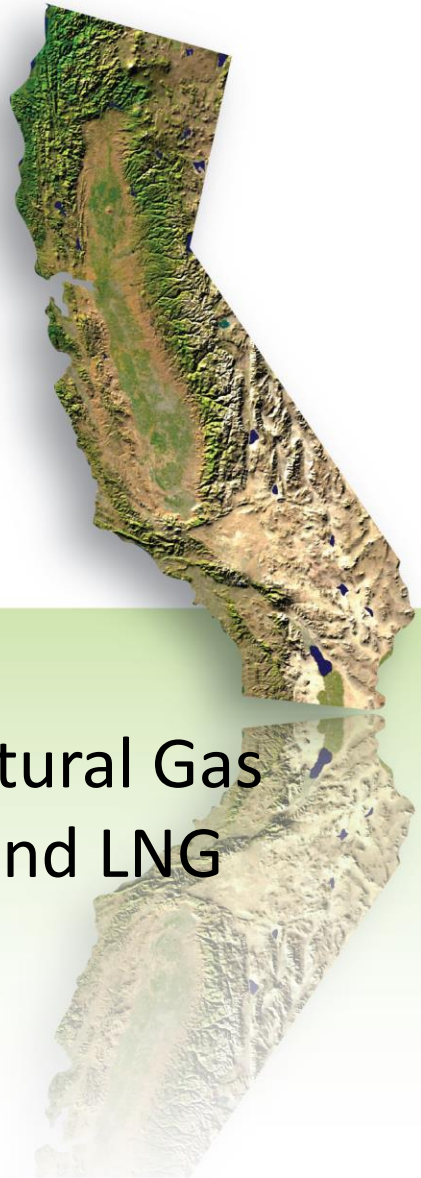
Verifier Accreditation Training for Mandatory Greenhouse Gas Reporting



Transactions Specialty

Course 2.3: Suppliers of Natural Gas, Natural Gas Liquids, Liquefied Petroleum Gas, CNG and LNG

California Environmental Protection Agency

Air Resources Board

MRR Verifier Accreditation: Course Content and Exams

Course 2: Transactions Specialty

2.1 Electric Power Entities

2.2 Suppliers of Transportation Fuels

2.3 Suppliers of Natural Gas, Natural Gas Liquids, Liquefied Petroleum Gas (LPG), Compressed Natural Gas (CNG) and Liquefied Natural Gas (LNG)

2.4 Suppliers of Carbon Dioxide (CO2)

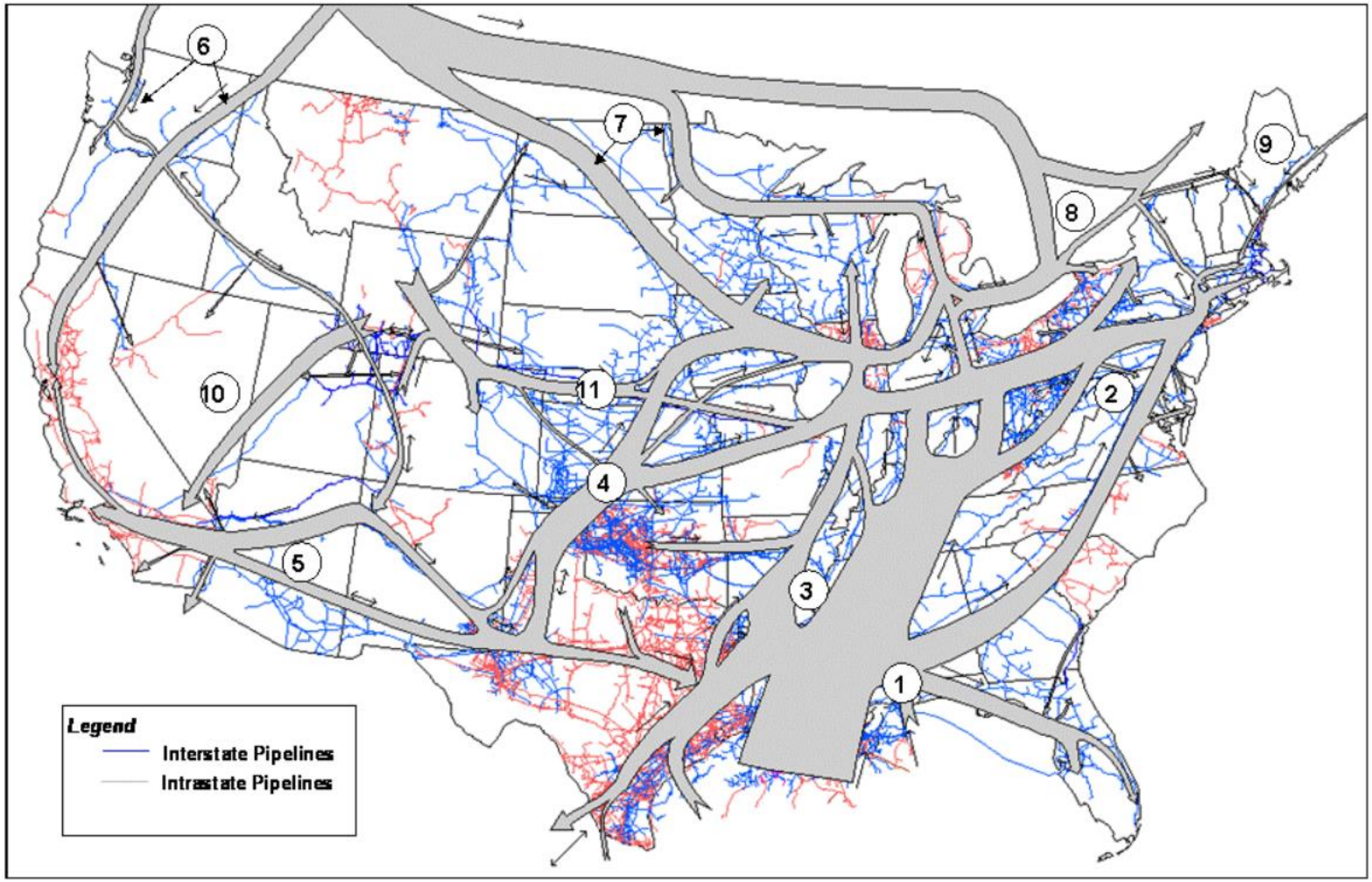
Course 2.3 Handouts

- Handout 2.3.1 NN Entity Report Case Study 5
- Handout 2.3.2 NGL Fractionation Facility Boundary

Course 2.3 Suppliers of Natural Gas, Natural Gas Liquids, Liquefied Petroleum Gas, CNG and LNG

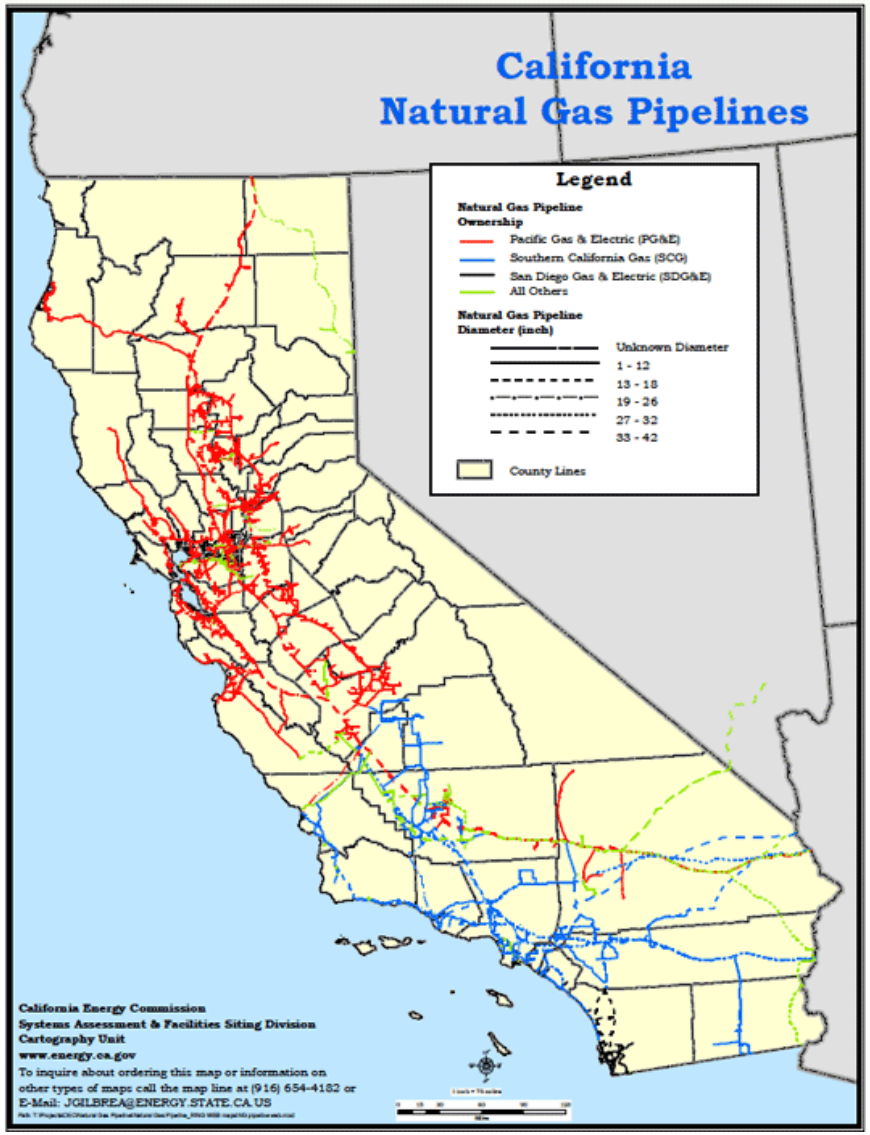
1. Overview
   - Applicability
   - Industry Overview
   - Emissions Calculations for LDCs
2. Measurement, Reporting and Verification
3. NGL Fractionators

The Big Picture



Source: Energy Information Administration, Office of Oil and Gas, Natural Gas Division, GasTran Gas Transportation Information System.

Still A Big Picture - California Pipelines



§ 95122 Applicability

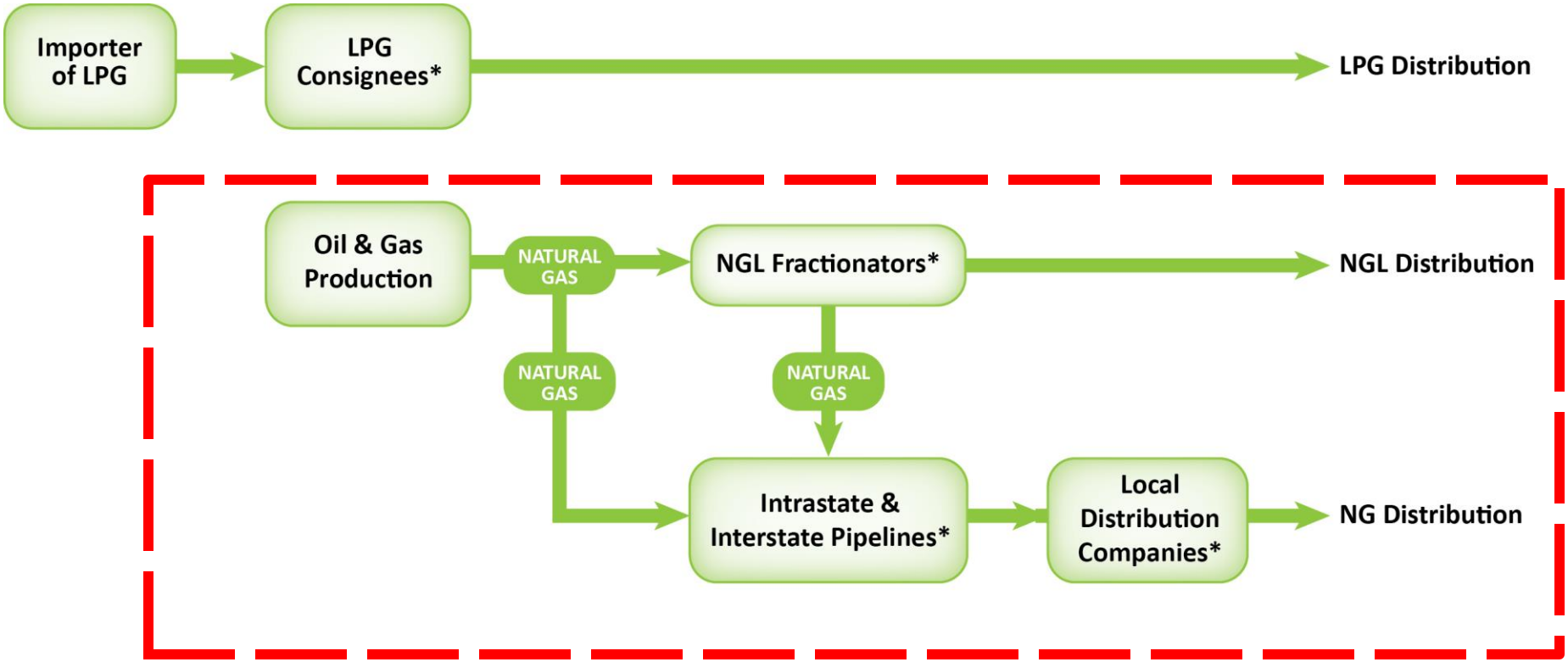
- Natural gas suppliers that produce, import or deliver an annual quantity that, if completely combusted, would result in ≥10,000 MT CO_2e, including
  - Operators of **interstate** pipelines
  - Operators of **intrastate** pipelines
  - Distributors of natural gas to end users
    - a.k.a., public utility gas corporations or publicly-owned gas utilities
  - LNG production facilities that receive NG from interstate pipelines
- Natural gas liquid (NGL) fractionators, regardless of size
- Consignees of LPG
- Consignees of CNG and LNG
- Verification required for emissions ≥25,000 MT CO_2e

Subpart NN of 40 CFR Part 98

- MRR § 95122 *Any supplier of natural gas or natural gas liquids who is required to report under § 95101 [of MRR] must comply [with Subpart NN]*
  - *Except as otherwise provided*

- **§ 95122 also includes interstate pipelines, but for volumes only, not GHGs**

NG, NGL, LPG suppliers



*Suppliers of NG, NGL, and LPG

Oil and Gas Process Diagram

Oil and Gas extraction and processing. (Report Subpart W)

Crude oil

Refinery (Subpart Y, C, and sometimes P)

Transportation fuels supplied via on-site rack. (Subpart MM, reported by refinery operator)

Natural gas (NG) and natural gas liquids (NGLs)

Imported fuels ("enterer"). (Subpart MM if outside terminal system)

Transportation fuels supplied via terminal rack (Subpart MM, reported by position holder at terminal)

NG and NGLs

NGL Fractionator (Subpart W and C as direct emissions. Subpart NN for NGLs supplied. Subpart W for product data for NGLs produced.)

Pipeline NG

Pipeline natural gas

Natural gas distribution company/utility (Subpart NN)

Role in Cap-and-Trade

- Goal to capture statewide emissions from natural gas
- Accomplished by reporting all NG coming into California (from other states) plus in-state production
- Reported upstream of (before) combustion
- Included under the “cap” of Cap-and-Trade beginning in 2015, second compliance period
- For compliance obligation calculation, ARB will deduct NG sold to covered entities
  - To avoid double counting

Responsible for Reporting Emissions - Local Distribution Companies (LDCs)

"Catch-all" term for natural gas utilities and intrastate pipelines

- MRR - LDCs must report the CO_2, CO_2 from biomass-derived fuels, CH_4, N_2O, and CO_2e emissions that result from the complete combustion of natural gas products
- Total emissions are calculated based on emissions from downstream combustion of natural gas to all users
  - Covered emissions are based on combustion of gas by end-users that are NOT covered entities
- Focuses on "mass balance" approach between gas received and gas delivered
- Designed to avoid double-counting of emissions

Total Emissions Calculation for LDCs (1 of 3)

§ 95122(b)(6): $CO_2 = \sum CO_{2i} - \sum CO_{2j} - \sum CO_{2l}$

CO_2 = Total emissions.

CO_{2i} = Emissions from natural gas received at the state border or city gate.

CO_{2j} = Emissions from natural gas received for redistribution to or received from other natural gas transmission companies.

CO_{2l} = Emissions from storage and direct deliveries from producers.

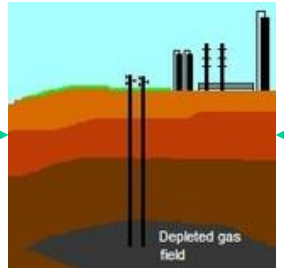
Total Emissions Calculation for LDCs (2 of 3)

§ 95122(b)(6): $CO_2 = \sum CO_{2i} - \sum CO_{2j} - \sum CO_{2l}$

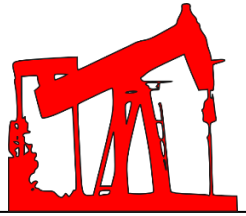
Large LDC

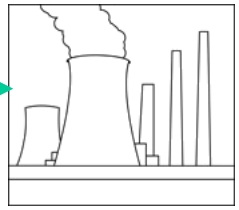
NG redistributed to or received from other pipelines: **CO_2j**

NG in and NG out of storage: **CO_2l**



NG received at city gate or border: **CO_2i**





Local production to LDC pipeline **CO_2l**

NG delivered to users >188,500 MMBtu/yr: reported and verified, but not part of total emissions

Total Emissions Calculation for LDCs (3 of 3)

For calculation of CO_2 for **<u>each</u>** term in the equation, reporters ***must use 40 CFR 98.403***

Method 1, Eq. NN-1, but replace the product of heating value and volume with the <u>actual measured MMBtu of gas received</u>

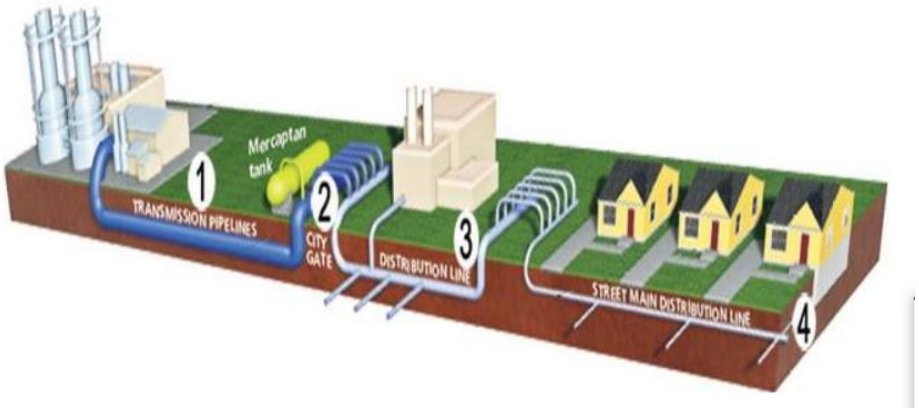
$$CO_{2i} = 1 \times 10^{-3} * \sum \boxed{Fuel_h * HHV_h} * EF_h \qquad \text{(Eq. NN-1)}$$

Calculation of CO_{2i} (1 of 2)

§ 95122(b)(6): $CO_2 = \sum CO_{2i} - \sum CO_{2j} - \sum CO_{2l}$

- **CO_{2i} = Emissions from natural gas received at the state border or city gate**

- *City gate* is "a point or measuring station at which a local gas distribution utility receives gas from a natural gas pipeline company or transmission system"
  - For small utilities, this is where they receive NG from a large utility, and may be their only reportable gas receipts



Calculation of CO_{2i} (2 of 2)

§ 95122(b)(6): $CO_2 = \sum CO_{2i} - \sum CO_{2j} - \sum CO_{2l}$

- For large utilities (e.g., PG&E, SoCal Gas), "city gate" is likely their interconnection with large interstate pipelines
- Example
  - NG that SoCal Gas receives from El Paso Pipeline is reported under CO_2i for SoCal Gas
  - SoCal is closest to the gas' end user

Verification of CO_{2i}

Verification of gas received at city gate or interconnection

- **Identify** how sales are recorded - invoices, real-time data, etc.
- **Review** sales information and ensure that entire calendar year was included
  - If missing data, confirm that appropriate MRR procedures were used
- **Ensure** that MMBtus were calculated appropriately
  - More detail on HHV in following slides
- **Recalculate** emissions
  - If there are discrepancies, review with reporter and follow standard verification process

Calculation of CO_{2j} –Avoids Double Counting

§ 95122(b)(6): $CO_2 = \sum CO_{2i} - \sum CO_{2j} - \sum CO_{2l}$

- **CO_{2j} = Emissions from natural gas received for <u>redistribution to</u> or <u>received from</u> other natural gas transmission companies (redelivered or received)**

- Redistribution **TO** = NG delivered to other pipelines or LDCs (if total deliveries in the year exceed 25,000 $MTCO_2e$)

- Received **FROM** = NG received from other pipelines or LDCs (regardless of amount)
    - Note: For larger utilities, this is similar to CO_{2i}

Redelivered or Received - Calculating CO_{2j}

- Breaking down the term

$$\mathrm{MMBtu_{Total}} = \mathrm{MMBtu_{redelivery}} - \mathrm{MMBtu_{receipts}}$$

- CO_2 is calculated for redelivery and receipts, using MMBtus
  - MMBtu received contributes to CO_{2total} .
  - MMBtu redelivered reduces CO_{2total}
- $(- \sum CO_{2j}) = - (MMBtu_{Total} * EF) =$
  $- (MMBtu_{redelivery} – MMBtu_{receipts})*EF$
- Subtract received from redelivered **(double negative here)**

Verification of CO_{2j} (1 of 2)

Based on risk analysis, sample a source or time period, obtain sales data, if available, as primary documentation; This element can be confusing for reporter's staff

- Confirm that it is documented in the GHG Monitoring Plan
- Do they understand the regulation?
- How did they ensure that only sales to pipelines and LDCs were included?

Verification of CO_{2j} (2 of 2)

- Confirm that sales to end-users were excluded
- Note that re-delivery data is reported as a spreadsheet attached to the Cal e-GGRT report

- Were only sales resulting in ≥ 25,000 MT CO_2e included?

Stored Gas - Calculation of CO_{2l}

§ 95122(b)(6): $CO_2 = \sum CO_{2i} - \sum CO_{2j} - \sum CO_{2l}$

- CO_{2l} = Emissions from storage and direct delivery from producers
- Mostly affects larger utilities
- Storage is calculated using Eq. NN-5

$$CO_{2l} = [Fuel_1 - Fuel_2] * EF$$

  - Fuel1 = MMBtu put into storage
  - Fuel2 = MMBtu taken out of storage + MMBtu received from producers of NG

- Note the double negative again. MMBtu put into storage reduces reported emissions; MMBtu removed from storage and delivered, and NG received from producers adds to reported emissions

Stored CO_{2l} – Verification (1 of 2)

- Verification of stored gas will likely be part of a larger verification of PG&E or SoCal Gas
  - Other facilities, but PG&E and SoCal account for the bulk
- These are complex facilities, with a variety of meters, most of which do not apply to GHG verification
- Fundamentally, gas out minus gas in
- Follow the audit trail

Stored CO_{2I} – Verification (2 of 2)

- Obtain tracking data for storage operations. Meter data? Inventory data?
- Are meters calibrated?
  - Can they provide evidence of +/-5% based on inventory data?
  - General Order 58a?
- Review sales or other data for purchases from local producers
  - Where is the HHV measured?
  - What is the annual weighted average HHV?

Questions and ARB Comments

1. Overview
2. **Measurement, Reporting and Verification**
   - **HHV and Pipeline Quality Standards**
   - **LDC End User Reporting**
   - **Biomethane**
   - **LNG Production**
   - **Case Studies**
3. NGL Fractionators

HHV and Pipeline Quality Standards (1 of 3) (§ 95122(b)(5))

- HHV should be measured at or near each interconnection point

- Pipeline quality standards are met if annual weighted average HHV is >970 Btu/scf and <1,100 Btu/scf If non-pipeline quality **and** single interconnection that contributes more than 3% of total emissions, must use tier 3 (carbon content)

HHV and Pipeline Quality Standards (2 of 3) (§ 95122(b)(5))

- If HHV >1,100 Btu/scf **but less than** 3% of emission, operator can use standard calculation, but must use emission factor of 54.67 kg CO_2/MMBtu. If <970 Btu/scf and 3%, use standard EF.

- Mostly an issue for utilities that receive NG from local production. Several reporting entities had to use 54.67 emission factor, but none had to use Tier 3.

HHV and Pipeline Quality Standards (3 of 3) (§ 95122(b)(5))

HHV/ Portion of emissions	<3% of total emissions	≥3% of total emissions
HHV: <970 Btu/scf	Tier 2 calc; 53.02 kg/MMBtu	Tier 3 calculation methodology
HHV: ≥970 Btu/scf, ≤1,100 Btu/scf	Tier 2 calc; 53.02 kg/MMBtu	Tier 2 calc; 53.02 kg/MMBtu EF
HHV: >1,100 Btu/scf	Tier 2 calc; 54.67 kg/MMBtu	Tier 3 calculation methodology

Verifying Measurements of HHV and Other Values (1 of 2)

- Review documentation for high heating values (HHV) used by data reporters

- Verify that all measurements (including quantity, composition and HHV value) were made at least monthly

Verifying Measurements of HHV and Other Values (2 of2)

For all HHVs determined by the reporter (i.e., not a default value or supplied by fuel supplier)

- Verify that an appropriate standard test published by a consensus-based standards organization was used (e.g., American Gas Association [AGA], American Petroleum Institute [API])
- If an LDC makes its own HHV measurements according to established practices, then its own measurements shall be used
- If LDC does not, it shall use the delivering pipeline's measurements

End User Reporting for LDC

- NG suppliers are required to report all deliveries of NG to end-users equal to or greater than 188,500 MMBtu (§ 95122(d)(2)(E))
  - Separate from MMBtu redeliveries that are NOT to end-users
  - Not included in emissions calculation, but used later by ARB to calculate compliance obligation
  - Ensures no double counting by other covered entities
- <u>Required</u> conformance review (§ 95131(b)(8)(F)(2))
- Reporters complete a worksheet that is uploaded to Cal e-GGRT

Verifying LDC Conformance – End Users (1 of 2)

- Discuss reporting requirement with the operator. How did they determine what needed to be included?
- Review source of transactions. Ask them to recreate query of customer database, if applicable.
- How did they determine that the counterparties were end users of the NG and not other pipelines?

Verifying LDC Conformance – End Users (2 of 2)

- Completeness check. Did the operator's source of data include all applicable end users?
- Sample sales data for individual customers
- Document steps in sampling plan

Biomethane Reporting (1 of 2)

- Natural gas suppliers can supply biomethane, which is biomass-derived natural gas meeting pipeline quality standards
- Only biomethane purchased by the supplier on behalf of the end user is reported as biomethane
- If biomethane is purchased directly by the end user, it is reported as fossil NG by the supplier (and reported as biomethane by the end user)

Biomethane Reporting (2 of 2)

- If reporting biomethane, must include name and address of biomethane vendor and production facility and annual MMBtu from each (§ 95103(d)(3))
- No NG suppliers reported biomethane in 2012. (They may deliver biomethane, but it is purchased by end user and reported as NG by supplier.)

Responsible for Reporting - LNG Production Facility

- LNG production facilities that received their NG from an interstate pipeline must report emissions from NG sold as LNG products
- One reporting entity. First reporting year is 2014 data reported in 2015.

Verification of LNG Production Facility

Verification

- Review sales documenting volume
- Ensure correct units of measurement (MMBtu - they may transact in Mscf or GGE) and HHV is measured at an appropriate location
- Ensure reported volumes and MMBtu were measured using financial transaction meters
- LNG producers reporting “LNG from Biomethane” must report information required by § 95103(j)(3) (biomethane producer data)

Verifying Measurements of Quantity for Natural Gas Suppliers

- Most transactions will be financial transactions- exempt from 95103(k) accuracy requirements (§ 95103(k)(7))
- Some NG utilities may have transactions that are <u>not</u> financial transactions
  - NG storage meters owned by the utility
  - EGUs and NG compressor stations owned by the utility
  - Tolling agreements (NG for electricity exchange)
- If so, utilities can meet requirements of CPUC General Order 58A (§ 95103(k)(7)(C))

Verifying CH_4 and N_2O Emissions for NG Suppliers

- Calculated just like CO_2, but using CH_4 and N_2O emission factors
- Standard emission factors still used for non-pipeline quality gas

Case Study 1 - Verifying an LDC Report

- See Handout 2.3.1 for report format
- How would you characterize risk for each of these parameters?
- What type of data would you target for review?

Eq. NN-1	Eq. NN-3	Eq. NN-5, fuel 1	Eq. NN-5, fuel 2b	Eq. NN-5, fuel 2a	Eq. NN-5, fuel 2c
Total annual MMBtu of natural gas received at the city gate	Annual MMBtu of Product Supplied to Transmission Pipelines or Other LDCs	MMBtu received and stored on-system	MMBtu of NG withdrawn from storage	Vaporized LNG not accounted for in NN-1	MMBtu of NG from local production
10,000,000	3,000,000	50,000	40,000	3,000	2,000,000

Data source: Monthly invoices from another public utility gas corporation. **Risk**? **Data Checks?**

Data source: Spreadsheet based on data from gas accounting. Invoices available. **Risk**? **Data Checks?**

Data source: Storage balance reports. Entity owns storage **Risk**? **Data Checks?**

Data source: Estimates based on truck measurements; reported de minimis **Risk**? **Data Checks?**

Data source: Spreadsheet from accounting, based on invoices **Risk**? **Data Checks?**

Case Study 1 -Verifying an LDC Report

(sample risk assessment, for discussion, not a suggested template)

- See handout for report format

Eq. NN-1	Eq. NN-3	Eq. NN-5, fuel 1	Eq. NN-5, fuel 2b	Eq. NN-5, fuel 2a	Eq. NN-5, fuel 2c
Total annual MMBtu of natural gas received at the city gate	Annual MMBtu of Product Supplied to Transmission Pipelines or Other LDCs	MMBtu received and stored on-system	MMBtu of NG withdrawn from storage	Vaporized LNG not accounted for in NN-1	MMBtu of NG from local production
10,000,000	3,000,000	50,000	40,000	3,000	2,000,000

Data source: Monthly invoices from another public utility gas corporation. **Risk**: Medium-low; large emission source but high quality data **Data review**: Review all 12 monthly invoices; ensure all gas receipts and interconnections are included

Data source: Spreadsheet based on data from gas accounting. Invoices available. **Risk**: Medium-High; multiple counterparties; data supplied by entity acctg (rather than third-party) **Data review**: Review spreadsheet; sample 3 monthly invoices for each counterparty

Data source: Storage balance reports. Entity owns storage **Risk**: High; unknown volume accounting procedures; unknown calibration frequency **Data review**: Review storage reports; interview staff about accounting procedures and measurement accuracy; refine sampling plan. Consider requesting additional data, including calibration records if warranted

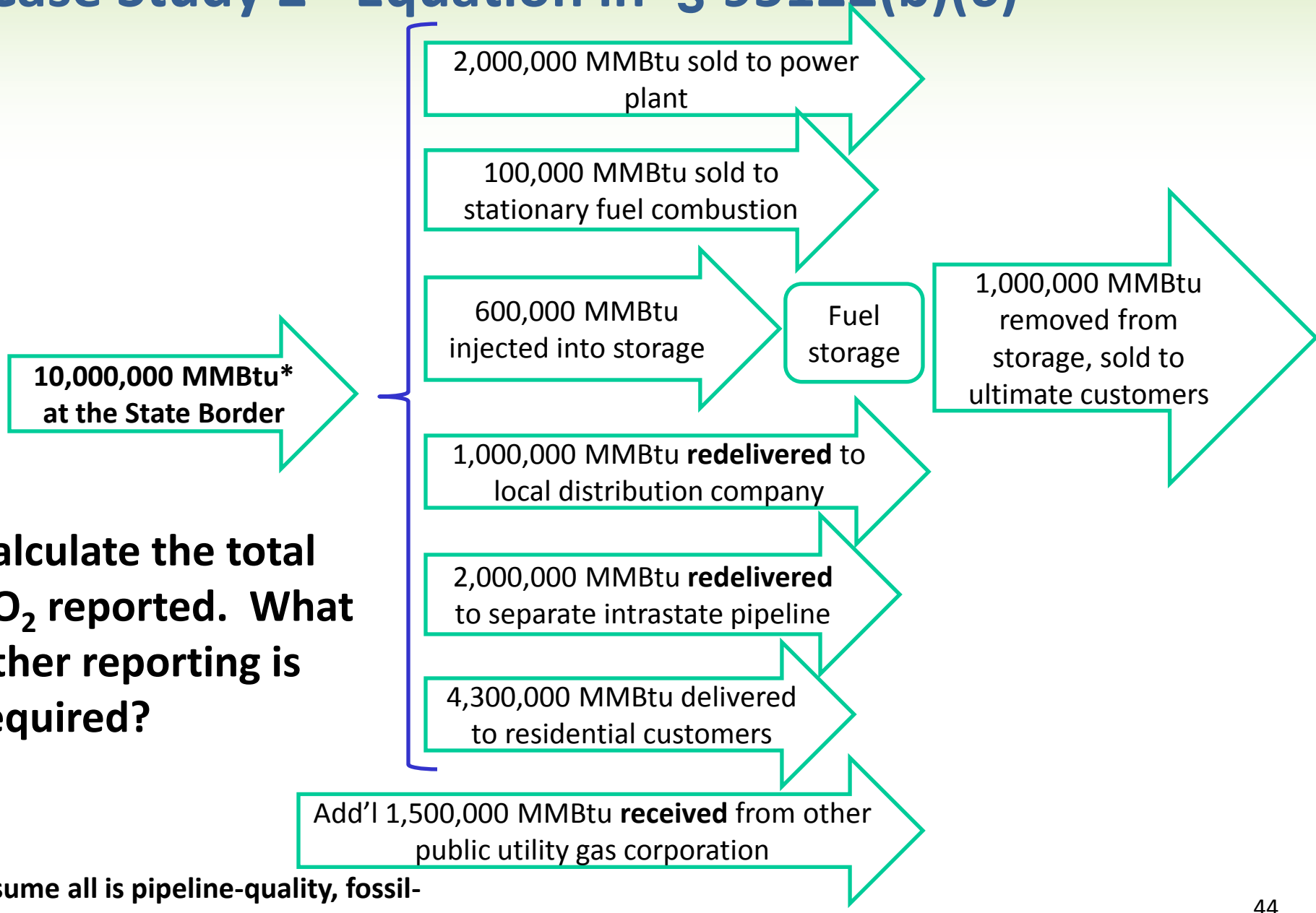
Data source: Estimates based on truck measurements; reported de minimis **Risk**: Low; small source, de minimis **Data review**: Review for reasonable calculation and

Data source: Spreadsheet from accounting, based on invoices **Risk**: High; multiple counterparties; some off-spec gas **Data review**: Sample invoices; review gas HHV measurements

Questions and ARB Comments

1. Overview
2. **Measurement, Reporting and Verification**
   - HHV and Pipeline Quality Standards
   - LDC End User Reporting
   - Biomethane
   - LNG Production
   - **Case Studies**
3. NGL Fractionators

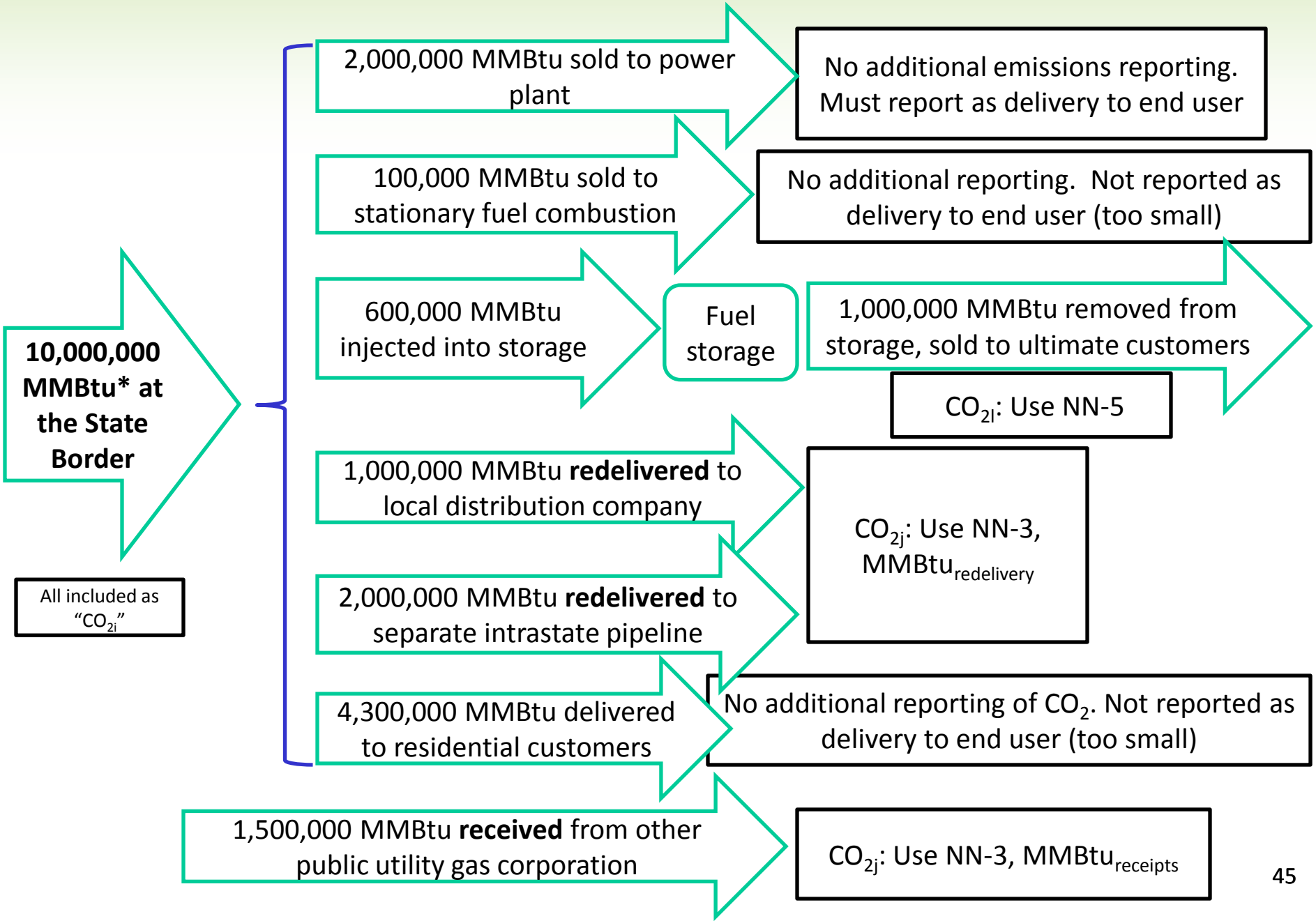
Case Study 2 - Equation in § 95122(b)(6)



Calculate the total CO_2 reported. What other reporting is required?

***Assume all is pipeline-quality, fossil-derived natural gas**

Case Study 2 – Solution (1 of 2)



Case Study 2 - Solution (2 of 2)

$$CO_2 = \sum CO_{2i} - \sum CO_{2j} - \sum CO_{2l}$$

CO_{2i} = All NG received at state line:
10,000,000 MMBtu * 53.02 kg CO_2/MMBtu *.001 MT/kg = 530,200 $MTCO_2$

CO_{2j} = Redelivered and received NG: ($MMBtu_{redelivery}$ – $MMBtu_{receipts}$)
(3,000,000 – 1,500,000)*53.02*.001 = 79,530 $MTCO_2$

CO_{2l} = (Put on storage – delivered from storage)
(600,000 – 1,000,000)* 53.02 kg CO_2/MMBtu *.001 MT/kg = -21,208 $MTCO_2$

CO_2Total = 530,200 - 79,530 - (-21,208) = **471,878 $MTCO_2$**

Questions and ARB Comments

1. Overview
2. Measurement, Reporting and Verification
3. **NGL Fractionators**
   - **Information Reported**
   - **LPG vs. non-LPG**
   - **Verifying Emissions**

NGL Fractionators Reporting (§ 95122)

- NGL fractionators are facilities that separate natural gas and y-grade natural gas liquids (minimally processed liquids) into liquid products like propane
  - Report emissions and product data
  - 8 reporting entities, all verified
- NGL fractionators report emissions from combustion and fugitive emissions (subparts C and W)
  - Only discussing supplier emissions in this course
  - Will generally submit as single facility report for all subparts (§ 95110 [C], 95150-95158 [W], and 95122 [NN])

LPG Consignee Reporting (§ 95122)

LPG consignees are the entities to whom shipments of LPG are delivered

- LPG generally enters California by rail; receiving entity must report
- Only emissions from downstream combustion of LPG (no subpart C or W)
- Consignees can be refineries or other large end-users or LPG distributor and marketers
- Consignees is often the “importer of record”, but not always. Contact ARB with question.

Oil and Gas Process Diagram

Oil and Gas extraction and processing. (Report Subpart W)

Crude oil

Natural gas (NG) and natural gas liquids (NGLs)

Refinery (Subpart Y, C, and sometimes P)

Transportation fuels supplied via on-site rack. (Subpart MM, reported by refinery operator)

Imported fuels ("enterer"). (Subpart MM if outside terminal system)

Transportation fuels supplied via terminal rack (Subpart MM, reported by position holder at terminal)

NG and NGLs

NGL Fractionator (Subpart W and C as direct emissions. Subpart NN for NGLs supplied. Subpart W for product data for NGLs produced.)

Pipeline NG

Pipeline natural gas

Natural gas distribution company/utility (Subpart NN)

Information Reported by NGL Fractionators (1 of 2)

NGL fractionators and consignees of LPG

- Quantities of NGL components produced/imported
  - Unless destination outside California can be demonstrated
- CO_2, CH_4, N_2O and CO_2e emissions that would result from the complete combustion of NGL components
- Annual quantity of LPG (propane) produced must be reported as **covered** product data (§ 95156(c))

- Emissions calculated using *40 CFR 98.403*
  - Method 2, Eq. NN-2 and Table MM-1 in 40 CFR 98.398
- Fractionators must sum the emissions from individual constituents

$$CO_{2i} = \sum_h Fuel_h * EF_h \qquad \text{(Eq. NN-2)}$$

LPG vs. non-LPG NGLs: Emissions Considerations (1 of 2)

- Natural gas liquids are any liquids from natural gas processing, including LPG, bulk products, blends, feedstocks
  - Not all NGL products are covered emissions
- NGL from condensate from oil production (considered product data for producer), and also could be sent to fractionator

LPG vs. non-LPG NGLs : Emissions Considerations (2 of 2)

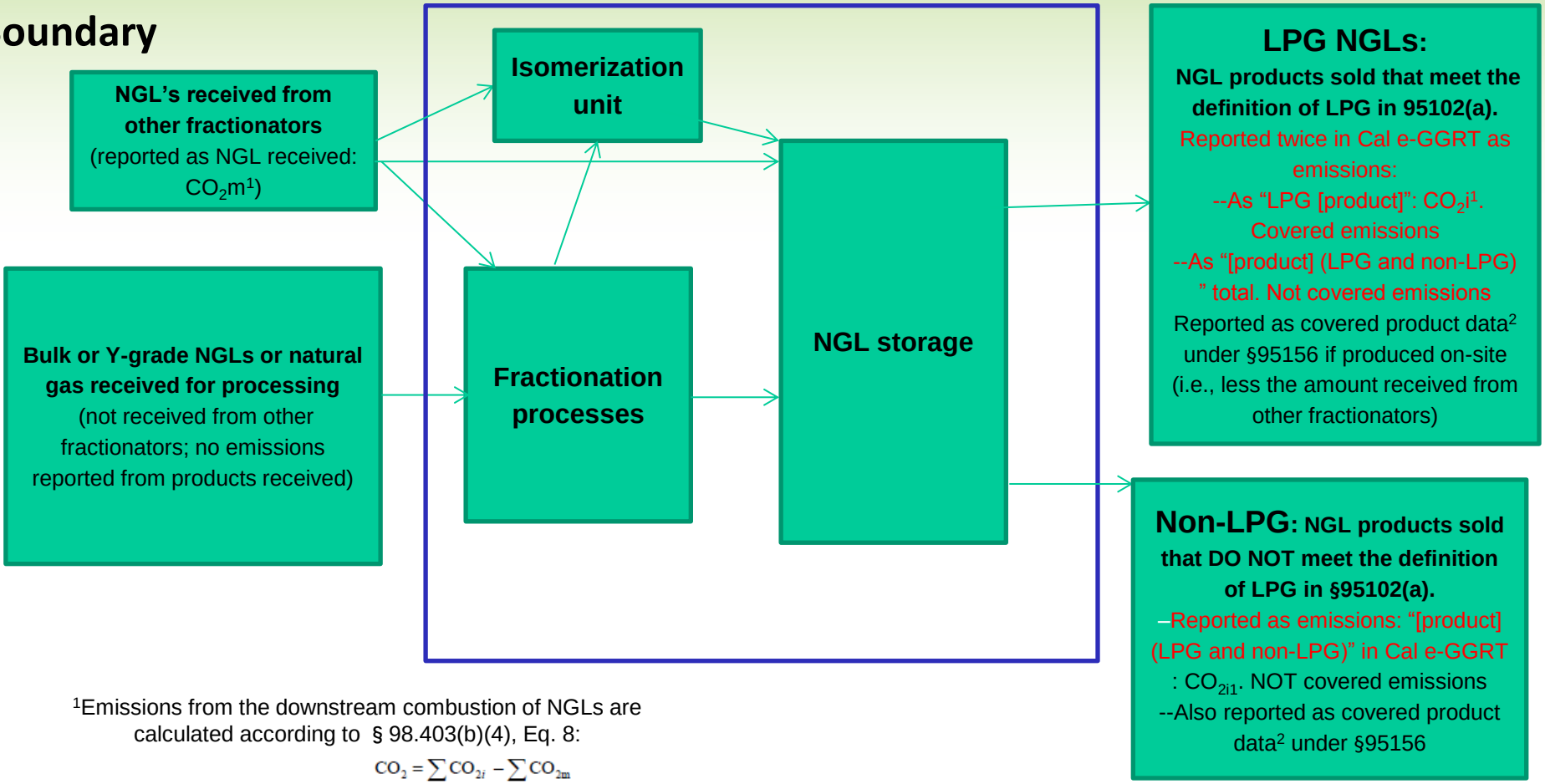
Liquefied petroleum gas (LPG) , aka “propane,” is a commercial fuel that meets specifications laid out in definition; used for heating, transportation, BBQ grills, etc.

- This is a subset of total NGL production
- These are the **COVERED** emissions pursuant to § 95852(e)(1)
- Why? Because they are used downstream as fuels for heating and transportation; other NGLs likely to be used as feedstocks for processes (plastics and other petrochemicals)

LPG vs non-LPG NGLs - Covered Product Data (§ 95156(c))

- All NGLs produced are considered covered products, so it includes LPG and non-LPG
- Why? NGL fractionation is considered an emission-intensive trade-exposed sector; covered product data is used to calculate free allocation of allowances to offset cost associated with actual fractionation process, not the downstream combustion of fuel
- Only NGLs *produced* are counted; i.e., any NGLs received from other fractionators (CO_{2j}) are not included as product data

NGL Fractionation Facility Boundary



[1]Emissions from the downstream combustion of NGLs are calculated according to § 98.403(b)(4), Eq. 8:

$$CO_2 = \sum CO_{2i} - \sum CO_{2m}$$

Where **CO_2i** = Annual CO_2 mass emissions that would result from the combustion or oxidation of fractionated NGLs delivered to all customers or on behalf of customers and **CO_2m** = Annual CO_2 mass emissions that would result from the combustion or oxidation of fractionated NGLs received from other fractionators and calculated in paragraph (c)(1) of this section (metric tons).

§ 95852(e)(1) "states that a producer of LPG…has a compliance obligation for every metric ton of CO_2e included in emissions data report", so only the subset of fuels that meet the definition of LPG are considered covered emissions.

[2] Pursuant to § 95156(c), covered product data includes the "annual production of the following natural gas liquids in barrels". The volume of NGLs reported as product data only include those volumes fractionated by the reporting entity, and excludes any volumes received from other NGL fractionators

Verifying Emissions from NGL Fractionators (1 of 2)

Evidence to request

- GHG Monitoring Plan
- Records of fuel production
  - Bills of lading for shipments
  - Metered data
- Composition data of products supplied AND
- Product specifications, especially for LPG (propane)
- Any documentation on NGLs received from other fractionators (high risk!)

Verifying Emissions from NGL Fractionators (2 of 2)

How to evaluate evidence

- Fuel production records should comply with measurement requirements and should be entered correctly into
  Cal e-GGRT
- The correct values from the emission factor and heating value tables should be entered correctly into Cal e-GGRT

Verifying Covered Product Data from NGL Fractionators

- All NGLs produced are considered covered products, so it includes LPG and non-LPG
- Information should be largely the same as emissions data
- Identify any differences
  - Ask about source of difference
  - Covered product data should only include NGLs produced on-site
- LPG is one of the fuels produced by NGL fractionators: there are others
  - Verifiers - include all fuels in sampling plan

Consignees of LPG and Information Reporting Requirements

- LPG consignees are the entities to whom shipments of LPG are delivered – fewer than 3 reported 2013 data
- LPG consignees are required to report the volume of LPG received in California
  - Reported by constituent, if known; if not known, report as total LPG consigned
- Verifier should review database of transactions, and sample invoices, shipping reports, or other applicable transactions data

Verifying Missing Data Substitutions for NGL Fractionators and LPG Consignees (§ 98.405)

- Similar to transportation fuel suppliers, “missing” or invalid data is unlikely to be encountered, since the values verifiers see are likely already the result of established billing procedures
- However, verifiers should ask how invalid data would be counted and reconciled if measurement devices were malfunctioning or another error occurred

Questions and ARB Comments

Course 2: Transactions Specialty

Complete:

2.1 Electric Power Entities

2.2 Suppliers of Transportation Fuels

2.3 Suppliers of Natural Gas, Natural Gas Liquids, Liquefied Petroleum Gas, CNG and LNG

Next:

2.4 Suppliers of Carbon Dioxide (CO2)