

# Qualifying Advanced Energy Project Credit

Notice 2013-12

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## SECTION 1. PURPOSE

Section 48C of the Internal Revenue Code provides for the qualifying advanced energy property project program and authorizes \$2.3 billion of credits (“the § 48C Phase I program” and “the § 48C Phase I credit”). This notice reports the results of the § 48C Phase I program and, as provided by § 48C(d)(4), establishes a second phase of the qualifying advanced energy project program (“the § 48C Phase II program”) to distribute the § 48C Phase I credits that are available for re-allocation after review of the

§ 48C Phase I program.

To be considered for an allocation of credits in the § 48C Phase II program, taxpayers must submit concept papers to the U.S. Department of Energy (“DOE”) by April 9, 2013 and applications to DOE and the Internal Revenue Service (“Service”) by July 23, 2013.

## SECTION 2. BACKGROUND

.01 Section 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 qualifying advanced energy project credit under § 48C.

.02 Section 48C(d)(1) provides that the Secretary, in consultation with the Secretary of Energy, shall establish a qualifying advanced energy project program to consider and award certifications for qualified investments eligible for credits to qualifying advanced energy project sponsors. In 2009, the Treasury Department and the Service, in consultation with the Secretary of Energy, established the § 48C Phase I program in Notice 2009-72, 2009-37 I.R.B. 325.

.03 Pursuant to § 48C(d)(1)(B), the § 48C Phase I program provided for \$ 2.3 billion of credits to be allocated to qualifying advanced energy projects. The Service fully allocated \$2.3 billion of credits under the § 48C Phase I program in 2009-2010.

.04 Section 48C(d)(4) requires the Secretary to review the allocation of § 48C Phase I credits not later than the date that is 4 years after the date of enactment of § 48C. The Secretary may conduct an additional program for applications for

certification if the Secretary determines that: (1) there is an insufficient quantity of qualifying applications for certification pending at the time of the review, or (2) any certification made pursuant to § 48C(d)(2) has been revoked pursuant to § 48C(d)(2)(B) because the project subject to the certification has been delayed as a result of third-party opposition or litigation.

.05 The Service has completed this review and has determined that § 48C Phase I credits in the total amount of \$150,228,397.00 are available for reallocation under the § 48C Phase II program.

.06 Pursuant to § 48C(a), the qualifying advanced energy project credit for a taxable year is an amount equal to 30 percent of the qualified investment (as defined in § 48C(b)) for that taxable year with respect to the taxpayer's qualifying advanced energy project (as defined in § 48C(c)(1)).

.07 Section 48C(b)(1) provides that the qualified investment for any taxable year is the basis of eligible property that is placed in service by the taxpayer during such taxable year and is part of a qualifying advanced energy project.

.08 Section 48C(b)(3) provides that the qualified investment for all taxable years with respect to any qualifying advanced energy project is limited to the amount designated by the Secretary as eligible for the credit under § 48C.

.09 Section 48C(d)(3) specifies the criteria that must be considered in determining which qualifying advanced energy projects are certified under § 48C(d).

.10 The qualifying advanced energy project credit generally is allowed in the

taxable year in which the eligible property (as defined in § 48C(c)(2)) is placed in service (as defined in section 3.04 of this notice) by the taxpayer. Pursuant to § 48C(d)(2)(C), a taxpayer that receives a certification under § 48C(d)(2) has 3 years from the date of issuance of certification to place the qualifying advanced energy project in service. If the taxpayer does not place the project in service by the end of that period, the certification is no longer valid.

.11 The at-risk rules in § 49 and the recapture and other special rules in § 50 apply to the qualifying advanced energy project credit.

.12 For further information regarding the qualifying advanced energy project program under § 48C, taxpayers may refer to [http://www.irs.gov/Businesses/Advanced-Energy-Credit-for-Manufacturers-\(IRC-48C\)](http://www.irs.gov/Businesses/Advanced-Energy-Credit-for-Manufacturers-(IRC-48C)). This website contains various information relating to the program, including answers to frequently asked questions.

### SECTION 3. DEFINITIONS

The following definitions apply for purposes of § 48C and this notice:

.01 Qualifying Advanced Energy Project. A qualifying advanced energy project is a project that meets the following requirements:

(1) the project re-equips, expands, or establishes a manufacturing facility (as defined in section 3.05 of this notice) for the production of specified advanced energy property or property that, after further manufacture, will become specified advanced energy property;

(2) the Service has certified pursuant to § 48C(d)(2) that part or all of the qualified investment in the project is eligible for a credit under § 48C; and

(3) the project does not produce any property which is used in the refining or blending of any transportation fuel (other than renewable fuels).

.02 Specified Advanced Energy Property. Specified advanced energy property means any of the following:

(1) property designed for use in the production of energy from the sun, wind, geothermal deposits (within the meaning of § 613(e)(2)), or other renewable resources;

(2) fuel cells, microturbines, or an energy storage system for use with electric or hybrid-electric motor vehicles;

(3) electric grids to support the transmission of intermittent sources of renewable energy, including property for the storage of such energy;

(4) property designed to capture and sequester carbon dioxide and sequester carbon dioxide emissions;

(5) property designed to refine or blend renewable fuels (but not fossil fuels) or to produce energy conservation technologies (including energy-conserving lighting technologies and smart grid technologies);

(6) new plug-in electric drive motor vehicles (as defined by § 30D), qualified plug-in electric vehicles (as defined by § 30(d)), or components that are designed specifically for use with such vehicles, including electric motors, generators, and power control units; or

(7) other property designed to reduce greenhouse gas emissions as may be determined by the Service as described in section 3.06 of this notice.

.03 Eligible Property. Eligible property is any property (other than a building or its

structural components) that meets the following requirements:

(1) the property is necessary for the production of specified advanced energy property described in § 48C(c)(1)(A)(i) or section 3.02 of this notice;

(2) the property is

(a) tangible personal property, or

(b) other tangible property (not including a building or its structural components)

that is used as an integral part of the qualifying advanced energy project; and

(3) depreciation (or amortization in lieu of depreciation) is allowable with respect to the property.

.04 Placed In Service. For purposes of § 48C, property is placed in service in the taxable year in which the property is placed in a condition or state of readiness and availability for a specifically assigned function. See § 1.46-3(d)(1)(ii) of the Income Tax Regulations. Thus, a qualifying advanced energy project is placed in service in the taxable year in which the project is placed in a condition or state of readiness and availability for its intended purpose. Eligible property (as defined in § 48C(c)(2) and section 3.03 of this notice) that is a part of the project is placed in service in the taxable year in which the property is placed in a condition or state of readiness and availability for its intended purpose.

.05 Manufacturing Facilities. For purposes of § 48C, manufacturing facilities are facilities that make, or process raw materials into, finished products (or accomplish any intermediate stage in that process).

.06 Advanced Energy Property Designed To Reduce Greenhouse Gas

Emissions. Property may be determined to be designed to reduce greenhouse gas emissions either through published guidance or in the letter notifying a taxpayer that the Service has accepted the taxpayer's application for § 48C certification with respect to the property.

#### SECTION 4. SECTION 48C PHASE II PROGRAM

.01 In General. The Service will consider a project under the qualifying advanced energy project program only if DOE provides a recommendation and ranking for the project (DOE recommendation). DOE will provide a recommendation and ranking only if it determines that the project has a reasonable expectation of commercial viability and merits a recommendation based on the criteria in § 48C(d)(3)(B). Accordingly, a taxpayer must submit for each project that it sponsors: (1) a concept paper for DOE consideration; (2) an application for recommendation by DOE ("application for DOE recommendation"); and (3) an application for certification under § 48C(d)(2) by the Service ("application for § 48C certification") (collectively (2) and (3) are referred to herein as "the § 48C applications"). A taxpayer must submit a concept paper and the § 48C applications as specified in section 5 and Appendix B of this notice through the eXCHANGE website at <https://eere-exchange.energy.gov>. EXCHANGE is an online application portal used by the Office of Energy Efficiency & Renewable Energy, DOE, into which applicants may securely input their data and information for review by DOE and the Service. Applicants will be able to submit an application for DOE recommendation and an application for § 48C certification simultaneously using eXCHANGE.

.02 Program Specifications.

(1) The Service determines the amount of the qualifying advanced energy project credit allocated to a qualifying advanced energy project at the time the Service accepts the application for certification for that project in accordance with section 4.02(8) of this notice (see section 5 of this notice for the requirements applicable to the concept paper and the § 48C applications).

(2) Section 48C Phase II credits in the amount of \$150,228,397.00 are available for allocation.

(3) The amount of the qualified investment that is eligible for the credit with respect to any project is limited to \$100 million. Accordingly, the maximum amount of credits allocated per project will be \$30 million.

(4) The DOE recommendations will include a ranking of projects in descending order (that is, first, second, third, etc.). The project receiving the highest ranking (that is, first) will be allocated the full amount of credit requested not to exceed \$30 million before any credit is allocated to a lower-ranked project. The amount of credit allocated to a project reduces the amount of credit available to lower-ranked projects. The same process will apply to the second and lower-ranked projects until the amount available for allocation is exhausted. DOE will recommend and rank projects only to the extent necessary to exhaust the amount available for allocation.

(5) For the § 48C Phase II program, the application period for certification begins on February 7, 2013, and ends on July 23, 2013. All timely submitted applications will be evaluated and ranked on their merit regardless of when in the application period they



are submitted.

(6) For the § 48C Phase II program, a concept paper for DOE consideration must be submitted by April 9, 2013. The § 48C applications must be submitted by July 23, 2013. If the § 48C applications are received on or before July 23, 2013, and otherwise meet the preliminary compliance review criteria, DOE will determine the merit of the project and (for projects determined to be meritorious) provide the DOE recommendation to the Service by October 11, 2013. See section 5.02 of this notice and Appendix B to this notice for the information required to be submitted to DOE in an application for DOE recommendation. Also, see Appendix B to this notice for a discussion relating to the process for applying for DOE recommendation and the instructions for filing concept papers and applications for DOE recommendation.

(7) Each applicant will receive an electronically generated confirmation of receipt upon submission of (a) the concept paper and (b) the § 48C applications. The timeliness of submission of the § 48C applications will be determined by the submittal date and time shown on the confirmation of receipt.

(8) For the § 48C Phase II program, the Service will accept or reject a taxpayer's application for § 48C certification by November 15, 2013, and it will notify the taxpayer, by letter, of its decision. If the application is accepted, the date of this letter will be treated as the acceptance date.

(9) If the taxpayer's application for § 48C certification is accepted, the acceptance letter will state the amount of the credit allocated to the project. The qualifying advanced energy project credit with respect to any project for all taxable

years may not exceed the amount of credit allocated to the project under section 4 of this notice. If a credit is allocated to a taxpayer's project, the taxpayer will be required to execute an agreement in the form set forth in Appendix A to this notice. The taxpayer must execute and return the agreement to the Service by January 10, 2014, at the address listed in section 6.02 of this notice. The Service will execute and return the agreement to the taxpayer by March 14, 2014. The executed agreement applies only to the taxpayer that signed the agreement. The taxpayer must notify the Service within 90 days of the acquisition of the project by any other person (a successor in interest) or, if the taxpayer is a member of an affiliated group filing consolidated returns, a change in the common parent company of the affiliated group. A successor in interest that plans to claim the § 48C credit allocated to the project must request permission to execute a new agreement with the Service. If the request is granted, the new agreement must be executed no later than the due date (including extensions) of the successor in interest's Federal income tax return for the taxable year in which the transfer occurs. If the successor in interest does not execute a new agreement, the following rules apply:

(a) in the case of an interest acquired before the time the qualifying advanced energy project is placed in service, any credit allocated to the project will be fully forfeited (and rules similar to the recapture rules of § 50(a) apply with respect to qualified progress expenditures); and

(b) in the case of an interest acquired after the qualifying advanced energy project is placed in service, the project ceases to be investment credit property (and rules similar to the recapture rules of § 50(a) will apply with respect to qualified progress

expenditures).

.03 For qualifying advanced energy projects that re-equip or expand a manufacturing facility, the taxpayer's qualified investment is limited to property that re-equips or expands the facility to produce specified advanced energy property listed in section 3.02 of this notice.

.04 The qualifying advanced energy project credit will not be allocated to any qualified investment for which a credit is allowed under §§ 48, 48A, or 48B, or for which a payment is received under § 1603 of the American Recovery and Reinvestment Tax Act of 2009, Division B of Pub. L. 111-5, 123 Stat 115.

## SECTION 5. CONCEPT PAPERS AND APPLICATIONS FOR DOE RECOMMENDATION AND § 48C CERTIFICATION

.01 In General. A taxpayer must submit for each project it sponsors (1) by April 9, 2013, a concept paper for DOE consideration and (2) if invited by DOE, by July 23, 2013, the § 48C applications. If an application for DOE recommendation does not (1) propose an eligible project or (2) include all of the information required by Appendix B to this notice, DOE may decline to consider the application. If DOE does not provide a recommendation for the application, the Service will not consider the application for § 48C certification.

.02 Information Required in the Concept Paper and Application for DOE Recommendation. A concept paper and application for DOE recommendation must include the information requested in Appendix B to this notice. Upon review of the concept paper, DOE will notify those applicants whose projects will be considered for

DOE recommendation, and will invite the applicants to submit an application for DOE recommendation. An applicant who is not invited will not be permitted to submit an application for DOE recommendation or an application for §48C certification.

.03 Information Required in the Application for § 48C Certification. By submitting an application through eXCHANGE, an applicant is submitting simultaneously an application for DOE recommendation and an application for § 48C certification. EXCHANGE will prompt an applicant to enter necessary information and will provide corresponding instructions regarding the requirements for the application for § 48C certification.

## SECTION 6. ISSUANCE OF CERTIFICATION

.01 Requirements for Certification. Pursuant to § 48C(d)(2)(B), a taxpayer has one year from the date of acceptance of the application for § 48C certification during which to provide evidence that the requirements of the certification have been met in accordance with section 6.02 of this notice. If such evidence is not timely received, the allocated § 48C Phase II credits are forfeited. A project is eligible for certification only if the taxpayer has received all federal, state, and local permits, including environmental authorization or reviews necessary to commence construction of the project. Section 48C(d)(2)(C) provides that a taxpayer that receives a certification has three years from the date of issuance of the certification to place the project in service and that the certification is void if the project is not placed in service by the end of that three-year period.

.02 Satisfaction of Requirements for Certification. Within one year from the

acceptance date (as determined in section 4.02(8) of this notice), the taxpayer must submit to the Service an electronic version on a USB flash drive or a CD of the documentation establishing that the certification requirements of section 6.01 of this notice are satisfied. The documentation must be formatted in one of the following software applications: Microsoft ® Word 2007 or later edition; Microsoft ® Excel 2007 or later edition; or Adobe ® Acrobat PDF 7.0 or later edition. The taxpayer should mark the package, "SECTION 48C CERTIFICATION REQUIREMENTS" and submit by U.S. mail, designated private delivery service, or hand delivery service (between the hours of 8 a.m. and 4 p.m. Central time, Monday through Friday) to:

Internal Revenue Service  
Industry Director, Natural Resources and Construction  
Attn: Executive Assistant (Technical)  
1919 Smith Street, floor 23  
Mail Stop 1000-HOU  
Houston, TX 77002

(1) The documentation establishing that the certification requirements of section 6.01 of this notice are satisfied must be accompanied by a letter that includes the following written declaration: "I declare that I am authorized to bind [name of applicant]. Under penalties of perjury, I declare that I have examined this submission, including accompanying documents, and, to the best of my knowledge and belief, all of the facts contained herein are true, correct, and complete."

(2) The taxpayer's submission (the letter including the perjury declaration and documentation) must be signed and dated by the taxpayer. The person signing for the taxpayer must have personal knowledge of the facts. Further, the submission must be signed by a person authorized under state law to bind the taxpayer, such as an officer

on behalf of a corporation, a general partner of a state law partnership, a member-manager on behalf of a limited liability company, a trustee on behalf of a trust, or the proprietor in the case of a sole proprietorship. If the taxpayer is a member of an affiliated group filing consolidated returns, the submission also must be signed by a duly authorized officer of the common parent of the group. A stamped, scanned, faxed, or otherwise copied signature is not permitted.

.03 Service's Action on Certification. After receiving the submission described in section 6.02 of this notice, the Service will decide whether or not to certify the project and will notify the taxpayer, by letter, of that decision. If the Service certifies the project, the date of this letter is the date of issuance of the certification.

## SECTION 7. OTHER REQUIREMENTS

.01 Significant Change in Plans. The taxpayer must inform the Service if the plans for the project change in any significant respect from the plans set forth in the § 48C applications. A significant change is any change that a reasonable person would conclude might have adversely influenced DOE in recommending or ranking of the project or the Service in accepting the application had they known about the change when they were considering the application. If the Service is informed of the change after the date on which the § 48C applications are due under section 4.02(6) of this notice:

- (1) the Service will give no further consideration to the project; and
- (2) any acceptance provided by the Service and any allocation or certification based on that acceptance will be void.

.02 Recapture of the § 48C Phase II Credits. Section 48C Phase II credits are subject to the recapture rules of § 50. Section 50(a)(1) provides, generally, for recapture of the investment credit if, during any taxable year, investment tax credit property is disposed of or otherwise ceases to be investment credit property with respect to the taxpayer before the close of the recapture period. The recapture period under § 50(a) is the 5-year period beginning on the date the property is placed in service.

.03 Effect of an Acceptance, Allocation, or Certification. An acceptance, allocation, or certification by the Service under this notice is not a determination that a project is eligible for the qualifying advanced energy project credit under § 48C or that any property that is part of the project is an eligible property under § 48C(c)(2). The Service may, upon examination (and after any appropriate consultation with DOE), determine that the project does not qualify for this credit or that the property is not an eligible property for purposes of this credit.

.04 No Right to a Conference or Appeal. A taxpayer does not have a right to a conference relating to any matters under this notice. Further, a taxpayer does not have a right to appeal the decisions made under this notice (including the acceptance or rejection of the application for § 48C certification, the amount of credit allocated to the project, or whether or not to certify the project) to any official of DOE or the Service.

.05 Submissions by U.S. Mail. For purposes of this notice, any information submitted to the Service pursuant to sections 4.02(9), 6.02, 7.01, or 8 of this notice that is submitted by U.S. mail will be treated as received by the Service on the date of the

postmark and any information submitted by a private delivery service will be treated as received by the Service on the date recorded or the date marked in accordance with §7502.

## SECTION 8. REDUCTION OR FORFEITURE OF ALLOCATED CREDITS

Under the provisions of this notice and the agreement set forth in Appendix A to this notice, the § 48C Phase II credits allocated under section 4 of this notice will be reduced or forfeited in certain situations. A taxpayer must notify the Service of the amount of any reduction or forfeiture required under the agreement. This notification must be sent to the address listed in section 6.02 of this notice.

## SECTION 9. QUALIFIED PROGRESS EXPENDITURES

.01 Section 48C(b)(2) provides that rules similar to the rules of § 46(c)(4) and (d) (as in effect on the day before the enactment of the Revenue Reconciliation Act of 1990) shall apply for purposes of § 48C. Former § 46(c)(4) and (d) provided the rules for claiming the investment credit on qualified progress expenditures (as defined in former § 46(d)(3)) made by a taxpayer during the taxable year for the construction of progress expenditure property (as defined in former § 46(d)(2)).

.02 In the case of self-constructed property (as defined in former § 46(d)(5)(A)), former § 46(d)(3)(A) defined qualified progress expenditures to mean the amount that is properly chargeable (during the taxable year) to capital account with respect to that property. With respect to a qualifying advanced energy project that is self-constructed property, amounts paid or incurred are chargeable to capital account at the time and to the extent they are properly includible in computing basis under the taxpayer's method



of accounting (for example, after applying the requirements of § 461, including the economic performance requirement of § 461(h)).

.03 To claim the advanced energy project credit with respect to the qualified progress expenditures paid or incurred by a taxpayer during the taxable year for construction of a qualifying advanced energy project, the taxpayer must make an election under the rules set forth in § 1.46-5(o) of the Income Tax Regulations. A taxpayer may not make the qualified progress expenditures election for a qualifying advanced energy project until the taxpayer has received an acceptance letter for the project under section 4.02(8) of this notice.

.04 If a taxpayer makes the qualified progress expenditures election pursuant to section 9.03 of this notice, rules similar to the recapture rules in § 50(a)(2)(A) through (D) apply. In addition to the cessation events listed in § 50(a)(2)(A), examples of other events that will cause the project to cease being a qualifying advanced energy project are:

(1) Failure to receive a certification for the project in accordance with section 6 of this notice;

(2) Failure to place the project in service within 3 years from the date of issuance of the certification under section 6.01 of this notice; or

(3) A significant change to the plans for the project as set forth in the § 48C applications if, under section 7.01 of this notice, the Service's acceptance of the project is void as a result of the change.

## SECTION 10. DISCLOSURE OF INFORMATION

.01 Announcement. Section 48C(d)(5) provides that the Service shall, upon making a certification, publicly disclose the identity of the applicant and the amount of the credit certified with respect to such applicant. Accordingly, the Service will publish the results of the allocation process, and disclose the following information in the event a qualifying advanced energy project credit is allocated to the taxpayer's project: (1) the name of the taxpayer and (2) the amount of the § 48C Phase II credit allocated to the project.

.02 Voluntary disclosure. Applicants may authorize the government to release additional information by completing and signing the voluntary disclosure waiver in the Disclosure Waiver section of the Taxpayer Data Spreadsheet. An applicant's decision to disclose or to withhold additional information does not influence the selection process either by DOE or by the Service.

.03 In General. A concept paper, the § 48C applications, and any other documentation submitted by the taxpayer pursuant to section 6.02 of this notice, and any documentation generated by the Service or DOE as part of this process are return information subject to § 6103. Except for the items of information that § 48C(d)(5) requires the Service to make available to the public or any other information that the applicant consents to disclose pursuant to section 10.02 of this notice, the other material remains the applicant's confidential return information, which is exempt from disclosure under the Freedom of Information Act (FOIA), 5 USC § 552(b)(3), in conjunction with § 6103. Other FOIA exemptions may also apply. For example, FOIA includes exemptions for trade secrets and commercial or financial information (5 USC

§ 552(b)(4)), as well as personal information (5 USC § 552(b)(6)).

.04 FOIA requests. Anyone interested in submitting a request for records under the FOIA with respect to the qualifying advanced energy project program under § 48C should direct a request that conforms to the Service's FOIA regulations, found at 26 C.F.R. § 601.702, to the following address:

IRS FOIA Request  
Baltimore Disclosure Office  
Room 940  
31 Hopkins Plaza  
Baltimore, MD 21201

#### SECTION 11. EFFECTIVE DATE

This notice is effective on February 7, 2013.

#### SECTION 12. PAPERWORK REDUCTION ACT

The collection of information contained in this notice has been reviewed and approved by the Office of Management and Budget (OMB) in accordance with the Paperwork Reduction Act (44 U.S.C. § 3507) under control number 1545-2151.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the collection of information displays a valid OMB control number.

The collections of information in this notice are in sections 4, 5, 6, 7, and Appendix B of this notice. This information is required to obtain an allocation of qualifying advanced energy project credits. This information will be used by the Service to verify that the taxpayer is eligible for the qualifying advanced energy project credits. The collection of information is required to obtain a benefit. The likely respondents are

business or other for-profit institutions.

The estimated total annual reporting burden is 55,000 hours.

The estimated annual burden per respondent varies from 70 to 150 hours, depending on individual circumstances, with an estimated average of 110 hours. The estimated number of respondents is 500.

The estimated annual frequency of responses is on occasion.

Books or records relating to a collection of information must be retained as long as their contents may become material in the administration of any internal revenue law. Generally, tax returns and return information are confidential, as required by 26 U.S.C. § 6103.

#### SECTION 13. DRAFTING INFORMATION

The principal author of this notice is Philip Tiegerman of the Office of Associate Chief Counsel (Passthroughs & Special Industries). For further information regarding this notice, contact Philip Tiegerman at (202) 622-3110 (not a toll-free number). For further information regarding the § 48C applications, the documentation to be submitted to the Service establishing that the requirements of § 48C(d)(2) are satisfied, and the issuance of the certification that the requirements of § 48C(d)(2) are satisfied, contact Marc Bernabo, 48C Program Manager, Office of the Industry Director, Natural Resources and Construction, at (713) 209-3669 (not a toll-free number).

**APPENDIX A**  
**AGREEMENT**

[Insert taxpayer's name, address, and identifying number] ("Taxpayer") and the Commissioner of Internal Revenue ("Commissioner") make the following agreement:

**WHEREAS:**

1. On or before [insert date and year], Taxpayer submitted to the Internal Revenue Service ("IRS"), an application for certification under the § 48C Phase II program described in Notice 2013-12 ("Application for § 48C Certification");

2. Taxpayer's Application for § 48C Certification is for the qualifying advanced energy project (the "Project") described below--

(1) The name of the Project is [insert name as provided in Taxpayer's application];

(2) The Project will be located in or near [insert city and state];

(3) The Project [insert either: "re-equips"; "expands"; or "establishes"] a manufacturing facility for the production of [insert type of property as described in § 48C(c)(1)(A)(i)(I) – (VII)].

(4) On [insert date of acceptance letter issued under section 4.02(7) of Notice 2013-12], the IRS accepted Taxpayer's Application for § 48C Certification for the Project and allocated a qualifying advanced energy project credit under § 48C in the amount of \$[insert number] to the Project.

**NOW IT IS HEREBY DETERMINED AND AGREED FOR FEDERAL INCOME TAX PURPOSES THAT:**

1. The total amount of the § 48C Phase II credit to be claimed for the Project under § 48C(a) must not exceed the amount allocated to the Project as specified in WHEREAS clause 2(4).

2. If Taxpayer fails to satisfy the certification requirements under section 6.02 of Notice 2013-12 within the time specified in § 48C(d)(2)(B) (1 year from the date the IRS accepted the Taxpayer's Application for § 48C Certification for the Project as specified in WHEREAS clause 2(4)), or if the IRS does not issue a certification for the Project under Notice 2013-12, the § 48C Phase II credit in the amount allocated to the Project as specified in WHEREAS clause 2(4) is fully forfeited.

3. Taxpayer will notify the IRS in writing at the address listed in section 6.02 of Notice 2013-12 when the Project is placed in service. This notification must be sent within 30 days of the date the Project is placed in service.

4. If the Project is not placed in service by Taxpayer within 3 years of the date of issuance of the certification as determined under section 6.03 of Notice 2013-12, the § 48C Phase II credit in the amount allocated to the Project as specified in WHEREAS clause 2(4) is fully forfeited.

5. If the plans for the Project change in any significant respect from the plans set forth in the application for DOE recommendation (as defined in section 4.01 of Notice 2013-12) and the Application for § 48C Certification and, under section 7.03 of Notice

2013-12, the acceptance of Taxpayer's Application for § 48C Certification on the date the IRS accepted the Taxpayer's Application for § 48C Certification for the Project as specified in WHEREAS clause 2(4) is void, then the § 48C Phase II credit in the amount allocated to the Project as specified in WHEREAS clause 2(4) is fully forfeited.

6. Taxpayer will not claim the qualifying advanced energy project credit under § 48C for any qualified investment for which a credit is allowed under §§ 48, 48A, or 48B or for which a payment is received under § 1603 of the American Recovery and Reinvestment Act of 2009, Division B of Pub. L. 111-5, 123 Stat 115.

7. If Taxpayer elects to claim the qualifying advanced energy project credit for the qualified progress expenditures paid or incurred by Taxpayer during the taxable year(s) during which the Project is under construction and the Project ceases to be a qualifying advanced energy project (whether before, at the time, or after the Project is placed in service), rules similar to the recapture rules in § 50(a)(2)(A) through (D) apply.

8. Taxpayer reasserts that the following information is trade secret or proprietary information: [Insert "All information identified as trade secret or proprietary in Taxpayer's application for DOE recommendation" or list the specific information in Taxpayer's application for DOE recommendation to which the reassertion applies.]

9. This agreement applies only to Taxpayer. Taxpayer must notify the IRS within 90 days of the acquisition of the Project by any other person (a successor in interest). A successor in interest that plans to claim the § 48C credit allocated to the Project must request permission to execute a new agreement with the IRS. If the request is granted, the new agreement must be executed no later than the due date (including extensions)

of the successor in interest's Federal income tax return for the taxable year in which the transfer occurs. If the interest is acquired at or before the time the Project is placed in service and the successor in interest fails to execute a new agreement, the qualifying advanced energy project credit in the amount allocated to the Project, as specified in the WHEREAS clause 2(4), is fully forfeited. If the interest is acquired after the time the Project is placed in service and the successor in interest fails to execute a new agreement, the Project ceases to be investment credit property, and the recapture rules of § 50(a) apply.

**THIS AGREEMENT IS FINAL AND CONCLUSIVE EXCEPT:**

1. The matter it relates to may be reopened in the event of fraud, malfeasance, or misrepresentation of a material fact;
2. It is subject to the Internal Revenue Code sections that expressly provide that effect be given to their provisions notwithstanding any law or rule of law; and
3. If it relates to a tax period ending after the date of this Agreement, it is subject to any law enacted after such date, which applies to the tax period.



By signing, the parties certify that they have read and agreed to the terms of this Agreement.

**Taxpayer: [insert name and identifying number]**

**By:** \_\_\_\_\_ **Date Signed:** \_\_\_\_\_  
[insert name]

**Title:** [insert title]  
[insert taxpayer's name]

**Commissioner of Internal Revenue**

**By:** \_\_\_\_\_ **Date Signed:** \_\_\_\_\_  
[insert name]

Title: Industry Director, Natural Resources & Construction

## **APPENDIX B: REQUEST FOR CONCEPT PAPERS AND FULL APPLICATIONS FOR DOE RECOMMENDATION**

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### **I. OVERVIEW**

The Internal Revenue Service (“Service”) with the assistance of the Department of Energy (“DOE”) seeks to select for certification applications of innovative technologies that demonstrate a reasonable expectation of commercial viability and are eligible for consideration based on the selection criteria in sections III and IV below. To be eligible, applications must be for qualifying advanced energy projects and projects must have a reasonable expectation of commercial viability.

This request for concept papers and full applications for DOE Recommendation:

1. Describes the information to be provided by the taxpayer to allow DOE to review and recommend projects,
2. Identifies the eligibility requirements, the merit review criteria for the concept papers, the merit review criteria for the full applications for DOE recommendation and Program Policy Factors to be used by DOE in the review of applications, and
3. Requests a tax credit that is 30% of the qualified investment not to exceed \$30 million per project.

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 in advance from all reviewers to assure that application information shall be kept confidential and used only for reviewing purposes. 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 taxpayers submitting applications through written submissions and/or oral presentations.

DOE may determine whether to recommend an application to the Service at any time after the full application has been received, without further exchanges or discussions with the Taxpayer.

Neither a procurement action (under Title 48 of the Code of Federal Regulations) nor a financial assistance award (under 10 CFR Part 600) is contemplated based on an application submitted under Notice 2013-12 (Notice).

DOE will be hosting an informational webinar on the § 48C Phase II program for potential applicants (taxpayers) on February 19, 2013 at 2:00 p.m. Eastern time. This initial webinar will provide information about how to prepare the Concept Paper. Participants will have the opportunity to submit written questions during the webinar. Answers will be posted on the IRS website at [http://www.irs.gov/Businesses/Advanced-Energy-Credit-for-Manufacturers-\(IRC-48C\)](http://www.irs.gov/Businesses/Advanced-Energy-Credit-for-Manufacturers-(IRC-48C)) and on DOE's eXCHANGE system at <https://eere-exchange.energy.gov/> under the § 48C Phase II opportunity announcement. The February 12, 2013 webinar will only address topics related to the concept paper phase of the process. Applicants who are subsequently invited to submit a full application will also be invited to a webinar addressing that stage of the process.

Webinar information is as follows:

1. Click this link to start or to join the Webinar:

<https://www1.gotomeeting.com/register/838885833>

2. Choose one of the following audio options:

**TO USE YOUR COMPUTER'S AUDIO:**

When the Webinar begins, you will be connected to audio using your computer's microphone and speakers (VoIP). A headset is recommended.

**TO USE YOUR TELEPHONE:**

If you prefer to use your phone, you must select "Use Telephone" after joining the Webinar and call in using the numbers below.

Toll: +1 (415) 655-0055

Access Code: 674-939-455

Audio PIN: Shown after joining the meeting

## **II. DOE REVIEW PROCESS**

A two-phase technical evaluation process will be used for applications submitted under the Notice: Phase 1 – concept paper and Phase 2 – full application. Based on the results of the concept paper review, a select number of taxpayers (up to approximately 50) will be invited to submit full applications. At its sole discretion, DOE may give all taxpayers who submit a full application the option of doing an in-person presentation, at their own expense, at DOE Headquarters at 1000 Independence Avenue SW, Washington, DC. 20585.

**FULL APPLICATIONS WILL BE ACCEPTED ONLY FROM TAXPAYERS THAT RECEIVE AN INVITATION TO SUBMIT THE FULL APPLICATION. NO OTHER FULL APPLICATIONS SUBMITTED UNDER THIS NOTICE WILL BE REVIEWED.**

- **Concept Paper – DUE April 9, 2013**

The first phase requires a taxpayer to submit a concept paper. As a result of this preliminary review, taxpayers will either receive an invitation to submit a full application package or be removed from further consideration. DOE expects to invite selected taxpayers to submit full applications no later than June 4, 2013.

As part of the review of the concept papers, DOE will carry out an initial compliance review to determine that (1) the concept paper meets the eligibility requirements (see Section III), (2) all required information has been submitted, and (3) all mandatory requirements of this Notice are satisfied. If a concept paper clearly fails to meet the eligibility requirements or does not provide sufficient information for evaluation, the concept paper will be considered non-responsive and eliminated from further review.

- **Full Application – DUE July 23, 2013**

The second evaluation phase will consist of a review of full application packages submitted by invitation as a result of the concept paper Phase. Applications submitted that were not invited, or do not expand on successful Phase I – concept paper proposals will not be reviewed. Successful Phase I – concept paper Taxpayers invited to submit full applications may not significantly change the scope or focus of the original concept paper proposals.

The review will be a thorough, consistent, and objective examination of applications based on merit review criteria outlined in Section IV (F).

Prior to the comprehensive review of the full applications, DOE will review compliance to determine that (1) the application meets the eligibility requirements, (2) the information required by this Notice has been submitted, (3) the taxpayer filed a timely concept paper, and (4) all mandatory requirements of this Notice are satisfied.

### **III. ELIGIBILITY INFORMATION**

To be eligible, (1) concept papers and applications must be for advanced energy projects, and (2) projects must have a reasonable expectation of commercial viability.

**Concept papers and full applications that do not clearly demonstrate how the proposed project meets the eligibility requirements will not be reviewed.**

**Eligibility requirements are as follows:**

#### **A. Qualifies as an advanced energy project**

As defined in 26 U.S.C. § 48C(c)(1), the term “qualifying advanced energy project” means a project—

- (i) which re-equips, expands, or establishes a manufacturing facility for the production of:
  1. property designed to be used to produce energy from the sun, wind, geothermal deposits (within the meaning of § 613(e)(2)), or other renewable resources,
  2. fuel cells, microturbines, or an energy storage system for use with electric or hybridelectric motor vehicles,
  3. electric grids to support the transmission of intermittent sources of renewable energy, including storage of such energy,
  4. property designed to capture and sequester carbon dioxide emissions,
  5. property designed to refine or blend renewable fuels or to produce energy conservation technologies (including energy-conserving lighting technologies and smart grid technologies),
  6. new qualified plug-in electric drive motor vehicles (as defined by § 30D), qualified plug-in electric vehicles (as defined by § 30(d)), or components which are designed specifically for use with such vehicles, including electric motors, generators, and power control units, or
  7. other advanced energy property designed to reduce greenhouse gas emissions as may be determined by the Treasury Secretary, and
- (ii) any portion of the qualified investment of which is certified as eligible for the § 48C credit.

#### **B. Has a reasonable expectation of commercial viability**

The application must demonstrate that the project has a reasonable expectation of commercial viability.

## **IV. SUBMISSION INFORMATION FOR DOE RECOMMENDATION PROCESS**

### **A. General**

An application for DOE recommendation and ranking must include a concept paper at Phase 1 and a full application at Phase 2 as described below. All applications shall be prepared in accordance with this request for applications for DOE recommendation in order to provide a standard basis for review and to ensure that each application will be uniform as to format and sequence.

Concept papers and full applications should clearly address each of the eligibility requirements and applicable merit review criteria to demonstrate the taxpayer's capability, knowledge, and experience regarding the requirements described herein.

Taxpayers should fully address the requirements of the Notice and this request and **not** rely on the presumed background knowledge of reviewers. DOE may reject an application that does not follow the instructions regarding the organization and content of the application when the nature of the deviation and/or omission precludes meaningful review of the application.

**ALL CONCEPT PAPERS AND FULL APPLICATIONS MUST BE SUBMITTED THROUGH EERE eXCHANGE TO BE CONSIDERED FOR DOE RECOMMENDATION UNDER THIS NOTICE.**

**CONCEPT PAPERS AND FULL APPLICATIONS RECEIVED AFTER THE STATED DEADLINES WILL NOT BE REVIEWED OR CONSIDERED FOR DOE RECOMMENDATION.**

### **B. Application Forms**

Required forms and information for downloading concept papers and full applications are available at <https://eere-exchange.energy.gov>. Taxpayers will need to register and create an account in EERE eXCHANGE at <https://eere-exchange.energy.gov/>. This account will then allow the user to submit concept papers and full applications for the 48C tax credit re-allocation. The taxpayer will have the opportunity to re-submit revised application materials for any reason as long as the revision is submitted by the specified deadline.

The taxpayer will receive an automated response when the concept paper or full application is received. This will serve as a confirmation of receipt. Please do not reply to the automated response. The Users' Guide for Applying to the Department of Energy EERE Funding Opportunity Announcements is found at <https://eere-exchange.energy.gov/Manuals.aspx>.

### C. Content and Form of Concept Papers

See Section III for a description of the eligibility requirements for the 48C tax credit under this Notice. See Section IV (F) for a description of the merit review criteria that will be used to evaluate the concept papers.

The purpose of the concept paper phase is to save taxpayers the considerable time and expense of preparing full applications for proposed projects that are unlikely to be selected for recommendation.

The concept paper must conform to the following requirements:

- The concept paper must be written in English.
- 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.
- The control number<sup>1</sup> 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.

Each concept paper should be limited to a single project.

Concept papers must be limited to 10 pages of narrative and five (5) pages of appendices. Pages in excess of the page limitation will not be considered for review. Merit review criteria are listed in Section IV (F).

**Table 1. Content Requirements for Concept Papers**

<b>SECTION</b>	<b>INFORMATION REQUIRED</b>
<b>Executive Summary</b>	Describe succinctly: 1. A brief summary of the project. 2. Tax credit requested (30% of the qualified investment and no more than \$30 million). 3. The potential impact that the proposed project would have on the relevant technology field, as well as on

<sup>1</sup> Upon login to EERE eXCHANGE (<https://eere-eXCHANGE.energy.gov/login.aspx>), the taxpayer may access its submissions to this Notice by clicking the “My Submissions” link in the navigation bar on the left side of the page. Every application that it has submitted to EERE and the corresponding control number is displayed on this page. If the Taxpayer submits more than one application to this Notice, a unique control number is assigned to each application.

	domestic manufacturing.
<b>Description of Advanced Energy Project</b>	<p>For eligibility purposes, provide:  A description of the specified advanced energy property (SAEP) the re-equipped, expanded or new manufacturing facility will produce. In the case of a project producing property that, after further manufacture, will become an SAEP, the taxpayer should (a) describe both the property produced at the facility and the SAEP for which the produced property will be used, and (b) state the percentage of the property produced at the facility that will be used for the production of SAEP.</p>
<b>Description of Commercial Viability</b>	<p>For merit review purposes, the taxpayer should present a discussion of:</p> <ol style="list-style-type: none"> <li>1. The market segment(s) for the manufactured product including: sufficiency of existing market(s), particularly dollar volume; market stability (demand and price for product and end product/system(s)); potential for sale of product into multiple market(s); and growth potential for market(s).</li> <li>2. Competitiveness of the product, including: pricing; strength of competitors (new and existing); and market entry strategy (e.g., product differentiation, barriers to entry, intellectual property rights, first mover advantage, etc.).</li> <li>3. Other viability factors, including: payback period; profitability of investment; and financial assumptions (costs, revenues, discount rate, etc.).</li> <li>4. Potential for project success based on: the level of commitment as demonstrated through references to partnership agreements, permits and other examples of progress; the track record of the management team in areas relevant to the project; and the identification of potential risks and plans for their mitigation.</li> <li>5. Description of overall corporate health, including any company-wide issues that could affect the taxpayer's ability to complete the project as proposed. Discuss any legal claims or liabilities, planned debt restructuring, planned corporate actions, or other factors which could negatively affect the likelihood of project completion.</li> </ol>
<b>American</b>	Briefly describe:



<b>Manufacturing</b>	<ol style="list-style-type: none"> <li>1. How the facility is sustainable in the United States (U.S.). As applicable, include discussion of what aspects of the product, technology, facility, process, or other aspect of the project are well suited for manufacturing in the U.S., the extent this activity is supported by local or domestic supply chain(s), and if the project is likely to be foundational in a strategic and growing industry segment, or other ways in which the project is sustainable or significant for American manufacturing.</li> <li>2. How the project adds to regional economic development, including whether the product or process is likely to contribute to greater research and development in the U.S., or if the project brings new skills to the American workforce.</li> <li>3. The major effects receipt of this tax credit would have on your decision making (examples could include decisions related to: whether to pursue the project; whether to develop the project in the U.S. or elsewhere; the timing of pursuing the project; size of the project, etc.).</li> </ol>
<b>Technological Innovation</b>	<p>For merit review purposes, briefly identify any unique technological innovations in which the product or process will play a key role.</p>
<b>Domestic Job Creation</b>	<p>For merit review purposes, please enter the number of direct jobs in the data fields in the eXCHANGE system (described in IV-E). Jobs should be listed as full-time equivalent employees directly billable to the project for each calendar year.</p>
<b>Project Schedule and Time to Completion</b>	<p>For merit review purposes, identify the date the project is scheduled to be fully operational.</p>
<b>Impact on Air Pollution and Anthropogenic Emissions of Greenhouse</b>	<p>For merit review purposes, briefly identify any unique contribution(s) the product will make in avoiding or reducing air pollutants and/or anthropogenic emissions of greenhouse gases.</p>

#### D. Content and Form of Full Applications

Based on the results of the concept paper review, a select number of taxpayers will be invited to submit full applications. **FULL APPLICATIONS WILL BE ACCEPTED ONLY FROM TAXPAYERS THAT HAVE RECEIVED AN INVITATION TO SUBMIT THE FULL APPLICATION. NO OTHER FULL APPLICATIONS WILL BE REVIEWED.**

The Advanced Energy Project must be deemed eligible and a concept paper must have been submitted in order for a full application to be considered.

Full applications must conform to the following requirements:

- All full applications must be written in English.
- 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.
- The control number, which is the same number used for the concept paper,<sup>2</sup> 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.
- Financial models should be submitted using Microsoft® Excel spreadsheet(s) and must include calculation formulas and assumptions.

Each full application should be limited to a single project.

The full application, excluding Appendices and Taxpayer Data Spreadsheet, shall not exceed thirty (30) pages. Pages in excess of the page limitation will not be considered for review. No material may be incorporated in any application by reference as a means to circumvent the page limitation.

This section outlines the format of the full application to be submitted by the taxpayer to the DOE for project recommendation. Guidelines and suggestions for specific content are included below. Full applications should be arranged in the following order. Strict adherence is required.

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<sup>2</sup> Upon login to EERE eXCHANGE (<https://eere-eXCHANGE.energy.gov/login.aspx>), the Taxpayer may access its submissions to this Notice by clicking the "My Submissions" link in the navigation on the left side of the page. Every application that it has submitted to EERE and the corresponding control number is displayed on this page. If the Taxpayer submits more than one application to this Notice, a unique control number is assigned to each application.

**Table 2. Content Requirements for Full Application**

SECTION	INFORMATION REQUIRED
<p align="center"><b>Executive Summary and Introduction</b></p>	<p>Provide an overall summary of the project, covering the following:</p> <ol style="list-style-type: none"> <li>1. A description of the project, including incremental manufacturing capacity.</li> <li>2. The SAEP the re-equipped, expanded or new manufacturing facility will produce. In the case of a project producing property that, after further manufacture, will become SAEP, the taxpayer should describe both the property produced at the facility and the SAEP for which the produced property will be used.</li> <li>3. The amount of tax credit requested and the estimated amount that will be treated as a qualified investment. The Taxpayer must request a credit that is no more than \$30 million and equal to 30 percent of the estimated amount that will be treated as a qualified investment (as determined under § 48C) if the project is certified as a qualified advanced energy project. The taxpayer may use a reasonable methodology and assumptions in determining such estimated amount.</li> </ol>
<p align="center"><b>American Manufacturing</b></p>	<p>Describe:</p> <ol style="list-style-type: none"> <li>1. How the facility is sustainable in the U.S. As applicable, include discussion of what aspects of the product, technology, facility, process, or other aspect of the project are well suited for manufacturing in the U.S., the extent this activity is supported by local or domestic supply chain(s), and if the project is likely to be foundational in a strategic and growing industry segment, or other ways in which the project is sustainable or significant for American manufacturing.</li> <li>2. How the project adds to regional economic development, including whether the product or process is likely to contribute to greater research and development in the U.S., or if the project brings new skills to the American workforce.</li> </ol>
<p align="center"><b>Commercial Viability</b></p>	<ol style="list-style-type: none"> <li>1. Business plan with information sufficient to allow reviewers to fully evaluate the project. This section should include, but not be limited to:             <ol style="list-style-type: none"> <li>a) <u>The market environment for the product</u></li> </ol> </li> </ol>

	<ul style="list-style-type: none"> <li>i. Define the overall market and market segment(s) the product will support and the growth potential of those market segments. Describe the projected market share for the next five years. Please document any assumptions with citations from market reports, conference proceedings or other sources.</li> <li>ii. Describe the size of existing market(s) in terms of dollar volume and number of players. If product can be sold in multiple market segments, please explain the potential for the various market segments.</li> <li>iii. Market stability (demand and price). Discuss trends and projections for demand and price. Describe growth potential (short-term and long-term).</li> <li>iv. A discussion of current competing products and competitors likely to enter the target market.</li> <li>v. Market entry strategy, including a discussion of any barriers to entry, product differentiation, first mover advantage, etc. Describe any strategies for expanding market share.</li> <li>vi. Overview of intellectual property arrangements with respect to the property produced.</li> <li>vii. Discuss sales forecasts. Identify confirmed or potential customers who will purchase, lease or use the property produced.</li> </ul> <p>b) <u>Financial Model Information</u></p> <ul style="list-style-type: none"> <li>i. Include a financial model, detailing the investments in and the cash flows anticipated over the project's expected lifecycle.</li> <li>ii. Description of payback period, Net Present Value (NPV), Adjusted Present Value (APV) and break-even analysis for the project. Key financial ratios, including but not limited to Return on Investment and Return on Assets, should be provided as well.</li> </ul>
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	<ul style="list-style-type: none"> <li>iii. The estimated amount that will be treated as a qualified investment (as determined under § 48C) if the project is certified as a qualified advanced energy project. The taxpayer may use a reasonable methodology and assumptions in estimating this amount.</li> <li>iv. The financing and ownership structure, including all beneficiaries.</li> <li>v. A description of the amounts and timings of off-take agreements to be entered into prior to commercial operation, and the financial strength of off-takers.</li> <li>vi. The amount of equity to be invested and the sources of such equity. Include as a separate appendix copies of any existing equity funding commitments or expressions of interest from equity funding sources for the project.</li> <li>vii. The amount of the total debt obligations to be incurred and the funding sources of all such debt. Include as a separate appendix copies of any existing debt funding commitments or expressions of interest from debt funding sources for the project.</li> <li>viii. Identification of any other federal, state or local government funding assistance.</li> <li>ix. Schedule with any project milestones not delineated in “Project Schedule and Time to Completion.”</li> <li>x. A description of the methodology and assumptions used in the financial model.</li> </ul> <p>c) <u>Management Team</u></p> <p>A description of 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. The taxpayer should demonstrate that the management</p>
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	<p>team members have a corporate history of successful completion of similar projects.</p> <p>d) <u>Risk Management</u></p> <p>Description of likely risks and mitigation strategies.</p> <p>2. Include as a separate appendix a copy of audited financial statements for the taxpayer and other projected funding sources for the most recently ended three (3) fiscal years, and the unaudited quarterly interim financial statements for the most recent quarter. Indicate any unusual circumstances of which reviewers should be aware.</p>
<p><b>Technological Innovation and Commercial Deployment</b></p>	<p>Provide evidence of the potential for technological innovation and commercial deployment, as indicated by the production of new or significantly improved technologies; improvements in levelized costs of stored or generated energy; manufacturing significance and value, as follows:</p> <ol style="list-style-type: none"> <li>1. A discussion of whether the project will produce a new or significantly improved technology as compared to commercial technologies currently in service in the U.S.<sup>3,4</sup></li> <li>2. Calculations of incremental cost improvements for the SAEP attributable to the facility, relative to comparable existing energy solutions. This information is captured with the related metrics of cost advantage over competitors, levelized cost, and the cost of CO<sub>2</sub> abatement. Section VII below explains these metrics and their quantification in greater detail. In addition to cost improvements, the taxpayer should describe other technological improvements for the SAEP attributable</li> </ol>

<sup>3</sup> A new or significantly improved technology means a technology that is concerned with the production, consumption or transportation of energy that is not a commercial technology currently in use in the U.S., and either (i) has only recently been developed, discovered or learned, or (ii) involves or constitutes one or more meaningful and important improvements in productivity or value in comparison to commercial technologies currently in use in the U.S.

<sup>4</sup> A commercial technology currently in use in the U.S. means a technology currently in general use in the commercial marketplace in the U.S. A technology is in general use if it has been installed in and is being used in three or more commercial projects in the U.S. in the same general application as in the proposed project, and has been in operation in each such commercial project for a period of at least five years. The five-year period shall be measured, for each project, starting on the in-service date of the project or facility employing that particular technology and ending on the date that full applications are due.

	<p>to the system or facility, as compared to the respective baseline energy solution.</p> <p>3. A calculation of the Attributable Annual Manufacturing Capacity (AAMC) in the “Attributable Manufacturing” tab of the Taxpayer Data Spreadsheet. The AAMC will be divided by the amount of tax credit requested to determine a normalized value for comparing different project proposals.</p>
<p><b>Domestic Job Creation</b></p>	<p>DOE will primarily focus on direct job creation for this evaluation criterion. DOE will apply a multiplier to calculate indirect job creation. DOE will consider both direct and indirect jobs created on an annual basis over a five-year period beginning in 2013.</p> <p>Please fill out the “Direct Jobs” tab in the Taxpayer Data Spreadsheet and list the direct jobs in terms of full-time equivalents (FTEs) that will be created during both construction and operation of your facility.<sup>5</sup> Please be as specific as possible, as reviewers will assess the reasonableness of taxpayers’ assertions. Direct Jobs are jobs of people whose work is directly billed to the project.</p> <p>Do not list Indirect Jobs, which are those in the supply chain rather than those at the project itself. Examples of indirect jobs include employees of companies who deliver materials, equipment, and services used on the project, such as steel workers, accountants, or end use installers. The review team will calculate the indirect jobs using a consistent methodology based on nationwide input/output economic models for advanced manufacturing.</p>
<p><b>Project Schedule and Time to Completion</b></p>	<p>1. To quantify the time from certification to completion, the taxpayer should fill out the first tab of the Taxpayer Data Spreadsheet. The dates required are: date of receiving all permits; date of construction; and date of commencement of production.</p>

<sup>5</sup> Full-time equivalent (FTE) is a way to measure a worker's involvement in a project. An FTE of 1.0 means that the person is equivalent to a full-time worker, while an FTE of 0.5 signals that the worker is only half-time. FTE is defined by the Government Accountability Office (GAO) as the number of total hours worked divided by the maximum number of compensable hours in a work year as defined by law. For example, if the work year is defined as 2,080 hours, then one worker occupying a paid full time job all year would consume one FTE. Two employees working for 1,040 hours each would consume one FTE between the two of them.

	<p>2. In addition, the taxpayer should provide a narrative supporting the taxpayer's capability to accomplish the technical objectives of the proposed project and demonstrating the overall feasibility of implementing the project at the proposed site. This includes, but is not limited to:</p> <ul style="list-style-type: none"><li>a) A project schedule for constructing and commissioning that<ul style="list-style-type: none"><li>i. is comprehensive and provides sufficient detail to demonstrate how taxpayer will meet the certification requirements, and</li><li>ii. demonstrates that the project is on track to be placed in service within three (3) years of such certification. The schedule should demonstrate that the taxpayer understands the required tasks and has allowed realistic times for accomplishing the technical and financial tasks. The schedule should include the milestones.</li></ul></li><li>b) A description of the taxpayer's plan to obtain and complete all necessary permits, and environmental authorizations and reviews.</li><li>c) A description of the current infrastructure at the site available to meet the needs of the project.</li></ul> <p>3. This section requires the following documentation, as is applicable to the project, to be included as appendices:</p> <ul style="list-style-type: none"><li>a) A complete list of all federal, state, and local permits, including environmental authorizations (if applicable) or reviews, necessary to commence construction of the project. Explain what actions have been taken to-date to satisfy the required authorizations and reviews, and the status of each.</li><li>b) As applicable, documentation supporting taxpayer's conclusion that the proposed site can fully meet all environmental, water supply, transmission interconnect, and other necessary requirements. Such documentation may include signed agreements, letters of intent, or term sheets, such</li></ul>
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	<p>as for supply and product transportation, and regulatory approvals supporting the key claims.</p> <p>c) Documentation demonstrating the taxpayer's ownership or control of the project site, such as a deed, a signed option to purchase the site from the site owner, or a letter of intent from the site owner to sell or lease to the taxpayer.</p> <p>d) Copies of the contracts or summaries of the key provisions of the following agreements:</p> <ul style="list-style-type: none"> <li>i. Operations &amp; Maintenance Agreement: include a summary of the terms and conditions of the contract and a copy of the contract.</li> <li>ii. Shareholders Agreement: summarize key terms and include the agreement as an appendix.</li> <li>iii. Engineering, Procurement and Construction Agreement: describe the key terms of the existing or expected contract arrangement, including firm price, liquidated damages, hold-backs, performance guarantees, etc.</li> <li>iv. A Professional Engineer (PE) must inspect and certify the project documents for feasibility. PE may be an employee of the taxpayer.</li> </ul>
<p><b>Impact on Air Pollution and Anthropogenic Emissions of Greenhouse Gases</b></p>	<p>Describe the direct impact that the SAEP will have on net reductions of air pollution and anthropogenic emissions of greenhouse gases (GHGs). Annual pollution and GHG emissions from the operation of the manufactured product should be quantified and discussed. This description includes total emissions reduced as derived by the project's AAMC and the output of the Taxpayer Data Spreadsheet, as shown in Section VII, for the re-equipped, expanded or new manufacturing facility. Emissions reductions will be divided by the amount of tax credit requested to determine a normalized value for comparing different project proposals.<sup>6</sup></p>

<sup>6</sup> If the taxpayer believes that the total emissions reduction from the SAEP attributable to the project is not accurately represented by the values provided in the Taxpayer Data Spreadsheet, the taxpayer may also provide a transparent justification for a different calculation and should employ cited numbers wherever assumptions are made.

<b>Taxpayer Data Spreadsheet</b>	Complete template provided in eXCHANGE.
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Please see Section VI for information on supporting documents.

### E. Submission and Registration Requirements for Application to DOE

Please read carefully the Notice and the statute to determine if your project is eligible for the § 48C credit. **The tax credits are for certain types of property in manufacturing facilities; they are not for renewable deployment projects or energy efficiency installation projects.**

DOE plans to review applications and recommend for tax credits through the following specific steps:

- Taxpayer submission of a concept paper April 9, 2013
- If requested, a taxpayer submission of a Final Application July 23, 2013
- DOE recommendations to the Service (no later than) October 11, 2013

An application to DOE will not be considered in the 2013 allocation round unless the concept paper is received by April 9, 2013 and, if requested, the full application is received by July 23, 2013. Only applications submitted via the EERE eXCHANGE system (<https://eere-exchange.energy.gov>) will be accepted.

#### 1. Where to Submit

Application material must be submitted under this announcement through EERE eXCHANGE at <https://eere-exchange.energy.gov/> to be considered. You cannot submit an application through EERE eXCHANGE unless you are registered. Please read the registration requirements below carefully and start the process immediately. Applications submitted by any other means will not be accepted.

If you have problems completing the registration process or submitting your application, send an email to the EERE eXCHANGE helpdesk at [eere-exchangesupport@hq.doe.gov](mailto:eere-exchangesupport@hq.doe.gov).

It is the responsibility of the taxpayer to verify successful transmission prior to the Application due date and time.

#### 2. Registration Process Requirements

Prior to submitting an application, the taxpayer must register and create an account on

EERE eXCHANGE at: <https://eere-exchange.energy.gov/>. This account will then allow the user to register for any open EERE Funding Opportunity Announcements (FOAs) that are currently in eXCHANGE. It is recommended that each business unit use only one account as the appropriate contact point for each submission.

The taxpayer will receive an automated response when the concept paper and full application have been submitted. This will serve as a confirmation of receipt. Please do not reply to the automated response. The taxpayer will have the opportunity to re-submit revised application materials for any reason until the specified deadline.

The taxpayer is responsible for the integrity and structure of the electronic files. DOE will not be responsible for reformatting, restructuring or converting any files submitted in response to this request.

### **3. Electronic Authorization of Applications**

Submission of material under this announcement through electronic systems used by DOE, including EERE eXCHANGE, constitutes the authorized representative's approval and electronic signature.

### **4. Markings of Confidential Information**

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

*“The data contained in pages [\_\_\_\_\_] of this document which hereby forms a part of the application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for review purposes. If this taxpayer is issued a tax credit under Section 1302 of the American Recovery and Reinvestment Act of 2009 as a result of or in connection with the submission of this application, DOE, except as prohibited or limited by law, shall have the right to use or disclose the data herein, other than such data that have been properly reasserted as containing trade secrets or proprietary information in the agreement described under section 4.02(9) of Notice 2013-12. This restriction does not otherwise limit the government’s right to use or disclose data that was obtained from any source, including the taxpayer.”*

To further protect trade secret, confidential, privileged or otherwise exempt information, each line or paragraph on the page or pages containing such data must be specifically identified and marked with text that is similar to the following:

*“The following contains proprietary information that [name of Taxpayer] requests not be released to persons outside the Government, except for purposes of review.”*

## **F. Application Review Information**

### **1. Compliance Review for Concept Papers and Full Applications**

As explained in more detail in Sections II and III, as part of the review of the concept papers and full applications DOE will carry out an initial compliance review to determine that (1) the application meets the eligibility requirements, (2) the required information has been submitted, (3) as applicable to full applications, a timely concept paper was submitted, and (4) all mandatory requirements of this Notice are satisfied. If an application clearly fails to meet the eligibility requirements or does not provide sufficient information for evaluation, the application will be considered non-responsive and eliminated from further review.

### **2. Merit Review Criteria**

#### **a. Merit Review Criteria for Concept Papers**

Subsequent to determining that the taxpayer’s project is eligible, DOE will screen projects for Technical Applicability and Corporate Viability on a pass/fail basis; projects that pass the screen will then be assigned numeric scores based on Commercial Viability. Criteria for the Technical Applicability Review and Commercial Viability are shown below.

#### **Technical Applicability and Corporate Viability Review criteria (pass/fail):**

- Technical validity
- Technology readiness
- Technology appropriateness for the role that is contemplated
- Potential technology obsolescence in the near term
- Corporate Viability

**Only Advanced Energy Projects that pass the above screen will be scored for Commercial Viability. Commercial Viability merit review criteria are as follows:**

#### **1) Market and Product Viability**

**(35 points)**

- Market segment(s) for the manufactured product
  - Sufficiency of existing market(s) (\$ volume)
  - Market stability (demand and price)

- Growth potential for market(s)
- Potential for sale of product into multiple market segments
- Product is competitive
  - Pricing
  - Product differentiation or technical novelty
  - Strength of competitors (new and existing)
  - Market entry strategy (barriers to entry, intellectual property rights, first mover advantage, and others as appropriate to the product.)

2) Project Financial Viability (35 points)

- The investment is profitable, based on described cash flow analysis of the project
- Payback period is reasonable
- Assumptions (costs, revenues, discount rate, etc.) are reasonable

3) Other Viability Factors (25 points)

- Level of Commitment – Commitment to the project is demonstrated through references to partnership agreements, existing financing arrangements, permits, and other indicators of progress
- Management Team – Team has a track record of success in areas relevant to the project
- Risk Management
  - All likely risks have been identified
    - Risk mitigation strategies have been identified and are credible

4) Exceptional Project Strengths (5 points)

The exceptional strength of the proposed project in any of the areas above (for example, the project is the first of its kind or has a very short payback period)

Concept papers will be rank ordered based on their numeric scores, and the following may be considered in determining the final group of concept papers invited to submit full applications:

- American Manufacturing Significance
  - Sustainability of facility in the U.S.
  - Product and facility support a robust local or domestic supply chain; the company is, or is likely to become, a key player in its local economic, business, and academic (if applicable) network
  - The product is likely to contribute to, or otherwise support, greater research and development activity in the U.S.
  - The project brings new skills to the American workforce
- Technological Innovation
- Domestic Job Creation

- Project Schedule Time to Completion
- Impact on Air Pollution and Anthropogenic Emissions of Greenhouse Gases
- U.S. Economic Competitiveness
- Regional Economic Development
- Geographic Diversity
- Technology Diversity
- Project Size Diversity

## **b. Merit Review Criteria for Full Applications**

In an effort to make the application process suitable to a diverse set of projects and streamline the DOE review, taxpayers must input the data necessary to address the merit review criteria into the Taxpayer Data Spreadsheet, shown in Section VIII.<sup>7</sup>

Each proposed project will be reviewed based on the SAEP produced at the manufacturing facility. In the case of a project producing property that, after further manufacture, will become SAEP, the DOE will review the project based on the SAEP for which the property produced at the facility will be used. For example, the review under the emissions criterion for a project that manufactures wind turbine blades will be in the context of the emissions profile of wind turbines, rather than the more narrow characteristics of blade production alone. In this example, the wind turbine blade will be assigned a portion of the overall emissions profile of a wind turbine based on the percentage of the wind turbine's cost that is attributable to the wind turbine blade, as discussed in Section VII below.

The taxpayer must calculate the incremental energy produced, saved or stored due to the project. The taxpayer will be required to provide and show the work used to produce derived numeric values specific to its product. In addition, it is critical that the taxpayer show and support all necessary calculation steps in the project's narrative.

The DOE review and recommendation process generally requires the use of the U.S. national averages (e.g., national grid mix, national fleet fuel efficiency) as a baseline for certain comparisons.<sup>8</sup>

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<sup>7</sup> If a Taxpayer can justify that it has a value that better represents its project than the values referenced in the Taxpayer Data Spreadsheet, the taxpayer may 1) select a value reported in the open literature, justify the use of this value as opposed to one supplied by DOE, and perform any necessary unit conversions, or 2) develop an independent estimate analogous to ones supplied in the Section H of the spreadsheet. Any customized calculations should be done according to commonly accepted industry standards and be sufficiently transparent to be reproducible by the merit review panel.

<sup>8</sup> A taxpayer may provide a different baseline for comparison if the taxpayer can justify that the SAEP attributable to the project will be put in service in a more narrowly-defined geographic region. Any customized calculations should be done according to commonly accepted industry standards and be sufficiently transparent to be reproducible by the merit review panel.

Full applications will be evaluated based on the following criteria:

- 1) Has strong potential to expand American manufacturing (Weight: 25%):**
  - Sustainability of facility in the U.S.
  - Product and facility support a robust local or domestic supply chain; the company is, or is likely to become, a key player in its local economic, business, and academic (if applicable) network
  - The product is likely to contribute to, or otherwise support, greater research and development activity in the U.S.
  - The project brings new skills to the American workforce
  - Growth potential of industry segment(s)
  
- 2) Demonstrates significant potential for commercial viability (Weight 20%):**
  - The business is capable of sustaining the project
  - Market segment(s) for the manufactured product are identified
  - Product is competitive
  - Manufacturing project cost estimate is reasonable and supported
  - The investment is profitable and the payback period is reasonable relative to the type of project
  - Risk management issues and mitigation strategies are identified and sufficiently addressed
  - Management Team has a track record of success in areas relevant to the project
  
- 3) Has the potential for technological innovation and commercial deployment, as indicated by (Weight 20%):**
  - Production of new or significantly improved technologies
  - Improvements in levelized cost of stored or generated energy
  - Manufacturing significance and value
  
- 4) Provides domestic job creation (Weight 15%):**
  - Total jobs created and jobs per tax credit requested
  - Quality and sustainability of operating jobs created
  - Reasonableness of number of jobs forecasted
  
- 5) Has shortest project time from certification to completion (Weight 10%)**
  - Number of months to project completion
  - Readiness to proceed with project as evidenced by firmness of site selection, progress of permitting process, written commitments from actual project partners
  - Reasonableness of schedule forecasted

**6) Contributes to avoiding or reducing airborne pollutants and/or greenhouse gases (Weight 10%):**

- Calculated total of net reduction or avoidance of anthropogenic emissions of greenhouse gases
- Avoided, sequestered, or reduced pollutants (e.g. NOx, SOx, etc.)
- Reasonableness of analysis and assumptions used to forecast emissions reductions or avoidance (based upon AAMC assumptions in Taxpayer Data Spreadsheet)

The comments and the scores assigned during the merit review process will not be made available for review by the taxpayer.

**3. Program Policy Factors**

In addition to the above criteria, DOE may consider the following program policy factors in determining which taxpayers will be invited to submit full applications to select for recommendation to the Service.

- U.S. Economic Competitiveness
- Geographic Diversity
- Technology Diversity
- Project Size Diversity
- Regional Economic Development

Unlike the Merit Review Criteria, these factors are not weighted.

**V. INSTRUCTIONS REGARDING QUANTITATIVE FACTORS INFORMATION SUBMISSION**

Taxpayers should fill out the Taxpayer Data Spreadsheet with the relevant data and include it with the application. This is intended to capture information in a consistent manner to allow a quantitative comparison to be made across all eligible projects. It is essential that taxpayers conform to this process in order to ensure a competitive review of all proposals. Additionally, taxpayers should substantiate in their narrative any data which is inputted into the Taxpayer Data Spreadsheet. Specifically, taxpayers should cite or justify their stated assumptions and show any calculations which are not performed by the Taxpayer Data Spreadsheet. The information below provides instructions for inputting data, examples specific to each type of SAEP, and guidance on how to use the reference data listed in Section VII.

**Attributable Annual Manufacturing Capacity (AAMC)**



In order to assess the significance of a taxpayer's proposed project, the following formulas (or their equivalent) must be used to quantify the AAMC. AAMC measures the total impact over the lifetime of deployed property which is attributable to one year of manufacturing. The AAMC will be divided by the qualified investment to determine the relative value, per dollar of tax credit, of different project proposals. Finally, the AAMC will be used to assess production significance and emissions abatement on a per-dollar-of-tax-credit basis.

General AAMC Instructions: The AAMC is calculated with four terms, annual production, fractional system contribution, annual performance of the SAEP, and expected lifetime of the deployed property. For annual production, taxpayers are required to justify the claimed production by providing yield loss (both manufacturing and downstream) and throughput data wherever possible. In particular, taxpayers should discuss previous manufacturing experience on similar or identical manufacturing equipment. If the taxpayer's annual production is not measured in terms of kWh, gallons of gasoline, or Mtons CO<sub>2</sub> (e.g., solar water heating, biodiesel, or methane gas recapture, respectively) then a conversion factor between the units of measurement and kWh, gallons of gasoline, or Mtons CO<sub>2</sub> should be cited and applied. When calculating the fractional system contribution, taxpayers should transparently state and justify (with citations wherever possible) current and future pricing assumptions for all significant value chain segments, including the property produced at the proposed facility. To calculate real-world annual performance, taxpayers should identify and employ the necessary de-rating factors, including degradation rates, such that the claimed annual performance is reflective of the average annual performance over the lifetime of the SAEP. Where appropriate, typical resource and use conditions should be chosen from the reference data provided in Section VII. If the necessary reference data is not available or representative of the taxpayer's specific manufactured property, the taxpayer should provide and substantiate assumptions with market reports and/or field data where possible. A similar approach should be taken for the deployed property lifetime. Specifically, if reference data from Section VII is not used, the taxpayer should cite life-cycle performance data of previously deployed, comparable property. Provided below are equations and examples corresponding to each type of SAEP which can be used as high level guidance when calculating AAMC.

Electricity Generation: For SAEP used to produce energy from the sun, wind, geothermal, or other renewable resources, the following formulas shall be used to estimate the electricity generation attributable to property produced at the proposed facility. Specifically, the AAMC is the kWhs generated which can be attributed to one year's worth of production from the proposed project:

$$AAMC_{(kWh)} = \frac{W_{Peak}}{Year} \times \left( \frac{Fractional}{System} \right) \times \left( \frac{Capacity}{Factor} \right) \times \left( \frac{Deployed}{Property} \right) \times \left( \frac{Lifetime}{(years)} \right)$$

Where:

$$\left( \frac{\text{Fractional System Contribution}}{\text{Contribution}} \right) = \left( \frac{\text{Manufacturing Costs} + \text{Sales Margin}}{\text{Total System Hardware Price}} \right) \times \left( \frac{\text{Percentage}}{\text{SABP}} \right)$$

And:

$$\left( \frac{\text{Capacity}}{\text{Factor}} \right) = \frac{\text{Annual Energy Output}_{\text{AC}}}{\text{Peak Power Rating} \times 8760 \text{ hrs}}$$

Example:

A photovoltaic company is building a “50 MW” crystalline silicon solar cell manufacturing line. 50 MW is input as the first term “ $W_{\text{peak production per year}}$ ” which is the annual peak power output of property produced from the manufacturing line. This 50 MW number is multiplied by a series of terms to produce an AAMC that represents the true lifetime electricity generation from this property after it is deployed.

The second term, “Fractional System Contribution” is used to discount the 50 MW by the solar cell’s fraction of a solar system’s total value. In this example, the company purchases silicon wafers and other consumable materials and processes them into a functional cell. The Fractional System Contribution represents the added value that the manufacturing process adds to the final system price. If the market value of a wafer and consumables is  $\$0.25/W_p$ , the cells are sold for  $\$0.40/W_p$ , and the total factory gate price of the entire PV system hardware (including the inverter and balance of system components) is  $\$1.50/W_p$ , then the Fractional System Contribution is  $(.40 - 0.25)/1.5 = 10\%$ . Note: in this example, 100% of the product manufactured by the solar cell line is allocated for SAEP. If instead, some fraction of the rated 50 MW capacity was allocated for an application other than SAEP, then the “Percentage SAEP” would be reduced from 100% to account for this diverted product stream.

The third term, “Capacity Factor” is used to calculate the ratio of annual energy produced to the total energy implied by the peak power rating of the manufactured property. In this example, the power output of the cells are reduced slightly when they are incorporated into a module and reduced further when the DC power from the module is converted to useable AC power via an inverter. Additionally, the modules are projected to degrade over their deployed lifetime. The actual average annual energy output of the system over its lifetime is determined by these reductions and the annual solar insolation or resource which is typical of current installations.

The fourth term, “Deployed Property Lifetime,” is the anticipated hours of operation of the manufactured property over its lifetime (after being incorporated into an end of supply chain component or system). In this example, the end of supply chain component is a photovoltaic module which may have a lifetime of 25 years. Thus the Deployed Property Lifetime would be 219,000 hours (25 years multiplied by 8,760 hours per year). Note: if the end of supply chain component property was instead, a PV inverter, then the Deployed Property Lifetime would be the expected lifetime, as evidenced by warranty or field data, of the inverter, not the PV system. If the potential lifetime of the end of supply chain component is *longer* than the expected lifetime of the generation system, then the Deployed Property Lifetime should be equal to the

expected system lifetime.

Energy Conservation: For SAEP designed to conserve energy, such as advanced building, smart grid, or industrial technologies, the following formulas shall be used to estimate the energy saved which is attributable to the incorporation of the property produced at the proposed facility. Specifically, the AAMC is the kWhs saved which can be attributed to one year's worth of production from the proposed project:

$$AAMC_{(kWh)} = \frac{\#Units}{Year} \times \left( \frac{Fractional\ Component}{Contribution} \right) \times \left( \frac{Annual\ Energy\ Savings}{Unit} \right) \times \left( \frac{Deployed\ Property}{Lifetime} \right)_{(yrs)}$$

Where:

$$\left( \frac{Fractional\ System}{Contribution} \right) = \left( \frac{Unit\ Manufacturing\ Costs + Unit\ Sales\ Margin}{Total\ Price\ of\ Efficiency\ Component} \right) \times \left( \frac{Percentage}{SABP} \right)$$

And:

$$\frac{Annual\ Energy\ Savings}{Unit} = \left( \frac{Annual\ Baseline\ System}{Consumption} \right) - \left( \frac{Annual\ Improved\ System}{Consumption} \right)$$

Example:

A heating, ventilating, and air conditioning (HVAC) equipment supplier is re-equipping a factory for the manufacture of advanced condensers. The re-equipping will enable 10,000 advanced condensers to be manufactured annually. This number will be inputted as the first term “# Units per year.” For the equations used above, the condenser could represent a sub-component of an advanced HVAC “component” (the complete collection of sub-components required to enable the conservation of energy, e.g., an advanced air handler, controller, packaging unit, etc.). Alternatively, if the condenser alone provides the full energy conservation benefit and can be integrated with traditional HVAC systems in a straightforward manner, then the condenser would be the “component.” In either case, the energy consuming “system” is the entire energy load which is directly impacted by, and fully encompassing of the energy conservation benefit. For this example, the system is simply a building.

The second term, “Fractional Component Contribution” is used to calculate the value fraction of an end of supply chain component that the manufactured condenser comprises. In this example, the company purchases supplies (fans, tubing, etc.) and materials (sheet metal, solder, etc.) to assemble a functional condenser. The “Fractional Component Contribution” represents the added value that the manufacturing process adds to the final component price. If the market value of the supplies and materials is \$100 per unit, the controller assembly is sold to downstream manufacturers for \$200, and the total “factory gate” price to a HVAC installer of the entire HVAC component is \$2,000, then the “Fractional Component Contribution” is  $(200-100)/2000 = 5\%$ . Note: if for example, 20% of the units manufactured were used in a different

system where there was no energy conservation benefit, then the “Percentage SAEP” term would be 80% and the “Fractional Component Contribution” would be further reduced accordingly.

The third term, “Annual Energy Savings per Unit” is used to calculate the annual energy savings which is enabled by incorporating *only* the component into a system and assuming typical climate and operation. In this example, the electricity consumption of the building may be decreased by 5,000kWh per year.

The fourth term, “Deployed Property Lifetime,” is the anticipated years of operation of the manufactured property over its lifetime. In this example, the anticipated years of operation should equal the warranty on the entire HVAC unit. Note: if the sub-component lifetime is shorter than the expected lifetime of the component, then the sub-component lifetime should be used for the “Deployed Property Lifetime.” The lifetime of the sub-component cannot be longer than the lifetime of the component or system in which it is installed.

Fuel Efficiency: For SAEP which increases fuel efficiency, such as a hybrid-electric or plug-in electric drive motor vehicle, the following formulas shall be used to estimate the annual energy saved which is attributable to the incorporation of the property produced at the proposed facility. Specifically, the AAMC is annual fuel savings which can be attributed to one year’s worth of production from the proposed project:

$$AAMC_{GGE} = \frac{\#Units}{yr} \times \frac{Fractional\ Component\ Contribution}{Unit} \times \frac{Annual\ Fuel\ Savings}{Unit} \times \left( \frac{Deployed\ Property\ Lifetime}{yrs} \right)$$

Where:

$$\frac{Fractional\ Component\ Contribution}{Unit} = \frac{Unit\ Manufacturing\ Cost + Unit\ Sales\ Margin}{Total\ Price\ of\ Efficiency\ Component} \times \frac{Percentage\ SAEP}{SAEP}$$

And:

$$\frac{Annual\ Fuel\ Savings}{Unit} = \frac{Annual\ Baseline\ System\ Consumption}{Unit} - \frac{Annual\ Improved\ System\ Consumption}{Unit}$$

Example 1:

An automobile supplier is expanding a factory for the manufacture of hybrid-electric controller assemblies. The expansion will enable 10,000 additional controllers to be manufactured annually. This number will be inputted as the first term “# Units per year.” For the equations used above, the controller could represent a sub-component of a hybrid drive train “component” (the complete collection of sub-components required to enable the efficiency improvement, e.g., a controller, battery, and electric motors). Alternatively, if the controller alone provides the full fuel efficiency improvement and can

be integrated with a traditional powertrain, then the controller would be the “component.” In either case, the fuel consuming “system” is the entire load which is directly impacted by, and fully encompassing of the fuel efficiency improvement. For this example, the system is simply the vehicle.

The second term, “Fractional Component Contribution” is used to calculate the value fraction of an end of supply chain component that the manufactured controller assembly comprises. In this example, the company purchases supplies (PCBs, power controllers, etc.) and materials (adhesives, wiring, etc.) to assemble a functional controller. The “Fractional Component Contribution” represents the added value that the manufacturing process adds to the final component price. If the market value of the supplies and materials is \$500 per unit, the controller assembly is sold to downstream manufacturers for \$1000, and the total “factory gate” price to an automobile manufacturer of the entire hybrid electric component is \$4,000, then the “Fractional Component Contribution” is 12.5%. Note: if, for example, 10% of the units manufactured were allocated instead for electric golf carts (non-SAEP) then the “Percentage SAEP” term would be 90% and the “Fractional Component Contribution” would be further reduced accordingly.

The third term, “Annual Fuel Savings per Unit” is used to calculate the annual fuel savings which is enabled by incorporating *only* the component into a system under typical use patterns. In this example, the fuel economy of the vehicle may be increased by 10 miles per gallon. The actual annual fuel savings would be determined by this increase in fuel economy and the annual vehicle miles traveled, for which the taxpayer should provide cited data. For alternative fuels such as diesel, savings should be converted to gallons of gasoline equivalent (GGE). For electric vehicle (EV) or plug-in hybrid electric vehicle (PHEV) systems, where electricity is consumed to further reduce the fuel consumption, an additional calculation of MWh consumed per GGE saved is required in the calculation of CO<sub>2</sub> emissions. See further instructions under “Impact on Air Pollution and Anthropogenic Emissions of Greenhouse Gases.”

The fourth term, “Deployed Property Lifetime,” is the anticipated years of operation of the manufactured property over its lifetime. In this example, the anticipated years of operation should be substantiated by citing fleet lifetime of previously deployed comparable systems. Note: if the sub-component lifetime is shorter than the expected lifetime of the system, then the sub-component lifetime should be used for the “Deployed Property Lifetime.” For example, if the subcomponent was a battery for an electric vehicle then the anticipated lifetime might be the warranted lifetime of the battery rather than the anticipated lifetime of the vehicle. The lifetime of the sub-component cannot be longer than the lifetime of the component or system in which it is installed.

#### Example 2:

A manufacturer of reciprocating engines is building a new factory to manufacture a new, high-efficiency engine for use in Combined Heat and Power (CHP) systems. CHP applications are included in “fuel efficiency” for purpose of this Notice because

they consume energy in the production of electricity and thermal energy.<sup>9</sup>

The new factory will enable 1,000 high-efficiency engines to be manufactured annually. This number will be inputted as the first term “# Units per year.” For the equations used above, the reciprocating engines could represent a sub-component of a CHP “component” (the complete collection of sub-components required to enable the efficiency improvement – e.g., fuel handling, thermal recovery unit, integrated controls, etc.). The energy consuming “system” is the entire energy load which is directly impacted by, and fully encompassing of the efficiency improvement. For CHP, the system may be an industrial building, hospital or other building.

The second term, “Fractional Component Contribution” is used to calculate the value fraction of an end of supply chain component that the manufactured engine comprises. In this example the company purchases supplies (fuel pumps, tubing, etc.) and materials (engine blocks, wire, etc.) to assemble a completed engine. The “Fractional Component Contribution” represents the added value that the manufacturing process adds to the final component price. If the market value of the supplies and materials is \$40,000 per unit, the controller assembly is sold to downstream manufacturers for \$100,000, and the total “factory gate” price to an engineering firm of the complete CHP system \$150,000, then the “Fractional Component Contribution” is  $(100,000-40,000)/150,000 = 40\%$ . Note: if for example, 25% of the units manufactured were used in a different system where there was no efficiency improvement or the system does not qualify as SAEP, then the “Percentage SAEP” term would be 75% and the “Fractional Component Contribution” would be further reduced accordingly.

The third term, “Annual Energy Savings per Unit” is used to calculate the annual energy savings which is enabled by incorporating *only* the component into a system and assuming typical climate and operation. In this example, the CHP system saves energy by displacing electricity from the grid and onsite thermal energy generation that would be generated by a boiler or other device. The net annual energy savings is the energy that would be consumed by grid generated electricity plus the energy that would be consumed by the onsite boiler minus the energy consumed by the CHP system. This net energy should be expressed in terms of gallons of gasoline equivalent using the conversion factors provided in the Taxpayer Data Spreadsheet.

The fourth term, “Deployed Property Lifetime” is the anticipated years of operation of the manufactured property over its lifetime. In this example, the anticipated years of operation should equal the warranty on the entire CHP system. Note: if the sub-component lifetime is shorter than the expected lifetime of the system, then the sub-component lifetime should be used for the “Deployed Property Lifetime.” The lifetime of the sub-component cannot be longer than the lifetime of the component or system in which it is installed.

GHG Emission Reduction: For SAEP with the primary purpose of reducing emissions or

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<sup>9</sup> Although the energy source for a CHP system may be renewable (e.g., landfill gas), the CHP system displaces thermal energy production (e.g., a boiler) that would typically use fossil fuel. Because fossil energy consumption is displaced by the CHP system, the “fuel efficiency” analysis is used.



sequestering GHG, the following formulas shall be used to estimate the annual emission reduction in CO<sub>2</sub> equivalent gases. Specifically, the AAMC is the Mtons of avoided CO<sub>2</sub> equivalent gas emission which can be attributed to one year's worth of production from the proposed project.

$$AAMC_{(Mtons\ CO_2\ eq)} = \frac{\#Units}{Year} \times \left( \frac{Fractional\ Component}{Contribution} \right) \times \left( \frac{CO_2\ eq\ Reduction}{Unit} \right) \times \left( \frac{Deployed\ Property}{Lifetime} \right)_{(yrs)}$$

Where:

$$\left( \frac{Fractional\ System}{Contribution} \right) = \left( \frac{Unit\ Manufacturing\ Costs + Unit\ Sales\ Margin}{Total\ Cost\ of\ Emissions\ Reduction\ Component} \right) \times \left( \frac{Percentage}{SAEP} \right)$$

And:

$$\frac{CO_2\ eq\ Reduction}{Unit} = \left( \frac{Annual\ Baseline\ CO_2\ eq\ Emissions}{Emissions} \right) - \left( \frac{Annual\ Improved\ CO_2\ eq\ Emissions}{Emissions} \right)$$

Example:

A chemical supplier is building a factory for the manufacture of physical solvents for CO<sub>2</sub> capture. The factory will produce 100,000 gallons of solvent. This volume will be inputted as the first term “# Units per year.” For the equations used above, the physical solvent would represent a sub-component of a CCS “component” (the collection of sub-components required for the full Carbon Capture and Sequestration (CCS) process). The “system” is the entire carbon emitting facility which is directly impacted by, and fully encompassing of, the CCS process.

The second term, “Fractional Component Contribution” is used to calculate the value fraction of an end of supply chain component that the manufactured solvent comprises. In this example the company purchases feedstock materials to process the solvent. The “Fractional Component Contribution” represents the added value that the manufacturing process adds to the final component price. If the feedstock costs \$50 per unit volume, this volume is sold to downstream manufacturers for \$500, and the total “factory gate” price of a functional CCS apparatus is \$5,000 (per unit volume), then the “Fractional Component Contribution” is (500-50)/5000 = 9%. Note: if, for example, 30% of the annual manufactured volume was sold for non-CCS applications then the “Percentage SAEP” term would be 70% and the “Fractional Component Contribution” would be further reduced accordingly.

The third term, “CO<sub>2</sub>eq Reduction per Unit” is used to calculate the annual CO<sub>2</sub>eq reduction which is enabled from incorporating *only* the full CCS component into a system under typical use patterns. In this example, the system emissions will be reduced by 1000 Mtons per year per unit.

The fourth term, “Deployed Property Lifetime,” is the anticipated years of operation of the manufactured property over its lifetime. In this example, the anticipated years of operation should be substantiated by providing information on likely solvent replacement schedules. Note: if the sub-component lifetime is shorter than the expected lifetime of the component, then the sub-component lifetime should be used for the “Deployed Property Lifetime.” The lifetime of the sub-component cannot be longer than the lifetime of the component or system in which it is installed.

Renewable Fuel Refining or Blending: For SAEP to be used exclusively in the refining or blending of renewable fuels, the following formulas shall be used to estimate the production of renewable fuel which is directly attributable to the annually manufactured property. Specifically, the AAMC is the renewable fuel generation which can be attributed to one year’s worth of production from the proposed project:

$$AAMC_{(G/G)} = \frac{\#Units}{Year} \times \left( \frac{Capacity}{Unit} \right) \times \left( \frac{Fractional}{Component} \right) \times \left( \frac{Deployed}{Property} \right)_{(yrs)}$$

Where:

$$\left( \frac{Fractional}{System} \right)_{(Contribution)} = \left( \frac{ManufacturingCosts + SalesMargin}{Total\ Installed\ System\ Price} \right) \times \left( \frac{Percentage}{SAEP} \right)$$

Example:

A pump manufacturer is building a factory for the manufacture of pumps specifically designed for renewable fuel refining or blending. The factory will produce 10,000 pumps per year. This volume will be inputted as the first term “# Units per year.”

The second term, “Capacity per Unit” is the estimated annual volume of fuel refined or blended annually, which is enabled by the pump under typical plant operations. For example, if a single pump is installed per biofuel refinery, the enabled capacity is the annual refined or blended product from the biofuel refinery.

The third term, “Fractional System Contribution” is used to calculate the value fraction of an end of supply chain system that the manufactured pump comprises. In this example the company purchases sub-components and materials to manufacture each pump. The “Fractional System Contribution” represents the added value that the manufacturing process adds to the final component price. If the sub-component and materials cost \$5000 per pump, this pump is sold to a construction company for \$10,000, and the total price of the constructed refinery, the “system,” is \$1M, then the “Fractional Component Contribution” is (10,000-5000)/1,000,000 = 0.5%. Note: as per the requirement that no portion of such a project be used for the refining or blending of non-renewable fuels, the “Percentage SAEP” term must be equal to 100% for such SAEP.

The fourth term, “Deployed Property Lifetime,” is the anticipated years of operation of the manufactured property over its lifetime. In this example, the anticipated



years of operation should equal the anticipated lifetime based on the planned service schedule or warranty. The lifetime of the component cannot be longer than the lifetime of the system in which it is installed.

Other Advanced Energy Technologies: For other technologies with the primary benefit of storing or transmitting renewable energy, taxpayers should quantify the annual renewable energy generated and/or saved which is directly attributable to the manufacture of their technology discounted by the likely fraction of their annual production which will be used for this purpose. Although no generic equations are provided for this technology area, taxpayers should review the equations and methodology above and transparently employ analogous calculations where possible and appropriate.

Impact on Air Pollution and Anthropogenic Emissions of Greenhouse Gases:

DOE anticipates a wide variety of manufacturing proposals and thus no standard, all-encompassing approach will be used to calculate pollutants and GHG emissions. Instead, the taxpayer is expected to quantify or discuss the pollutant and/or GHG emissions associated with the operation of the SAEP.

To quantify the primary effects on CO<sub>2</sub> emissions (“AAMC CO<sub>2</sub> Reduction” as listed in the Taxpayer Data Spreadsheet), the following four technology-specific approaches are used.

For Electricity Generation and Energy Conservation SAEP, the following equation is used to calculate the reduction in emissions of CO<sub>2</sub> from the AAMC:

$$\text{Reduced CO}_2 \text{ Emissions} = \text{AAMC}_{\text{MWh}} \times \left( \frac{0.606 \text{ Mtons}}{\text{MWh}} \right)_{\text{US Avg}}$$

This calculation ignores CO<sub>2</sub> emissions associated with the manufacture, installation, and end-of-life processes and assumes that the dominant impact with respect to CO<sub>2</sub> emissions is the offset consumption of average U.S. grid electricity reduction.

For most Fuel Efficiency SAEP, a similar equation is used:

$$\text{Reduced CO}_2 \text{ Emissions} = \text{AAMC}_{\text{GGE}} \times \left( \frac{0.0088 \text{ Mtons}}{\text{GGE}} \right)_{\square}$$

For Fuel Efficiency SAEP, such as EVs and PHEVs, which require the consumption of electricity to enable the full fuel efficiency, the following equation is used:

$$\text{Reduced CO}_2 \text{ Emissions} = \text{AAMC}_{\text{GGE}} \times \left[ \left( \frac{0.0088 \text{ Mtons}}{\text{galGGE}} \right) - \left( \frac{\text{MWh}}{\text{GGE}} \right) \times \left( \frac{0.606 \text{ Mtons}}{\text{MWh}} \right) \right]$$

The “MWh/GGE” term is calculated by the taxpayer.

For Renewable Fuel Refining or Blending SAEP, the calculation is modified to account for CO<sub>2</sub> emissions associated with the manufacture of renewable fuel:

$$\text{Reduced CO}_2 \text{ Emissions} = \text{AAMC}_{\text{GGE}} \times \left[ \left( \frac{0.0088 \text{ Mtons}}{\text{galGGE}} \right)_{\text{saved}} - \left( \frac{\text{MWh}}{\text{GGE}} \right)_{\text{LCA}} \right]$$

The life cycle analysis (LCA) is determined by the taxpayer by selecting the most relevant fuel and corresponding process from the “LCA Fuel CO<sub>2</sub> Assumptions” tab. Taxpayers must select the LCA number which most closely corresponds to their SAEP. If the taxpayer believes that the actual LCA emissions associated with the operation of the SAEP differs significantly from data provided, then the taxpayer may substantiate an alternative LCA number in their narrative.

For GHG Emission Reduction SAEP, the AAMC is equivalent to the CO<sub>2</sub> emission reduction and thus no additional calculations are necessary.

The AAMC CO<sub>2</sub> Reduction represents the total CO<sub>2</sub> impact over the lifetime of deployed property which is attributable to one year of manufacturing. This number is further adjusted in three ways to assess the magnitude of the CO<sub>2</sub> reduction of a given project. First, the normalized value of this reduction is assessed by dividing by the requested tax credit. Second, the normalized AAMC CO<sub>2</sub> Reduction is then divided by the deployed property lifetime to capture the CO<sub>2</sub> impact after the first year of SAEP deployment. Third, the normalized AAMC CO<sub>2</sub> Reduction is multiplied by the projected factory lifetime. This number calculates the total carbon impact over the lifetime of all deployed property over the lifetime of the factory. Because this number will scale with the factory lifetime, the taxpayer should justify the claimed operational period of the factory in the project narrative. All of these three AAMC CO<sub>2</sub> Reduction figures will be used in the scoring of Evaluation Criteria 2 as shown in the Taxpayer Data Spreadsheet workbook.

#### Technological Innovation and Cost Reduction:

Taxpayers must provide quantitative information regarding their project’s innovation and value. This information is captured with the related metrics of technological or cost advantage over competitors, levelized cost, and the cost of CO<sub>2</sub> abatement. The preferred approach is for the taxpayer to discuss and quantify each of these three metrics. However, DOE recognizes the difficulty associated with calculating levelized costs (and thus \$/CO<sub>2</sub>) for many types of eligible property. If the taxpayer is unable to perform a levelized cost or CO<sub>2</sub> abatement cost calculation for the SAEP then the taxpayer should provide a quantitative or qualitative assessment of how their

technological or cost advantage over competitors translates into system price savings, improved performance, or improved system life.

Technological or Cost Advantage over Competitors: The Taxpayer Data Spreadsheet requires taxpayers 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. Although high level metrics such as levelized costs can capture this cost advantage, taxpayers are encouraged to select a lower level metric (i.e. \$/W, \$/Unit, efficiency, etc.) and later discuss the impact this granular cost advantage has upon the levelized cost. If the taxpayer’s manufactured property has multiple advantages over currently manufactured property, the taxpayer should select and quantify the most significant advantage in the Taxpayer Data Spreadsheet while discussing all technological and cost advantages in their narrative.

Levelized Cost: The levelized cost of energy (LCOE) calculation should assume that the manufactured property is part of the SAEP and where appropriate, be based on the financial and resource assumptions provided in Section VII. This “improved” LCOE value 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, and prices of commodity fuels or feedstocks.
- Justification for any use of a resource-related parameter (e.g., capacity factor) different than the national averages provided.
- 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.

Cost of Abatement: The form and units of the levelized cost vary across each energy type in the Taxpayer Data Spreadsheet. Thus, the cost of abatement equations are specific to each energy type to ensure consistent, accurate and comparable abatement

costs are produced by the Taxpayer Data Spreadsheet. For all energy types the cost of abatement reflects the incremental cost and associated incremental reduction in carbon emissions from a baseline.

For Electricity Generation and Efficiency technologies the cost of abatement is calculated with the following equation:

$$\frac{\$}{\text{Mton}_{\text{CO}_2}} = 10 \times \left[ \frac{\left( \frac{\$}{\text{kWh}} \right)_{\text{improved}} - \left( \frac{\$}{\text{kWh}} \right)_{\text{baseline}}}{\left( \frac{\text{Mtons}_{\text{CO}_2}}{\text{MWh}} \right)_{\text{Gtd.}} } \right]$$

The *baseline* ¢/kWh is defined by the retail electric rate of the electricity being generated or saved (i.e. residential, commercial, or utility). The factor of 10 in the numerator provides dimensional consistency. For simplicity, all improved technologies are assumed to be non-carbon emitting.

For Fuel Efficiency technologies the cost of abatement is calculated with the following equation:

Incremental levelized cost / incremental emissions reduction:

$$\frac{\$}{\text{Mton}_{\text{CO}_2}} = \frac{\left( \frac{\$}{\text{GGE}} \right)_{\text{Incremental}}}{\left( \frac{\text{Mtons}_{\text{CO}_2}}{\text{GGE}} \right)}$$

In this calculation, an *incremental* LCOE term is used to simplify the taxpayer’s data entry into the Taxpayer Data Spreadsheet. This term represents the difference in LCOE (\$/GGE) costs between the baseline system and the improved system. The specific calculation of this difference or increment will vary depending upon the fuel efficiency technology being considered. The denominator represents the emissions reduction associated putting the improved system in place, principally in terms of its displacement of the baseline technology.

For example, for a vehicle fuel efficiency technology, the incremental LCOE (\$/GGE) may be calculated as:

$$\left( \frac{\$}{\text{GGE}} \right)_{\text{Incremental}} = \left( \frac{\left( \frac{\$}{\text{mile}} \right)}{\text{GGE}} \right)_{\text{Improved}} - \left( \frac{\left( \frac{\$}{\text{mile}} \right)}{\text{GGE}} \right)_{\text{Baseline}}$$

In this case the \$/Mile term represents the fully-burdened cost associated with each mile driven and includes factors such as depreciation. To calculate the incremental

\$/GGE, the taxpayer calculates the difference between baseline and improved \$/GGE. The denominator of the cost of abatement term is based on the “well to wheels” emissions associated with burning a GGE of the consumed fuel. Taxpayers should show their work and reference Section VII when calculating these values.

For other fuel efficiency technologies, such as a CHP application, the incremental LCOE (\$/GGE) may be calculated as:

$$\frac{\$}{\text{GGE}} - \frac{\$}{\text{BTU}} \times \frac{\text{BTU}}{\text{GGE}}$$

In this case, the \$/BTU term represents the fully-burdened cost associated with each BTU of heat that the CHP system generates as a by-product of the power generation. The cost of abatement denominator reflects the emissions avoided as a result of the reduced consumption of the fuel that would have to be burned to generate the heat now supplied by the CHP system.

For GHG Reduction technologies the cost of abatement is equivalent to the levelized cost (i.e., for these technologies, the levelized cost is already expressed as the cost abatement) and thus no additional calculations are necessary.

For Renewable Fuel Refining or Blending technologies the cost of abatement calculation is analogous to the Electricity equations provided above:

$$\frac{\$}{\text{Mton}_{\text{CO}_2}} - \frac{\left(\frac{\$}{\text{GGE}}\right)_{\text{refined}} - \left(\frac{\$}{\text{GGE}}\right)_{\text{traditional}}}{\left(\frac{\text{Mtons}_{\text{CO}_2}}{\text{GGE}}\right)_{\text{traditional}} - \left(\frac{\text{Mtons}_{\text{CO}_2}}{\text{GGE}}\right)_{\text{refined}}}$$

In this case the traditional fuel is the fossil fuel not consumed. The term “Mtons/GGE<sub>traditional</sub>” in the denominator is similar to the denominator term in the fuel efficiency example provided previously. The second term in the denominator “Mtons/GGE<sub>refined</sub>” accounts for the life-cycle (“seed to wheels”) carbon emissions associated with consumption of the renewable fuel. This value is referenced from the “LCA Fuel CO<sub>2</sub> Assumptions” tab based upon the taxpayer’s renewable fuel type selection.

If a taxpayer cannot reasonably calculate a LCOE for the SAEP associated with the proposed manufactured property, the taxpayer can instead provide an estimated cost of GHG emissions abatement. The taxpayer should provide and justify the use of a cost value from a published study for a comparable energy system.

If the taxpayer chooses to calculate a cost of abatement without a corresponding LCOE value for the SAEP, the basis of the calculation is similar to that required in the LCOE

calculation. For example, a taxpayer could calculate an incremental LCOE by calculating the net present value of the incremental cost to the baseline system and dividing by the net present value of the incremental performance improvement. This calculation should also be based on the financial and resource assumptions provided and should be expressed in nominal terms and should not include 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:

- Explanation of why an LCOE value either could not be calculated or was not appropriate to calculate for the end use energy product.
- 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.
- 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 cost of abatement 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” cost of abatement 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.

Finally, if the taxpayer chooses to provide a cost of abatement value for the closest comparable end use energy product from a published study, the following information should be provided as documentation:

- Explanation of why an LCOE 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, U.S., region of U.S.), the carbon emissions associated with the baseline energy mix and the end use energy product, the key

financial assumptions (e.g., interest rates, taxes, 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, would the study’s cost value likely have increased or decreased).

**VI. SUPPORTING DOCUMENTS**

The taxpayer should include such appendices as are applicable to the project. In addition to items specifically requested in Table 2 of IV (D) above, examples of appropriate appendices include:

- Copy of internal or external engineering reports.
- Copy of site plan, together with evidence that taxpayer 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 taxpayer's conclusion that the site is fully acceptable as the project site for a manufacturing facility and for its intended use.
- Taxpayer expressions of interest or commitment letters from equity and debt financing sources.
- Expressions of interest or commitment letters from potential customers.
- Off-take agreements.

**VII. TECHNICAL REFERENCES FOR ADVANCED ENERGY TECHNOLOGIES SUPPLIED FIGURES**

This section assists the taxpayer in calculating the quantitative factors required in the project proposal. Wherever appropriate, the taxpayer should use this information for baseline assumptions for estimating factors such as the annual performance of the SAEP, expected lifetime of the deployed property and LCOE property. Additionally, in the event that the taxpayer is unable to calculate the levelized cost or the cost of abatement, this information *may* be used as inputs to the Taxpayer Data Spreadsheet.

**Table 1: Financial Assumptions for Levelized Cost of Energy Analysis  
Common Financial Inputs for LCOE Analysis by Market Sector**

Market	Buildings (grid-tied)		Central Generation
	Residential	Commercial	Utility

<b>Financials</b>			
	Residential Mortgage	Commercial Loan	IPP and Utility
<b>General</b>			
<b>Analysis Period</b>	20	20	20
<b>Inflation Rate</b>	2.5%	2.5%	2.5%
<b>Real Discount Rate</b>	5.5%	5.5%	7.5%
<b>Taxes &amp; Insurance</b>			
<b>Federal Tax</b>	29%	35%	35%
<b>State Tax</b>	7%	7%	8%
<b>Property Tax</b>	0	0	0
<b>Sales Tax</b>	0	0	0
<b>Insurance</b>	0	0	0
<b>Depreciation</b>			
<b>Federal</b>	N/A	MACRS-Mid-Q	MACRS-Mid-Q
<b>State</b>	N/A	MACRS-Mid-Q	MACRS-Mid-Q
<b>Loan</b>			
<b>Loan (Debt) Percent</b>	100%	50%	50%
<b>Loan Term</b>	30	15	20
<b>Loan Rate</b>	6%	6%	6%
<b>Constraining Assumptions</b>			
<b>PPA Escalation Rate</b>	N/A	N/A	0
<b>Target Internal Rate of Return</b>	N/A	N/A	15%
<b>Target Minimum Debt Service Coverage Ratio</b>	N/A	N/A	1.4
<b>Positive Cash Flow</b>	N/A	N/A	No
<b>Incentives</b>			
<b>Federal, State, or Local Subsidies</b>	Do not include	Do not include	Do not include

**Suggested LCOE Tools:**

All Electricity Generating Technologies (general tool):  
RET Finance: <http://analysis.nrel.gov/retfinance/>



The NREL Strategic Energy Analysis Center launched [RET Finance](#) in *October 2001*. It is an Internet-based cost of electricity model that simulates a 30-year nominal dollar cash flow for a variety of renewable energy power projects. As an online application, RET Finance is accessible from anywhere using an Internet connection and a browser. RET Finance calculates project earnings, detailed cash flows, and debt payments and also computes a project's levelized cost-of-electricity, after-tax internal rate of return, and debt service coverage ratio.

### Solar Technologies

**SAM 2012.5.11:** <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 Solar Advisor Model (SAM). The Solar Advisor Model evaluates several types of financing (from residential to utility-scale) and a variety of technology-specific cost models for several (and eventually all) SETP technologies. The SETP technologies currently represented in SAM include concentrating solar power (CSP) parabolic trough and dish-stirling systems and photovoltaic (PV) flat plate and concentrating technologies. Other technologies will be added in future versions, including CSP central receivers and residential solar water heating.

### Geothermal Technologies

**Geothermal Electricity Technology Evaluation Model (GETEM):**

<http://www1.eere.energy.gov/geothermal/getem.html>.

The Geothermal Electricity Technology Evaluation Model (GETEM) was developed to aid the Geothermal Technologies Program (GTP) in understanding the performance and the cost of the technologies it is seeking to improve. It is a detailed model of the estimated performance and costs of currently available U.S. geothermal power systems. GETEM can be used to analyze and evaluate currently available technologies and it can also be used to estimate what certain technologies might cost five to twenty years in the future, given the direction of potential Research, Development and Demonstration (RD&D) projects. The model is intended to help GTP determine which proposed RD&D programs and projects might offer the most improvements for the taxpayer dollar.

### Small Wind Technologies

[www.nrel.gov/wind/docs/spread\\_sheet\\_Final.xls](http://www.nrel.gov/wind/docs/spread_sheet_Final.xls)

**Table 2: Vehicle Assumptions**

<b>Metric</b>	<b>Value</b>	<b>Units</b>
Annual Miles Traveled	12,000	Miles
Vehicle Lifetime Miles	160,000	Miles
2008 Average US Gasoline Price	\$3.26	\$
Baseline Vehicle Fuel Economy	23.4	mpg

Vehicle Cost	\$23,337	\$
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**Table 3: Common Service Life Years**

Technology	Service Life Years
Solar Photovoltaics	30
Fuel Cell	20
Heat Pumps	7 to 20
Electric Water Heaters	20
Natural Gas Engine	20
Oil-Fired Engine	20
Natural Gas Turbine	20
NG Micro Turbine	20
Wind	30
Electric Rooftop Heat Pump	15
Ground-Source Heat Pump	20
Suggested for non-distributed technologies	20

Assumption Tables to the EIA AEO, August 2012 and DOE Solar Energy Technology Program. <http://www.eia.gov/forecasts/aeo/assumptions/index.cfm>

**Table 4: Other Common Technical Assumptions and Baseline for Levelized Cost of Energy Analysis**

Electricity Generation and Storage

End Use Energy Product (Technology)	Resource Characteristics	Capacity Factor <sup>1</sup>
Biomass (general)	N/A <sup>2</sup>	68%
Geothermal	200 deg C; 3000m depth	84%
Landfill gas utilization (general)	N/A	85%
Wind	Class 5	39%
Wind – Offshore	Class 5	42%
Solar Thermal – CSP	Phoenix AZ	32%
Solar Photovoltaic (general)	Phoenix AZ	20%
Storage – CAES	N/A	25%
Storage – Pumped Hydro	N/A	25%
Storage – Adv. Batteries	N/A	25%
Storage – Flywheel	N/A	25%

<sup>1</sup> Generation - NREL Analysis estimates based on averages from multiple published sources; Storage – Input costs from EPRI 2009 Overview of Electric Energy Storage Options for the Electric Enterprise

<sup>2</sup> A constant nominal price of \$2.02/million Btu should be assumed to determine the fuel price contribution to the LCOE.

N/A – not applicable

If a natural gas price is needed to compute the LCOE of a technology, a constant nominal price of \$4.66/ thousand cubic feet should be used (based on EIA AEO 2009).

## VIII. SAMPLE TAXPAYER DATA SPREADSHEET

This section provides taxpayers a depiction of the Taxpayer Data Spreadsheet, captured in the images on the following pages.

User Input	Calculated or from other tab	Instructions are in the yellow boxes next to the corresponding inputs	
<p>This worksheet is used to capture quantitative information regarding applicant proposals. Detailed instructions, examples, and reference data are provided <b>Sections V and VII of Appendix B</b>. Input data and assumptions should be substantiated in and show clear correspondence to applicant's project narrative. Applicant should first fill out the relevant user input (green) cells in the <i>Applicant Information</i> section of the <i>Applicant Data Sheet</i> tab. Next, applicant should fill out user input cells in both the <i>Direct Jobs</i> and <i>Tech Innovation, Cost Reduction</i> tabs. Finally, applicant should verify that all necessary calculations have been performed as anticipated and are captured in the calculated cells (pink) for each criteria area shown on the <i>Applicant Data Sheet</i> tab. Data will be extracted from this workbook to compare submission. Therefore no cells, rows, or columns, should be added.</p>			
<b>Applicant Information</b>			
Company Name			
City			
State			
Qualified Investment \$			
Tax Credit Requested \$ (30% of Qualified Inv)	\$ -		\$30 million maximum
Energy Type	Click to choose		
Technology Area			Used to categorize applications for review process
If Other Technology:			
Product Description (<50 words):			
Factory Lifetime		Years	
Deployed property lifetime		Years	Refers to the manufactured property and should correlate with the warranty on this property.
Date Complete permitting		mm/dd/yyyy	
Date Begin Construction		mm/dd/yyyy	
Date Begin Production		mm/dd/yyyy	
Levelized Cost (or Incremental Levelized Cost for Fuel Efficiency)			Net present value assessment for the cost of technology using the financial and resource assumptions (where available) provided in Section H of Appendix B and including life cycle costs as possible.
Type of Electricity Generation Being Replaced or Saved	Click to choose		<b>Required for Energy Generation or Energy Efficiency Only</b> - Used to calculate the cost of carbon emission reduction.
Technological or Cost Advantage over Competitors			Demonstrated or verified competitiveness over directly comparable technology with respect to most relevant figure of merit (i.e. \$/W, ¢/kWh, \$/GGE, ¢/BTU, \$/Mton CO <sub>2</sub> , \$/sq ft, etc). This number is not used in further calculations.
Brief description of cost advantage (<50 words). Full description to be provided in narrative.			
<b>Criterion 1: Creates domestic jobs</b>			
Direct Job Summary	Number of Employees	Jobs/ \$1M Tax Credit	
	FTE		
Construction Jobs	-	- ▲	
Operating Jobs	-	- ▲	
<b>Total Direct Jobs</b>	-	- ▲	

Has the shortest project time from certification to completion		
Milestone	Date mm/dd/yyyy	Days to complete milestone
Application Due Date		
Complete permitting		0
Begin Construction		0
Begin Production		0

## **IX. QUESTIONS/ AGENCY CONTACTS**

All questions and answers related to this Notice will be posted on EERE eXCHANGE at: <https://eere-eXCHANGE.energy.gov/>. **Please note that you must first select 48C from the list of options in order to view the questions and answers specific to this Notice.** Service/DOE will attempt to respond to a question within 3 business days, unless a similar question and answer has already been posted on the website.

Please send questions in writing via fax to the Service point of contact Marc Bernabo at (713) 209-3964. He may also be reached by telephone at (713) 209-3669.

Questions related to the registration process and use of the EERE eXCHANGE website should be submitted to: [eere-exchangesupport@hq.doe.gov](mailto:eere-exchangesupport@hq.doe.gov)