

# CGC Project Benefits Report Template

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PREPARATION GUIDE FOR PHASE II PROPONENTS TO PROGRAM  
OPPORTUNITY NOTICE (PON) 3106

MAY 2015

## Overview

This guide is designed to help applicants to the NYSERDA's Cleaner Greener Communities Phase II program develop the standardized Project Benefits Report (PBR) that must be submitted as part of the proposal to the CFA PON 3106. NYSERDA expects all CGC investment to create near-term benefits, and have the potential to create significant long-term environmental, community, and economic development benefits. All CGC Phase II Category 2 and 3 proponents are required to develop a PBR and submit it with the CFA in the format described in this guide. Successful applicants will have a chance to update the PBR and refine the estimates during project development and execution. A PBR template is available in Attachment A: Project Metrics Report Template.

## Definitions

**CGC Program Performance Metrics:** These are a preliminary set of metrics NYSERDA has identified to track (or predict) the benefits of its entire portfolio of CGC projects. The metrics are shown at the end of this guide in Attachment B: CGC Program Performance Metrics. There are two types of Program Performance Metrics:

Required Performance Metrics (RPM)s: These are metrics NYSERDA anticipates using to demonstrate CGC program value by rolling them up across all projects. The RPMs may be used in other NYSERDA programs. All CGC proponents must therefore estimate potential benefits against all of these metrics. *It is not required, however, that proposals positively impact all these metrics.* The RPMs are as follows:

- GHG savings/year (MTCDE)
- Conventional Energy Savings (MMBTU / Year), defined as a change in use of conventional grid electricity and fossil fuels.
- Conventional Energy Cost Savings / Year (\$)
- Number of Permanent Jobs Created
- NYSERDA CGC Investment (\$)
- Investment by Others (\$)

Sector Common Metrics (SCM): All other non-required CGC Performance Metrics shown in Attachment B are considered to be Sector Common Metrics. NYSERDA would like to record these wherever possible, but understands they are applicable only to select projects. To assist NYSERDA, proponents are strongly encouraged to review metrics in Attachment B and include them in their PBRs where applicable. For example, land use and transportation-related projects and plans would be strongly encouraged to attempt to estimate VMT Reduction as a metric.

**Regional (or local) Sustainability Indicators:** Sustainability indicators describe community performance and are used by planners to set and to track progress towards goals. Under Phase I, the CGC program developed a comprehensive list of potential performance indicators to support the Regional Sustainability Plans. All Category 2 and 3 proponents in this solicitation will be required to demonstrate a project's ability to positively influence indicators in its applicable Regional Sustainability Plan as discussed in Section 4 of the PBR.

## Instructions for Creating a PBR

The PBR format is flexible and designed to let proponents customize it for their needs. Each PBR should contain the four sections discussed below, although not all sections will require content. Once complete the proponent should save the document in PDF format and name it “CFA ##### Project Benefits Report” to be included as an attachment in the CFA in response to question Q\_3497. PBRs should be kept concise and limited to no more than five pages.

### Standard Format of the PBR

#### Section 1. Benefits Overview

Provide a brief description of the components of the proposal that will result in the benefits discussed in the statement. [limited to 150 words]

#### Section 2. Expected Annual Benefits by Close of CGC Project Period

This section describes the cumulative and/or effective annual rate of benefits proponents expect to achieve by close of CGC funding. For example, if a project installs equipment in its last month, the annual savings rate would be the effective rate expected from that point forward from final installation. The section is only required for Category 3 projects with tangible infrastructure or technology components, and/or for programs that expect to engage markets or communities during the CGC funding period. Other proponents, including most Category 2 proponents, should list “N/A” under this heading in their PBR and move to Section 3.

#### Section 2 Instructions

Proponents should review Attachment B: CGC Program Performance Metrics and prepare a table as shown below that includes all required metrics (RPMs) and any optional sector common metrics (SCMs) relevant to the project. For example, smart growth and transportation-related projects are strongly encouraged to include the SCM “VMT Reduction” in the table. In addition proponents are encouraged to include in the table any other custom metrics that they feel will convey the benefits of the proposed project as shown above.

Section 2: CGC Benefits by Point of Project Close			
Type	Metric	Direct	Indirect
RPM	Permanent Jobs Created (FTE)		
RPM	NYSERDA CGC Investment (\$)		N/A
RPM	Investment by Others (matching and leveraged)		
RPM	Conventional Energy Savings (MMBTU/year)		
RPM	Natural Gas Savings (therms/year)		
RPM	Grid Electricity Savings (KWh/year)		
RPM	Gasoline Savings (gallons / year)		
RPM	Diesel Savings (gallons / year)		
RPM	Fuel Oil Savings (gallons / year)		
RPM	Conventional Energy Cost Savings (\$ / year)		
RPM	GHG Savings (MTCDE / year)		

Only RPMs for energy types that will be impacted by the project need be included.

SCM	(Optional) SCM Metric 1 (From Attachment B)		
SCM	(Optional) SCM Metric 2, and so on... (From Attachment B)		
Custom	List all other metrics in separate rows		

Proponents should quantify and report benefits in the table. Below it they should concisely *summarize* methods, baseline assumptions, use of external tools, references to studies and protocol, etc. Each metric, and associated methods, should be listed separately.

For GHG savings from grid electricity use, proponents are required to use NYSERDA’s state average GHG emission factor of 625 lbs CO<sub>2</sub>e/MWh. They should refer to *Attachment C: Calculating GHG Emissions* for emissions factors from all fuels needed to convert energy savings to GHG emission savings.

*Direct vs. Indirect Benefits*

CGC projects can create benefits in operations and in the wider community around them. Therefore in Section 2 proponents should do their best to list benefits separately as “direct” and “indirect” in the table above. In general “direct” benefits are those achieved by the components specifically attributed to CGC funding, while “indirect” benefits include all others such as:

- Benefits achieved by the project as a whole, including non-CGC portions.
- Benefits achieved by others because of the project such as savings by residents moving to a community redevelopment that now have lower energy bills and transportation needs.
- Benefits achieved by residents and businesses participating in a CGC-supported market or service.
- Benefits achieved by energy and/or land use policies or programs that cause shifts in consumption patterns in communities.
- Any other benefits a proponent can reasonably argue are indirectly caused by the proposed project.

Proponents are encouraged to think holistically about how their projects may directly and indirectly impact the communities they are in. Because indirect benefits have the potential to be larger than direct benefits, NYSERDA will evaluate the *reasonableness* of the estimates rather than the magnitude of estimates. If a proponent has questions, they may contact the CGC team prior to submission.

**Section 3. Potential for Future and/or Long Term Transformational Benefits**

This section is an opportunity for proponents to demonstrate how projects will manifest and grow benefits in the future. NYSERDA is particularly interested in understanding how CGC investments have the potential to foster long term and wide-spread market transformation toward sustainability.

This section is required for all Category 2 planning and Category 3 program related proposals. However, all proponents are encouraged to report potential long term benefits. For proposals that do not anticipate benefits growing beyond the funded project period, they should list “N/A” under this heading and move to Section 4.

*Section 3 Instructions*

Proponents should review Attachment B: CGC Program Performance Metrics and prepare a table as shown below that includes all required metrics (RPMs) and any optional metrics (SCMs) that they believe relevant to the project. For example, smart growth and transportation-related projects are strongly encouraged to include the SCM “VMT Reduction.” In addition proponents are encouraged to include in the table any other custom metrics that they feel will convey the benefits of the proposed project. The Section 3 table should have three columns labeled “by 5 years,” “by 15 years,” and “by 30 years” representing potential near, mid, and long term benefits.

Section 3: Future and Long Term Transformation Benefits				
Type	Metric	by 5 years	by 15 Years	by 30 Years
RPM	Permanent Jobs Created (FTE)			
RPM	NYSERDA CGC Investment (\$)	NA	NA	NA
RPM	Investment by Others (matching and leveraged)			
RPM	Conventional Energy Savings (MMBTU/year)			
RPM	Natural Gas (therms/year)			
RPM	Grid Electricity (KWh/year)	<div style="border: 1px solid black; padding: 5px; width: fit-content;">                     Only RPMs for energy types that will be impacted by the project need be included.                 </div>		
RPM	Gasoline Savings (gallons / year)			
RPM	Diesel Savings (gallons / year)			
RPM	Fuel Oil Saving (gallons / year)			
RPM	Propane Savings (gallons / year)			
RPM	Conventional Energy Cost Savings (\$ / year)			
RPM	GHG Savings (MTCDE / Year)			
SCM	(Optional) SCM Metric 1 (From Attachment B)			
SCM	(Optional) SCM Metric 2, and so on... (From Attachment B)			
Custom	List all other metrics in separate rows			

Proponents should attempt, to the best of their ability, to forecast and report quantifiable potential benefits in the table. NYSERDA understands these forecasts are highly uncertain and will not require proponents to achieve these estimates. For those that want to identify a metric as a benefit but are unable or unwilling to forecast a benefit, they can simply list “TBD” in the table.

Below the table in the PBR, proponents should include a concise *summary* of how they projected each metric, listing assumptions, methods, and data sources. For long term benefits proponents may use local modeling or cite research studies, literature, and other peer-reviewed rule of thumb sources and tools to estimate long term benefits of policies. For metrics listed “TBD,” proponents can describe qualitatively why and how they think the listed metrics will be positively impacted and on what timeframe. Proponents should list each metric separately.

For GHG savings from grid electricity use, proponents are required to use the NYSERDA state average GHG emission factor of 625 lbs CO<sub>2</sub>e/MWh. They should refer to *Attachment C: Calculating GHG Emissions* for emissions factors from all fuels needed to energy savings to GHG emission savings.

### *What are long term transformation benefits and how to estimate them?*

Long term benefits are those that grow directly, or indirectly, from CGC projects. NYSERDA anticipates that its CGC investments will be poised to inspire, grow, and facilitate market transformation to sustainable practices and services. Some examples of transformational benefits include:

- A Category 3 project may demonstrate growing benefits through its intent to scale up, or from its potential to be replicated.
- A specific transit investment or plan may create transformational benefits as it grows ridership and attracts investment to the region.
- Neighborhood redevelopment with LEED-ND principles may attract investment, jobs, and reduce energy use and GHG emissions among residents and businesses through compact development.
- A market transformation project for renewable energy will grow benefits as that market grows.
- Investment in public policy and planning can create significant long term environmental, social, and economic benefits in communities.

There is no rule to make these forecasts, although proponents are encouraged to look for tools, resources, and studies in their sectors to help them make estimates. Recognizing that estimates are speculative and may vary widely between proponents for even similar projects, NYSERDA will favor quality and reasonableness of the assumptions over quantity. Examples of reasonableness include:

- A statement that a project will attract \$100 million in commercial investment and create 500 jobs within 10 years will be considered more reasonable if it is backed by a bona fide Market Analysis study as opposed to simple offhand assumptions.
- A statement that the benefits of a pilot project will grow through replication will be considered more reasonable if the proposal appears to have a strategic approach for fostering market transformation, as opposed to simply asserting that a good idea will replicate on its own.
- Forecasted benefits from programs, policy development, and planning activities will be considered more reasonable if they can cite literature, research, performance of peers, or other references that back assumptions of performance and growth.

### **Section 4. Potential to Impact Regional and Local Sustainability Indicators**

This section must be developed by all proponents to categories 2 and 3. NYSERDA anticipates all CGC investments will positively support the long term goals and indicators adopted in their region's CGC Phase I Regional Sustainability Plan.

Sustainability Indicators are different from CGC Program Performance Metrics in that they describe community and regional sustainability performance. Indicators are diverse and cover a vast array of sectors from community livability, land use and transportation, climate adaptation, economic development, and many other sectors. Proponents can find resources on the [CGC Phase II Guidance Document website](#) including:

- Full Regional Sustainability Plans (RSPs)

- A convenient summary of RSP indicators and goals adopted by regions in excel format
- A Sustainability Indicators Guidance Document that includes a description of how indicators were calculated at a regional level

*Section 4 Instructions*

Proponents should review the indicators adopted in their RSP. All proponents should create a table of indicators in the format shown below and list at least two RSP indicators they expect to be positively influenced by the proposal. In addition, proposals to Category 2 for comprehensive or sustainability planning should also include an additional 3-5 local sustainability indicators it expects to target through its planning process. The Sustainability Indicators Guidance Document is an excellent resource to start identifying additional potential indicators.

Proponents should enter a baseline value for the indicator in the table, if known. Otherwise proponents can list the value as “TBD.” *Proposals for community-scale plans are encouraged to draw indicators that are already known for the community.* They should also indicate in the “in RSP?” column if the metric is listed in the region’s RSP. For the brief description of impact (one line only), proponents can estimate an actual change, list a potential goal, or simply provide a description of how the indicator will likely change.

Section 4: Potential to Impact Regional and Local Sustainability Indicators			
Indicator	In RSP?	Baseline (if known)	Brief one-line description of impact
Indicator 1	Yes		
Indicator 2	No		
List all indicators....	etc.		

Below the table, proponents should include a concise *summary* of the basis for each indicator’s one-line impact statement. This may include a rational for the project’s linkage to an indicator, references to studies, additional qualitative description, application of tools, etc. Proponents should list each indicator separately and try to limit description for each indicator to no more than 3-4 sentences.

*How to link Regional sustainability indicators to individual projects?*

Some specific projects may need to include the concept of a “project boundary” when reporting an impact on a regional sustainability indicators. For example, Housing and Transportation Index is commonly adopted in Regional Sustainability Plans. This index is the percent of household income spent on transportation plus housing. A specific urban redevelopment project will positively impact this indicator, but its singular impact may not manifest over a regional average. Therefore the proponent could assume the “project boundary” to be the future population of the redevelopment and compare this group’s expected Housing and Transportation Index to the regional average as a means to show benefit.

# Attachment A: Project Metrics Report Template

## CFA #####, Project Benefit Report

[Project Title]

### Section 1. Benefits Overview

Provide a brief description of the components of the proposal that will result in the benefits discussed in the statement. [limited to 150 words]

### Section 2. Expected Annual Benefits by Close of CGC Project Period

[List N/A under heading if section excluded]

Section 2: CGC Benefits by Point of Project Close			
Type	Metric	Direct	Indirect
RPM	Permanent Jobs Created (FTE)	[e.g., 25]	
RPM	NYSERDA CGC Investment (\$)	[e.g., 2,300,000]	N/A
RPM	Investment by Others (matching and leveraged)		
RPM	Conventional Energy Savings (MMBTU/year)		
RPM	Natural Gas Savings (therms/year)		
RPM	Grid Electricity Savings (KWh/year)		
RPM	Gasoline Savings (gallons / year)		
RPM	Diesel Savings (gallons / year)		
RPM	Fuel Oil Savings (gallons / year)		
RPM	Conventional Energy Cost Savings (\$ / year)		
RPM	GHG Savings (MTCDE / year)		
SCM	(Optional) SCM Metric 1 (From Attachment B)		
SCM	(Optional) SCM Metric 2, and so on... (From Attachment B)		
Custom	List all other metrics in separate rows		

Fill in an estimated value in all cells, or list "N/A". Use units in table.

Only RPMs for energy types that will be impacted by the project need be included.

Methods and Assumptions [entry for each row in table]

**Metric 1:** Concisely summarize methods, baseline assumptions, data sources, protocol, studies, ad hoc assumptions, etc., used to make the estimates. Referencing a known method or protocol can replace the need to provide a detailed description thereof. Describe basis of classifying benefits as direct, indirect, or both where applicable.

**Metric 2:** [methods discussion....]

**Metric 3:** [methods discussion....]

**Metric 4:** and so on...

### Section 3. Potential for Future and/or Long Term Transformational Benefits

[List N/A under heading if section excluded]

Section 3: Future and Long Term Transformation Benefits				
Type	Metric	by 5 years	by 15 Years	by 30 Years
RPM	Permanent Jobs Created (FTE)			
RPM	NYSERDA CGC Investment (\$)	NA	NA	NA
RPM	Investment by Others (matching and leveraged)			
RPM	Conventional Energy Savings (MMBTU/year)	25,000	40,000	
RPM	Natural Gas (therms/year)			
RPM	Grid Electricity (KWh/year)			
RPM	Gasoline Savings (gallons / year)			
RPM	Diesel Savings (gallons / year)			
RPM	Fuel Oil Saving (gallons / year)			
RPM	Conventional Energy Cost Savings (\$ / year)			
RPM	GHG Savings (MTCDE / Year)			
SCM	(Optional) SCM Metric 1 (From Attachment B)			
SCM	(Optional) SCM Metric 2, and so on... (From Attachment B)			
Custom	List all other metrics in separate rows			

Only RPMs for energy types that will be impacted by the project need be included.

Fill in an estimated value in all cells, or list "N/A". Use units in table. Benefits need not be projected for all time periods.

Methods and Assumptions [entry for each row in table]

**Metric 1:** Describe custom methods, forecast assumptions, models, studies, growth rates, data sources, etc., used to make the estimates. For metrics listed as "TBD" according to instructions, explain qualitatively the potential impact and on what timeframe.

**Metric 2:** and so on....

### Section 4. Projected Impact on Regional and Local Sustainability Indicators

Section 4: Potential to Impact Regional and Local Sustainability Indicators			
Indicator	In RSP?	Baseline (if known)	Brief one-line description of impact
Indicator 1 (unit)	Yes	list value, or TBD	
Indicator 2 (unit)	No		
List all indicators....	etc.		

Methods and Assumptions [entry for each row in table]

**Indicator 1:** include a concise *summary* of the basis of each indicator, references to studies, additional qualitative description, application of tools, explanation of impact, etc.

**Indicator 2:** and so on...

## Attachment B: CGC Program Performance Metrics

This table includes a preliminary list of metrics that NYSERDA would like to roll up across all CGC projects to help demonstrate program impact.

**Required Performance Metrics (RPMs)** should be included in all benefit tables included in Section 2 and Section 3 Project Benefit Reports (PBRs). For Energy, only RPMs for specific energy types affected need be included.

**Sector Common Metrics (SCMs)** are optional for Section 2 and Section 3 PBR responses. NYSERDA encourages proponents to include them if their projects will provide benefits to them.

Sector	Type	Metric	Unit
Environment	RPM	GHG Emissions Savings / year	MTCDE/year
Energy	RPM	Total Conventional Energy Savings	MMBTU
	(below)	Conventional Energy Savings (By Type)	(See below)
	RPM	Natural Gas Savings (or increase)	therms / year
	RPM	Grid Electricity Savings (or increase)	KWh / year
	RPM	Gasoline Savings (or increase)	gallons / year
	RPM	Diesel Savings (or increase)	gallons / year
	RPM	Fuel Oil Savings (or increase)	gallons / year
	RPM	Propane Savings (or increase)	gallons / year
	SCM	Biomass Fuel Created	MMBTU / year
	SCM	Renewable Electricity Created	MWh / year
	SCM	Installed Solar/Wind/Geothermal Capacity	MW
	SCM	Number of new LEED or Certified Buildings	number
Transportation	SCM	Vehicle-Miles-Traveled (VMT) reduced	miles / year
	SCM	Use of CNG	MMBTU / year
	SCM	Use of Ethanol	gallons / year
	SCM	Use of Biodiesel	MMBTU / year
	SCM	Use of Electricity in Vehicles	MWh / year
	SCM	Number of alternative vehicles on road	number
Waste Management	SCM	Organic MSW, sewage sludge, or other waste Composted or Digested	tons / year
	SCM	Landfill / WWTP Gas Captured	MMBTU / year
	SCM	Solid Waste Diverted	tons / year
Economic	RPM	Conventional Energy Cost Savings	\$
	RPM	Permanent Jobs Created	number
	RPM	NYSERDA CGC Investment (funding requested)	\$
	RPM	Investment by Others I(matching and leveraged)	\$
	SCM	Operational / Lifecycle Cost Savings	\$ / year
	SCM	Revenue Generated by New or Increased Business	\$ / year

## Attachment C: Calculating GHG Emissions

Proponents can use the tables below to convert energy savings into GHG emissions. All proponents, regardless of where they are in the state, are required to use NYSERDA’s State Average emission factor of to convert any grid electricity usage or savings into GHG emissions. GHG savings should be reported in units of MTCDE, or “Metric Tons of Carbon Dioxide Equivalent,” or 1000kg CO<sub>2</sub>e. The factors listed in the last column in the chart below would need to be divided by 1000.

NYSERDA does not expect that proponents be experts in GHG calculations, and will work with successful proponents to refine and improve GHG benefit estimates where needed. Proponents may contact the CGC team with questions, and may indicate in their PBRs that they require assistance.

### Fuel (Scope 1) and Electricity (Scope 2) Emission Factors

Fuel Type	Heating Value	CO <sub>2</sub> Factor	CH <sub>4</sub> Factor	N <sub>2</sub> O Factor	CO <sub>2</sub> e
<b>Electricity Consumption (Scope 2)</b>		lb/MWh	lb/GWh	lb/GWh	kg/MWh
NYSERDA State Average		625	--	--	283.5
<b>Solid Fuels</b>	mmBtu / ton	kg / mmBtu	g / mmBtu	g / mmBtu	kg/mmBtu
Anthracite Coal	25.09	103.54	11	1.60	104.27
Bituminous Coal	24.93	93.40	11	1.60	94.13
Sub-bituminous Coal	17.25	97.02	11	1.60	97.75
Lignite Coal	14.21	96.36	11	1.60	97.09
Mixed (Commercial Sector)	21.39	95.26	11	1.60	95.99
Mixed (Electric Power Sector)	19.73	94.38	11	1.60	95.11
Mixed (Industrial Coking)	26.28	93.65	11	1.60	94.38
Mixed (Industrial Sector)	22.35	93.91	11	1.60	94.64
Coke	24.80	102.04	11	1.60	102.77
Municipal Solid Waste	9.95	90.70	32	4.20	92.67
Petroleum Coke (Solid)	30.00	102.41	32	4.20	104.38
Plastics	38.00	75.00	32	4.20	76.97
Tires	26.87	85.97	32	4.20	87.94
Agricultural Byproducts	8.25	118.17	32	4.20	120.14
Peat	8.00	111.84	32	4.20	113.81
Solid Byproducts	25.83	105.51	32	4.20	107.48
Wood and Wood Residuals	15.38	93.80	32	4.20	95.77
<b>Gaseous Fuels</b>	mmBtu / scf	kg CO <sub>2</sub> / mmBtu	g CH <sub>4</sub> / mmBtu	g N <sub>2</sub> O / mmBtu	kg / mmBtu
Natural Gas (per scf)	0.001028	53.02	1.000	0.100	53.072
Blast Furnace Gas	0.000092	274.32	0.022	0.100	274.351
Coke Oven Gas	0.000599	46.85	0.480	0.100	46.891
Fuel Gas	0.001388	59.00	0.022	0.100	59.031
Propane Gas	0.002516	61.46	0.022	0.100	61.491
Biogas (Captured Methane)	0.000841	52.07	3.200	0.630	52.333

## Fuel (Scope 1) and Electricity (Scope 2) Emission Factors

Fuel Type	Heating Value	CO <sub>2</sub> Factor	CH <sub>4</sub> Factor	N <sub>2</sub> O Factor	CO <sub>2</sub> e
Liquid Fuels	mmBtu / gallon	kg CO <sub>2</sub> / mmBtu	g CH <sub>4</sub> / mmBtu	g N <sub>2</sub> O / mmBtu	kg/ mmBtu
Asphalt and Road Oil	0.158	75.36	3.0	0.60	75.609
Aviation Gasoline	0.120	69.25	3.0	0.60	69.499
Butane	0.101	65.15	3.0	0.60	65.399
Butylene	0.103	67.73	3.0	0.60	67.979
Crude Oil	0.138	74.49	3.0	0.60	74.739
Distillate Fuel Oil No. 1	0.139	73.25	3.0	0.60	73.499
Distillate Fuel Oil No. 2	0.138	73.96	3.0	0.60	74.209
Distillate Fuel Oil No. 4	0.146	75.04	3.0	0.60	75.289
Ethane	0.069	62.64	3.0	0.60	62.889
Ethylene	0.100	67.43	3.0	0.60	67.679
Heavy Gas Oils	0.148	74.92	3.0	0.60	75.169
Isobutane	0.097	64.91	3.0	0.60	65.159
Isobutylene	0.103	67.74	3.0	0.60	67.989
Kerosene	0.135	75.20	3.0	0.60	75.449
Kerosene-type Jet Fuel	0.135	72.22	3.0	0.60	72.469
Liquefied Petroleum Gases (LPG)	0.092	62.98	3.0	0.60	63.229
Lubricants	0.144	74.27	3.0	0.60	74.519
Motor Gasoline	0.125	70.22	3.0	0.60	70.469
Naphtha (<401 deg F)	0.125	68.02	3.0	0.60	68.269
Natural Gasoline	0.110	66.83	3.0	0.60	67.079
Other Oil (>401 deg F)	0.139	76.22	3.0	0.60	76.469
Pentanes Plus	0.110	70.02	3.0	0.60	70.269
Petrochemical Feedstocks	0.129	70.97	3.0	0.60	71.219
Petroleum Coke	0.143	102.41	3.0	0.60	102.659
Propane	0.091	61.46	3.0	0.60	61.709
Propylene	0.091	65.95	3.0	0.60	66.199
Residual Fuel Oil No. 5	0.140	72.93	3.0	0.60	73.179
Residual Fuel Oil No. 6	0.150	75.10	3.0	0.60	75.349
Special Naphtha	0.125	72.34	3.0	0.60	72.589
Still Gas	0.143	66.72	3.0	0.60	66.969
Unfinished Oils	0.139	74.49	3.0	0.60	74.739
Used Oil	0.135	74.00	3.0	0.60	74.249
Biodiesel (100%)	0.128	73.84	1.1	0.11	73.897
Ethanol (100%)	0.084	68.44	1.1	0.11	.057
Rendered Animal Fat	0.125	71.06	1.1	0.11	71.117
Vegetable Oil	0.120	81.55	1.1	0.11	81.607

**Sources:** Solid, gaseous, liquid and biomass fuels: Federal Register (2009) EPA; 40 CFR Parts 86, 87, 89 et al; Mandatory Reporting of Greenhouse Gases; Final Rule, 30Oct09, 261 pp. Tables C-1 and C-2 at FR pp. 56409-56410. Revised emission factors for selected fuels: Federal Register (2010) EPA; 40 CFR Part 98.