EIA's Proposed Natural Gas Liquids Realignment

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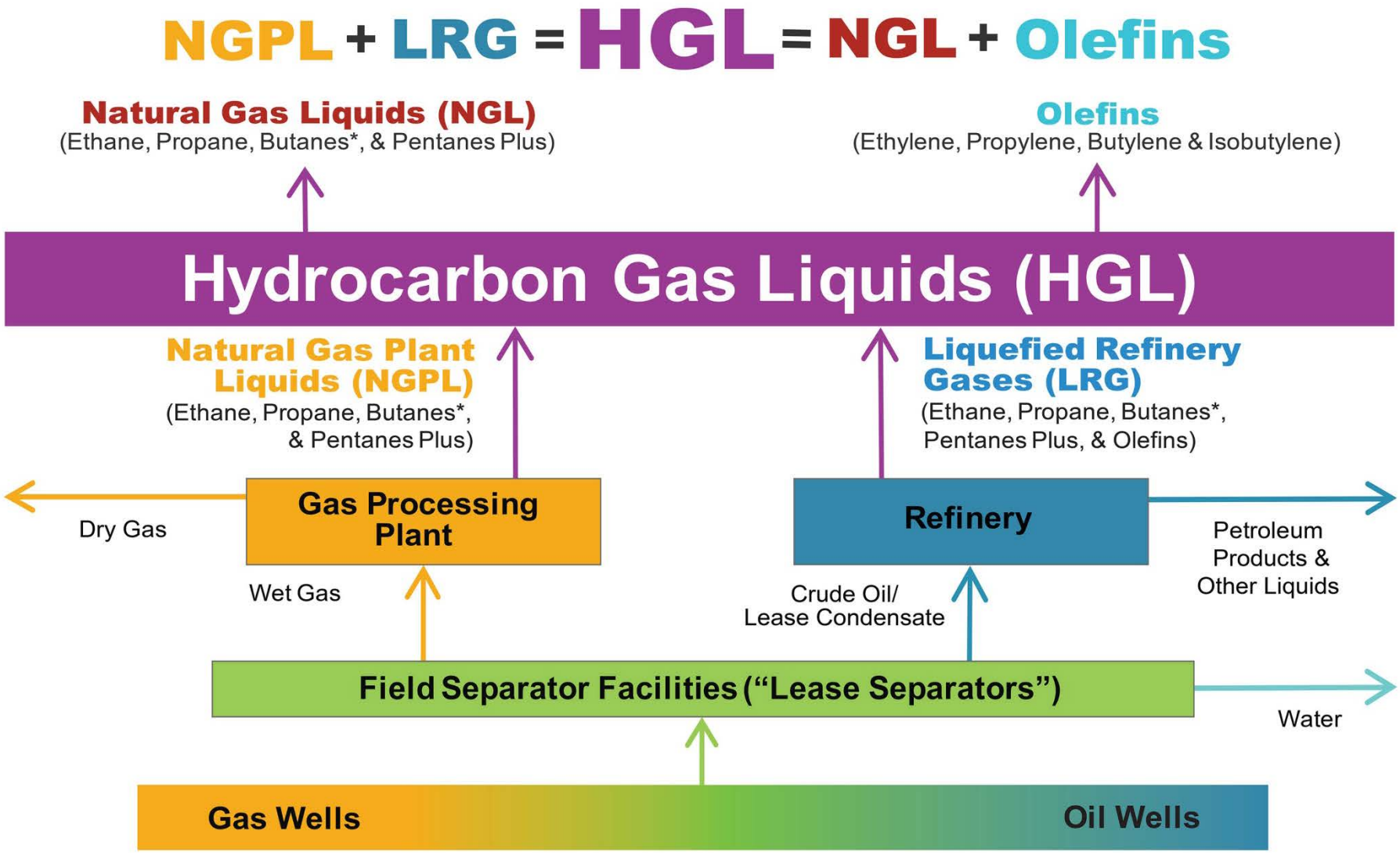
Background

- A high oil-to-gas price ratio has gas producers focusing on liquids, contributing to growing NGL production.
- EIA has begun highlighting our NGL data series and analysis pieces, and issues with terminology have become apparent.
- We attempted to address the inconsistencies arising from supply-oriented versus market-oriented terminology.
- We seek feedback on proposed new terminology and proposed changes to existing terminology. Feedback on implementation is also welcome.

Questions for our workshop attendees

- Does the new terminology make sense? Is it clear why we made changes? Are the changes an improvement?
- We are looking for feedback on four topics in particular:
  - Separation of NGL and olefins
  - Creation of new term: Hydrocarbon Gas Liquids (HGL)
  - Changes to term Liquefied Petroleum Gas (LPG)
  - Removal of lease condensate as an NGL
- Feedback on these items and anything else is welcome and appreciated. Please direct feedback to NGL@eia.gov.

Overview of gas liquids flow

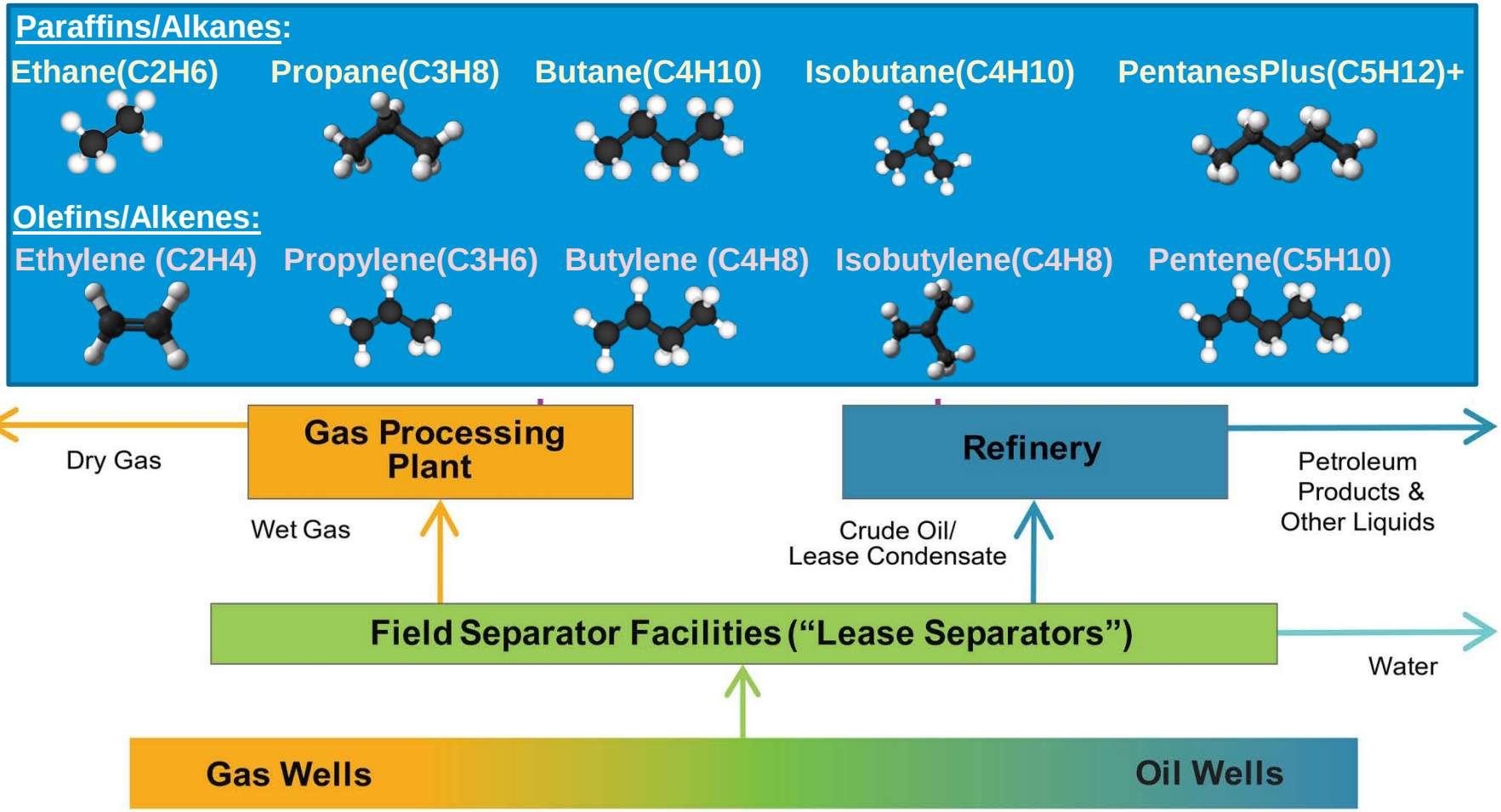


Butanes include normal butane and isobutane.

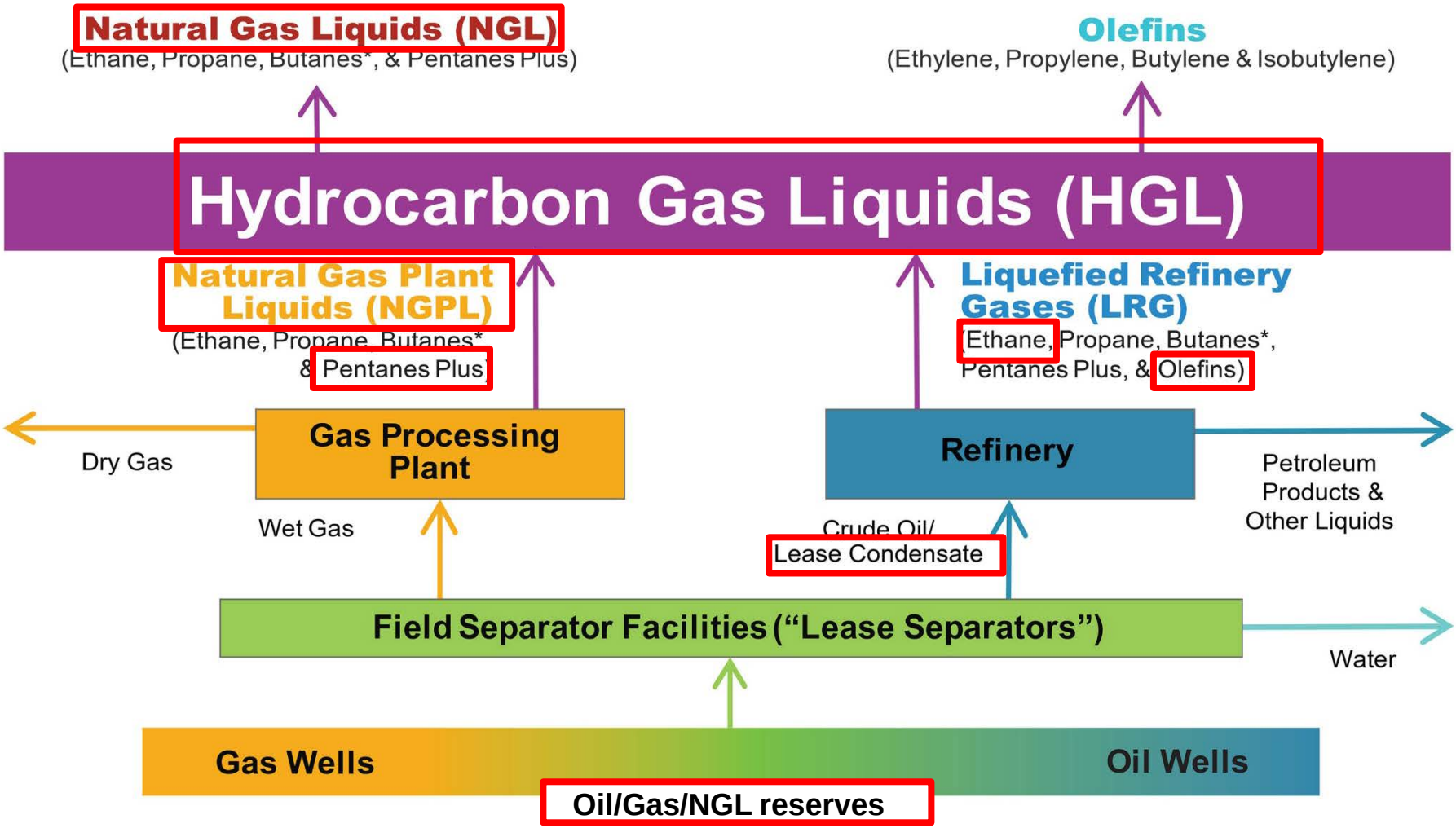
The molecules

Natural Gas Plant Liquids are all "paraffins" or "alkanes." See below:

Liquefied Refinery Gases include some "paraffins," but also "olefins" or "alkenes," listed below:



Where do issues arise?



NGPL + LRG = HGL = NGL + Olefins

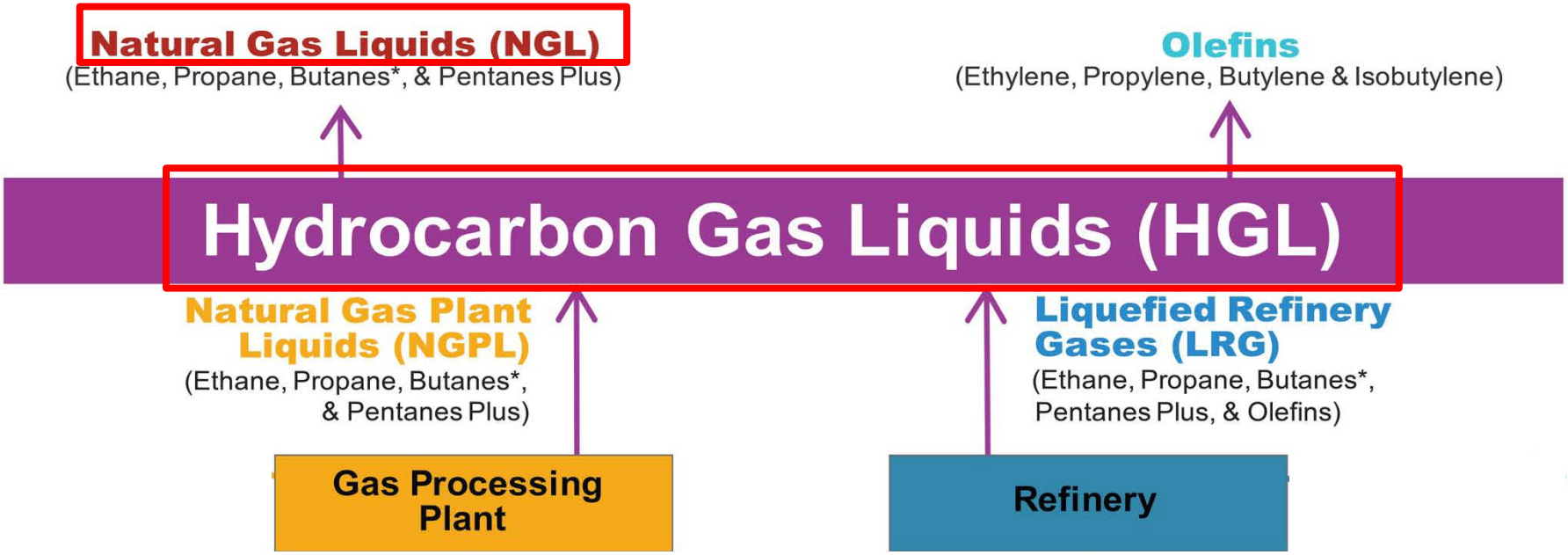
Downstream Issues

Natural Gas Liquids (NGL)
(Ethane, Propane, Butanes*, & Pentanes Plus)

Olefins
(Ethylene, Propylene, Butylene & Isobutylene)

- NGL will now include all NGPL and paraffinic LRG, and exclude olefins.

Downstream issues



Hydrocarbon Gas Liquids

- New term to encompass both NGL and Olefins
- NGPL plus LRG will capture all liquids from a production standpoint
- NGL plus Olefins will capture all liquids from a market standpoint
- HGL is equivalent to the union of NGPL and LRG or of NGL and olefins
- NGL will now include all NGPL and paraffinic LRG, and exclude olefins.

NGPL + LRG = HGL = NGL + Olefins

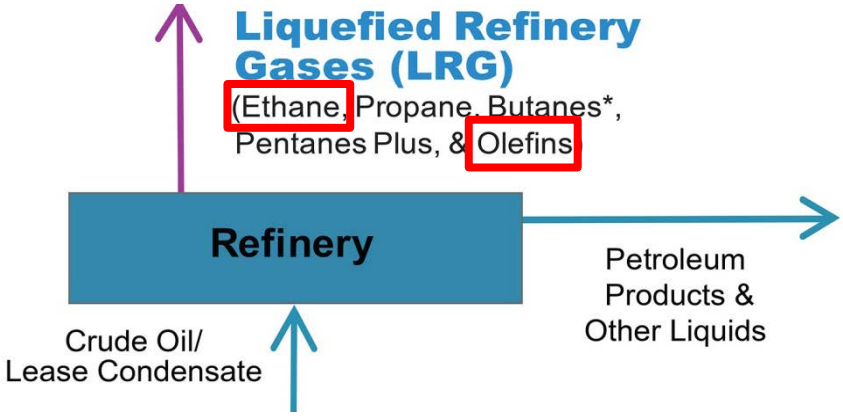
Midstream petroleum issues

Liquefied Petroleum Gas (LPG)

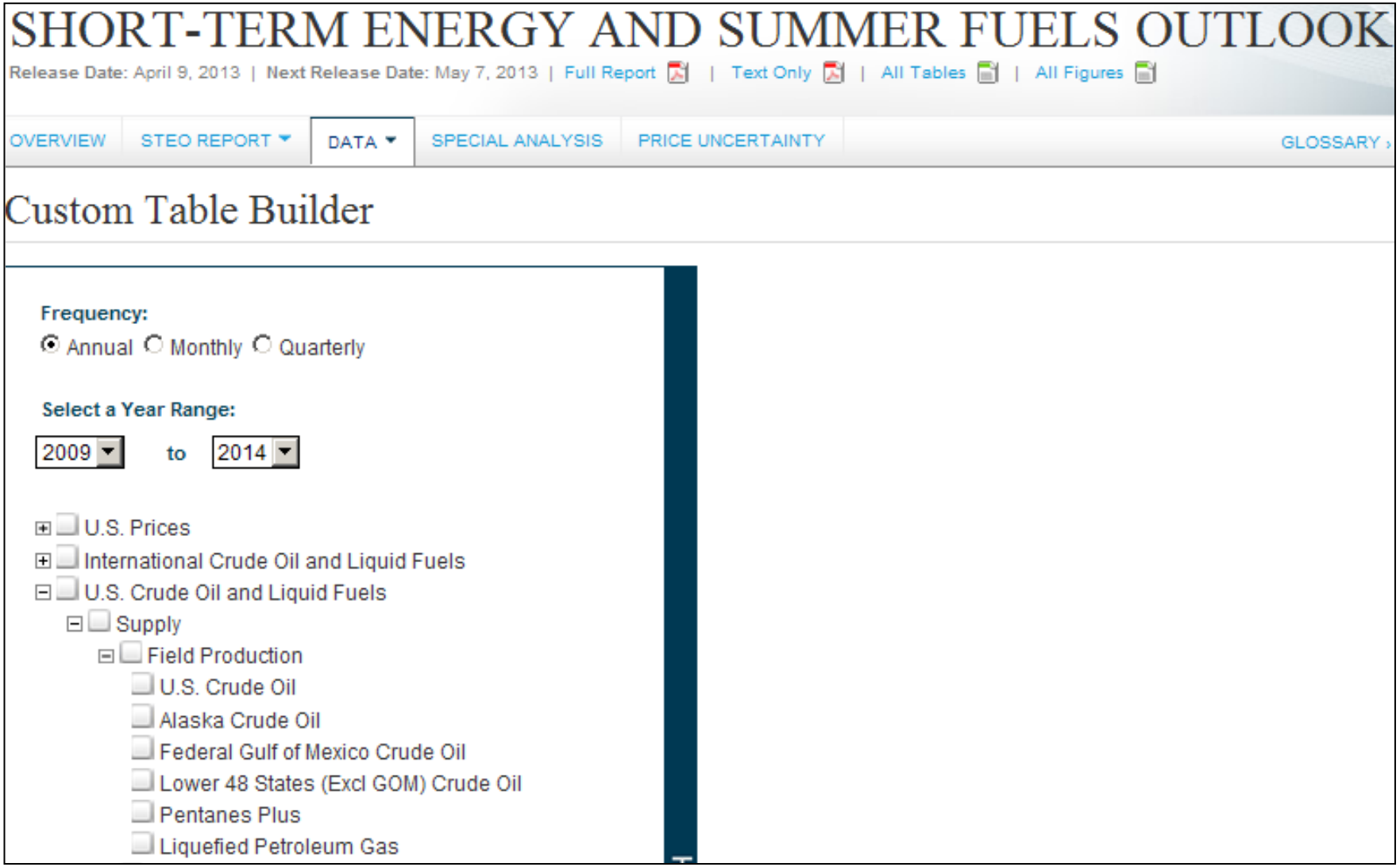
- Currently defined as C2-C4 by EIA
- We propose removing ethane as it is not a liquid and industry and IEA exclude it from LPG

Olefins

- Olefins, or alkenes, are a subset of Liquefied Refinery Gas (LRG)
- We propose leaving them in LRG but removing them from the definition of NGL on the grounds that when people discuss NGL they are excluding olefins



Example of midstream petroleum issues

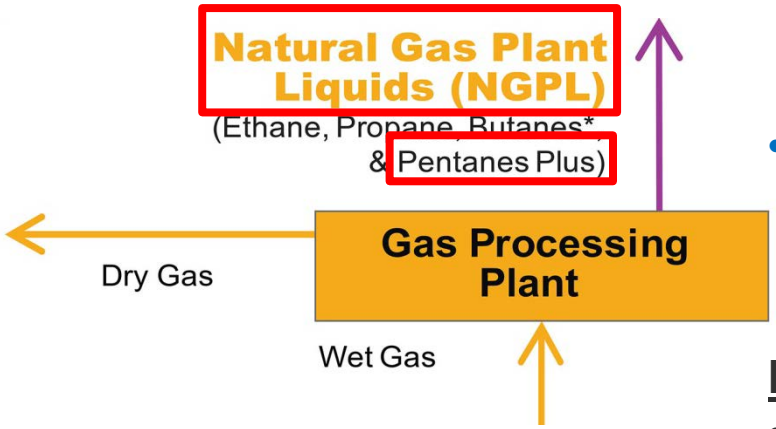


NGPL + LRG = HGL = NGL + Olefins

Midstream gas issues

Natural Gas Plant Liquids

- Currently considered "field production" of crude oil
- We would like to discontinue this since they are a natural gas byproduct



Pentanes Plus

- We will now define "natural gasoline" (a market term and product traded in the spot market) as a subset of Pentanes Plus
- Natural gasoline is "mostly pentanes and hexanes," which accounts for most of pentanes plus

Extraction Loss

- Shrinkage due to NGPL removal is called "extraction loss" by EIA.
- Propose changing name to "NGPL production" on the grounds that the NGPL are not lost but removed and sent to market

Example of midstream gas issues

Table 5.1b Petroleum Overview, Selected Years, 1949-2011
(Thousand Barrels per Day)

Year	Field Production [1]					Renewable Fuels and Oxygenates [5]	Processing Gain [6]
	Crude Oil [2]			Natural Gas Plant Liquids [4]	Total		
	48 States [3]	Alaska	Total				
1949	5,046	0	5,046	430	5,477	NA	-2
1950	5,407	0	5,407	499	5,906	NA	2
1955	6,807	0	6,807	771	7,578	NA	34
1960	7,034	2	7,035	929	7,965	NA	146
1965	7,774	30	7,804	1,210	9,014	NA	220
1970	9,408	229	9,637	1,660	11,297	NA	359
1975	8,183	191	8,375	1,633	10,007	NA	460
1976	7,958	173	8,132	1,604	9,736	NA	477
1977	7,781	464	8,245	1,618	9,862	NA	524
1978	7,478	1,229	8,707	1,567	10,275	NA	496
1979	7,151	1,401	8,552	1,584	10,135	NA	527
1980	6,980	1,617	8,597	1,573	10,170	NA	597
1981	6,962	1,609	8,572	1,609	10,180	NA	508
1982	6,953	1,696	8,649	1,550	10,199	NA	531
1983	6,974	1,714	8,688	1,559	10,246	NA	488
1984	7,157	1,722	8,879	1,630	10,509	NA	553
1985	7,146	1,825	8,971	1,609	10,581	NA	557
1986	6,814	1,867	8,680	1,551	10,231	NA	616
1987	6,387	1,962	8,349	1,595	9,944	NA	639

NGPL + LRG = HGL = NGL + Olefins

Upstream issues

Lease Condensate

- Currently considered an NGL, but is mixed with and sold as crude oil
- To be recategorized as crude oil because it never reaches NGL markets

Reserves

- NGL are shown in reserves as "Natural Gas Liquids Proved Reserves"
- To be changed to "Expected Production from Total Natural Gas Proved Reserves," with NGPL and dry gas break-out
- NGPL and dry gas reserves are conceptually confusing, since they must be processed above ground to become separate products

Miscellaneous issues

Natural Gas Liquids

- NGL to be used in the plural

NGPL Composite Price

- "NGL Composite Price" renamed "NGPL Composite Price"
- This is to correspond to the NGPL/LRG differentiation

Light/Heavy NGL

- Light NGL and Heavy NGL are acceptable terms, but will not be in the glossary and must be defined wherever used
- This is a useful distinction for analysis but not relevant to our data collection, so we will opt to define it on an as-needed basis.

HGL: before and after realignment

Before	After / Supply	After / Supply	After / Demand	After / Demand
NGL	NGPL	LRG	NGL	Olefins
NGPL/LRG	Ethane	Ethane	Ethane	Ethylene
LPG	LPG	LPG	LPG	Propylene
Ethane	Propane	Propane	Propane	Butylene
Ethylene	Butane	Butane	Butane	Normal
Propane	Normal	Normal	Normal	Iso
Propylene	Iso	Iso	Iso	
Butane	Pentanes+	Olefins	Pentanes+	
Butylene		Ethylene		
Isobutane		Propylene		
Isobutylene		Butylene		
Pentanes+		Normal		
Isopentane		Iso		
Lease Condensate				

NGPL + LRG = HGL = NGL + Olefins

Comparison of term: natural gas liquids (NGL)

EIA Proposed	GPA (Gas Processors Association)	IEA (International Energy Agency)	USGS (U.S. Geological Survey)
Ethane, propane, normal butane, isobutane, and pentanes plus. Natural gas plant liquids and all liquefied refinery gases, except olefins.	Natural gas liquids are those hydrocarbons liquefied at the surface in field facilities or in gas processing plants.	NGL are liquid or liquefied hydrocarbons recovered from natural gas in separation facilities or gas processing plants.	Natural gas liquids include natural gas plant liquids (primarily ethane, propane, butane, and isobutane) and lease condensate.

NGPL + LRG = HGL = NGL + Olefins

Comparison of term: liquefied petroleum gases (LPG)

EIA Proposed	GPA (Gas Processors Association)	IEA (International Energy Agency)
Primarily propane, normal butane, and isobutane. These gases may be marketed individually or mixed. They can be liquefied through pressurization without refrigeration for convenience of transportation. Excludes ethane and olefins.	"LP-gas": Predominately propane or butane separately or in mixtures which are maintained in a liquid state under the pressure within the confining vessel.	Light hydrocarbon fractions comprising propane and butane or a combination of the two. They could also include propylene, butylene, isobutene and isobutylene. LPG are normally liquefied under pressure for transportation and storage.

Comparison with Gas Processors Association

Term	EIA Proposed	GPA (Gas Processors Association)
Liquefied refinery gases (LRG)	Hydrocarbon gas liquids produced in refineries from processing of crude oil and unfinished oils. Ethane, ethylene, propane, propylene, normal butane, butylene, isobutane, and isobutylene.	Liquid propane or butane produced by a crude oil refinery. It may differ from LP-gas in that propylene and butylene may be present.
Natural gasoline	A commodity product commonly traded in NGL markets (mostly pentanes and hexanes) that remain liquid at ambient temperatures and atmospheric pressure. A subset of pentanes plus.	A mixture of hydrocarbons, mostly pentanes and heavier, extracted from natural gas.

Changes proposed by EIA to realign NGL data and related terminology

Natural Gas Liquids (NGL) Use in the singular as market term; exclude olefins and lease condensate

Olefins Separate as subset of Liquefied Refinery Gas (LRG); include ethylene, propylene, butylene, and isobutylene; exclude aromatics

Natural Gas Plant Liquids (NGPL) Discontinue NGPL as "field production of crude oil;" NGPL ≠NGL

Reserves Change to "Expected Production from Total Natural Gas Proved Reserves," with NGL and dry gas break-out

Extraction Loss Change name to "NGPL production"

NGPL Composite Price Rename composite spot price instead of "NGL Composite Price"

Pentanes Plus Make synonymous with plant condensate and define as "mostly pentanes and hexanes, including natural gasoline"

Hydrocarbon Gas Liquids (HGL) Create a new term, HGL = NGL + olefins = NGPL + LRG

Liquefied Petroleum Gas (LPG) Remove ethane and olefins from LPG definition

Lease Condensate Re-categorize exclusively as crude oil; excluded from NGL

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Thank you!

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