Instructions for Applicants	
User Input	Calculated or from other tab
This worksheet is used to capture information on Clean Energy Manuf	
First, applicants should fill out the relevant user input (green) cells in t	
Next, applicant should proceed to the yellow tab that is specific to the	

Section	Applicant Information
Project Overview	Applicant Case Number
	Company Name
	City (HQ)
	State (HQ)
	Zip Code (HQ)
	City (Facility)
	State (Facility)
	Zip Code (Facility)
	Qualified Investment ($)
	Expected Credit Rate
	Tax Credit ($)
	Production or Recycling
	Specified Advanced Energy Property (SAEP)
	Primary Facility Product
	Technology Readiness Level
	Secondary Specified Advanced Energy Property, if applicable
	Secondary non SAEP property, if applicable
Project/Business Plan	Date Complete Permitting

	Date Begin Construction
	Date Begin Operation
	Is this project being considered or planning to apply to local, state, or other federal agency programs?
	If Yes, briefly explain funding:
Jobs	Direct Construction Jobs
	Meet Wage and Apprenticeship Requirements?
	Direct Operating Jobs

Instructions are in yellow boxes next to the corresponding inputs
facturing and Recycling project proposals. Input data and assumptions should be substantiated in a

the **Project Overview tab.**

eir primary technology area to submit additional details on production capacity.

Input	Units	Notes
		The case number used
		Dollar amount of the q in 48C(b).
30%		Applicants should selec requirements under 48 should select 6% from t
0		Calculated by multiplyi
		Indicate whether the p a recycling project, alsc
		Every application can o yellow tab). If applicant *here*. If Primary SAEP is
		Brief description of the turbine blades"). The d
		Submit the Technology scale, see here: https:/
		For projects that utilize Energy Properties, appl secondary SAEP(s) here not for any secondary t
		For facilities that utilize describe the products h
	mm/dd/yyyy	

	mm/dd/yyyy	
	mm/dd/yyyy	
		Examples include other agencies, and state or l
	FTE equivalent	Quantify the number o
		Do the construction job guidance?
	FTE equivalent	Quantify the number o retrofits/reequipped fa

and show clear correspondence to applicant's project narrative.

to track the application in the DOE 48C application portal
ualified investment that "re-equips, expands, or establishes" the facility, as defined
ct a 30% tax credit if they anticipate meeting the wage and apprenticeship C(e)(5) and (6). Applicants who do not anticipate meeting those requirements the dropdown.
ng Qualified Investment by Expected Credit Rate.
roject is primarily in producing or recycling eligible advanced energy property. If it is o complete the Recycling Tab.
nly choose one Specified Advanced Energy Property (and fill out the corresponding ts serves multiple SAEP, select the yellow thet best fit your intended *primary SAEP* Other, also complete the Other tab.
facility product that is an output of the facility in 5 words or less (e.g., "wind istinction between SAEP and Facility Product is defined in Appendix B of the notice.
Readiness Level (1-9) of the primary facility product. For a definition of the TRL /www.nasa.gov/pdf/458490main_TRL_Definitions.pdf
any portion of the qualified investment to produce multiple Specified Advanced licants should identify a primary technology output above, but may briefly list e. Applicants should only fill out one yellow tab for the primary technology area and technology areas.
any portion of the qualified investment to produce non-SAEP, please briefly here.

federal tax credits, grants from the Department of Energy or other federal ocal economic development incentives.
f direct jobs that will be created during construction of the facility. Direct jobs are
os meet wage and apprenticeship requirements, as specificed in 48C(e) and treasury
f direct jobs that will be created during operation of the facility. For cilities, only include the number of additional operating jobs created by the project.

Instructions for Manufacturers of Eligible Renewable Energy Products

User Input	Calculated or from other tab	Instructions are in yellow boxes next to the

Manufacturing facilities for renewable energy products or microturbines should complete each green cell on tl
production. These metrics include rating factors that describe the performance of the product in its ultimate u
the example to the right and/or the Assumptions tab for assistance.

Annual Production

Descriptor	Data	Units	Notes/Instructions
Identify Primary Renewable Property Type			Select the eligible property type
If "other renewable property", please specify here			If you selected "other renewable specify the name here
Annual Production Capacity		*MW/year*	Expected annual production. Us electrical technologies such as s components without watt rating the amount of watts of the end component, and state your assu
Conversion Factor and Explanation			For non-watt rated technologies factor (e.g., square meters to wa
Manufacturing Contribution		*$/W*	Value added contribution to syst feedstock materials, upstream c
Total System Hardware Price		*$/W*	Price to end user of total system system but excluding installatior
Typical Annual Capacity Factor		*%*	See *Assumptions* tab for commo assumptions of typical use. Defi output)/(peak power rating * 87 capacity factor, please justify in value between 0 and 1.
Share of Facility Output		*%*	Fraction of production from proj that will be allocated to eligible must be a value between 0 and
Deployed Property Lifetime		*years*	See *Assumptions* tab for commo assumptions of typical use. Num equipment will operate.

corresponding inputs his tab to indicate annual se. Applicants may reference	
	EXAMPLE
	Descriptor
being produced at the facility	Identify Primary Renewable Property Type
property" in row 7, please	If "other renewable property", please specify here
e equivalent watts for non- olar water heating. For s, make an assumption about product per unit of your mptions below.	Annual Production Capacity
ONLY, explain your conversion atts) in 50 words or less.	Conversion Factor and Explanation
tem (excludes price paid for omponents, etc.).	Manufacturing Contribution
hardware including balance of labor costs.	Total System Hardware Price
n capacity factors, based on ned as (annual energy 60 hours). If you use a different the narrative. Entries must be a	Typical Annual Capacity Factor
ject (i.e., manufacturing facility) equipment production. Entries 1.	Share of Facility Output
n capacity factors, based on ber of years the deployed	Deployed Property Lifetime

Data	Units	Notes/Instructions
Property that produces energy from the wind - 48C(c)(1)(A)(i)(I)		Forged offshore wind tower flanges
	375 *MW/year*	See example conversion explanation below
Facility produces 200 flanges a year, 2 flanges used per tower section, 4 tower sections per turbine, assume 15 MW wind turbine.		
	0.003 *$/W*	Tower contributes $0.15/W (NREL 2022). While flanges make up ~8% of value, the specific steel manufacturing only contributes 1/4 value add for 2% contribution to towers
	3.16 *$/W*	Total hardware cost of offshore wind turbine and BOS (NREL, 2022).
	42% *%*	Average U.S. capacity factor of offshore wind is 42%, per the *Assumptions* tab.
	80% *%*	Most of the facility's production goes to offshore wind turbine tower flanges, but some is reserved for other applications. Applicant would indicate this in the Project Overview under secondary non-SAEP property.
	30 *years*	Assumed offshore wind system lifetime is 30 years, per the assumptions tab

Instructions for Manufacturers of Eligible Microturbines

User Input	Calculated or from other tab	Instructions are in yellow boxes next to the

Manufacturing facilities for microturbines should complete each green cell on this tab to indicate annual produ
rating factors that describe the performance of the product in its ultimate use. Applicants may reference the e
Assumptions tab for assistance.

Annual Production

Descriptor	Data	Units	Notes/Instructions
Annual Production Capacity		*MW/year*	Expected annual production. Us electrical technologies such as s components without watt rating the amount of watts of the end component, and state your assu
Conversion Factor and Explanation			For non-watt rated technologies factor (e.g., square meters to wa
Manufacturing Contribution		*$/W*	Value added contribution to syst feedstock materials, upstream c
Total System Hardware Price		*$/W*	Price to end user of total system system but excluding installatior
Typical Annual Capacity Factor		*%*	See *Assumptions* tab for commo assumptions of typical use. Defi output)/(peak power rating * 87 capacity factor, please justify in value between 0 and 1.
Share of facility output		*%*	Fraction of production from proj that will be allocated to eligible must be a value between 0 and
Deployed Property Lifetime		*years*	See *Assumptions* tab for commo assumptions of typical use. Num equipment will operate.

corresponding inputs
uction. These metrics include
xample to the right and/or the

e equivalent watts for non-
olar water heating. For
s, make an assumption about
product per unit of your
mptions below.

ONLY, explain your conversion
atts) in 50 words or less.

tem (excludes price paid for
omponents, etc.).

hardware including balance of
labor costs.

n capacity factors, based on
ned as (annual energy
60 hours). If you use a different
the narrative. Entries must be a

ject (i.e., manufacturing facility)
equipment production. Entries
1.

n capacity factors, based on
ber of years the deployed

EXAMPLE

Descriptor	Data
Annual Production Capacity	5
Conversion Factor and Explanation	N/A
Manufacturing Contribution	$1.50
Total System Hardware Price	$3.00
Typical Annual Capacity Factor	60%
Share of facility output	100%
Deployed Property Lifetime	10

Units	Notes/Instructions
MW/year	Facility produces 5 MW of microturbines per year for combined heat and power systems in commercial and industrial applications.
	Not applicable; technology is already rated in watts.
$/W	Cost to produce this microturbine system is roughly $1,500/kW, or $1.50/W.
$/W	Total installed cost of the microturbine system is about $3,000/kW, or $3.00/W.
%	Manufacturer estimates the average capacity factor of their CHP systems is roughly 60%.
%	All of the facility's production goes to microturbine manufacturing.
years	Common service life of a microturbine is 10 years, per the Assumptions tab.

Instructions for Manufacturers of Fuel Cells

User Input	Calculated or from other tab	Instructions are in yellow boxe

Manufacturing facilities for fuel cells should complete each green cell on this tab to indicate annual productio selection, as well as other metrics to understand the performance of the product in its ultimate use. Applicant Assumptions tab for assistance.

Fuel Type/Process	Alcohol to jet from ethanol - gasification - municipal solid waste		Select the

Annual Attributable Production Capacity (AAPC)

Descriptor	Data	Units	Notes/Inst
Annual Production Capacity		*Unit/year*	Projected (manufactu
Manufacturing Contribution		*$/Unit*	Value adde feedstock
Total Installed System Price		*$/Unit*	Price to en system but
Capacity per unit per year		*GGE*	Capacity o gasoline ec should be
Share of Facility Output		*%*	Fraction of allocated t
Deployed Property Lifetime		*years*	See *Assum* assumptio equipment

es next to the corresponding inputs n. These metrics include a "Fuel Type/Process" ts may reference the example to the right and/or the	
most representative fuel type for the fuel cell.	Fuel Type/Process
ructions	**EXAMPLE** **Descriptor**
(not peak or potential) number of units ired annually.	Annual Production Capacity
ed contribution to system (excludes price paid for materials, upstream components, etc.).	Manufacturing Contribution
d user of total system hardware including balance of t excluding installation labor costs.	Total Installed System Price
f each fuel cells per year, best expressed in gallons of quivalent (GGE). Kilograms, MW, or other units converted to GGE using BTUs or MJs.	Capacity per unit per year
project (i.e., manufacturing facility) that will be o eligible equipment.	Share of Facility Output
ptions tab for common capacity factors, based on ns of typical use. Number of years the deployed t will operate.	Deployed Property Lifetime

Alcohol to jet from isobutanol - fermentation - corn grain/starch		The electrolyzers will run on renewable electricity, so the applicant selects the LCA for "renewable electrolysis." This is equivalent to a 100% reduction in emissions per GGE.

Data	Units	Notes/Instructions
	50 *Unit/year*	Applicant produces 1000 1-MW electrolyzers at its new facility.
	50,000 *$/Unit*	Electrolyzers are sold for $100,000 each, but use $50,000 worth of platinum group metals and other inputs, so the value added by the manufacturer is $50,000.
	1,000,000 *$/Unit*	The full hydrogen electrolysis system is estimated at $1 million for a 1-MW capacity electrolyzer.
	150,000 *GGE*	A 1-MW electrolyzer could be expected to produce about 150,000 kg of hydrogen per year under typical operating conditions.
	100 *%*	100% of the facility will be used to produce clean hydrogen.
	10 *years*	Electrolyzers are expected to last about 10 years before replacement.

Instructions for Manufacturers of Energy Storage Systems

User Input	Calculated or from other tab	Instructions are in yellow boxes next

Manufacturing facilities for (non-vehicle*) energy storage systems should complete each green cell on tl
metrics include rating factors that describe the performance of the product in its ultimate use. Applicant
and/or the Assumptions tab for assistance.
*Manufacturers of batteries for electric vehicles should complete the vehicles tab.

Annual Attributable Production Capacity (AAPC)

Descriptor	Data	Units	Notes/Instructions
Annual Production Capacity		*MW/year*	Expected annual produ production capacity in output of the batteries watt ratings, make an a the end product per ur assumptions below.
Conversion Factor and Explanation			For non-watt rated tec factor (e.g., square me
Manufacturing Contribution		*$/kWh*	Value added contributi feedstock materials, up
Total System Hardware Price		*$/kWh*	Price to end user of tot system but excluding ir
Typical Annual Capacity Factor		*%*	See *Assumptions* tab fo assumptions of typical output)/(peak power r capacity factor, please value between 0 and 1
Share of facility output		*%*	Fraction of production that will be allocated fo value between 0 and 1
Deployed Property Lifetime		*years*	See *Assumptions* tab fo assumptions of typical equipment will operate

to the corresponding inputs his tab to indicate annual production. These ts may reference the example to the right

	EXAMPLE
	Descriptor
uction. Facilities that typically express their Megawatt-Hours should instead state power in Megawatts. For components without assumption about the amount of watts of nit of your component, and state your	Annual Production Capacity
hnologies ONLY, explain your conversion ters to megawatt-hours) in 50 words or less.	Conversion Factor and Explanation
ion to system (excludes price paid for ostream components, etc.).	Manufacturing Contribution
tal system hardware including balance of nstallation labor costs.	Total System Hardware Price
or common capacity factors, based on use. Defined as (annual energy ating * 8760 hours). If you use a different justify in the narrative. Entries must be a ..	Typical Annual Capacity Factor
from project (i.e., manufacturing facility) or eligible equipment. Entries must be a ..	Share of facility output
or common capacity factors, based on use. Number of years the deployed e.	Deployed Property Lifetime

Data	Units	Notes/Instructions
	100 *MW/year*	Lithium-ion battery factory assembles 200 MWh of 2-hour duration batteries for stationary storage applications. Those batteries represent 100 MW of power.
N/A		N/A
	$50 *$/kWh*	Manufacturer adds $50/kWh of value in assembling the battery cell and pack.
	$400 *$/kWh*	Total price of the installed system is $400/kWh.
	10% *%*	Capacity factor of stationary storage, according to the *Assumptions* tab.
	100% *%*	100% of the factory is being used for battery production.
	10 *years*	Assumed battery system lifetime is 10 years

Instructions for Manufacturers of Eligible Electric, Fuel Cell, and Hybrid Vehicles and Components (

User Input	Calculated or from other tab	Instructions are in yellow boxe

Manufacturing facilities for eligible vehicles and their components should complete each green cell on this tab include rating factors that describe the performance of the product in its ultimate use. Applicants may referer tab for assistance.

Annual Attributable Production Capacity (AAPC)

Descriptor	Data	Units	Notes/Inst
Identify End Vehicle Type			Select the
Annual Production Capacity		*Unit/year*	Projected manufactu
Manufacturing Contribution		*$/Unit*	Value adde feedstock
Total Price of Vehicle Equipment		*$/Unit*	Price to en system but
Share of facility output		*%*	Fraction of that will be Entries mu
Deployed Property Lifetime		*years*	See *Assum* assumptio equipment
Annual Improved System Fuel Consumption		*Miles per gallon of gasoline equivalent (MPGGE)*	Projected l typical ope duty vehicl **below. If p**
Miles per kWh		*Miles per kWh*	If electric c typical ope

excl. charging equipment)	
es next to the corresponding inputs o to indicate annual production. These metrics nce the example to the right and/or the Assumptions	
ructions	**Descriptor**
eligible property type being produced at the facility	Identify End Vehicle Type
(not peak or potential) number of units ured annually.	Annual Production Capacity
ed contribution to system (excludes price paid for materials, upstream components, etc.).	Manufacturing Contribution
d user of total system hardware including balance of t excluding installation labor costs.	Total Price of Vehicle Equipment
production from project (i.e., manufacturing facility) e allocated to produce vehicle technology. st be a value between 0 and 1.	Share of facility output
ptions tab for common capacity factors, based on ns of typical use. Number of years the deployed t will operate.	Deployed Property Lifetime
iquid fuel consumption of improved system under eration (e.g., average fuel economy of a hybrid heavy- le). **If fully electric, enter "0" and fill out the row** **lugin hybrid, fill out both rows.**	Annual Improved System Fuel Consumption
or plug-in hybrid, state the required electricity under eration (e.g., average MPGe of an electric vehicle).	Miles per kWh

EXAMPLE

Data	Units	Notes/Instructions
electric vehicle		Batteries are sold for EVs
	100,000 *Unit/year*	Applicant produces 100,000 EV batteries per year at its 10 GWh factory.
	$6,000 *$/Unit*	Finished battery is sold for $12,000, but inputs and subcomponents cost $6,000, so the "manufacturing contribution" of this facility is $6,000.
	$25,000 *$/Unit*	Total price of electric vehicle is $25,000.
	90% *%*	90% of the facility's output goes to EVs, 10% to consumer electronics.
	16 *years*	Assumed EV lifetime is 16 years.
	0 *Miles per gallon of gasoline equivalent (MPGGE)*	Presumes the improved system uses no liquid fuel.
	3 *Miles per kWh*	The improved system uses electricity and gets roughly 3 miles per kWh.

Instructions for Manufacturers of Eligible Grid Modernization Equipment and Electric Vehicle Charg

User Input	Calculated or from other tab	Instructions are in yellow boxe

Manufacturing facilities for eligible grid modernization equipment should complete each green cell on this tab rating factors that describe the performance of the product in its ultimate use. Applicants may reference the e assistance.

Annual Attributable Production Capacity (AAPC)

Descriptor	Data	Units	Notes/Instr
Identify property type			Select the e
Annual Production Capacity		*Units, kVA, etc. per year*	Projected (manufactu terms of pc raw numbe
Manufacturing Contribution		*$/Unit*	Value adde (excludes p component
Total Price of Equipment		*$/Unit*	Price to enc system but
Typical Annual Capacity Factor		*%*	See *Assump* assumptior output)/(pe capacity fac value betw
Share of facility output		*%*	Fraction of that will be be a value l
Deployed Property Lifetime		*years*	See *Assump* assumptior equipment

ing Equipment
s next to the corresponding inputs to indicate annual production. These metrics include example to the right and/or the Assumptions tab for

	EXAMPLE
ructions	**Descriptor**
eligible property type being produced at the facility	Identify property type
not peak or potential) number or capacity of units red annually. If possible, express the total capacity in ower capacity (e.g., kVA for transformers) rather than r of units produced.	Annual Production Capacity
d contribution to system for each unit produced rice paid for feedstock materials, upstream ts, etc.).	Manufacturing Contribution
d user of total system hardware including balance of excluding installation labor costs.	Total Price of Equipment
otions tab for common capacity factors, based on ns of typical use. Defined as (annual energy eak power rating * 8760 hours). If you use a different ctor, please justify in the narrative. Entries must be a een 0 and 1.	Typical Annual Capacity Factor
production from project (i.e., manufacturing facility) allocated to produce eligible equipment. Entries must between 0 and 1.	Share of facility output
otions tab for common capacity factors, based on ns of typical use. Number of years the deployed will operate.	Deployed Property Lifetime

Data	Units	Notes/Instructions
Electric grid modernization equipment or com		Large Power Transformers are grid modernization equipment
	2,000 *MVA/year*	Projected (not peak or potential) number or capacity of units manufactured annually. If possible, express the total capacity in electrical terms (e.g., kVA for transformers) rather than raw number of units.
	1,000,000 *$/Unit*	The manufacturer purchases $500,000 of raw materials for each LPT, but sells each one for $1.5 million, so generates $1 million of value in the process.
	1,500,000 *$/Unit*	The total value of the completed LPT is $1.5 million
	65% *%*	Average U.S. capacity factor of transmission equipment is 65%, per the *Assumptions* tab.
	100% *%*	We assume all of the facility output is for LPTs.
	20 *years*	Assumed LPT lifetime is 25 years.

Instructions for Manufacturers of Eligible Refining, Blending, or Electrolyzing Equipment

User Input	Calculated or from other tab	Instructions are in yellow boxe

Manufacturing facilities for eligible refining, blending, or electrolyzing equipment for eligible fuels, products, a this tab to indicate annual production. These metrics include a "Fuel Type/Process" selection, as well as other product in its ultimate use. Applicants may reference the example to the right and/or the Assumptions tab for

Fuel Type/Process	Alcohol to jet from ethanol - gasification - wood waste	*If other, enter here*	Select the electrolyzi

Annual Attributable Production Capacity (AAPC)

Descriptor	Data	Units	Notes/Inst
Annual Production Capacity		*Unit/year*	Projected (manufactu
Manufacturing Contribution		*$/Unit*	Value adde feedstock
Total Installed System Price		*$/Unit*	Price to en system but
Capacity per unit per year		*GGE*	Amount of refining, el expressed MW, or otl MJs.
Deployed Property Lifetime		*years*	See *Assum* assumptio equipment
Share of Facility Output		*%*	Percentage allocated t between 0

es next to the corresponding inputs and chemicals should complete each green cell on metrics to understand the performance of the assistance.	
most representative fuel refining, blending, or ng process in cell B5. If other, enter in C5.	Fuel Type/Process
ructions	**EXAMPLE** **Descriptor**
(not peak or potential) number of units ired annually.	Annual Production Capacity
ed contribution to system (excludes price paid for materials, upstream components, etc.).	Manufacturing Contribution
d user of total system hardware including balance of t excluding installation labor costs.	Total Installed System Price
fuel, chemical, or product enabled the given unit of ectrolyzing, or blending equipment annually, best in gallons of gasoline equivalent (GGE). Kilograms, her units should be converted to GGE using BTUs or	Capacity per unit per year
ptions tab for common capacity factors, based on ns of typical use. Number of years the deployed t will operate.	Deployed Property Lifetime
e of a project (i.e., manufacturing facility) that will be o eligible equipment. Entries must be a value and 1.	Share of Facility Output

Gaseous hydrogen - renewable electrolysis		The electrolyzers will run on renewable electricity, so the applicant selects the LCA for "renewable electrolysis." This is equivalent to a 100% reduction in emissions per GGE.

Data	Units	Notes/Instructions
	50 *Unit/year*	Applicant produces 1000 1-MW electrolyzers at its new facility.
	50,000 *$/Unit*	Electrolyzers are sold for $100,000 each, but use $50,000 worth of platinum group metals and other inputs, so the value added by the manufacturer is $50,000.
	1,000,000 *$/Unit*	The full hydrogen electrolysis system is estimated at $1 million for a 1-MW capacity electrolyzer.
	150,000 *GGE*	A 1-MW electrolyzer could be expected to produce about 150,000 kg of hydrogen per year under typical operating conditions.
	10 *years*	Electrolyzers are expected to last about 10 years before replacement.
	100 *%*	100% of the facility will be used to produce clean hydrogen.

Instructions for Manufacturers of Eligible Energy Conservation Equipment

User Input	Calculated or from other tab	Instructions are in yellow boxe

Manufacturing facilities for eligible energy conservation equipment should complete each green cell on this ta
"Fuel Type/Process" selection for the incumbent and improved technologies, as well as other metrics to unde
Applicants may reference the example to the right and/or the Assumptions tab for assistance.

Fuel Information

Baseline Fuel Type/Process		**If selected 'Other', explain here**	Select the electrolyzi
Improved Fuel Type/Process		**If selected 'Other', explain here**	Select the blending, c projects, s switching r text.

Annual Attributable Production Capacity (AAPC)

Descriptor	Data	Units	Notes/Inst
Identify Property Type			Identify if commercia
Annual Production Capacity		*Unit/year*	Projected annually.
Manufacturing Contribution		*$/Unit*	Value adde feedstock
Total Price of Efficiency Equipment		*$/Unit*	Price to en system but
Annual Baseline System Consumption		*MMBTU/year*	Likely annu switching energy cor Baseline sy commercia
Annual Improved System Consumption		*MMBTU/year*	Likely annu switching energy cor
Deployed Property Lifetime		*years*	See *Assum* assumptio equipment
Share of Facility Output		*%*	Fraction of will be allo must be a

es next to the corresponding inputs ab to indicate annual production. These metrics include a rstand the performance of the product in its ultimate use.

most representative baseline fuel refining, blending, or ng process.
most representative improved/ new fuel refining, or electrolyzing process. For efficiency improvement elect the same fuel type/ process as the baseline if fuel not applicable and explain efficiency improvement in the

ructions
roperty is serving residential market; industrial or al market; or both
(not peak or potential) number of units manufactured
ed contribution to system (excludes price paid for materials, upstream components, etc.).
d user of total system hardware including balance of t excluding installation labor costs.
ual energy consumption of baseline system (WITHOUT fuel or efficiency technology) under typical operation (e.g., nsumption of average home using natural gas heating). ystem assumptions must match the assumptions used in al viability section of concept paper application
ual energy consumption of improved system (AFTER fuel or efficiency technology) under typical operation (e.g., nsumption of average home with air source heat pump).
ptions tab for common capacity factors, based on ns of typical use. Number of years the deployed t will operate.
production from project (i.e., manufacturing facility) that cated to produce energy efficiency technology. Entries value between 0 and 1.

EXAMPLE		
Baseline Fuel Type/Process	Natural Gas	The project manufact replace natural gas fu
Improved Fuel Type/Process	Grid electricity	Heat pumps are assu

EXAMPLE			
Descriptor	**Data**	**Units**	**Notes/Instructions**
Identify Property Type	Residential		Heat Pumps are for re
Annual Production Capacity	10,000	*Unit/year*	Manufacturer produc heat pumps
Manufacturing Contribution	$3,500	*$/Unit*	Heat Pumps are sold materials and compo is $3500 per unit.
Total Price of Efficiency Equipment	$5,000	*$/Unit*	Price to end user of t balance of system bu
Annual Baseline System Consumption	80	*MMBTU/year*	Annual energy consu natural gas furnance
Annual Improved System Consumption	16	*MMBTU/year*	Cold climate heat pur 64 MMBTU
Deployed Property Lifetime	10	*years*	Heat pumps average
Share of Facility Output	100%	*%*	All of the factory's ou

tures heat pumps which are assumed to rnaces.
med to be powered by grid electricity.

esidential scale
es 10,000 units of cold-climate air-source
for $5000 but incorporate $1500 of input nents, so the manufacturer's contribution
otal HVAC system hardware including t excluding installation labor costs.
mption of the average building using of comparable size to heat pump
np is projected to reduce energy usage by
lifetime are 10 years
tput goes to producing heat pump

Instructions for Manufacturers of Carbon Capture, Removal, Use, and Storage

User Input	Calculated or from other tab	Instructions are in yellow boxe

Manufacturing facilities for eligible carbon capture, remove, use, or storage equipment -- or other equipment
green cell on this tab to indicate annual production. These include metrics to understand the performance of t
reference the example to the right and/or the Assumptions tab for assistance.

Annual Attributable Production Capacity (AAPC)

Descriptor	Data	Units	Notes/Instr
Annual Production Capacity		*Unit/year*	Projected (r annually.
Manufacturing Contribution		*$/Unit*	Value adde feedstock r
Total Cost of Emissions Reduction Component		*$/Unit*	Price to enc including b
CO2e Reduction Per Unit		*Metric tons CO2e*	Annual CO2 equipment "CO2 Equiv
Deployed Property Lifetime		*years*	See *Assump* assumptior equipment
Share of Facility Output		*%*	Percentage allocated to and 1.

s next to the corresponding inputs designed to reduce emissions -- should complete each he product in its ultimate use. Applicants may

ructions	Annual Attributable Production Capacity **Descriptor**
not peak or potential) number of units manufactured	Annual Production Capacity
d contribution to system (excludes price paid for naterials, upstream components, etc.).	Manufacturing Contribution
d user of total system hardware (e.g., full CCS system) alance of system but excluding installation labor costs.	Total Cost of Emissions Reduction Component
2-equivalent emissions reductions per unit deployed. For that reduces non-CO2 emissions, applicants can use the alency Assumptions" on the *Assumptions* tab.	CO2e Reduction Per Unit
otions tab for common capacity factors, based on s of typical use. Number of years the deployed will operate.	Deployed Property Lifetime
of a project (i.e., manufacturing facility) that will be eligible equipment. Entries must be a value between 0	Share of Facility Output

(AAPC)		
Data	**Units**	**Notes/Instructions**
	100,000 *Unit/year*	A manufacturer projects that its new factory will produce 100,000 gallons of a solvent that can be used in carbon capture systems.
	450 *$/Unit*	Value added contribution to system (excludes price paid for feedstock materials, upstream components, etc.).
	5,000 *$/Unit*	The full price of the functional CCS apparatus is estimated at $5,000 per gallon of solvent.
	100 *Metric tons CO2e*	Each gallon of solvent is expected to reduce 1,000 metric tons of CO2e per year.
	20 *years*	The solvent is expecteed to last 20 years before replacement
	50% *%*	Half of the facility's solvent will be sold into the cleaning products market, so only 50% of the facility's output is dedicated to eligible technologies.

Instructions for Recyclers of Qualified Energy Properties

User Input	Calculated or from other tab	Instructions are in yellow boxe

Recycling facilities of qualified energy properties should complete each green cell on this tab to indicate annu properties (input) and the products (output) and associated production information. Applicants may referenc tab for assistance.

Fuel Information

Input Technology Area		**If selected 'Other', explain here**	Select the recycling ir material da
Output Technology Area		**If selected 'Other', explain here**	Select the recycling o critical mat

Annual Attributable Production Capacity (AAPC)

Descriptor	**Data**	**Units**	**Notes/Inst**
Recovery Rate		*Mass/Unit*	Projected (
Annual Production Capacity		*Unit/year*	Projected (produced. MWh, tonı

es next to the corresponding inputs al production. These metrics include the recycled e the example to the right and/or the Assumptions

	EXAMPLE
most representative technology area for the nput. If the input is a critical material, use the critical ata sheet and application	Input Technology Area
most representative technology area for the utput. If the output is a critical material, fill out the terial data sheet	Output Technology Area

ructions	EXAMPLE **Descriptor**
(not peak or potential) recovered rate	Recovery Rate
(not peak or potential) number of output units Fill in the Unit column with the appropriate unit e.g. nes, etc	Annual Production Capacity

Electric or fuel cell vehicles - 48C(c)(1)(A)(i)(VII)	**If selected 'Other', explain here**	Select the most representative technology area for the recycling input. If the input is a critical material, use the critical material data sheet and application
Electric or fuel cell vehicles - 48C(c)(1)(A)(i)(VII)	**If selected 'Other', explain here**	Select the most representative technology area for the recycling input. If the output is a critical material, select other and write in the critical material

Data	**Units**	**Notes/Instructions**
0.5	*g Li/battery cell*	Projected (not peak or potential) recovered rate
100,000	*kg Li/year*	Manufacturer produces 100,000 kg of of Lithium from recycled batteries inputs

Instructions for Manufacturers of Other Greenhouse Gas Reduction Equipment

User Input	Calculated or from other tab	Instructions are in yellow boxe

Manufacturing facilities for other equipment designed to reduce greenhouse gas emissions should complete e include metrics to understand the performance of the product in its ultimate use. Applicants may reference th

Provide Brief Description of Output			In 10 words qualifies fo

Annual Attributable Production Capacity (AAPC)

Descriptor	Data	Units	Notes/Instr
Base Unit		Unit	Describe th
Annual Production Capacity		*Unit/year*	Projected (
Manufacturing Contribution		*$/Unit*	Value adde upstream c
Total Cost of Emissions Reduction Component		*$/Unit*	Price to enc balance of
CO2e Reduction Per Unit		*Metric tons CO2e/unit*	Annual CO2 that reduce Assumptior
Deployed Property Lifetime		*years*	See *Assump* typical use.
Share of Facility Output		*%*	Percentage eligible equ

s next to the corresponding inputs
ach green cell on this tab to indicate annual production. These
e example to the right and/or the Assumptions tab for assistance.

s or less, describe what product the facility produces and why it
r the 48C tax credit

ructions

e unit of production

not peak or potential) number of units manufactured annually.

d contribution to system (excludes price paid for feedstock materials,
omponents, etc.).

d user of total system hardware (e.g., full CCS system) including
system but excluding installation labor costs.

2-equivalent emissions reductions per unit deployed. For equipment
s non-CO2 emissions, applicants can use the "CO2 Equivalency
ns" on the *Assumptions* tab.

otions tab for common capacity factors, based on assumptions of
Number of years the deployed equipment will operate.

of a project (i.e., manufacturing facility) that will be allocated to
ipment. Entries must be a value between 0 and 1.

Baseline Metrics and Conversion Factors	
Metric	**Value**
MJ per gallon of gasoline	120
BTUs per gallon of gasoline	114,000
Annual Miles Traveled (average new light-duty vehicle)	10,850
Baseline Vehicle Fuel Economy	24
Vehicle Cost (2021 average new light-duty vehicle)	42,000

CO2 Equivalency Assumptions	
Original Metric	**CO2e Emissions (metric tons)**
Metric ton of CO2	1
Metric ton of Methane	22.7
Metric ton of Nitrous Oxide	270
Metric ton of HFCs/PFCs	Various (use EPA calculator be
Metric ton of SF6	20,684
Gallon of gasoline avoided	0.009
Megawatt-hour of electricity avoided	0.709

Source: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

Common Service Life Assumptions	
Technology	**Service Life Years**
General suggestion (for technologies excluded below)	*20*
Distributed Solar Photovoltaics - Modules	26
Distributed Solar Photovoltaics - Inverters	21
Distributed Wind	20
Battery Storage - Cells	10
Battery Storage - String Inverters	15
Fuel Cell	10
Micro Turbine	10
Air-Source Heat Pump	9 to 22
Electric Rooftop Heat Pump	21
Ground-Source Heat Pump	8 to 21
Grid Modernization Equipment	25
Light-duty Vehicle	16
Utility-scale PV	30
Utility-scale Wind	30
Utility-scale Fuel Cells	30
Utility-scale Combustion Turbines	30

Common Capacity Factor Assumptions	
End Use Energy Product (Technology)	**Capacity Factor (%)**
Biomass (general)	52%
Geothermal	73%
Grid - Transmission/Transportation	65%
Grid Equipment - Interconnection	80%
Landfill gas utilization (general)	80%
Solar Thermal	28%
Solar Photovoltaic (general)	20%

Storage	10%
Storage – Pumped Hydro	N/A
Storage – Adv. Batteries	10%
Storage – Flywheel	N/A
Wind	44%
Wind – Offshore	42%

CO2 Equivalency Assumptions	
Original Metric	**CO2e Emissions (metric tons)**
Metric ton of CO2	1
Metric ton of Methane	22.7
Metric ton of Nitrous Oxide	270
Metric ton of HFCs/PFCs	Various (use EPA calculator be
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Source: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

Units
MJ/GGE
BTU/GGE
miles
mpg
$

low)

Notes
https://www.eia.gov/analysis/studies/buildings/dg_storage_chp/
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However, these technologies will remain in service as long as going-forward revenues (system value) exceed going-forward costs (variable and fixed operating costs). Thus actual service life may be shorter-than or substantially longer than 30-years.

Notes
Fleet capacity factor in 2021
Fleet capacity factor in 2021
Fleet capacity factor in 2021
Based on NEMS EMM Region 20 WECC Southwest
Based on ac kWh delivered and dc watts rated power (Use 25% if ac-to-ac)

Based on NEMS EMM Region 18 and 19: Southwest Power Pool Central and North
Based on NEMS EMM Region 7 NPCC New England

low)