to projects that deeply reduce emissions to levels significantly below a reasonable domestic industry average and the 20% reduction eligibility requirement stated in Appendix A(2).

When evaluating the Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy criterion, DOE will give priority to projects that advance the commercial viability and uptake of replicable decarbonization efforts in major industrial applications (e.g., cement, iron and steel, aluminum, chemicals, and other energy-intensive manufacturing sectors), including innovative solutions, and to projects that align with one or more cross-cutting industrial decarbonization techniques, such as energy efficiency, electrification, low-carbon fuels, feedstocks, and energy sources (LCFFES), material efficiency or substitution, and carbon capture utilization and storage (CCUS).

i. Concept Papers for Greenhouse Gas Emission Reduction Projects

a) Concept Paper Content for Greenhouse Gas Emission Reduction Projects

This section describes the specific content that applicants must provide in the concept paper files for applications proposing Greenhouse Gas Emission Reduction Projects. Template files for submitting this information will be provided through the eXCHANGE portal.

Table: Concept Paper Content Requirements
for Greenhouse Gas Emission Reduction Projects

Section	Information Requested
Project Overview	Provide an overview of the proposed project. At a minimum, include: • **Company Overview:** Describe your company and existing industrial or manufacturing capabilities. • **Project Scope:** Describe the eligible industrial or manufacturing facility to be re-equipped, including size, location, and other relevant information such as equipment and processes employed. Indicate the proposed changes supported by the project, including a list of the anticipated eligible property that will make up the qualified investment of the qualifying advanced energy project: low- or zero-carbon process heating systems; carbon capture, transport, utilization, or storage systems; energy efficiency and reduction in waste; or other industrial technology to be installed to reduce the facility's GHG emissions by at least 20%. Indicate whether the retrofit project will achieve the required 20% reduction in direct (Scope 1) emissions facility-wide, indirect fuel- and energy-related (Scope 2) emissions facility-wide, subunit emissions, or some combination thereof. Describe any anticipated changes to production capacity or output as a result of the retrofit. • **Emissions:** Describe your baseline annual emissions from the year prior to the retrofit compared to peers in your industry, and the anticipated emissions reductions to be achieved through the measures associated with the proposed project. The latter should be provided in both absolute and percentage terms, relative to your facility's baseline emissions.

Commercial Viability	**Project Plan:** • *Project Timeline:* Provide planned dates to begin re-equipping the industrial or manufacturing facility, and how many months it will take to commence operations and achieve full production capacity with the reduced emissions profile once certified. • *Siting and Permitting:* Explain the rationale for selection of the project site and indicate the current status of any required siting and permitting. • *Risk Management Plan:* Identify project risks or challenges and any relevant strategies for risk mitigation and management, such as legal, financial, engineering, procurement, construction, physical climate, and environmental risks. **Business Plan:** • *Financial Information:* Describe sources of financing for this project, including the amount and strength of funding sources that will provide the equity to be invested in the project; the amount of total debt obligations that will be incurred and the funding sources of all such debt, and the dollar amount of incentives or funds pursued or awarded from local and state governments, as well as other federal incentives pursued or awarded. If applicable, describe any existing or prospective offtake arrangements for the project's products. • *Cost Information:* Describe the cost competitiveness of the facility's products, as demonstrated through a comparison of the estimated price of your facility's product against similar products in the same market segment. **Management Plan:** • Describe the key management team members who will design, construct, permit, and execute the project. Include a description of relevant industry experience of the top-tier executives responsible for the success of the project. • Describe any corporate health indicators, including legal claims or liabilities, planned debt restructuring, planned corporate actions, and other factors that could negatively affect the likelihood of project completion.

Greenhouse Gas Emissions Impacts	• **Emissions Impacts:** Quantify the direct (Scope 1) and indirect fuel- and energy-related (Scope 2) GHG emissions associated with the qualified investment immediately before and after the retrofit project. Express post-retrofit emissions in both absolute and relative (% reduction) terms. Where possible, justify these estimates with publicly available data (e.g., EPA Greenhouse Gas Reporting Protocol [GHGRP] reporting) and engineering studies. Explain any significant differences between direct emissions from the facility immediately before the retrofit and a reasonable domestic industry average. • **Process Improvements:** Describe the portions of the manufacturing process that will be re-equipped by the project. • **Best-In-Class Technologies:** Describe the equipment used to facilitate the GHG emissions reductions, and the extent to which best-in-class technologies are deployed.
Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy	• **Existing Capacity:** Describe and provide the annual output for all of the facility's products prior to the retrofit project. In the Concept Paper Data Sheet, submit the relevant annual production information. • **Innovation and U.S. Competitiveness:** Describe how the retrofit project can pave the way for decarbonizing heavy industry by advancing the commercial viability and uptake of replicable decarbonization approaches in major industrial applications, including innovative solutions. • **Supporting U.S. Supply Chains:** Describe whether the equipment used to facilitate the GHG emissions reductions at your facility is/are produced domestically or the percentage of domestically-sourced materials used in the production of said equipment.

Workforce and Community Engagement (Submitted as a separate PDF document)	Describe your plan for contributing to job creation and ensuring project viability, timely completion, and ultimate success by fostering a stable and supportive workforce and host community. At a minimum, include:
	• Job Creation and Workforce Continuity:
	  ○ Briefly characterize the jobs (both direct and indirect) your project will create (e.g., mechanics and construction workers), including (a) during completion of the project and (b) after the project is placed in service, and any indicators of job quality.
	  ○ Describe partnerships with apprenticeship readiness programs, or community-based workforce training and support organizations serving displaced industrial workers, including in the coal, other energy, and automotive sectors, and others facing systematic barriers to employment to facilitate participation in the project's construction and operations.
	• **Ensuring Timely Project Completion Through Workforce and Community Engagement:**
	  ○ Describe current and planned efforts to engage with community and labor stakeholders, including as it relates to the ability to complete the project in the shortest time and with adequate workforce.
	  ○ Describe current and planned efforts to ensure availability of the workforce needed to successfully complete the project and place it in service in a timely manner, including through training programs that serve workers currently underrepresented in the sector.
	  ○ Describe any activities to strengthen support of the community such as through benefit-sharing agreements, consideration of environmental impact, and use of local resources.
	• Energy Community Transition:
	  ○ Describe the extent to which the project will support energy communities, including through transition opportunities for workers in the coal, other energy, and automotive sectors, and through the use of existing infrastructure in energy transition communities.
	• Local Environmental Impacts:
	  ○ Describe the impact of your project on local air, water, and/or land quality, as well as any efforts to mitigate local pollution and waste.
	Determine whether the location or community qualifies as a disadvantaged community according to the Climate and Economic

	Justice Screening Tool (CEJST).

b) Concept Paper Technical Review Criteria for Greenhouse Gas Emission Reduction Projects

This section describes the technical review criteria that DOE will use to evaluate concept papers proposing Greenhouse Gas Emission Reduction Projects.

Criterion 1: Commercial Viability

- Project schedule and time from certification to completion, based on readiness to proceed with the proposed project and reasonableness of the timeframe required for construction and commissioning of the project.
- The extent to which risk management issues and mitigation strategies are identified and addressed
- Strength of the proposed business plan, including the source and certainty of funding that will be invested in the project, including equity, private financing, DOE funding, state and local incentives, and other sources.
- Strength of the proposed management plan, including the management team's track record of success in areas relevant to the project and corporate health of the applicant.

Criterion 2: Greenhouse Gas Emissions Impacts

- The comprehensiveness, specificity, and reasonableness of the description and quantification of current and anticipated emissions, accounting for any anticipated changes to the facility's production volumes.
- The impact of the retrofit on direct (Scope 1) and indirect fuel- and energy-related (Scope 2) GHG emissions reductions from the facility, in both absolute (tons of carbon dioxide equivalent), percentage emission reductions, and the cost of avoided emissions (dollars per ton of carbon dioxide equivalent, based on tax credit dollars requested).

Criterion 3: Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy

- The extent to which the proposed project enhances U.S. leadership in low-emissions manufacturing by advancing the commercial viability and uptake of replicable decarbonization approaches in major industrial applications.
- The extent to which the proposed project aligns with one or more cross-cutting industrial decarbonization techniques, such as energy efficiency, electrification, LCFFES, material efficiency or substitution, and CCUS.

Criterion 4: Workforce and Community Engagement

- Job Creation and Workforce Continuity:

    - The number of domestic jobs created (both direct and indirect) (a) during completion of the project (the credit period) and (b) during operations of the facility after it is placed in service, including jobs within energy communities (if applicable) attained by locals or individuals previously employed by the local or regional coal industry.
    - The quality and manner in which the proposed project will create and/or retain high-quality, good-paying jobs (both direct and indirect) with employer-sponsored benefits for all classifications and phases of work.
    - The extent to which the applicant engaged key stakeholders to develop partnerships to better serve local and diverse workforce through training and support.
- Ensuring Timely Project Completion Through Workforce and Community Engagement:
    - The extent of current and planned efforts to engage community and labor stakeholders, including as it relates to the ability to execute the project on schedule and with adequate workforce.
    - The extent to which workforce recruitment and support of the community for the project have been strengthened through benefit-sharing agreements, consideration of environmental impact, use of local resources, and improved access to employment opportunities for the local workforce.
- Energy Community Transition:
    - The extent to which the application includes specific and high-quality actions to support energy communities, including transition opportunities for workers in the coal, other energy, and automotive sectors.
    - The extent to which a project will utilize existing resources or infrastructure that previously supported the local or regional coal industry.
- Local Environmental Impacts:
    - The extent to which the proposed project accounts for its environmental impact to the surrounding community by having clear plans to avoid or reduce local air pollution, land contamination, and/or water contamination.
    - The extent to which the application identifies specific, measurable benefits for disadvantaged communities, including energy communities.

ii. Section 48C(e) Applications for Greenhouse Gas Emission Reduction Projects

a) Section 48C(e) Application Content for Greenhouse Gas Emission Reduction Projects

This section describes the specific content that applicants must provide in the § 48C(e) application files and appendices for applications proposing Greenhouse Gas Emission Reduction Projects. Template files for submitting this information will be provided

through the eXCHANGE portal.

Table: Section 48C(e) Application Content Requirements for Greenhouse Gas Emission Reduction Projects

Section	Information Requested
Project Overview	Provide an overview of the proposed project. At a minimum, include: • **Company Overview:** Describe your company and existing industrial or manufacturing capabilities. • **Project Scope:** o Describe the eligible industrial or manufacturing facility to be re-equipped, including size, location, and other relevant information. Include a detailed description of the equipment and processes employed at the proposed facility. Applicants are encouraged to submit diagrams, schematics, and/or images (e.g., a detailed process flow diagram) as appendix materials. o Indicate the proposed changes supported by the project, including a list of the anticipated eligible property that will make up the qualified investment of the qualifying advanced energy project: low- or zero-carbon process heating systems; carbon capture, transport, utilization, or storage systems; energy efficiency and reduction in waste; or other industrial technology to be installed to reduce the facility's GHG emissions by at least 20%. o Indicate whether the retrofit project will achieve the required 20% reduction in direct (Scope 1) emissions, indirect fuel- and energy-related (Scope 2) emissions, subunit emissions, or some combination thereof. o Describe any anticipated changes to production capacity or output as a result of the retrofit. o Describe any significant changes to the project scope that have occurred since the concept paper stage. • **Emissions:** Describe your baseline emissions compared to peers in your industry, and the anticipated emissions reductions to be achieved through the measures associated with the proposed project. The latter should be provided in both absolute and percentage terms, relative to your facility's baseline emissions.

Commercial Viability	**Project Plan:**
	• *Project Management and Timeline:*
	  ○ Provide a project schedule through operation and achieving full production capacity, which demonstrates how certification requirements will be met within two (2) years of receiving an allocation decision from the IRS, and how the project will be placed in service within two (2) years of such certification. Documentation supporting the project schedule should be submitted as separate appendix materials.
	  ○ Describe plans to ensure an adequate supply of essential inputs needed for successful operation of the project.
	  ○ For the following contracts and agreements, summarize key terms and conditions in the narrative and submit copies as appendix materials. A Professional Engineer must inspect and certify the project documents for feasibility and may be an employee of the applicant.
	  ○ Operations and Maintenance Agreement.
	  ▪ Shareholders Agreement.
	  ▪ Engineering, Procurement and Construction Agreement, including firm price, liquidated damages, holdbacks, and performance guarantees, for example.
	• *Siting and Permitting*: Explain the rationale for selection of the project site and provide documentation supporting the applicant's conclusion that the proposed site can fully meet all environmental, water supply, transmission interconnection, and other necessary requirements. Include a complete list of all federal, state, and local permits, including environmental authorizations (if applicable) or reviews necessary to commence construction of the project. Additional documentation that supports key claims may be provided as appendix materials, such as regulatory approvals and signed agreements, letters of intent, or term sheets for supply and product transportation.
	• *Risk Management Plan*: Identify project risks or challenges and any relevant strategies for risk mitigation and management, including legal, financial, engineering, procurement, and construction risks. Include a discussion of natural disasters (e.g., earthquakes), climate impacts, and extreme weather patterns (e.g., tornadoes, hurricanes, heat and freezing temperatures, drought, wildfire, and floods) that may impact the resilience/sustainability of the project.
	Business Plan: Provide the following financial information for the proposed project, and market information for the facility's product.
	• *Financial Information:*

	○ Describe the financial viability of the project and provide supporting metrics such as payback period, net present value (NPV), or return on investment and return on assets. ○ Estimate the project's qualified investment (as determined under § 48C) if the project is certified to receive a credit. The applicant may use any reasonable methodology and assumptions in estimating this amount. ○ Describe the amount of equity that will be invested in the project, including the sources of such equity and their strengths. Provide any existing equity funding commitments or expressions of interest from equity funding sources for the project as separate appendix materials. ○ Describe the amount of total debt obligations that will be incurred and the funding sources of all such debt. Include any existing debt funding commitments or expressions of interest from debt funding sources for the project as separate appendix materials. ○ Describe any local, state, or other federal incentives or funds that are being pursued or have been awarded for the proposed project, such as grants, loan guarantees, or tax credits. Also include a description of any instances where any federal agencies or non-federal governmental entities have entered into an arrangement as a customer or offtaker of the project's products or services, or other federal contracts, including acquisitions, leases, and other arrangements, that may indirectly support the applicant's proposed project. ○ Calculate the levelized cost of measured reduction in GHG emissions (based on costs of the full supply chain) that will be enabled by the project. Instructions for calculating levelized cost metrics are provided in Section V. Explain the methodology and assumptions used in the § 48C(e) application narrative. • *Market Information:* ○ Describe the markets your products will serve, including the existing market size, dollar volume, and growth potential. Where applicable, include consideration of federal, state, or local subsidies or procurement requirements that could influence demand for a lower-carbon product. If the product can be sold in multiple market segments, describe each one. ○ Discuss the current and anticipated competitiveness of your market, including competing products and competitors. ○ Provide the estimated price of your facility's product after re-equipping and how it compares to similar technologies or materials in the same market segment, including conventional and lower-carbon products. This should be expressed in the same units as annual production (e.g., $/watt, $/kilowatt-hour,

	and $/ton) per the instructions in the 48C Application Data Sheet. Applicants should include the absolute difference and percentage change from a reasonable domestic industry average. o Discuss your sales forecast, including details of any offtake agreements and including the objectives set forward in the federal Buy Clean Initiative for low-carbon materials. Identify confirmed or potential customers who will purchase, lease, or otherwise use the facility's product. Offtake agreements, environmental product declarations, low-carbon materials certifications, and other documents provided as evidence may be included as appendix materials. o Based on the above information, summarize your product's projected market share for the next five years including trends and projections for demand and price, growth potential (short-term and long-term), and strategies to expand your market share (e.g., ways to circumvent market barriers). **Management Plan:** Provide the following information for the company and key management team members: • Describe the ownership structure of the company, including all beneficiaries. • List key management and senior personnel for the project, including the names, positions or titles, qualifications, and relevant experience. Resumes maybe be included as combined appendix materials, preferably in an Adobe PDF document labeled Resumes.pdf. • Describe the unique capabilities and expertise of the applicant and any major project partners, including debt or equity sponsors, contractors/vendors (if known), and any other counterparty that the applicant believes will enable the project to be successful, as well as the prior experience of the applicant and any major project partners in similar undertakings to the proposed project. • Summarize any pending or threatened (in writing) action, suit, proceeding, or investigation, including any action or proceeding by or before any governmental authority, that relates to the senior/key personnel, and the status of any appeals. • Describe any corporate health indicators, including legal claims or liabilities, planned debt restructuring, planned corporate actions, and other factors that could negatively affect the likelihood of project completion. Provide a copy of audited financial statements for the applicant and other projected funding sources for the most recently ended three (3) fiscal years, and the unaudited quarterly interim financial statements for the current

	fiscal year, as separate appendix materials. If all three years of audited statements are not available, provide all available statements and any additional information or appendices that provide similar evidence of corporate health.
Greenhouse Gas Emissions Impacts	• **Emissions Impacts:** Quantify the direct (Scope 1) and indirect, upstream fuel- or energy-related (Scope 2) GHG emissions of the facility immediately before and after the retrofit project, both in the application narrative and the 48C Application Data Sheet. Consider how projects may affect other emissions at the facility or in fuel or energy use over the lifetime of the projects (e.g., electrification projects may reduce Scope 1 emissions but increase Scope 2 emissions). Express post-retrofit emissions reductions in both absolute and relative (% reduction) terms, where the latter must be at least 20%. Emissions should be calculated and submitted in the 48C Application Data Sheet using the methodology described in Section V, and, where possible, inputs should be justified with publicly available data (e.g., GHGRP reporting), engineering studies, or other evidence. Explain any significant differences between direct emissions from the facility and a reasonable domestic industry average. • **Process Improvements:** Describe the portions of the industrial or manufacturing process that will be re-equipped by the project, the nature of the improvements, and how the improvements drive emissions reductions. Wherever possible, the applicant should substantiate these assessments with analysis or engineering studies, which should be described in the narrative and may be submitted as appendix materials. • **Best-In-Class Technologies:** Describe the equipment used to facilitate the GHG emissions reductions, and the extent to which best-in-class technologies are deployed. Where multiple emissions-reducing technologies are deployed, describe each.

Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy	• **Output of Your Facility:** Describe the products currently produced at the facility and average annual output in appropriate units (e.g., tons of steel). Explain whether the retrofit will alter the capacity or output of the facility, including whether the retrofit will shift output from one product to another. Describe the market these products serve, including whether they align with federal, state, or local Made in America requirements, such as Buy America programs or domestic content-based tax credits. Applicants should provide engineering studies or other analysis to substantiate the impacts of the retrofit on facility output capacity as separate appendix materials. • **Supporting Domestic Clean Energy Markets:** Describe the extent to which the equipment used to facilitate the GHG emissions reductions at your facility is produced domestically. For instance, a project utilizing carbon capture equipment should explain whether they are sourcing from domestic CCUS companies or manufacturers. • **Supporting Domestic Low-Carbon Industry:** Describe how your project will help strengthen resilience of critical domestic supply chains that facilitate progress towards a net-zero economy, including by spurring or fulfilling the growing demand for low-carbon construction materials, such as those covered in the Buy Clean Initiative. • **Innovation:** Describe the extent to which the retrofit project employs innovative solutions that can enhance U.S. leadership and industrial competitiveness. This should include the use of advanced industrial or manufacturing approaches.

Workforce and Community Engagement (Submitted as a separate PDF document)	Describe your plan for contributing to job creation and ensuring project viability, timely completion, and ultimate success by fostering a stable and supportive workforce and host community. Applicants are encouraged to use Specific, Measurable, Achievable, Relevant, and Timely (SMART) milestones wherever possible and where relevant. At a minimum, include:
	
	Job Creation and Workforce Continuity: Describe the applicant's approach to creating and maintaining high-quality jobs for both new and incumbent workers.
	
	• Characterize and estimate the number of jobs your project will create (e.g., mechanics and construction workers), including both direct and indirect jobs both during completion of the project (the credit period) and during operation of the facility after it is placed in service and any indicators of job quality.
	• Describe partnerships with apprenticeship readiness programs, or community-based workforce training and support organizations serving displaced industrial workers, including in the coal, other energy, and automotive sectors, and others facing systematic barriers to employment to facilitate participation in the project's construction and operations.
	• Summarize the applicant's plan to attract, train, and retain a skilled and well-qualified workforce both during completion of the project (the credit period) and during operation of the facility after it is placed in service. A collective bargaining agreement, labor-management partnership, or other similar agreement would provide evidence of such a plan. Alternatively, applicants may describe:
	  ○ Wages, benefits, and other worker supports to be provided as benchmarking against prevailing wages for construction and local median wages for other occupations;
	  ○ Commitments to invest in workforce education and training, including measures to reduce attrition, increase productivity from a committed and engaged workforce, and support the development of a resilient, skilled, and stable workforce for the project; and
	  ○ Efforts to engage employees in the design and execution of workplace safety and health plans.
	• Describe employees' ability to organize, bargain collectively, and participate, through labor organizations of their choosing, in decisions that affect them. This contributes to the effective conduct of business and facilitates amicable settlements of any potential disputes between employees and employers, providing

	assurances of project efficiency, continuity, and multiple public benefits. In the description, explain whether workers can form and join unions of their choosing, and how they will have the opportunity to organize with the purposes of exercising collective voice in the workplace. **Ensuring Timely Project Completion Through Workforce and Community Engagement:** Describe current and planned efforts to engage with community and labor stakeholders, including as it relates to strengthening support of the community, workforce recruitment, and the ability to execute the project on schedule and with adequate workforce. • Provide a comprehensive list of stakeholders that the project plans to engage from local governments, Tribal governments, labor unions, and community-based organizations. • Describe current and planned efforts to engage with listed stakeholders, including as it relates to the ability to complete the project in the shortest time and with adequate workforce. • Describe current and planned efforts to ensure availability of the workforce needed to successfully complete the project and place it in service in a timely manner, including through training programs that serve workers currently underrepresented in the sector. • Describe any activities to strengthen support of the community such as through benefit-sharing agreements, consideration of environmental impact, and use of local resources. Discussions should reference Workforce and Community Engagement Agreements, or any plans to develop such agreements, from representative organizations reflecting substantive engagement and feedback on applicant's approach to community and labor engagement. Examples of such agreements are Good Neighbor Agreements/Community Benefits Agreements, Collective Bargaining Agreements, Project Labor Agreements or Community Workforce Agreements. Actual agreements must be provided in the submission package as appendix files. **Energy Community Transition:** Describe the extent to which the project will support energy communities. • Describe plans to utilize existing local and regional resources that previously supported the local or regional coal, other energy, or automotive industries, including through transition opportunities for workers in the coal, other energy, and automotive sectors into clean energy industries.

	• If applicable, include discussion on plans to repurpose existing infrastructure/assets that have been abandoned due to the closing of a coal mine or coal plant.
	
	Local Environmental Impacts: Describe the impact of your project on local air, water, and/or land quality, as well as any efforts to mitigate local pollution and waste.
	
	• Discuss any anticipated negative and cumulative environmental impacts of the project, including impacts on local air, water, and/or land quality. Describe any efforts to mitigate local pollution and waste.
	• Determine whether the location or community qualifies as a disadvantaged community according to the Climate and Economic Justice Screening Tool (CEJST).
	• Within the context of cumulative environmental impacts, applicants should use the U.S. Environmental Protection Agency's Environmental Justice Screening and Mapping (EJSCREEN) tool (*https://www.epa.gov/ejscreen*) to quantitatively discuss existing environmental impacts in the project area.
	• If anticipated project benefits will flow to an applicable disadvantaged community, identify applicable benefits that are quantifiable, measurable, and trackable, such as:
	  ○ (1) A decrease in energy burden;
	  ○ (2) A decrease in environmental exposure and burdens;
	  ○ (3) An increase in access to low-cost capital;
	  ○ (4) An increase in high-quality job creation, the clean energy job pipeline, and job training for individuals;
	  ○ (5) Increases in clean energy enterprise creation and contracting (e.g., through investment in underserved and underrepresented businesses);
	  ○ (6) Increases in energy democracy, including community ownership;
	  ○ (7) Increased parity in clean energy technology access and adoption; and
	  ○ (8) An increase in energy resilience.
	• In addition, applicants should also discuss how the project will maximize all of the benefits listed above. Describe how and when anticipated benefits are expected to flow to the disadvantaged community. For example, will the benefits be provided directly within the disadvantaged communities identified, or are the benefits expected to flow in another way? Further, will the benefits flow during project development or after project completion, and how will applicant track benefits delivered?

b) Section 48C(e) Application Technical Review Criteria for Greenhouse Gas Emission Reduction Projects

This section describes the technical review criteria that DOE will use to evaluate § 48C(e) applications proposing Greenhouse Gas Emission Reduction Projects.

Criterion 1: Commercial Viability

- Project schedule and time from certification to completion
    - Readiness to proceed with the proposed project as evidenced by firmness of site selection and progress towards securing required permits, contracts, reviews, and agreements; and
    - Reasonableness of the timeframe required for construction and commissioning of the project, including interim milestones and overall timeline.
- The extent to which risk management issues and mitigation strategies are identified and addressed, including the level of contingency proposed to address risk.
- Strength of the proposed business plan, including:
    - The source and certainty of funding for the equity that will be invested in the project, including private financing, DOE funding, state and local incentives, and other sources.
    - The strength of key arrangements, such as financing, acquisition/supply strategy, and power purchase agreements for the proposed project, as well as offtake (sales) arrangements for the facility's product.
    - The degree to which the application justifies the proposed project's economic viability, sustainability, and potential growth.
    - The degree to which the investment is profitable, based on the proposed budget and spend plan, as well as described cash flow analysis of the project.
    - The levelized cost of measured reduction in GHG emissions.
    - The potential for commercial deployment, based on anticipated demand and cost premiums for lower-carbon industrial or manufacturing products.
- Strength of the proposed management plan, including the management team's track record of success in areas relevant to the project and corporate health of the applicant.

In assessing each item above, the following will be considered: (a) the comprehensiveness, specificity, and accuracy of the information and plans provided; (b) the reasonableness of assumptions used in making estimations and projections; and (c) the extent to which the applicant demonstrates an understanding of relevant risks and the quality of the strategies put forward to mitigate and manage those risks.

Criterion 2: Greenhouse Gas Emissions Impacts

- The comprehensiveness, specificity, and reasonableness of the description and quantification of current and anticipated emissions, accounting for any anticipated

changes to the facility's production volumes.

- The impact of the retrofit on direct (Scope 1) and indirect fuel- and energy-related (Scope 2) GHG emissions at the facility, in terms of absolute emission reductions (tons of carbon dioxide equivalent), percentage emission reductions from before to after the retrofit, and the cost of reduced emissions (dollars per ton of absolute carbon dioxide equivalent reduced, based on tax credit dollars requested).
- Use of current best-in-class industrial or manufacturing approaches and innovative, low-emissions equipment, fuels, materials, or processes, as demonstrated through project planning documents, front-end engineering and design (FEED) studies, or otherwise.
- Extent to which the retrofit enables the facility to align with the long-term strategy of the United States to reach net-zero emissions by 2050.

Criterion 3: Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy

- The extent to which the proposed project enhances U.S. leadership in low-emissions industry or manufacturing by advancing the commercial viability and uptake of replicable decarbonization approaches in major industrial applications.
- The extent to which the proposed project aligns with one or more cross-cutting industrial decarbonization techniques, such as energy efficiency, electrification, LCFFES, material efficiency or substitution, and CCUS. These approaches align with but are not limited to the DOE Industrial Decarbonization Roadmap.
- The extent to which the project supports the development of U.S. capacity to meet federal, state, or local Made in America requirements, such as Buy America requirements or domestic content incentives in the §§ 30D, 45Y, or 48E federal tax credits.
- The extent to which the project promotes the competitiveness of the U.S. industrial base through the adoption of innovative technologies or processes, such as advanced industrial or manufacturing techniques.

Criterion 4: Workforce and Community Engagement

- **Job Creation and Workforce Continuity:**
  - The number of domestic jobs created (both direct and indirect) (a) during completion of the project (the credit period) and (b) during operation of the facility after it is placed in service, including jobs within energy communities (if applicable) attained by locals or individuals previously employed by the local or regional coal industry.
  - The quality and manner in which the proposed project will create and/or retain high- quality, good-paying jobs (both direct and indirect) with employer-sponsored benefits for all classifications and phases of work.
  - The extent to which the applicant engaged key stakeholders to develop partnerships to better serve local and diverse workforce through training and

support.
    - The extent to which the project provides employees with the ability to organize, bargain collectively, and participate, through labor organizations of their choosing, in decisions that affect them and that contribute to the effective conduct of business and facilitates amicable settlements of any potential disputes between employees and employers, providing assurances of project efficiency, continuity, and multiple public benefits.
    - The extent to which applicant demonstrates that they are a responsible employer, with ready access to a sufficient supply of appropriately skilled labor, and an effective plan to minimize the risk of labor disputes or disruptions.
- **Ensuring Timely Project Completion Through Workforce and Community Engagement:**
    - The extent of current and planned efforts to engage community and labor stakeholders, including as it relates to the ability to execute the project on schedule and with adequate workforce.
    - The extent to which workforce recruitment and support of the community for the project have been strengthened through benefit-sharing agreements, consideration of environmental impact, use of local resources, and improved access to employment opportunities for the local workforce.
    - The extent to which the applicant demonstrates community and labor engagement to date that results in support of the community for the proposed project and availability and maintenance of the necessary workforce.
    - The extent to which the applicant has a clear and appropriately robust plan to engage—ideally through a clear commitment to negotiate an enforceable Workforce and Community Agreements—with labor unions, Tribal entities, and community-based organizations that support or work with disadvantaged communities and other affected stakeholders.
    - The extent to which the applicant has considered accountability to affected workers and community stakeholders, including those most vulnerable to project activities with a plan to publicly share Workforce and Community Engagement plan commitments.
    - Extent to which a project will generate economic prosperity in the local community.
- **Energy Community Transition:**
    - The extent to which the application includes specific and high-quality actions to support energy communities, including transition opportunities for workers in the coal, other energy, and automotive sectors into clean energy transition opportunities.
    - The extent to which a project will utilize existing local and regional resources that previously supported the local or regional coal industry or repurpose existing infrastructure/assets that have been abandoned due to closing of a coal mines or coal plant.
- **Local Environmental Impacts:**
    - The extent to which the proposed project accounts for its environmental impact to the surrounding community by having clear plans to avoid or reduce local air pollution, land contamination, and/or water contamination.

- The extent to which the applicant identifies specific, measurable benefits for disadvantaged communities, how the benefits will flow to disadvantaged communities, and how negative environmental impacts affecting disadvantaged communities would be mitigated.

C. Critical Material Projects

Priority Areas for Critical Material Projects

All critical materials projects described in Appendix A(3) of this guidance are eligible to apply for a § 48C allocation and will be evaluated by DOE against the four technical review criteria reflecting overall program objectives:

- Criterion 1: Commercial Viability
- Criterion 2: Greenhouse Gas Emissions Impacts
- Criterion 3: Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy
- Criterion 4: Workforce and Community Engagement

When evaluating the strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy criterion, DOE will take into consideration whether the project addresses critical materials as determined by the Secretary of Energy, as described in Appendix A(3)(b).

i. Concept Papers for Critical Material Projects

a) Concept Paper Content for Critical Material Projects

This section describes the specific content that applicants must provide in the concept paper files for applications proposing Critical Materials Projects. Template files for submitting this information will be provided through the eXCHANGE portal.

Table: Concept Paper Content Requirements for Critical Material Projects

Section	Information Requested
Project Overview	Provide an overview of the proposed project. At a minimum, include: • **Company Overview:** Describe your company, including prior experience processing, refining, or recycling critical materials. • **Project Summary:** Describe the eligible facility, including size, location, and other relevant information. Indicate what the investment will accomplish, including the specified critical materials; whether the project will establish, re-equip, or expand a facility; and whether the facility will process, refine, or recycle the relevant critical material. If the project involves more than one critical material, indicate the project's primary critical material, and any additional critical materials the project will process, refine, or recycle. Summarize the equipment and processes employed in the proposed facility; and for projects that re-equip or expand facilities, summarize what will be added or changed in the facility.

Commercial Viability	**Project Plan:** • *Project Timeline:* Provide planned dates to begin construction and operation of the project, and how many months the project will take to commence production and achieve full production capacity once certified. • *Siting and Permitting:* Explain the rationale for selection of the project site, including motivating factors such as suppliers, offtakers, and co-located industries. Indicate the current status of any required siting and permitting. • *Risk Management Plan:* Identify project risks or challenges and any relevant strategies for risk mitigation and management, such as legal, financial, engineering, procurement, construction, physical climate, and environmental risks. **Business Plan:** • *Financial Information:* Describe sources of financing for the proposed project, including the amount and strength of funding sources that will provide the equity to be invested in the project, the amount of total debt obligations that will be incurred and the funding sources of all such debt, and the dollar amount of incentives or funds pursued or awarded from local and state governments, as well as other federal incentives pursued or awarded. • *Market Information:* Describe the current size and growth potential of the markets your produced critical materials will serve, as well as your anticipated market share and target consumers. • *Cost Information:* Provide the estimated costs of your facility's products and how they compare to other domestic critical material producers, including new and recycled materials. **Management Plan:** • Describe the key management team members who will design, construct, permit, and operate the facility. Include a description of relevant industry experience of the top-tier executives responsible for the success of the project. • Describe any corporate health indicators, including legal claims or liabilities, planned debt restructuring, planned corporate actions, and other factors that could negatively affect the likelihood of project completion.

Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy	• **Output of Your Facility:** Indicate the critical materials and associated quantities that will be produced by your facility. Describe the proposed facility's products and projected annual output for each critical material. In the case of retrofitting, re-equipping, or expanding an existing facility, indicate how the project will alter the facility's annual output. In the Concept Paper Data Sheet, submit the relevant annual production information for each critical material produced in the facility. • **Inputs to Your Facility**: Describe key inputs needed for your processing, refining, or recycling process, such as source materials (e.g., raw ore, brines, mine tailings, end-of-life products, or waste streams). Describe any known sources for your inputs and indicate domestic sources. Describe any current or anticipated supply chain vulnerabilities. • **Supply Chain Resilience**: Describe how your facility's products will help build resilience of domestic supply chains that are critical for energy products that facilitate progress towards a net-zero economy, from raw materials to end-of-life. For instance, critical materials producers intending to serve the battery market should indicate the extent to which their project supports the electric vehicle or stationary energy storage supply chains, as opposed to consumer electronics. Describe whether these products align with U.S. federal, state, or local domestic content requirements, such as those in the § 30D tax credit. **End-Use Applications:** Indicate whether the facility's products will be used in multiple specified advanced energy technologies (e.g., wind, solar, and electric grid) or multiple sectors (e.g., transportation, industry, and electricity).

Greenhouse Gas Emissions Impacts	• **End Product Impacts:** Describe the end-use application of facility's products and how their use contributes to GHG emissions reduction or avoidance by advancing the adoption of clean energy or other low-carbon products and technologies, such as the advanced energy property described in 48C(c)(1)(A)(i). • **Direct Facility Emissions:** Qualitatively describe the anticipated sources of GHG emissions in the processing, refining, or recycling process (e.g., fuel use, process emissions). • **Facility Performance:** Provide any details about the production process (e.g., efficiency and lifetime) that indicate its potential to result in lower emissions than leading competitors or incumbents. **Mitigation Efforts:** Describe any planned efforts to mitigate GHG emissions of the proposed facility, including the use of best-in-class or innovative processing, refining, or recycling approaches and/or low-carbon fuels, processes, or materials.

Workforce and Community Engagement (Submitted as a separate PDF document)	Describe your plan for contributing to job creation and ensuring project viability, timely completion, and ultimate success by fostering a stable and supportive workforce and host community. At a minimum, include:
	• **Job Creation and Workforce Continuity:**
	  ○ Briefly characterize the jobs (both direct and indirect) your project will create (e.g., mechanics and construction workers), including (a) during completion of the project and (b) after the project is placed in service, and any indicators of job quality.
	  ○ Describe partnerships with apprenticeship readiness programs, or community-based workforce training and support organizations serving displaced industrial workers, including in the coal, other energy, and automotive sectors, and others facing systematic barriers to employment to facilitate participation in the project's construction and operations.
	• **Ensuring Timely Project Completion Through Workforce and Community Engagement:**
	  ○ Describe current and planned efforts to engage with community and labor stakeholders, including as it relates to the ability to complete the project in the shortest time and with adequate workforce.
	  ○ Describe current and planned efforts to ensure availability of the workforce needed to successfully complete the project and place it in service in a timely manner, including through considerations of training programs that serve workers currently underrepresented in the sector.
	  ○ Describe any activities to strengthen support of the community such as through benefit-sharing agreements, consideration of environmental impact, and use of local resources.
	• **Energy Community Transition:**
	  ○ Describe the extent to which the project will support energy communities, including through transition opportunities for workers in the coal, other energy, and automotive sectors, and through the use of existing infrastructure in energy transition communities.
	• **Local Environmental Impacts:**
	  ○ Describe the impact of your project on local air, water, and/or land quality, as well as any efforts to mitigate local pollution and waste.
	  ○ Determine whether the location or community qualifies as

	a disadvantaged community according to the Climate and Economic Justice Screening Tool (CEJST).

b) Concept Paper Technical Review Criteria for Critical Material Projects

This section describes the technical review criteria that DOE will use to evaluate concept papers proposing Critical Materials Projects.

Criterion 1: Commercial Viability

- Project schedule and time from certification to completion, based on readiness to proceed with the proposed project and reasonableness of the timeframe required for construction and commissioning of the project.
- The extent to which risk management issues and mitigation strategies are identified and addressed.
- Strength of the proposed business plan, including:
  - Market size and growth potential for each produced critical material;
  - Market share and price competitiveness of each produced critical material; and
  - The source and certainty of funding that will be invested in the project, including equity, private financing, DOE funding, state and local incentives, and other sources.
- Strength of the proposed management plan, including the management team's track record of success in processing, refining, or recycling critical materials and corporate health of the applicant.

Criterion 2: Greenhouse Gas Emissions Impacts

- The extent to which the project will enable emissions reductions associated with the potential to displace higher-emitting incumbent technologies, based on a demonstration that the produced critical material will be used in the manufacturing of technologies eligible under § 48C(c)(1)(A)(i).
- The extent to which the project involves current best-in-class manufacturing or recycling approaches.
- The extent to which the project involves best-in-class and/or innovative equipment, processes, and low-carbon fuels.
- The extent to which the project aligns with the long-term strategy of the United States to achieve net-zero emissions.

Criterion 3: Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy

- The extent to which the project would increase availability of materials critical to clean energy products through expanded domestic production capacity or recycling.
- The extent to which the proposed project addresses a critical supply chain need for clean energy products, based on a comparison of the production capacity and the

current and anticipated gap between domestic manufacturing capacity and demand for the relevant critical materials.

Criterion 4: Workforce and Community Engagement

- Job Creation and Workforce Continuity:
  - The number of domestic jobs created (both direct and indirect) (a) during completion of the project (the credit period) and (b) during operations of the facility after it is placed in service, including jobs within energy communities (if applicable) attained by locals or individuals previously employed by the local or regional coal industry.
  - The quality and manner in which the proposed project will create and/or retain high-quality, good-paying jobs (both direct and indirect) with employer-sponsored benefits for all classifications and phases of work.
  - The extent to which the applicant engaged key stakeholders to develop partnerships to better serve local and diverse workforce through training and support.
- Ensuring Timely Project Completion Through Workforce and Community Engagement:
  - The extent of current and planned efforts to engage community and labor stakeholders, including as it relates to the ability to execute the project on schedule and with adequate workforce.
  - The extent to which workforce recruitment and support of the community for the project have been strengthened through benefit-sharing agreements, consideration of environmental impact, use of local resources, and improved access to employment opportunities for the local workforce.
- Energy Community Transition:
  - The extent to which the application includes specific and high-quality actions to support energy communities, including transition opportunities for workers in the coal, other energy, and automotive sectors.
  - The extent to which a project will utilize existing resources or infrastructure that previously supported the local or regional coal industry.
- Local Environmental Impacts:
  - The extent to which the proposed project accounts for its environmental impact to the surrounding community by having clear plans to avoid or reduce local air pollution, land contamination, and/or water contamination.
  - The extent to which the application identifies specific, measurable benefits for disadvantaged communities, including energy communities.

ii. Section 48C(e) Applications for Critical Material Projects

a) Section 48C(e) Application Content for Critical Material Projects

This section describes the specific content that applicants must provide in the § 48C(e) application files and appendices for applications proposing critical materials projects. Template files for submitting this information will be provided through the eXCHANGE

portal.

Table: Section 48C(e) Application Content Requirements for Critical Material Projects

Section	Information Requested

Project Overview	Provide an overview of the proposed project. At a minimum, include:
	Company Overview: Describe your company, including prior experience processing, refining, or recycling critical materials.
	• **Project Summary:**
	  ○ Describe the proposed manufacturing or recycling facility, including size, location, and other relevant information.
	  ○ Indicate what the project will accomplish, including:
	  ▪ Whether the project will establish, re-equip, or expand a facility.
	  ▪ The specified critical materials, and whether the facility will process, refine, or recycle the specified materials. If the project involves more than one critical material, indicate the project's primary critical material, and any additional critical materials the project will process, refine, or recycle.
	  ▪ Describe the facility's products, including the produced critical material's purity percentage and the clean energy supply chains they will support.
	  ▪ Describe the associated inputs (e.g., raw ore, mine tailings, end-of-life products, waste streams, or other source materials).
	  ○ Describe in detail the equipment and processes employed at the proposed facility to manufacture or recycle critical materials.
	  ▪ If the proposed project re-equips or expands an existing facility, describe clearly what the proposed project will add or change in the existing facility.
	  ▪ To clearly illustrate the proposed facility or proposed changes to an existing facility, applicants are encouraged to submit diagrams and/or images (e.g., a detailed process flow diagram) as appendix materials.
	  ▪ Provide a list of the anticipated eligible property that will make up the qualified investment of the qualifying advanced energy project.
	  ○ Describe any significant changes to the project that have occurred since the concept paper stage.

Commercial Viability	**Project Plan:** • *Project Management and Timeline:* ○ Provide a project schedule through operation and achieving

	full production capacity, which demonstrates how certification requirements will be met within two (2) years of receiving an allocation decision from the IRS, and how the project will be placed in service within two (2) years of such certification. Documentation supporting the project schedule should be submitted as separate appendix materials. ○ Describe plans to ensure an adequate supply of essential inputs needed for successful operation of the project. ○ For the following contracts and agreements, summarize key terms and conditions in the narrative and submit copies as appendix materials. A Professional Engineer must inspect and certify the project documents for feasibility and may be an employee of the applicant. ▪ Operations and Maintenance Agreement ▪ Shareholders Agreement ▪ Engineering, Procurement and Construction Agreement, including firm price, liquidated damages, holdbacks, and performance guarantees, for example. • *Siting and Permitting:* Explain the rationale for selection of the project site and provide documentation supporting the applicant's conclusion that the proposed site can fully meet all environmental, water supply, transmission interconnection, and other necessary requirements. Include a complete list of all federal, state, and local permits, including environmental authorizations (if applicable) or reviews necessary to commence construction of the project. Additional documentation that supports key claims may be provided as appendix materials, such as regulatory approvals and signed agreements, letters of intent, or term sheets for supply and product transportation. • *Risk Management Plan:* Identify project risks or challenges and any relevant strategies for risk mitigation and management, including legal, financial, engineering, procurement, construction risks. Include a discussion of natural disasters (e.g., earthquakes), climate impacts and extreme weather patterns (e.g., tornadoes, hurricanes, heat and freezing temperatures, drought, wildfire, and floods) that may impact the resilience/sustainability of the project. **Business Plan:** Provide the following financial information for the proposed project, and market and cost information for the facility's products. • *Financial Information:* ○ Submit a cash flow model detailing investments in and cash flows anticipated over the facility's expected lifetime, including

	a description of the methodology and all assumptions used. ○ Describe the payback period, net present value (NPV), adjusted present value (APV), and break-even analysis for the project and other financial metrics including but not limited to return on investment and return on assets. ○ Estimate the project's qualified investment (as determined under § 48C) if the project is certified to receive a credit. The applicant may use any reasonable methodology and assumptions in estimating this amount. ○ Describe the amount of equity that will be invested in the project, including the sources of such equity and their strengths. Provide any existing equity funding commitments or expressions of interest from equity funding sources for the project as separate appendix materials. ○ Describe the amount of total debt obligations that will be incurred and the funding sources of all such debt. Include any existing debt funding commitments or expressions of interest from debt funding sources for the project as separate appendix materials. ○ Describe any local, state, or other federal incentives or funds that are being pursued or have been awarded for the proposed project, such as grants, loan guarantees, or tax credits. Also include a description of any instances where any federal agencies or non-federal governmental entities have entered into an arrangement as a customer or offtaker of the project's products or services, or other federal contracts, including acquisitions, leases, and other arrangements, that may indirectly support the applicant's proposed project. • Market Information: ○ Describe the markets your products will serve, including the existing market size, dollar volume, and growth potential. If the product can be sold in multiple market segments, describe each one. ○ Discuss the current and anticipated competitiveness of your market, including competing products and competitors. ○ Discuss your sales forecast, including details of any offtake agreements you may have to support your project. Identify confirmed or potential customers who will purchase, lease, or otherwise use the facility's product. Offtake agreements and other documents provided as evidence may be included as appendix materials. ○ Based on the above information, summarize your products' projected market share for the next five years including trends and projections for demand and price, growth potential (short-term and long-term), and strategies to expand your market share (e.g., ways to circumvent market barriers).

	• *Cost Information:*
	  ○ Provide the estimated cost of your facility's product and how it compares to similar technologies or materials in the same market segment, including new and recycled products. This should be expressed in the same units as annual production (e.g., $/watt, $/kilowatt-hour, and $/ton) per the instructions in the 48C Application Data Sheet. Applicants should include the absolute difference and percentage change from a reasonable domestic industry average.
	  ○ Calculate the levelized cost of generated critical materials. Instructions for calculating levelized cost metrics are provided in Section V. Explain the methodology and assumptions used in the § 48C(e) application narrative.
	
	Management Plan: Provide the following information for the company and key management team members:
	
	• Describe the ownership structure of the company, including all beneficiaries.
	• List key management and senior personnel for the project, including the names, positions or titles, qualifications, and relevant experience. Resumes maybe be included as combined appendix materials, preferably in an Adobe PDF document labeled Resumes.pdf.
	• Describe the unique capabilities and expertise of the applicant and any major project partners, including debt or equity sponsors, contractors/vendors (if known), and any other counterparty that the applicant believes will enable the project to be successful, as well as the prior experience of the applicant and any major project partners in similar undertakings to the proposed project.
	• Summarize any pending or threatened (in writing) action, suit, proceeding, or investigation, including any action or proceeding by or before any governmental authority, that relates to the senior/key personnel, and the status of any appeals.
	• Describe any corporate health indicators, including legal claims or liabilities, planned debt restructuring, planned corporate actions, and other factors that could negatively affect the likelihood of project completion. Provide a copy of audited financial statements for the applicant and other projected funding sources for the most recently ended three (3) fiscal years, and the unaudited quarterly interim financial statements for the current fiscal year, as separate appendix materials. If all three years of audited statements are not available, provide all available statements and any additional information or appendices that provide similar evidence of corporate health.

Greenhouse Gas Emissions Impacts	**Greenhouse Gas Emissions Impacts of the Facility's Products:** • **End Product Impacts:** Describe the end-use application of facility's products and how their use contributes to GHG emissions reduction or avoidance by advancing the adoption of clean energy or other low-carbon products and technologies, such as the advanced energy property described in 48C(c)(1)(A)(i). Include internal or external analysis to substantiate indirect emissions benefits. **Greenhouse Gas Emissions from the Facility:** At a minimum, include: • *Direct Emissions:* Qualitatively and quantitatively characterize the anticipated sources of GHG emissions in the processing, refining, or recycling process (e.g., fuel use, process emissions). Emissions should be provided in the 48C Application Data Sheet using the methodology described in Section V, and input assumptions should be justified with publicly available data and engineering studies. Explain any significant differences between direct emissions from the facility and industry averages. • *Facility Performance:* Provide any details about the processing, refining, or recycling process (e.g., efficiency and lifetime) that indicate its potential to result in lower emissions than leading competitors or incumbents. Wherever possible, the applicant should substantiate assessments of process improvements with analysis or engineering studies, which should be described in the narrative and may be submitted as separate appendix materials. • *Mitigation Efforts:* Describe any planned efforts to mitigate GHG emissions of the proposed facility. • *Company Commitments and Track Record:* Describe any company commitments or experience reducing GHG emissions of critical material processing, refining, or recycling facilities.
Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy	• **Output of Your Facility:** Describe the proposed facility's critical material products and projected annual production for each. In the case of retrofitting, re-equipping, or expanding an existing facility, indicate how the project will alter the facility's annual output. In the 48C Application Data Sheet, submit the relevant annual production information for each critical material produced in the proposed facility and then justify each in the § 48C(e) Application narrative. • **Inputs to Your Facility**: Describe key inputs needed for your processing, refining, or recycling process, such as source materials (e.g., raw ore, brines, mine tailings, end-of-life products,

	or waste streams). Describe any known sources for your inputs and indicate domestic sources. Describe any current or anticipated supply chain vulnerabilities. • **Supply Chain Resilience:** Describe how your proposed facility's products will help build resilience of domestic supply chains that are critical for energy products that facilitate progress towards a net-zero economy, from raw materials to end-of-life. For instance, critical materials producers intending to serve the battery market should indicate the extent to which their project supports the electric vehicle or stationary energy storage supply chains, as opposed to consumer electronics. Describe whether these products align with U.S. federal, state, or local domestic content requirements, such as those in the § 30D tax credit. Reference any offtake or sales arrangements provided in the Commercial Viability Criterion section to justify the end-use applications and, where possible, include these in the appendix. • **End-Use Applications:** Indicate whether the facility's products will be used in multiple clean energy products (e.g., wind, solar, and electric grid) or multiple sectors (e.g., transportation, industry, and electricity) that facilitate progress towards a net-zero economy.

Workforce and Community Engagement (Submitted as a separate PDF document)	Describe your plan for contributing to job creation and ensuring project viability, timely completion, and ultimate success by fostering a stable and supportive workforce and host community. Applicants are encouraged to use Specific, Measurable, Achievable, Relevant, and Timely (SMART) milestones wherever possible and where relevant. At a minimum, include:
	
	Job Creation and Workforce Continuity: Describe the applicant's approach to creating and maintaining high-quality jobs for both new and incumbent workers.
	
	• Characterize and estimate the number of jobs your project will create (e.g., mechanics and construction workers), including both direct and indirect jobs both during completion of the project (the credit period) and during operation of the facility after it is placed in service and any indicators of job quality.
	• Describe partnerships with apprenticeship readiness programs, or community-based workforce training and support organizations serving displaced industrial workers, including in the coal, other energy, and automotive sectors, and others facing systematic barriers to employment to facilitate participation in the project's construction and operations.
	• Summarize the applicant's plan to attract, train, and retain a skilled and well-qualified workforce both during completion of the project (the credit period) and during operation of the facility after it is placed in service. A collective bargaining agreement, labor-management partnership, or other similar agreement would provide evidence of such a plan. Alternatively, applicants may describe:
	  ○ Wages, benefits, and other worker supports to be provided as benchmarking against prevailing wages for construction and local median wages for other occupations;
	  ○ Commitments to invest in workforce education and training, including measures to reduce attrition, increase productivity from a committed and engaged workforce, and support the development of a resilient, skilled, and stable workforce for the project; and
	  ○ Efforts to engage employees in the design and execution of workplace safety and health plans.
	• Describe employees' ability to organize, bargain collectively, and participate, through labor organizations of their choosing, in decisions that affect them. This contributes to the effective conduct of business and facilitates amicable settlements of any potential disputes between employees and employers, providing

	assurances of project efficiency, continuity, and multiple public benefits. In the description, explain whether workers can form and join unions of their choosing, and how they will have the opportunity to organize with the purposes of exercising collective voice in the workplace. **Ensuring Timely Project Completion Through Workforce and Community Engagement:** Describe current and planned efforts to engage with community and labor stakeholders, including as it relates to strengthening support of the community, workforce recruitment, and the ability to execute the project on schedule and with adequate workforce. • Provide a comprehensive list of stakeholders that the project plans to engage from local governments, Tribal governments, labor unions, and community-based organizations. • Describe current and planned efforts to engage with listed stakeholders, including as it relates to the ability to complete the project in the shortest time and with adequate workforce. • Describe current and planned efforts to ensure availability of the workforce needed to successfully complete the project and place it in service in a timely manner, including through training programs that serve workers currently underrepresented in the sector. • Describe any activities to strengthen support of the community such as through benefit-sharing agreements, consideration of environmental impact, and use of local resources. Discussions should reference Workforce and Community Engagement Agreements, or any plans to develop such agreements, from representative organizations reflecting substantive engagement and feedback on applicant's approach to community and labor engagement. Examples of such agreements are Good Neighbor Agreements/Community Benefits Agreements, Collective Bargaining Agreements, Project Labor Agreements or Community Workforce Agreements. Actual agreements must be provided in the submission package as appendix files. **Energy Community Transition:** Describe the extent to which the project will support energy communities. • Describe plans to utilize existing local and regional resources that previously supported the local or regional coal, other energy, or automotive industries, including through transition opportunities for workers in the coal, other energy, and automotive sectors into clean energy industries.

	• If applicable, include discussion on plans to repurpose existing infrastructure/assets that have been abandoned due to the closing of a coal mine or coal plant.
	
	Local Environmental Impacts: Describe the impact of your project on local air, water, and/or land quality, as well as any efforts to mitigate local pollution and waste.
	
	• Discuss any anticipated negative and cumulative environmental impacts of the project, including impacts on local air, water, and/or land quality. Describe any efforts to mitigate local pollution and waste.
	• Determine whether the location or community qualifies as a disadvantaged community according to the Climate and Economic Justice Screening Tool (CEJST).
	• Within the context of cumulative environmental impacts, applicants should use the U.S. Environmental Protection Agency's Environmental Justice Screening and Mapping (EJSCREEN) tool (*https://www.epa.gov/ejscreen*) to quantitatively discuss existing environmental impacts in the project area.
	• If anticipated project benefits will flow to an applicable disadvantaged community, identify applicable benefits that are quantifiable, measurable, and trackable, such as:
	  ○ (1) A decrease in energy burden;
	  ○ (2) A decrease in environmental exposure and burdens;
	  ○ (3) An increase in access to low-cost capital;
	  ○ (4) An increase in high-quality job creation, the clean energy job pipeline, and job training for individuals;
	  ○ (5) Increases in clean energy enterprise creation and contracting (e.g., through investment in underserved and underrepresented businesses);
	  ○ (6) Increases in energy democracy, including community ownership;
	  ○ (7) Increased parity in clean energy technology access and adoption; and
	  ○ (8) An increase in energy resilience.
	• In addition, applicants should also discuss how the project will maximize all of the benefits listed above. Describe how and when anticipated benefits are expected to flow to the disadvantaged community. For example, will the benefits be provided directly within the disadvantaged communities identified, or are the benefits expected to flow in another way? Further, will the benefits flow during project development or after project completion, and how will applicant track benefits delivered?

b) Section 48C(e) Application Technical Review Criteria for Critical Material Projects

This section describes the technical review criteria that DOE will use to evaluate § 48C(e) applications proposing Critical Material Projects.

Criterion 1: Commercial Viability

- Project schedule and time from certification to completion
    - Readiness to proceed with the proposed project as evidenced by firmness of site selection and progress towards securing required permits, contracts, reviews, and agreements.
    - Reasonableness of the timeframe required for construction and commissioning of the project, including interim milestones and overall timeline.
- The extent to which risk management issues and mitigation strategies are identified and addressed, including the level of contingency proposed to address risk.
- Strength of the proposed business plan, including:
    - The potential for commercial deployment, based on estimates of market share, market growth potential, and price competitiveness of the product
    - The source and certainty of funding for the equity that will be invested in the project, including private financing, DOE funding, state and local incentives, and other sources
    - The strength of key arrangements, such as financing, acquisition/supply strategy, and power purchase agreements for the proposed project, as well as offtake (sales) arrangements for the facility's products.
    - The degree to which the application justifies the proposed project's economic viability, sustainability, and potential growth.
    - The degree to which the investment is profitable, based on the proposed budget and spend plan, as well as described cash flow analysis of the project.
    - The levelized cost of the produced critical materials, or similar metric, compared to similar critical materials within the same market segment.
- Strength of the proposed management plan, including the management team's track record of success in areas relevant to the project and corporate health of the applicant.

In assessing each item above, the following will be considered: (a) the comprehensiveness, specificity, and accuracy of the information and plans provided; (b) the reasonableness of assumptions used in making estimations and projections; and (c) the extent to which the applicant demonstrates an understanding of relevant risks and the quality of the strategies put forward to mitigate and manage those risks.

Criterion 2: Greenhouse Gas Emissions Impacts

- The extent to which the critical material produced in the facility would facilitate a

reduction in anthropogenic emissions of GHGs by being utilized in the production of advanced energy property, such as those technologies eligible under § 48C(c)(1)(A)(i).

- Use of current best-in-class manufacturing approaches and innovative, low-emissions equipment, fuels, materials, or processes, as demonstrated through project planning documents, front-end engineering and design studies, or otherwise.
- Plans to align with the national target of net-zero emissions by 2050, including efforts to reduce both direct (Scope 1) and indirect, upstream fuel- and energy-related (Scope 2) emissions over the lifetime of the facility.
- Efforts to reduce emissions in the upstream supply chain (e.g., through contracts with low-emissions suppliers).
- Activities to monitor facility emissions and energy use, including through any relevant voluntary or required reporting protocols (e.g., EPA's Greenhouse Gas Reporting Program).

Criterion 3: Strengthening U.S. Supply Chains and Domestic Manufacturing for a Net-Zero Economy

- The extent to which the project would increase availability of materials critical to clean energy products through expanded domestic production capacity or recycling.
- The extent to which the proposed project addresses a critical supply chain need, based on a comparison of the production capacity and the current and anticipated gap between domestic manufacturing capacity and demand for the relevant critical materials.
- The extent to which the project will support and encourage follow-on supply chain investments in the region.
- The extent to which the project promotes long-term U.S. manufacturing competitiveness, based on projected commercial use cases for the produced critical materials within clean energy technology supply chains; the feasibility of delivering market-ready products at the stated annual production levels, the efficiency, emissions, or productivity of the facility beyond the state-of-the-art; and the potential to avoid or reduce end-of-life waste from the facility or final product through the use of alternative processes, technologies, or materials.

Criterion 4: Workforce and Community Engagement

- **Job Creation and Workforce Continuity:**
    - The number of domestic jobs created (both direct and indirect) (a) during completion of the project (the credit period) and (b) during operation of the facility after it is placed in service, including jobs within energy communities (if applicable) attained by locals or individuals previously employed by the local or regional coal industry.
    - The quality and manner in which the proposed project will create and/or retain high- quality, good-paying jobs (both direct and indirect) with employer-

sponsored benefits for all classifications and phases of work.
    - The extent to which the applicant engaged key stakeholders to develop partnerships to better serve local and diverse workforce through training and support.
    - The extent to which the project provides employees with the ability to organize, bargain collectively, and participate, through labor organizations of their choosing, in decisions that affect them and that contribute to the effective conduct of business and facilitates amicable settlements of any potential disputes between employees and employers, providing assurances of project efficiency, continuity, and multiple public benefits.
    - The extent to which applicant demonstrates that they are a responsible employer, with ready access to a sufficient supply of appropriately skilled labor, and an effective plan to minimize the risk of labor disputes or disruptions.
- **Ensuring Timely Project Completion Through Workforce and Community Engagement:**
    - The extent of current and planned efforts to engage community and labor stakeholders, including as it relates to the ability to execute the project on schedule and with adequate workforce.
    - The extent to which workforce recruitment and support of the community for the project have been strengthened through benefit-sharing agreements, consideration of environmental impact, use of local resources, and consideration of workforce and improved access to employment opportunities for the local workforce.
    - The extent to which the applicant demonstrates community and labor engagement to date that results in support of the community for the proposed project and availability and maintenance of the necessary workforce.
    - The extent to which the applicant has a clear and appropriately robust plan to engage—ideally through a clear commitment to negotiate an enforceable Workforce and Community Agreements—with labor unions, Tribal entities, and community-based organizations that support or work with disadvantaged communities and other affected stakeholders.
    - The extent to which the applicant has considered accountability to affected workers and community stakeholders, including those most vulnerable to project activities with a plan to publicly share Workforce and Community Engagement plan commitments.
    - Extent to which a project will generate economic prosperity in the local community.
- **Energy Community Transition:**
    - The extent to which the application includes specific and high-quality actions to support energy communities, including transition opportunities for workers in the coal, other energy, and automotive sectors into clean energy transition opportunities.

- The extent to which a project will utilize existing local and regional resources that previously supported the local or regional coal industry or repurpose existing infrastructure/assets that have been abandoned due to closing of a coal mines or coal plant.

- **Local Environmental Impacts:**
  - The extent to which the proposed project accounts for its environmental impact to the surrounding community by having clear plans to avoid or reduce local air pollution, land contamination, and/or water contamination.
  - The extent to which the applicant identifies specific, measurable benefits for disadvantaged communities, how the benefits will flow to disadvantaged communities, and how negative environmental impacts affecting disadvantaged communities would be mitigated.

IV. DOE Recommendation Process

The final outcome of each stage of the DOE review process is to develop a recommendation and ranking (DOE recommendation) of projects. DOE will provide a recommendation and ranking for a project only if it determines that the application meets all requirements described in this guidance, and that the project is eligible, has a reasonable expectation of commercial viability, merits a recommendation, and supports program policy factors when considering the full portfolio of recommended projects.

A. Program Policy Factors

In addition to the criteria described in Section III, DOE may also consider the following program policy factors when determining the DOE recommendation.

- The degree to which the proposed project contributes to a portfolio that optimizes the use of available credit amounts to address existing or anticipated gaps, vulnerabilities, or opportunities and to expand domestic manufacturing capacity in priority supply chains in a timely manner.
- The degree to which the proposed project contributes to a portfolio that enables the highest potential for GHG emissions reductions and the enhancement of American competitiveness in a global net-zero economy.
- The degree to which the proposed project exhibits technological and product diversity when compared to other projects recommended for allocation.
- The degree to which the proposed project contributes to portfolio diversity within a project category and across project categories.
- The degree to which the proposed project contributes to a portfolio that supports a diversity of organizational sizes, including small- and medium-sized manufacturers.
- The degree to which the proposed project is likely to contribute to a long-term, place-based, coordinated, and collaborative regional economic development

strategy.

- The degree to which the proposed project, or group of projects, represent a desired geographic distribution, when compared to other projects recommended for allocation.
- The degree to which the proposed project will accelerate transformational technological advances in areas that industry by itself is not likely to undertake because of financial uncertainty.
- The degree to which the proposed project contributes to a portfolio of recommended projects with at least 40% of credits allocated to projects in energy communities, as described in § 48C(e)(2).
- The degree to which the proposed project, and other projects recommended for allocation, contributes to the total portfolio meeting the goals reflected in the Workforce and Community Engagement technical review criterion.
- The degree to which the proposed project has broad public support from the communities most directly impacted by the project.
- The degree to which the project contributes to a portfolio that meets the goals reflected in the Workforce and Community Engagement technical review criterion by producing additional benefits to communities, particularly disadvantaged communities, such as reducing co-pollutants and other environmental (e.g., air and water) burdens.

B. DOE Recommendations

i. Concept Paper Recommendations

For the concept paper stage, the DOE recommendation will include all projects that are encouraged to submit a § 48C(e) application. Projects that are not included in the DOE recommendation will receive a letter of discouragement. An applicant that receives a letter of discouragement in response to a submitted concept paper may still submit a § 48C(e) application in accordance with this guidance. Receiving such a letter does not disqualify an applicant from submitting a § 48C(e) application but represents DOE's feedback that the project is unlikely to receive a recommendation based on the information provided in the concept paper.

ii. Section 48C(e) Application Recommendations

For the § 48C(e) application stage, the DOE recommendation will include the portfolio of projects that help to achieve the goals of the program. This recommendation will be based on a combination of the numeric score from the technical review process, as well as the application of the above program policy factors.

V. Additional Instructions on the Data Sheet Submission

To capture and process information submitted in the concept paper and § 48C(e) application, applicants are required to fill out and submit the supplementary Concept

Paper Data Sheet and 48C Application Data Sheet, respectively. The above sections on content and form of concept papers and § 48C(e) applications indicate which categories of information will be captured in the data sheet. This section provides explanations and examples on select terms for which the applicant may benefit from additional information. This list is not exhaustive, and each project category will have its own Data Sheet template for the concept paper and § 48C(e) application stages. **Refer to the relevant Data Sheet for specific information requested relevant to your project.**

Applicants should substantiate in their narrative any data which is inputted into either Data Sheet. It is essential that applicants conform to this process in order to ensure a competitive review of all proposals.

A. Production Capacity Metrics

Annual production	This term represents projected (not peak) annual product output of the facility in the relevant units. For critical materials and industrial facilities, this is typically represented in tons. For clean energy technologies, the data sheet will provide a section with the appropriate units in terms of energy output or savings (e.g., MW, MWh, and kVA). Applicants are required to justify the claimed production in their narrative by providing yield loss and throughput data wherever applicable and possible.
Share of facility output *(Clean Energy Manufacturing and Recycling Projects only)*	This term, which applies only to clean energy manufacturing projects, represents the portion of the facility output that produces eligible clean energy products as opposed to other applications. Where possible, applicants manufacturing multiple products or products with multiple applications should utilize offtake agreements to demonstrate the portion that will go to eligible applications. For example, an application for a facility that will produce bearings, 60% of which will be for wind turbines and 40% for diesel-powered heavy machinery would count only the 60% proportion of output for wind turbines as its share of facility output for determining the qualified investment in the qualifying advanced energy project.

Manufacturing contribution *(Clean Energy Manufacturing and Recycling Projects only)*	This term identifies the value added in the production of the product delivered by the facility, as a fraction. For instance, a c-Si solar cell producer's Manufacturing Contribution would not include the value of inputs (e.g., wafers) or the other components of a solar power installation (e.g., glass, frames, backsheets, inverters, racking, tracking). Applicants should transparently state and justify, with citations wherever possible, current and future pricing assumptions for all significant value chain segments, including the product produced at the proposed facility.
Real-world annual performance *(Clean Energy Manufacturing and Recycling Projects only)*	This term is a rating factor that applies to the performance of the real-world application into which the products produced by the facility are deployed. It varies by technology but incorporates any necessary de-rating factors, including capacity factors, lifecycle assessments, and degradation rates, such that the claimed performance is reflective of the average annual performance of the clean energy installations. Where appropriate, typical resource and use conditions should be selected from the reference data provided in the Assumptions tab of the 48C Application Data Sheet. If the necessary reference data is not available or representative of the applicant's specific product, the applicant should provide and substantiate assumptions with market reports and/or field data where possible.
Deployed product lifetime *(Clean Energy Manufacturing and Recycling Projects only)*	This term represents the service lifetime of the products produced by the facility (not the lifetime of the facility itself). The applicant should provide and substantiate assumptions with market reports and/or field data where relevant.

B. Jobs Metrics

Direct construction jobs	This entry will allow applicants to list the type and quantity of direct full-time employees in construction-related jobs. Direct construction jobs are those that are billed to the project and do not include indirect or induced jobs, such as suppliers, producers of equipment or services used in the project, accounting or administrative services, end-use installers, or operating jobs at the facility but unrelated to the project. Applicants will be asked to indicate whether these construction jobs meet the wage and apprenticeship requirements.
Direct operations jobs	This entry will allow applicants to list the type and quantity of direct full-time employees in operations-related jobs at the facility. Direct operations jobs are those that support the eligible manufacturing, recycling, or production activity at the facility, such as technicians, supervisors, engineers, quality control specialists, office staff, and more. In the case of re-equipped facilities, applicants will be asked to indicate both current and future operations jobs (e.g., to capture job loss, retention, or growth).

C. Emissions Metrics

Estimated facility emissions for existing sites	This entry should reflect the most recent assessment of annual emissions from the existing manufacturing, recycling, or industrial facility. Submissions should be provided in total metric tons CO_2e (not normalized to production output) for the most recent year. For facilities with non-CO_2 emissions, these may be converted to CO_2e using EPA's Greenhouse Gas Equivalencies Calculator (which utilizes global warming potential from IPCC's Fourth Assessment Report).
	
	• To estimate emissions from a manufacturing facility, applicants are expected to enter direct (Scope 1) and indirect fuel- and energy-related (Scope 2) greenhouse gas emissions information in the appropriate tabs in the Data Sheet, which are based on the EPA Greenhouse Gas Reporting Protocol and EPA's Simplified GHG Emissions Calculator (*https://www.epa.gov/climateleadership/simplified-ghg-emissions-calculator*).
	  ○ Scope 1 emissions include emissions from fuel combustion and chemical processes.
	  ○ Scope 2 emissions will be calculated on the basis of fuel and electricity consumption. DOE may adjust emissions factors over time to reflect anticipated changes in electricity and fuel characteristics beyond the facility's control (e.g., grid decarbonization).
	• Applicants that wish to qualify on the basis of a 20% emissions reduction in a particular unit of a facility may also choose to submit current emissions associated with that unit but must still also provide facility-wide metrics.
	• In addition to the Data Sheet, large industrial facilities with existing GHGRP reports are expected to also submit their GHG emissions figures from the most recent calendar year, expressed in metric tons of CO_2 equivalent, as available in the FLIGHT tool (*https://ghgdata.epa.gov/ghgp/*).

Estimated future facility emissions for new, expanded, or re-equipped facilities	This entry is an estimate of the future annual emissions after the § 48C(e) project. Submissions should be provided in metric tons CO_{2e}. For facilities with non-CO_2 emissions, these may be converted to CO_{2e} using EPA's Greenhouse Gas Equivalencies Calculator. The applicant is expected use the same methodology as in the calculation of the current facility emissions. For GHG Emissions Reduction projects, the retrofit must enable Scope 1, Scope 2, or subunit reductions of at least 20% for a project to be eligible. However, applications will be evaluated on their combined Scope 1 and Scope 2 impacts facility-wide.
Emissions reduction (%) *(Greenhouse Gas Reduction Projects only)*	This entry will be calculated in the Data Sheet by subtracting from 1 the ratio between the estimated future annual facility emissions, after the retrofit, and the current annual facility emissions. The reduction must be greater than 20% in Scope 1, Scope 2, or subunit emissions for a project to be eligible. However, applications will be evaluated on their combined Scope 1 and Scope 2 impacts facility-wide.
Lifecycle analysis, well-to-gate lifecycle emissions rate, and other product details *(Clean Energy Manufacturing and Recycling Projects only)*	For certain technologies, emissions impacts of the ultimate product may vary significantly based on their ultimate use. For instance, electric vehicle batteries can have very different impacts on the basis of their application and specifications (e.g., vehicle class, lifetime, and range). The Data Sheet will contain default assumptions for all of these figures. However, in many cases, applicants will have an opportunity to enter an alternative figure and justify that in the application narrative. Manufacturers of equipment to refine, blend, or electrolyze renewable and low-carbon and low-emissions fuels, chemicals, and products (§ 48C(c)(1)(A)(i)(V)) will be asked to submit product well-to-gate Lifecycle Analyses (LCAs) in the 48C Application Data Sheet. Assumptions will be provided for many common products, but the applicant may also use a methodology associated with related tax credits (e.g., the § 45V and § 40B tax credit programs), Argonne National Lab's GREET Model (*https://greet.es.anl.gov*), or a comparable industry methodology, to calculate an alternative and justify that in the application narrative.

Process changes *(Greenhouse Gas Reduction Projects only)*	Select whether the retrofit involved energy efficiency, electrification, LCFFES, material efficiency or substitution, CCUS, others, or multiple approaches.

D. Technological or Cost Advantage

The 48C Application Data Sheet requires applicants to identify their technological or cost advantage over competitors with respect to the most relevant figure of merit. Ideally this is an apples-to-apples comparison between similar property of similar function. For example, a wind blade manufacturer might compare the performance and cost of the proposed blade manufacturing to current commercially manufactured blades. For a GHG reduction project that involves a carbon capture retrofit, a manufacturer might compare the performance and cost of their proposed carbon capture system to installed carbon capture systems elsewhere in the market.

Although high level metrics such as levelized costs can capture this cost advantage, applicants are encouraged to select a lower-level metric (i.e., $/W, $/Unit, and efficiency) and later discuss the impact this granular cost advantage has upon the levelized cost. If the applicant's manufactured property has multiple advantages over currently manufactured property, the applicant should select and quantify the most significant advantage in the 48C Application Data Spreadsheet while discussing all technological and cost advantages in their narrative.

E. Levelized Cost

The 48C Application Data Sheet requires applicants to identify their levelized cost of energy and/or emissions abatement, where applicable.

The levelized cost of energy (LCOE) and levelized cost of emissions abatement (LCEA) are measures of the average net present cost of advanced energy property over its deployed lifetime. LCOE or LCEA is required only for Clean Energy Manufacturing and Recycling facilities that produce equipment to generate, store, or avoid energy or GHG emissions, and is not relevant for direct greenhouse gas reduction retrofits or critical material projects. The LCOE/LCEA calculation should assume that the facility's products are part of a final clean energy installation and, where appropriate, be based on the financial and resource assumptions provided in the 48C Application Data Sheet or the suggested tools below. The 48C Application Data Sheet will provide stock information, such as inflation rates, taxes and insurance, and depreciation. LCOE should be expressed in nominal terms and should not include any federal, state, or other financial incentives. Further, plant and related cost values and prices of commodity fuels or feedstocks used in the calculation should reflect current national wholesale averages where possible.

The following information should be provided as documentation:

- Brief description of the methodology used as the basis for the calculation. This methodology should be a commonly accepted industry standard.
- Identification and brief rationale for the source of key values used in the calculation, including capital or first costs, operating and maintenance costs, prices of commodity fuels or feedstocks, and carbon emissions associated with the operation of the end-use energy product.
- Justification for any use of a resource-related parameter (e.g., capacity factor) different than the national averages provided.
- In the case of LCEA, identification and brief rationale for the key values associated with the baseline energy mix, including the cost of generation and carbon emissions.
- Explanation of any factors impacting the levelized cost that could not be quantified and included in the calculation, and their potential directional effect on the resulting cost (i.e., increase or decrease).
- Explanation of any relationship between the cost of the manufactured property and the performance of the end use energy product.
- If possible, an "unimproved" levelized cost calculation that does not reflect the input of the manufactured property (e.g., relies on the competitive standard of the day), based on the same financial and resource assumptions used in the "improved" calculation.

Suggested LCOE Tools:

- **System Advisor Model** (*https://sam.nrel.gov*): The National Renewable Energy Laboratory (NREL), in conjunction with Sandia National Laboratory and in partnership with DOE's Solar Program developed the System Advisor Model (SAM). The model evaluates several types of financing (from residential to utility-scale) and a variety of technology-specific cost models for several technologies, including solar photovoltaics, concentrated solar power, solar water heating, wind, geothermal, battery storage, and marine energy.
- **Simple Levelized Cost of Energy (LCOE) Calculator** (*https://www.nrel.gov/analysis/tech-lcoe.html*): The NREL Energy Analysis team's LCOE calculator allows the comparison of capital costs, operations and maintenance, performance, and fuel costs. This does not include more complex financial metrics, discount rates, degradation costs, or other inputs needed for a full LCOE. For more detailed analysis, projects should use the System Advisor Model above.
- **Hydrogen Financial Analysis Scenario Tool** (*https://www.nrel.gov/hydrogen/h2fast.html*): The Hydrogen Financial Analysis Scenario Tool, H2FAST, provides a quick and convenient in-depth financial analysis for hydrogen and nonhydrogen systems and services. H2FAST is available as a downloadable Excel spreadsheet. The model uses a generally accepted accounting principles analysis framework and provides annual projections of income statements,

cash flow statements, and balance sheets.

If the applicant chooses to provide an LCOE or LCEA value for the closest comparable end use energy product from a published study, the following information should be provided as documentation:

- Explanation of why a value either could not be calculated or was not appropriate to calculate for the end-use energy product.
- Brief description of the methodology used in the cited study.
- Identification of key assumptions used in the study, including the year basis for which the cost is reported (if the cost is reported in real terms; e.g., $2011), the year of costs and prices of fuel commodities, the year to which the end cost value is referenced (e.g., could be a future year), the extent of technology improvement assumed for the comparable end use energy product, the regional extent of the baseline assumed (e.g., global, the United States, or a region of United States), the carbon emissions associated with the baseline energy mix and the end-use energy product, the key financial assumptions (e.g., interest rates, taxes, and incentives included), and the resource-related parameters (e.g., capacity factors).
- Explanation of how the above assumptions differ from those provided above for guiding the calculation of the cost of abatement, and the potential directional effect of these differences on the study's cost value (i.e., if the aforementioned assumptions required for cost of abatement calculation had been used, explain whether the study's cost value likely have increased or decreased).

VI. Section 48C(e) Application Appendix Files

In the § 48C(e) application stage, the applicant should include such appendices as are applicable to the project. In addition to items specifically requested in Section III and the 48C Application Data Sheet, examples of appropriate appendix materials include:

- Copy of internal or external engineering reports. An example would be a front-end engineering and design (FEED) study for an industrial retrofit project.
- Copy of site plan, together with evidence that applicant owns or controls a site. Examples of evidence would include a deed, or an executed contract to purchase or lease the site.
- Lists of all federal, state, and local permits, including environmental authorizations or reviews, necessary to commence construction.
- Information supporting applicant's conclusion that the site is fully acceptable as the project site for a qualifying advanced energy project and for its intended use.
- Applicant expressions of interest or commitment letters from equity and debt financing sources.
- Expressions of interest or commitment letters from potential customers.

- Project diagrams e.g., process flow diagrams.
- Financial statements.
- Off-take agreements.
- Workforce and Community Engagement Agreements, such as Good Neighbor Agreements/Community Benefits Agreements, Collective Bargaining Agreements, Project Labor Agreements or Community Workforce Agreements.
- Letter of significant change in plans.

VII. Questions/Comments and Informational Webinar

A. Informational Webinar

DOE will conduct one or more informational webinars during the application process. They will be held after the initial additional guidance is released but before the due date for the § 48C(e) application.

Attendance is not mandatory and will not positively or negatively impact the review of any applicant submissions. As the webinar will be open to all applicants who wish to participate, applicants should refrain from asking questions or communicating information that would reveal confidential and/or proprietary information specific to their project.

The informational webinar will be held no later than June 30, 2023. Additional information including a link for registration can be found at *https://www.energy.gov/infrastructure/48C*.

B. Questions and Comments

Any questions or comments regarding the non-tax aspects of this notice can be submitted to the Department of Energy at ***48CQuestions@hq.doe.gov***. DOE may post questions and answers related to this notice on the eXCHANGE portal at *https://48C-exchange.energy.gov* (select 48C from the list of options to view questions and answers specific to the notice). Any questions or comments received under this notice are subject to public release pursuant to the Freedom of Information Act. DOE is under no obligation to respond to, or acknowledge receipt of, any questions or comments submitted under this notice and any responses provided do not constitute legal advice provided by either DOE or the IRS.

Questions related to the eXCHANGE portal should be directed to ***InfrastructureExchangeSupport@hq.doe.gov***. This includes questions about account registration or using the portal. Questions regarding application materials, eligibility, the DOE review process, or other programmatic questions not about the portal should not be sent to this email address.

APPENDIX C
Section 48C(e) Energy Communities Census Tracts