

Clean Energy Transformation Rule: Stakeholder Meeting

January 14, 2020



Clean Energy Transformation Rule Agenda

- 1:30 p.m. **Introductions and Welcome**
Ben Blank
- 1:40 p.m. **Overall scope and approach of the rule**
Bill Drumheller
- 2:25 p.m. **GHG emission content calculation for electricity – draft rule language**
Neil Caudill
- 3:15 p.m. Break**
- 3:25 p.m. **Energy Transformation Projects-** preliminary discussion
Bill Drumheller
- 4:15 p.m. **Next steps**
Debebe Dererie
- 4:30 p.m. Adjourn



Clean Energy Transformation Act: Proposed Ecology Approach & Rulemaking

Bill Drumheller
Air Quality Program

Rulemaking Meeting #1
January 14, 2020

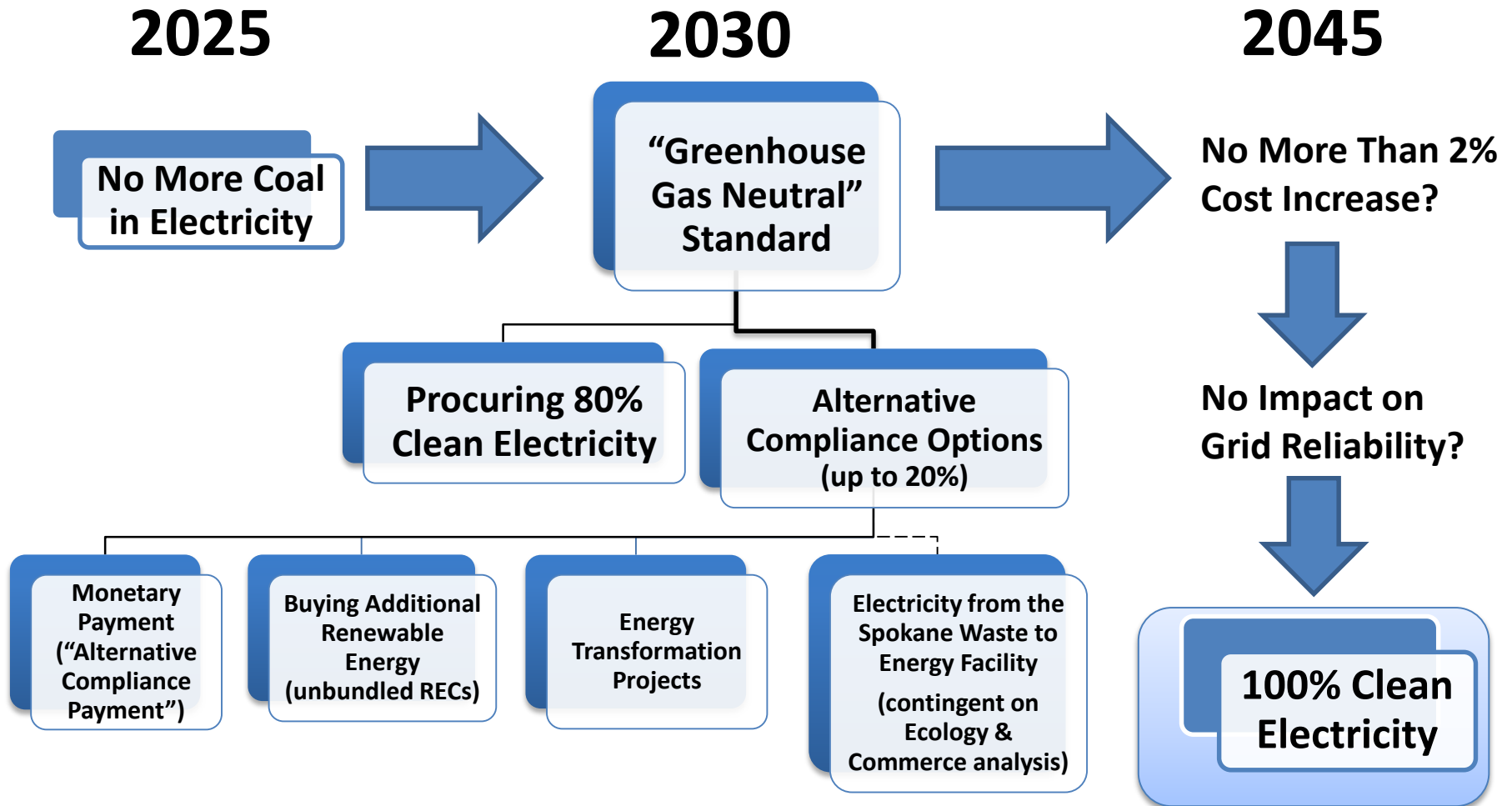


Goals for This Session

- Brief explanation of the Clean Energy Transformation Act (CETA)
- Explain Ecology's role in CETA
- Provide a high-level overview of Ecology's CETA strategy and how this rulemaking fits that strategy
- In-depth discussion about each of the two rule topics



Clean Energy Transformation Act: Transition to 100% Clean Electricity



Clean Energy Transformation Act

What is “Clean Energy” ?

Renewable Resources

Geothermal
Biodiesel
Biomass
Renewable Natural Gas

Wind
Solar
Water (hydropower)
Ocean/Wave/Tidal
Renewable Hydrogen

Non-emitting Resources*

Nuclear
Grid technologies

Electricity Efficiency & Conservation

*These resources
have no emissions*

* “Non-emitting electric generation” excludes “renewable resources” by definition

Rulemaking

Greenhouse Gas (GhG) Content Calculation

- Known sources
- Unspecified power

RCW 19.405.070 & 19.405.020 (22)

Energy Transformation Projects (ETPs)

- Determine ETP types
- “Criteria” for ETPs
- Program requirements

RCW 19.405.040 & RCW 19.405.100

Ecology's Role in CETA

RCW 19.405.040 (1)(b)(iv)

Spokane Waste to Energy Determination

- Life-cycle GhG analysis (with Commerce)

Advisory Bodies & Workgroups

- EFSEC transmission
- Others as invited

Outside of Rule



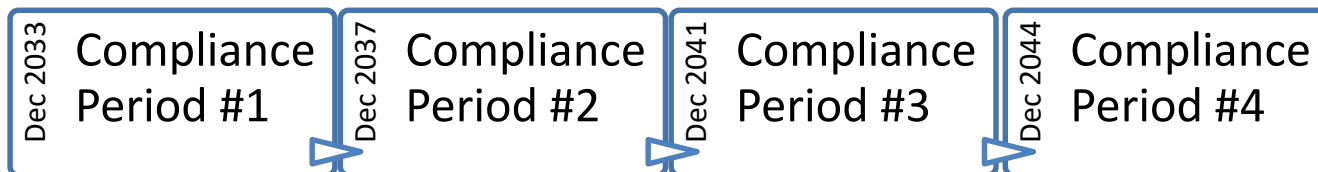
Ten Years Until First Compliance Period

- CETA law takes effect May 2019
- Ecology rulemaking began October 2019

Initial rulemaking deadline (December 2020)



Greenhouse Gas Neutral Standard (January 2030)



100% Clean Energy Standard (January 2045)



Ecology CETA Work Timetable

Rulemaking Processes

2019-2020:
Initial
Rulemaking

- Finish greenhouse gas content calculation rule
- Establish processes for energy transformation projects (ETPs)

Unspecified
Power
Rulemaking

- Consider whether to update unspecified emission factor

Follow-up
Rulemakings
(if necessary)

Administrative Processes

Types of
ETPs

- Identify potentially eligible ETP types

ETP Process
& Protocols

- Establish ETP program
- Project applications
- Develop protocols
- Project evaluations

Beginning of Compliance: 2030

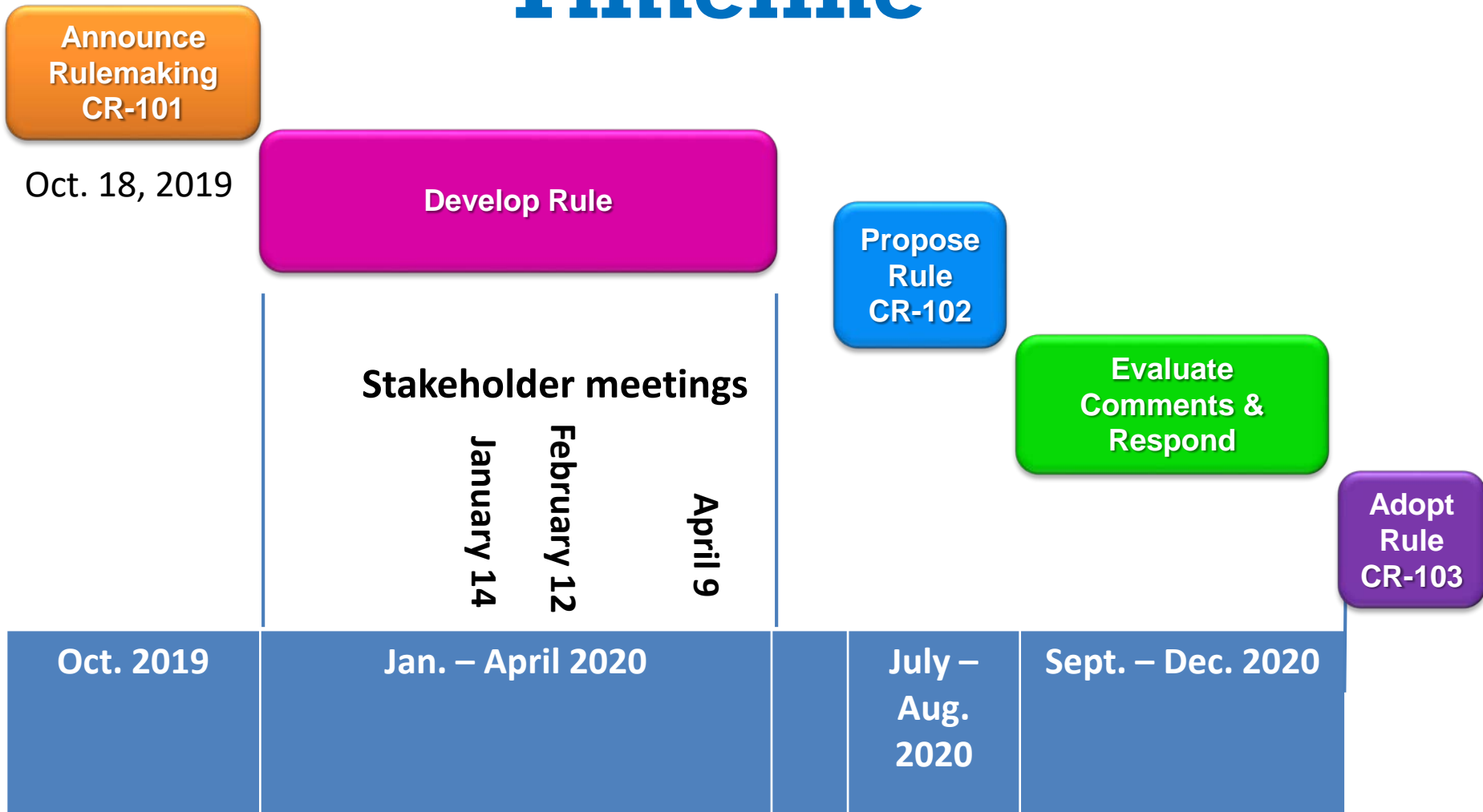


Initial Ecology Rulemaking

- Establish a process for determining energy transformation project types
- Establish a process and the requirements for developing the standards, methodologies, and procedures for evaluating energy transformation projects
- Create the greenhouse gas content calculation



Ecology Rulemaking Timeline





Questions and Discussion

Greenhouse Gas (GHG) Content Calculation

Neil Caudill
Air Quality Program

Rulemaking Meeting #1
January 14, 2020



Goals for This Session

- Go over method as written, discuss, and get feedback
- GHG content calculation statutory direction
- Calculation framework
- Data sources
- Method selection
- Calculation overview
- Examples
- Rule language discussion



Statutory Language: Rules

- 100(9): Pursuant to the administrative procedures act, Chapter 34.05 RCW, rules needed for the implementation of this chapter must be adopted by January 1, 2021, unless specified otherwise elsewhere in this chapter. These rules may be revised as needed to carry out the intent and purposes of this chapter.



Statutory Language: Concept

- "Greenhouse gas content calculation" means a calculation expressed in carbon dioxide equivalent and made by the department of ecology, in consultation with the department, for the purposes of determining the emissions from the complete combustion or oxidation of fossil fuels and the greenhouse gas emissions in electricity for use in calculating the greenhouse gas emissions content in electricity.



Statutory Language: GHGs

- "Greenhouse gas" includes carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and any other gas or gases designated by the department of ecology by rule under RCW 70.235.010.



Statutory Language: Fuel Mix Disclosure

- 070(1): Each electric utility must provide to the department, in the case of a consumer-owned utility, or to the commission, in the case of an investor-owned utility, its greenhouse gas content calculation in conformance with this section. A utility's greenhouse gas content calculation must be based on the fuel sources that it reports and discloses in compliance with chapter 19.29A RCW. An investor-owned utility must also report the information required in this subsection to the department.



Statutory Language: Unspecified

- 070(2): For unspecified electricity, the utility must use an emissions rate determined, and periodically updated, by the department of ecology by rule. The department of ecology must adopt an emissions rate for unspecified electricity consistent with the emissions rate established for other markets in the western interconnection. If the department of ecology has not adopted an emissions rate for unspecified electricity, the emissions rate that applies for the purposes of this chapter is 0.437 metric tons of carbon dioxide per megawatt-hour of electricity.
- "Unspecified electricity" means an electricity source for which the fuel attribute is unknown or has been separated from the energy delivered to retail electric customers.



Statutory Language: Definitions

- **"Non-emitting electric generation"**
 - means electricity from a generating facility or a resource that provides electric energy, capacity, or ancillary services to an electric utility and that does not emit greenhouse gases as a by-product of energy generation.
 - "Non-emitting electric generation" does not include renewable resources.



Statutory Language: Definitions

- **“Renewable resource”** means:
 - water;
 - wind;
 - solar energy;
 - geothermal energy;
 - renewable natural gas;
 - renewable hydrogen;
 - wave, ocean, or tidal power;
 - biodiesel fuel that is not derived from crops raised on land cleared from old growth or first growth forests; or
 - biomass energy.



Statutory Language: Definitions

- **“Biomass energy:”**
 - Includes:
 - organic by-products of pulping and the wood manufacturing process;
 - animal manure;
 - solid organic fuels from wood;
 - forest or field residues;
 - untreated wooden demolition or construction debris;
 - food waste and food processing residuals;
 - liquors derived from algae;
 - dedicated energy crops; and
 - yard waste.
 - Does not include:
 - Wood pieces that have been treated with chemical preservatives such as creosote, pentachlorophenol, or copper-chrome-arsenic;
 - wood from old growth forests; or
 - municipal solid waste.



Statutory Directions

- All GHGs: consistent with reporting (global warming potentials – GWPs)
- Consistent with fuel mix disclosure (FMD) report
- CETA classifications: biomass (MSW counts), renewable, non-emitting
- Unspecified electricity: periodically update, start with 0.437 MT CO₂e/MWh
- Collaborate with Commerce/UTC
- Rules complete 1/1/2021



GHG Content Calculation

- Dual use: informational / FMD and CETA
- Calculated for each source separately, then summed
- Tiered method based on power plant:
 - EPA GHG reporting data
 - EIA reports
 - Unspecified electricity
- Method only, no new reporting to Ecology: Commerce/UTC adopt



EIA Data

 *Independent Statistics & Analysis*
U.S. Energy Information Administration

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Form EIA-923 detailed data with previous form data (EIA-906/920)

Monthly (M) release date: November 29, 2019 for September 2019 data
Next monthly release: End of December 2019 (October 2019 data)
Annual release date: September 20, 2019, Final 2018 data
2018 Re-released: November 21, 2019 [Corrections/Revisions](#)

The survey Form EIA-923 collects detailed electric power data -- monthly and annually -- on electricity generation, fuel consumption, fossil fuel stocks, and receipts at the power plant and prime mover level. Specific survey information provided:

- Schedule 2 - fuel receipts and costs
- Schedules 3A & 5A - generator data including generation, fuel consumption and stocks
- Schedule 4 - fossil fuel stocks
- Schedules 6 & 7 - non-utility source and disposition of electricity
- Schedules 8A-F - environmental data

Monthly data (M) - approximately 2,026 plants from the monthly survey
Annual final data - approximately 2,026 monthly plants + 7,278 plants from the annual survey

The EIA-906, EIA-920, EIA-923 and predecessor forms provide monthly and annual data on generation and fuel consumption at the power plant and prime mover level. A subset of plants, steam-electric plants 10 MW and above, also provides boiler level and generator level data. Data for utility plants are available from 1970, and for nonutility plants from 1999. Beginning with January 2004 data collection, the EIA-920 was used to collect data from the combined heat and power plant (cogeneration) segment of the nonutility sector, also as of 2004, nonutilities filed the annual data for nonutility source and disposition of electricity. Beginning in 2007, environmental data was collected on Schedules 8A – 8F of the Form 923 and includes by-product disposition, financial information, NOX control operations, cooling system operations and FGP and FGD unit operations. Beginning in 2008, the EIA-923 superseded the EIA-906, EIA-920, FERC 423, and the EIA-423. Schedule 2 of the EIA-923 collects the plant level fuel receipts and cost data previously collected on the FERC and EIA Forms 423. [Fuel receipts and costs data prior to 2008.](#)

Power plant data prior to 2001 are separate files for utility and nonutility plants. For 2001 data and subsequent years, the data are Excel spreadsheet files that include data for all plants and make other changes to the presentation of the data.

The Form EIA 906/920 data for 2004-2006 were updated. A new method of allocating fuel consumption between electric power generation and useful thermal output (UTO) was implemented for 2004-2008. This new methodology proportionally distributes a combined heat and power (CHP) plant's losses between the two output products (electric power and UTO). In the historical data, UTO was consistently assumed to be 80 percent efficient and all other losses at the plant were allocated to electric power. This change results in the fuel for electric power to be lower, while the fuel for UTO is higher than the prior set of data as both are given the same efficiency. This results in the appearance of an increase in efficiency of production of electric power between 2003 and 2004. The same methodology is applied to final 2007 and preliminary 2008 data. More information about the methodology can be found in the [Appendix C, Technical Notes, to the Electric Power Monthly](#)

year	format
2019M: EIA-923 September 2019	ZIP
2018: EIA-923	ZIP
2017: EIA-923	ZIP
2016: EIA-923	ZIP
2015: EIA-923	ZIP
2014: EIA-923	ZIP
2013: EIA-923	ZIP
2012: EIA-923	ZIP
2011: EIA-923	ZIP
2010: EIA-923	ZIP
2009: EIA-923	ZIP
2008: EIA-923	ZIP
2007: EIA-906/920/923	ZIP
2006: EIA-906/920	ZIP
2005: EIA-906/920	ZIP
2004: EIA-906/920	ZIP
2003: EIA-906	ZIP
2002: EIA-906	ZIP
2001: EIA-906	ZIP
All data prior to 2019 are final.	

Historical data

<https://www.eia.gov/electricity/data/eia923/>



EPA Data



2018 Greenhouse Gas Emissions from Large Facilities

Share | View U.S. GHG Inventory | View Other GHGRP Data Products | Help

NEW! Now you can visit ghgdata.epa.gov from your mobile device. [Click here to learn how to create a bookmark to our page on your mobile device.](#)

Data Year: 2018 | Data Type: All Emitters | Find a Facility or Location:

Browse to a State: Choose State | Emissions by Fuel Type: Choose Fuel Type | Filter By: Greenhouse Gas | Emission Range | Filter By Status: All Facilities

Data View: Map | List | Trends | Bar Chart | Pie Chart

APPLY SEARCH | Clear Filter | Export Data

Sector	Power Plants	Petroleum and Natural Gas Systems	Refineries	Chemicals	Other	Minerals	Waste	Metals	Pulp and Paper	Total Reported Emissions
2018 GHG Emissions (Million Metric Tons CO ₂ e)	1,815	316	181	191	130	116	109	94	36	2,987
# of Reporting Facilities	1,389	2,319	140	457	1,316	383	1,498	304	218	7,655

Map | Satellite

Map data ©2020 Google, INEGI, ORION-ME | Terms of Use

This data set does not reflect total U.S. GHG emissions. Learn more about related EPA GHG data sources. Data reported to EPA as of 08/04/2019.

FLIGHT R.143

<https://ghgdata.epa.gov/>



EPA Data



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Greenhouse Gas



Selection of Subjects for Customized Search

[<< Return](#)

Step 1: Currently Selected Subject(s)

- Subpart Information

You may now GO TO **Step 2: Retrieve Tables for Selected Subjects**

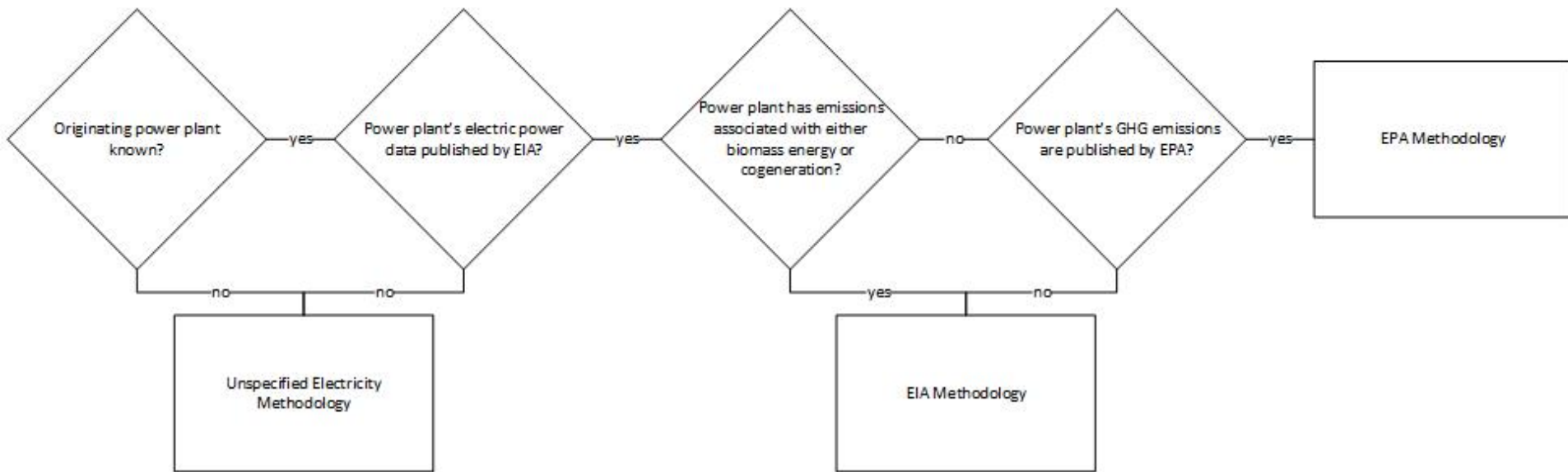
OR select an additional [subject](#) by clicking on one of the underlined subject names listed below.

[Facility Information](#) Address and other location information about the facility.

https://ofmpub.epa.gov/enviro/ad_hoc_table_column_select_v2.retrieval_list?database_type=GHG&selected_subjects=Subpart+Information&subject_selection=+&table_1=+



Method Selection



Example

Source	EIA?	EPA?	Cogen/Bio?	Method
Unspecified				
Small NG Facility				
Nuclear Plant				
Cogen Refinery				
Wood Power Plant				
Waste to Energy				
Coal Power Plant				



Example

Source	EIA?	EPA?	Cogen/Bio?	Method
Unspecified	No			
Small NG Facility	No			
Nuclear Plant	Yes			
Cogen Refinery	Yes			
Wood Power Plant	Yes			
Waste to Energy	Yes			
Coal Power Plant	Yes			



Example

Source	EIA?	EPA?	Cogen/Bio?	Method
Unspecified	No	No		
Small NG Facility	No	No		
Nuclear Plant	Yes	No		
Cogen Refinery	Yes	Yes		
Wood Power Plant	Yes	No		
Waste to Energy	Yes	Yes		
Coal Power Plant	Yes	Yes		



Example

Source	EIA?	EPA?	Cogen/Bio?	Method
Unspecified	No	No	NA	
Small NG Facility	No	No	No	
Nuclear Plant	Yes	No	No	
Cogen Refinery	Yes	Yes	Cogen	
Wood Power Plant	Yes	No	Bio	
Waste to Energy	Yes	Yes	No	
Coal Power Plant	Yes	Yes	No	



Example

Source	EIA?	EPA?	Cogen/Bio?	Method
Unspecified	No	No	NA	Unspecified
Small NG Facility	No	No	No	Unspecified
Nuclear Plant	Yes	No	No	EIA
Cogen Refinery	Yes	Yes	Cogen	EIA
Wood Power Plant	Yes	No	Bio	EIA
Waste to Energy	Yes	Yes	No	EPA
Coal Power Plant	Yes	Yes	No	EPA



EPA Method

$$\frac{\text{EPA plant GHG emissions} \times \text{cogeneration correction factor}}{\text{plant net electric generation}} \times (\text{utility claims} + \text{transmission losses})$$

– Repeat for each plant



EPA Example: Waste to Energy

- EPA emissions = 200,000 MT CO₂e
- Cogen factor = 1
- EIA net gen = 120,000 MWh

- Utility claims = 100,000 MWh
- Transmission losses = 2% = 2,000 MWh



EPA Example: Waste to Energy

- (200,000 MT CO₂e x 1)
- Divide by 120,000 MWh
= 1.667 MT CO₂e /MWh
- x (100,000 MWh + 2,000 MWh)
= 170,000 MT CO₂e



EIA Method

$$\frac{\textit{EIA plant GHG emissions}}{\textit{plant net electric generation}}$$

x (utility claims + transmission losses)

- EIA emissions = (elec fuel consumption quantity x EFs x GWP)
- Repeat for each plant



40 CFR Part 98

TABLE C-1 TO SUBPART C OF PART 98—DEFAULT CO₂ EMISSION FACTORS AND HIGH HEAT VALUES FOR VARIOUS TYPES OF FUEL

DEFAULT CO₂ EMISSION FACTORS AND HIGH HEAT VALUES FOR VARIOUS TYPES OF FUEL

Fuel type	Default high heat value	Default CO ₂ emission factor
Coal and coke	mmBtu/short ton	kg CO ₂ /mmBtu
Anthracite	25.09	103.69
Bituminous	24.93	93.28
Subbituminous	17.25	97.17
Lignite	14.21	97.72
Coal Coke	24.80	113.67
Mixed (Commercial sector)	21.39	94.27
Mixed (Industrial coking)	26.28	93.90
Mixed (Industrial sector)	22.35	94.67
Mixed (Electric Power sector)	19.73	95.52
Natural gas	mmBtu/scf	kg CO ₂ /mmBtu
(Weighted U.S. Average)	1.026 × 10 ⁻³	53.06
Petroleum products—liquid	mmBtu/gallon	kg CO ₂ /mmBtu
Distillate Fuel Oil No. 1	0.139	73.25
Distillate Fuel Oil No. 2	0.138	73.96
Distillate Fuel Oil No. 4	0.146	75.04
Residual Fuel Oil No. 5	0.140	72.93
Residual Fuel Oil No. 6	0.150	75.10
Used Oil	0.138	74.00
Kerosene	0.135	75.20
Liquefied petroleum gases (LPG) ¹	0.092	61.71
Propane ¹	0.091	62.87
Propylene ²	0.091	67.77



<https://www.ecfr.gov/cgi-bin/text-idx?SID=6fabaca4a021d1644a635557203baa75&mc=true&node=sp40.23.98.c&rgn=div6>

EIA Example: Wood Power Plant

- EIA emissions = 918,743 MT CO₂e
 - Wood
 - 550,000 tons wood
 - Tier 1 from 40 CFR Part 98
 - GWPs from WAC 173-441-040
 - 913,838 MT CO₂e
 - Natural gas
 - 90,000 mscf
 - 4,905 MT CO₂e



EIA Example: Wood Power Plant

Category	Wood	Natural Gas	Combined
EIA Emissions (MT CO ₂ e)	913,838	4,905	918,743
EIA Net Gen (MWh)	340,000	8,000	348,000
Plant Emissions Rate (MT CO ₂ e/MWh)	2.69	0.61	2.64
Utility Claims (MWh)	200,000	6,000	206,000
4% Transmission (MWh)	8,000	240	8,240
Utility Emissions (MT CO ₂ e)	559,054	3,826	562,880



Unspecified Electricity

- Included in WAC 173-444
- Part of GHG content calculation
- Will use default value in statute
- 0.437 MT of CO₂e/MWh of electricity
- 1,000 MWh = 437 MT CO₂e



Utility Emissions

Utility emissions = EPA + EIA + unspecified

- Non-emitting electric generation and renewable resources: included in prior steps, not here
- All plants for each category previously summed



Example: Utility Emissions

- EPA = 170,000 MT CO₂e
- EIA = 3,826 MT CO₂e
- Unspecified = 437 MT CO₂e

- Total = 174,263 MT CO₂e





Questions and Discussion

Clean Energy Transformation Rule: Energy Transformation Projects

Bill Drumheller
Air Quality Program

Rulemaking Meeting #1
January 14, 2020



Goals for This Session

- Show how the law envisions energy transformation projects (ETPs)
- Explain our ideas about how to use the rule as an ETP program foundation
- Gather feedback about our thinking and some key questions to inform rule language development



What are Energy Transformation Projects?

- An energy transformation project must do all of these:
 - Provide energy-related goods or services, other than the generation of electricity
 - Reduce fossil fuels and greenhouse gases
 - Provide benefits to electric utility customers



Statutory Direction to Ecology

- Energy transformation projects must:
 - “Use criteria developed by the department of ecology” (with UTC and Commerce)
 - “Establish a conversion factor” for ETPs from greenhouse gas emissions to energy and a separate factor for transportation ETPs
 - “Be associated with the consumption of energy in Washington.”
 - “Not create a new use of fossil fuels that results in a net increase of fossil fuel usage.”
 - Not be double counted toward standard.



Emission Reduction Criteria

Emissions reductions must be:

- Real, specific, identifiable, and quantifiable
- Permanent
- Enforceable by state government
- Verifiable
- Not required by another statute, rule, or other legal requirement
- Not reasonably assumed to occur absent investment, or if an investment has already been made, not reasonably assumed to occur absent additional funding in the near future



ETP Program Requirements

Ecology must adopt rules:

“ ... to establish requirements for energy transformation project investments including, but not limited to, verification procedures, reporting standards, and other logistical issues as necessary.”

(with Commerce and UTC input)



Core Ecology ETP Work (1)

- Determining the types of energy transformation projects.
 - Statute has a “may include but is not limited to” list of potential examples.
- Establishing a program foundation for protocol development and project evaluation.



Core Ecology ETP Work (2)

Elements given in CETA statute:

Boundary Conditions

+ Quantification Methodology

+ Quality Assurance Principles

+ Evaluation Standards

= Protocol Development

Key component of ETP work!



Proposed ETP Concept

Determine the types of ETPs that are potentially eligible

Public process established in rule

Role for future additions?



Interested parties submit project proposals

Process established in rule

Protocol as part of proposal?

Separate protocol development?



Ecology evaluates proposals

Process established in rule

Public comment (Project? Protocol? Other?)



Projects meeting requirements are recognized



ETP Program Foundation

- As envisioned, this rule will:
 - Allow Ecology to create a list of potentially eligible project types
 - Create the process and procedures for submitting projects for evaluation
 - Ensure public input throughout
 - Calibrate the amount of work put into protocols with proven demand



Key Questions for Today (1)

- Is it helpful to have a formal list of potentially eligible ETP types first?
- How flexible should such a list be?
- Should project proponents be allowed to submit proposed protocols (in full or in part) along with projects?
- Should protocol development instead be done through 3rd parties (consultants) or at state agencies ?



Key Questions for Today (2)

- How much public input should be integrated into project evaluation?
- What criteria should Ecology consider in setting priorities for project evaluation and should those priorities be formalized in the proposed rule?
- What areas of uncertainty around ETPs do you think are most important for Ecology to address?





Questions and Discussion

Next Steps

- Next stakeholder meetings at Ecology:
 - February 12, 2020 (1:30 p.m. – 4:30 p.m.)
 - including input for regulatory analyses
 - April 9, 2020 (9 a.m. – noon)
- Summary of this meeting will be posted on the rulemaking website in 10 days
- Provide comments and suggestions by Jan 24, 2020
<http://aq.ecology.commentinput.com/?id=TYfx2>



Comments and Suggestions

https://ecology.wa.gov/Regulations-Permits/Laws-rules-rulemaking/Rulemaking/WAC-173-444

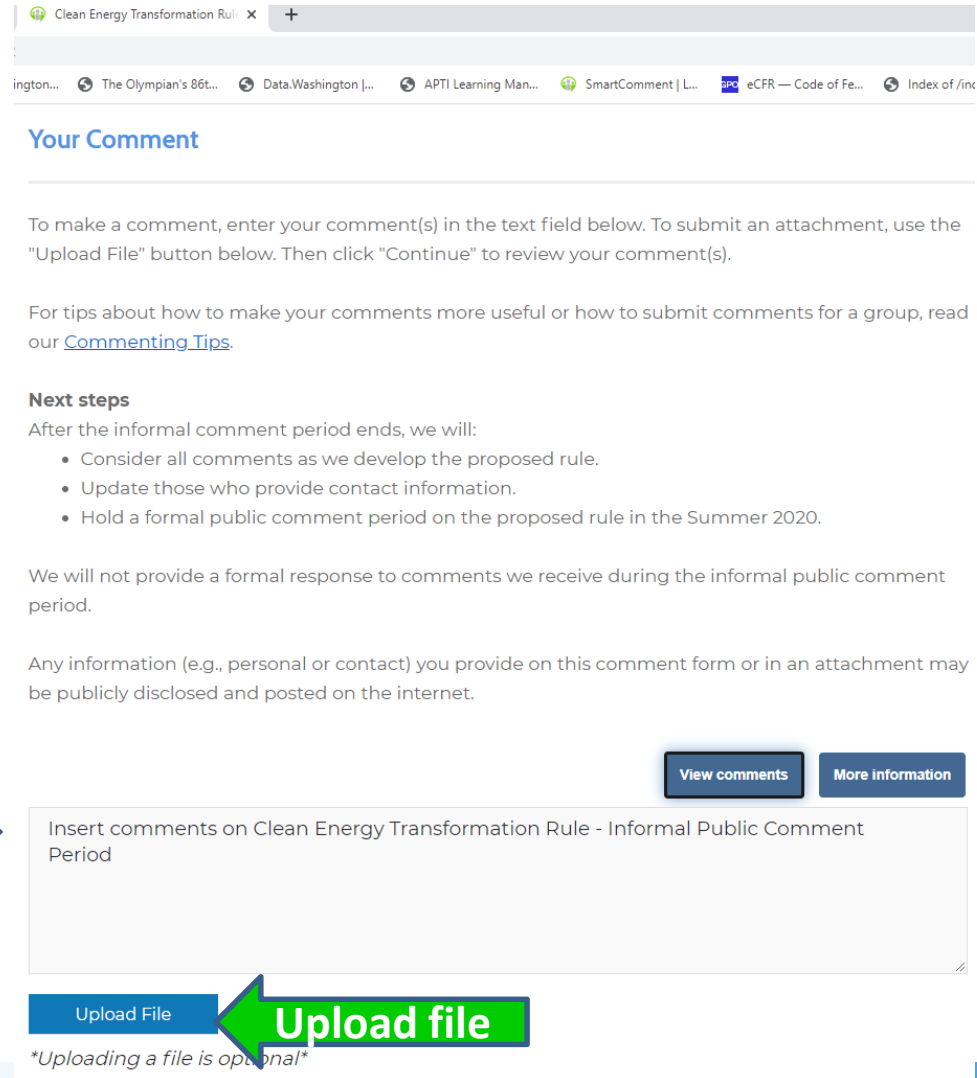
The screenshot shows the website for WAC-173-444. The header includes the Department of Ecology logo and navigation links for Regulations & Permits, Research & Data, About Us, and Contact Us. A secondary navigation bar lists Home, Air & Climate, Water & Shorelines, Waste & Toxics, and Spills & Cleanup. The main content area is titled "Public input & involvement" and includes a "Public comment period (informal)" from Dec. 20, 2019, to April 20, 2020. A link to "Submit your comments online and read others' comments" is highlighted with a green arrow. Below this is a section for "Ecology's meetings with stakeholders" with a table of dates, documents, and locations.

Date	Documents	Location
Tuesday Jan. 14, 2020	Agenda Draft rule language	Ecology, Lacey (map to location) Register to attend (in person or webinar) *
Wednesday Feb. 12, 2020	none yet	Ecology, Lacey (map to location) webinar *
Thursday April 9, 2020	none yet	Ecology, Lacey (map to location) webinar *



Comments and Suggestions

http://aq.ecology.commentinput.com/?id=TYfx2



Clean Energy Transformation Rule x +

ington... The Olympian's 86t... Data.Washington J... APTI Learning Man... SmartComment | L... eCFR — Code of Fe... Index of /inc

Your Comment

To make a comment, enter your comment(s) in the text field below. To submit an attachment, use the "Upload File" button below. Then click "Continue" to review your comment(s).

For tips about how to make your comments more useful or how to submit comments for a group, read our [Commenting Tips](#).

Next steps

After the informal comment period ends, we will:

- Consider all comments as we develop the proposed rule.
- Update those who provide contact information.
- Hold a formal public comment period on the proposed rule in the Summer 2020.

We will not provide a formal response to comments we receive during the informal public comment period.

Any information (e.g., personal or contact) you provide on this comment form or in an attachment may be publicly disclosed and posted on the internet.

[View comments](#) [More information](#)

Insert comments on Clean Energy Transformation Rule - Informal Public Comment Period

[Upload File](#) [Upload file](#)

Uploading a file is optional

Comment here

Upload file



More Information

- Rulemaking web page:
<https://ecology.wa.gov/Regulations-Permits/Laws-rules-rulemaking/Rulemaking/WAC-173-444>
- To join the email notification list:
<http://listserv.ecology.wa.gov/scripts/wa-ECOLOGY.exe?SUBED1=ECOLOGY-CLEAN-ENERGY-UPDATES&A=1>



Contacts

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