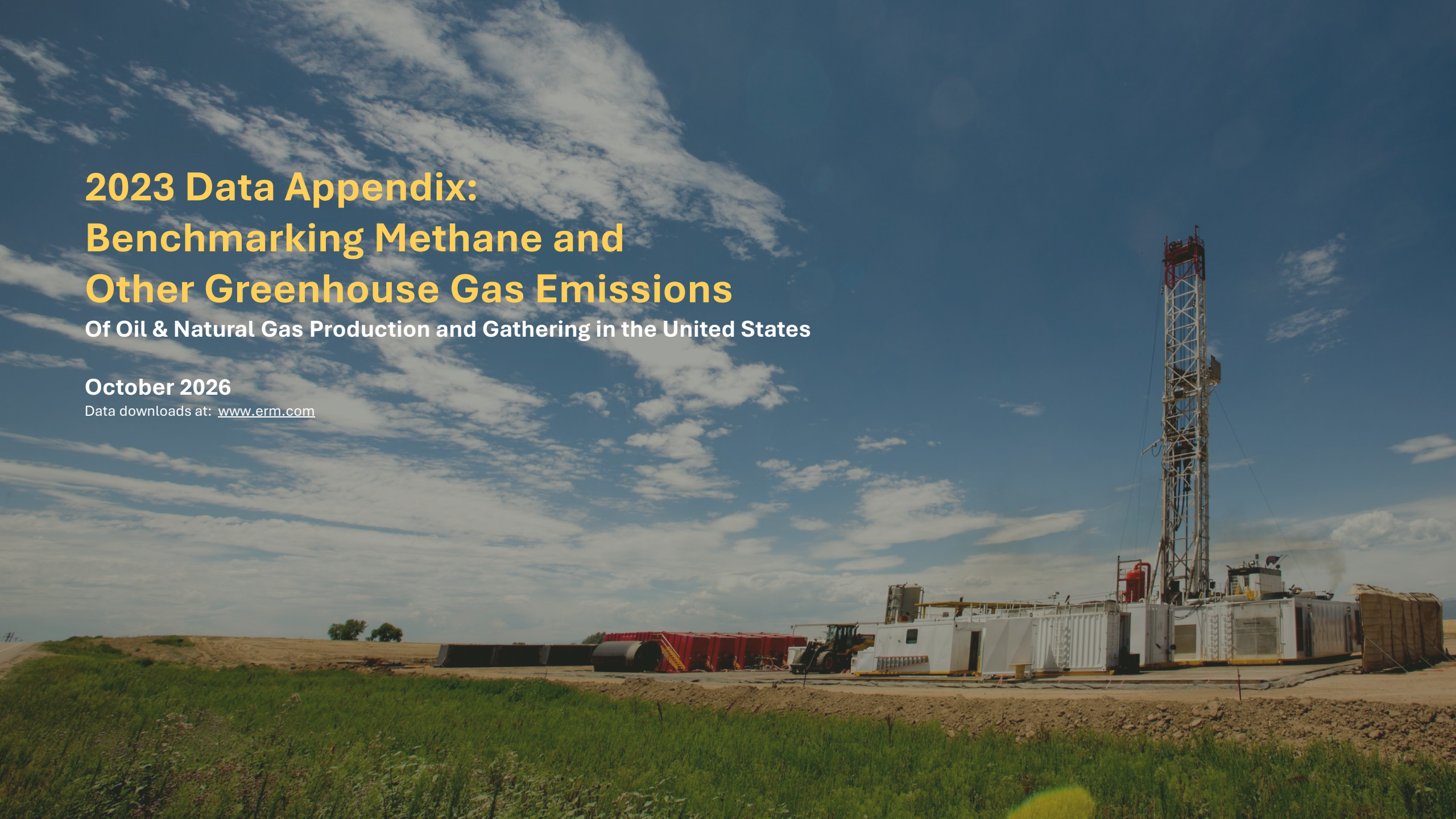


2023 Data Appendix: Benchmarking Methane and Other Greenhouse Gas Emissions

Of Oil & Natural Gas Production and Gathering in the United States

October 2026

Data downloads at: www.erm.com

Contents

This appendix to the 2026 Oil and Gas Benchmarking Report contains standalone 2023 data. This document includes most of the charts and tables included in the main report, which focuses on 2024 data, with the exception of certain trends charts. The 2023 subpart W data in this appendix are sourced from EPA's Envirofacts database, which as of publication EPA is no longer updating. As a result, this appendix may not capture corrections to 2023 data that companies resubmitted after EPA stopped updating its public database. All corrections to prior to 2024 data are reflected in the main 2026 report and accompanying data dashboards. For additional background on the report as well as information on its methodology, please see the main 2026 report.

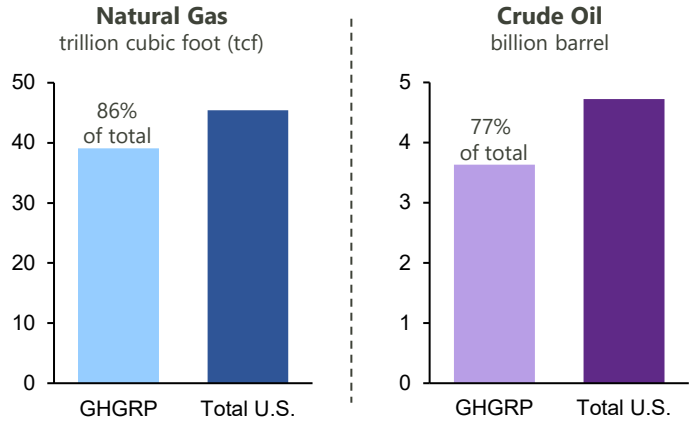
Production Segment	3
• Basin-Level Summary Data	6
• Company-Level Summary Data	11
• Company- & Basin-Level Summary Data	23
Gathering & Boosting Segment	58
• Basin-Level Summary Data	61
• Company-Level Summary Data	66
• Company- & Basin-Level Summary Data	78
Combined Production and Gathering & Boosting Segment	112
• Basin-Level Summary Data	115
• Company-Level Summary Data	122
• Company- & Basin-Level Summary Data	137

2023 Production Segment

Relative Scope of Data Analyzed (2023)

- Onshore oil and gas production reported to the GHGRP represents 77% of total U.S. annual oil production, and 86% of total U.S. annual gas production
- Reported onshore production segment methane represents 45% of total methane reported under Subpart W
- Reported onshore production segment CO_2e represents 42% of total CO_2e reported under Subpart W
- Oil and gas production reported to GHGRP as a percent of total U.S. oil and gas production slightly increased from 2021-2022

2023 Hydrocarbon Production
GHGRP vs. Total U.S.*



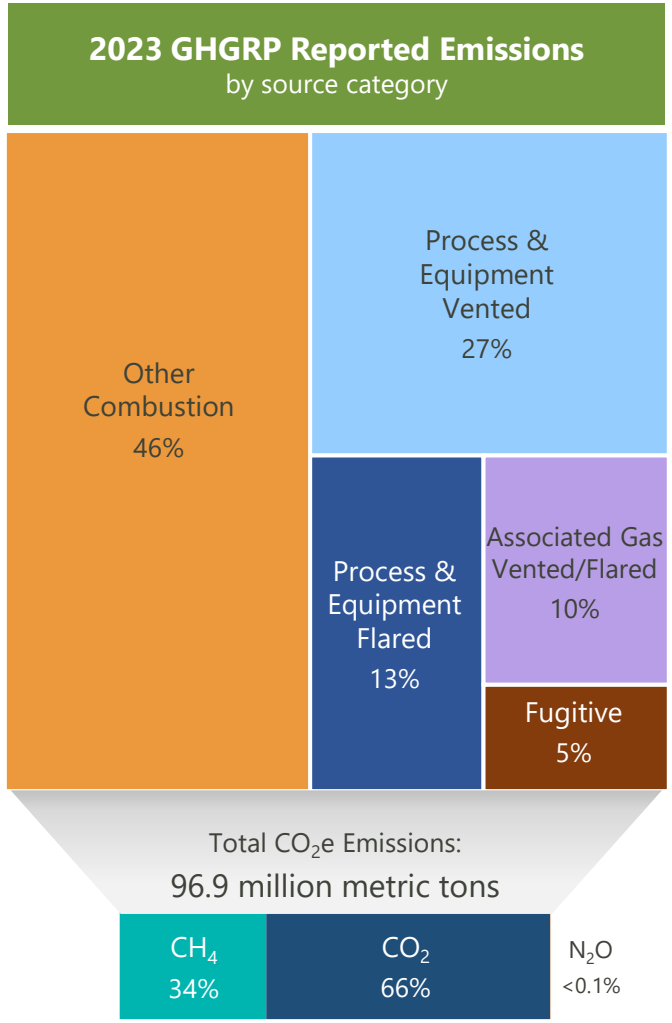
*Source: U.S. EIA

Types of Emissions Associated with Oil & Gas Production

The GHGRP subpart W onshore production segment includes reporting on emissions from 17 emissions sources. In addition, this report attributes emissions associated with six additional sources that are estimated at the national level by EPA in the GHG Inventory, but not included in GHGRP. The relative contribution of GHG emissions from oil and gas production can vary widely by both type of gas and emissions source. Factors influencing the relative contribution of emissions include geology, targeted hydrocarbons (e.g., dry gas vs. wet gas), available infrastructure, and company policies and practices.

For purposes of comparison within this report, emissions sources are grouped into five categories:

- **Process & Equipment Vented** Vented emissions are intentional releases of natural gas from equipment and processes. Common sources of vented emissions include gas-driven pneumatic devices, compressor seals, tanks, and liquids unloading.
- **Process & Equipment Flared** Flared emissions consist primarily of CO_2 from the combustion of gas that is captured from equipment and processes. Flaring also results in methane emissions from uncombusted gas that escapes through the flare stack.
- **Associated Gas Vented & Flared** Associated gas vented and flared emissions occur at oil wells that do not capture a portion or any of the gas that is produced alongside oil. The gas is directly released to the atmosphere or combusted in a flare rather than captured for sale, on-site use, or reinjection.
- **Fugitive** Fugitive emissions are unintentional releases, or leaks, of natural gas. These emissions are often caused by faulty or worn-out equipment. Sources of fugitive emissions include seals and cracks on equipment such as tanks and piping, and leakage from infrastructure components such as valves and connectors.
- **Other Combustion** Non-flaring combustion is a significant source of CO_2 emissions from oil and gas production. Diesel and natural gas engines used to power equipment and provide electricity represent the largest source of other combustion emissions. Other combustion also includes methane emissions from uncombusted gas.

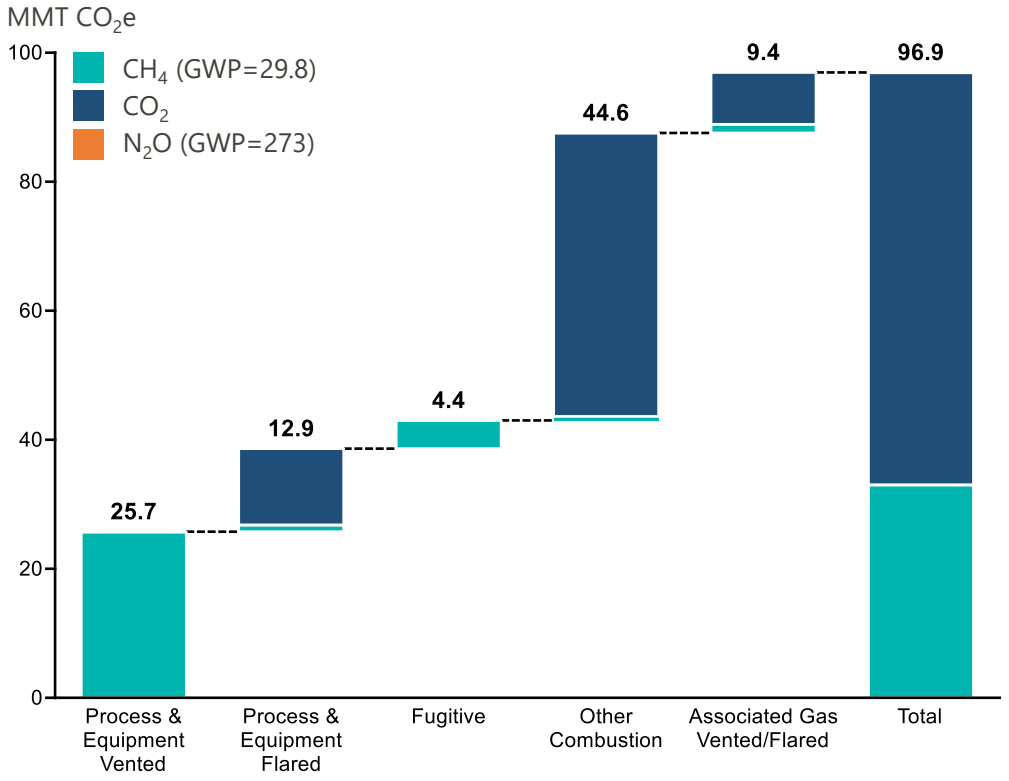


Sources of Methane Emissions

Process and equipment vented, and fugitive methane emissions make up approximately 91% and 31% of the total production segment methane and GHG emissions, respectively, reported across all sources included in this report. Pneumatic devices are the largest source of reported methane emissions.

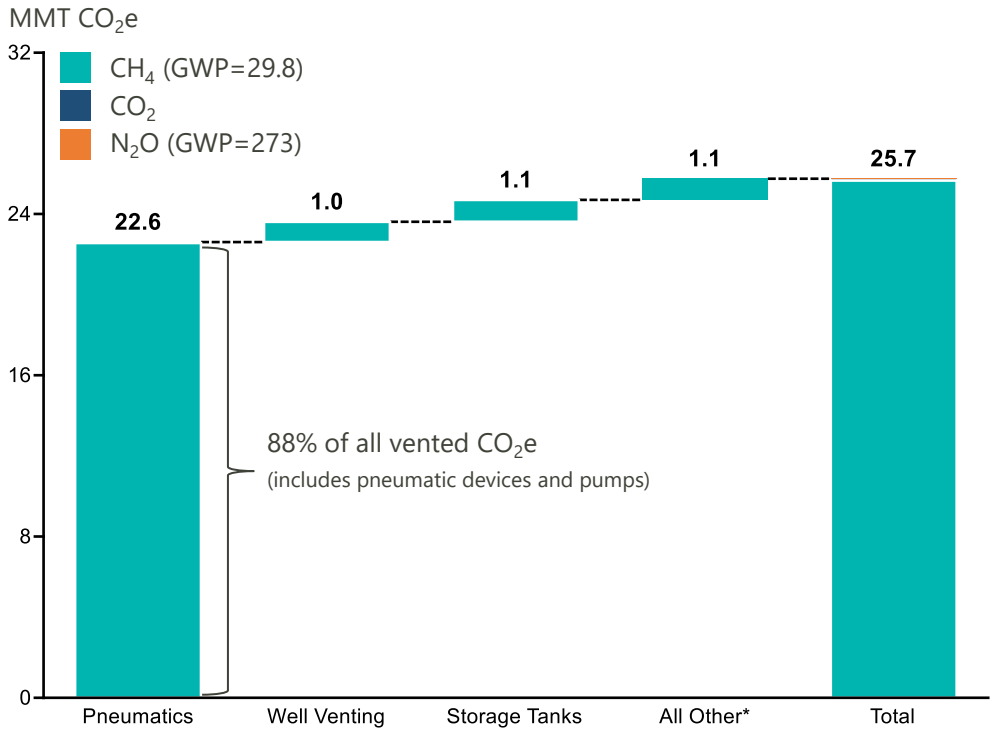
2023 Reported Production Emissions, by Source Category

million metric ton CO_2e (MMT CO_2e)



2023 Reported Process & Equipment Vented Emissions, by Source

million metric ton CO_2e (MMT CO_2e)

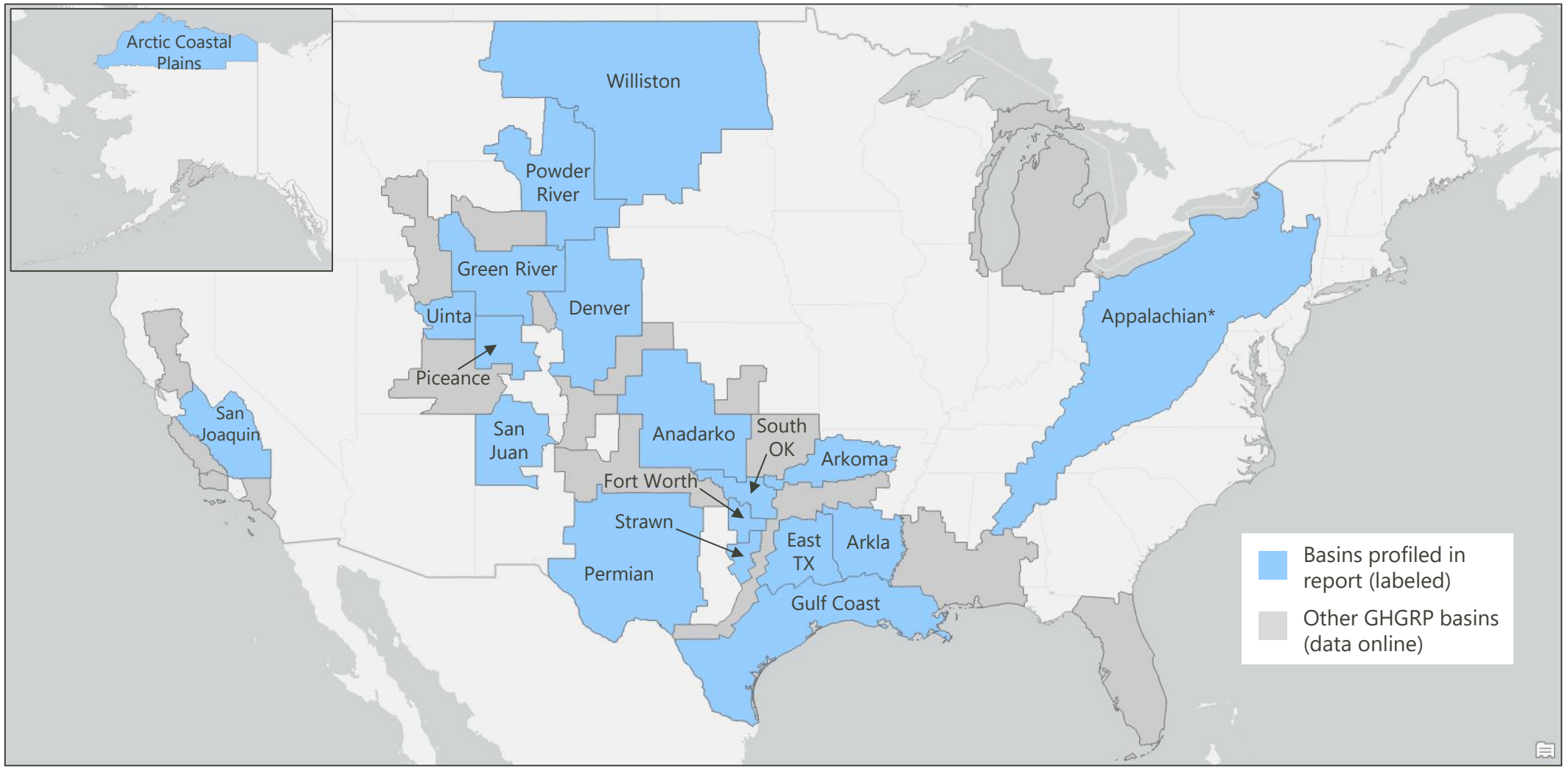


*Includes: Centrifugal compressors, Completions/workovers, dehydrators, reciprocating compressors, compressor blowdowns and starts, well drilling, pressure relief valves, well testing, and acid gas removal units

Basin-Level Summary Data

This section provides data on hydrocarbon production, GHG emissions, emissions intensity, and sources of emissions for the 19 largest hydrocarbon production basins in the U.S. by 2023 production volume. Together these basins represent 99.0% and 99.3% of total 2023 natural gas and oil production, respectively, in the EPA data.

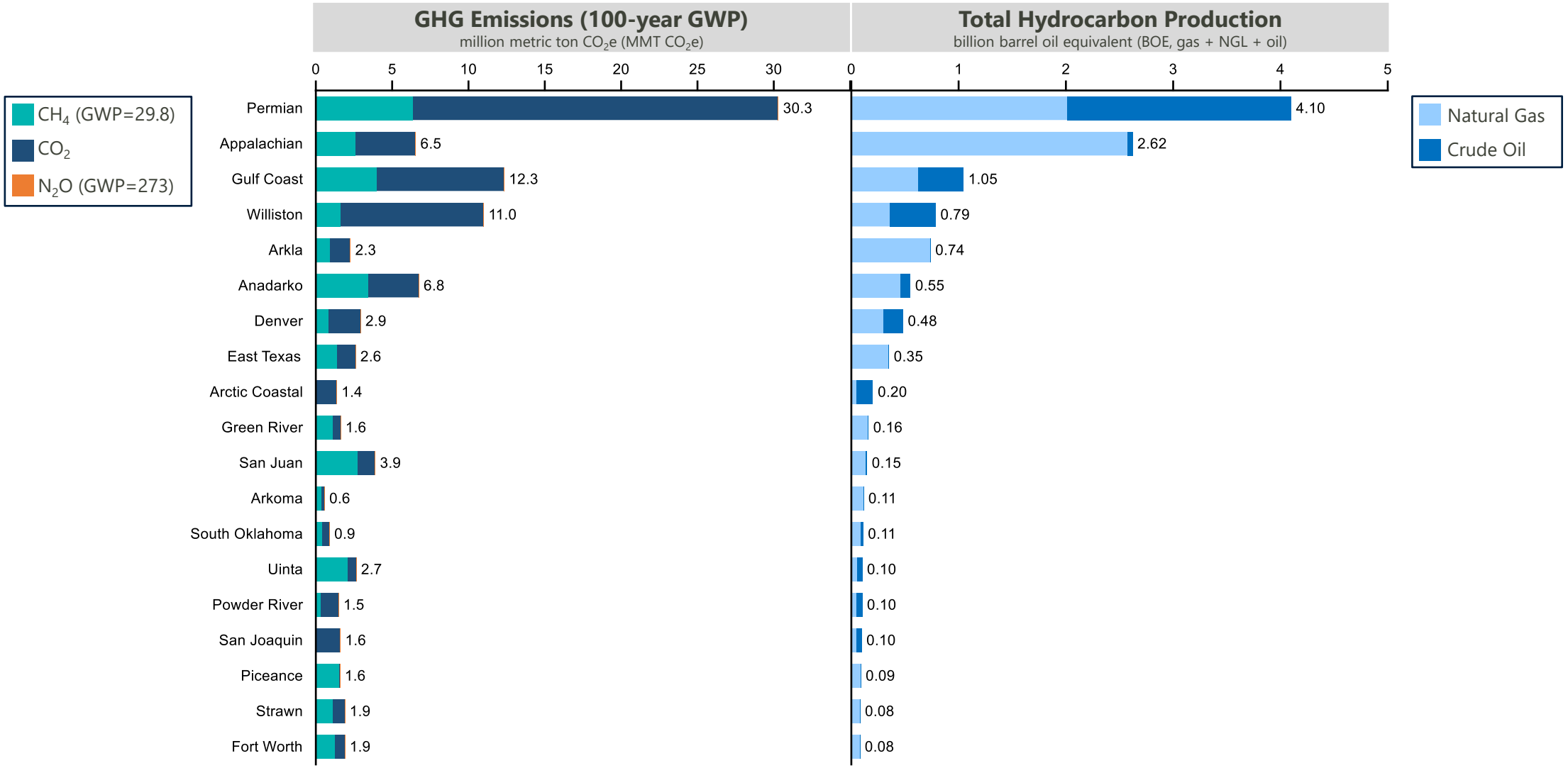
GHGRP Basins



* GHGRP data contain two distinct Appalachian basins (160 & 160A). This analysis combines data reported across both basins and presents them as a single basin.
Note: Basin boundaries defined by geologic provinces published by the American Association of Petroleum Geologists; data provided by U.S. EPA.

2023 Data

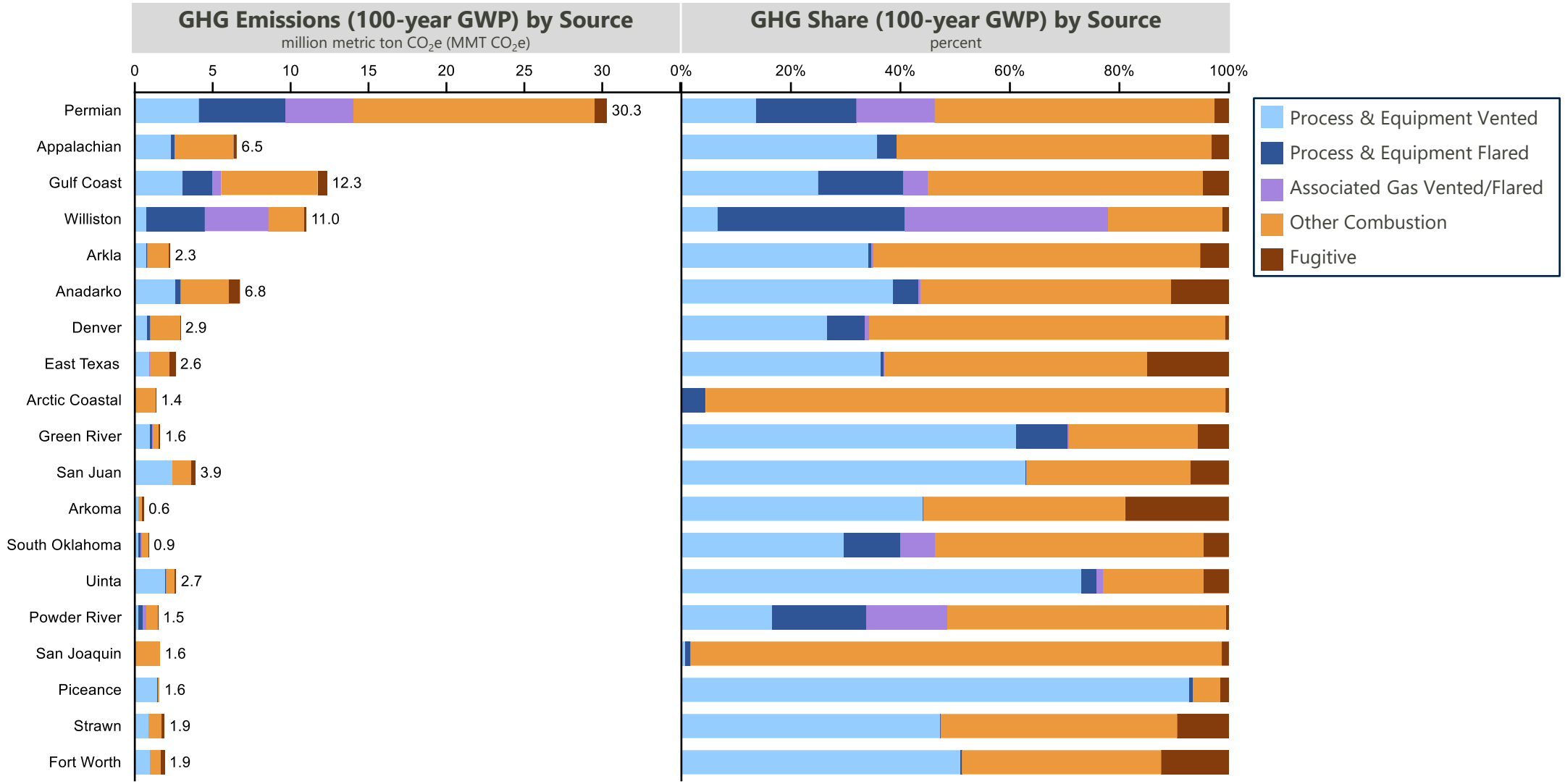
GHGRP Basin Production & Emissions



Note: Basins are ranked in descending order of hydrocarbon production (BOE)

2023 Data

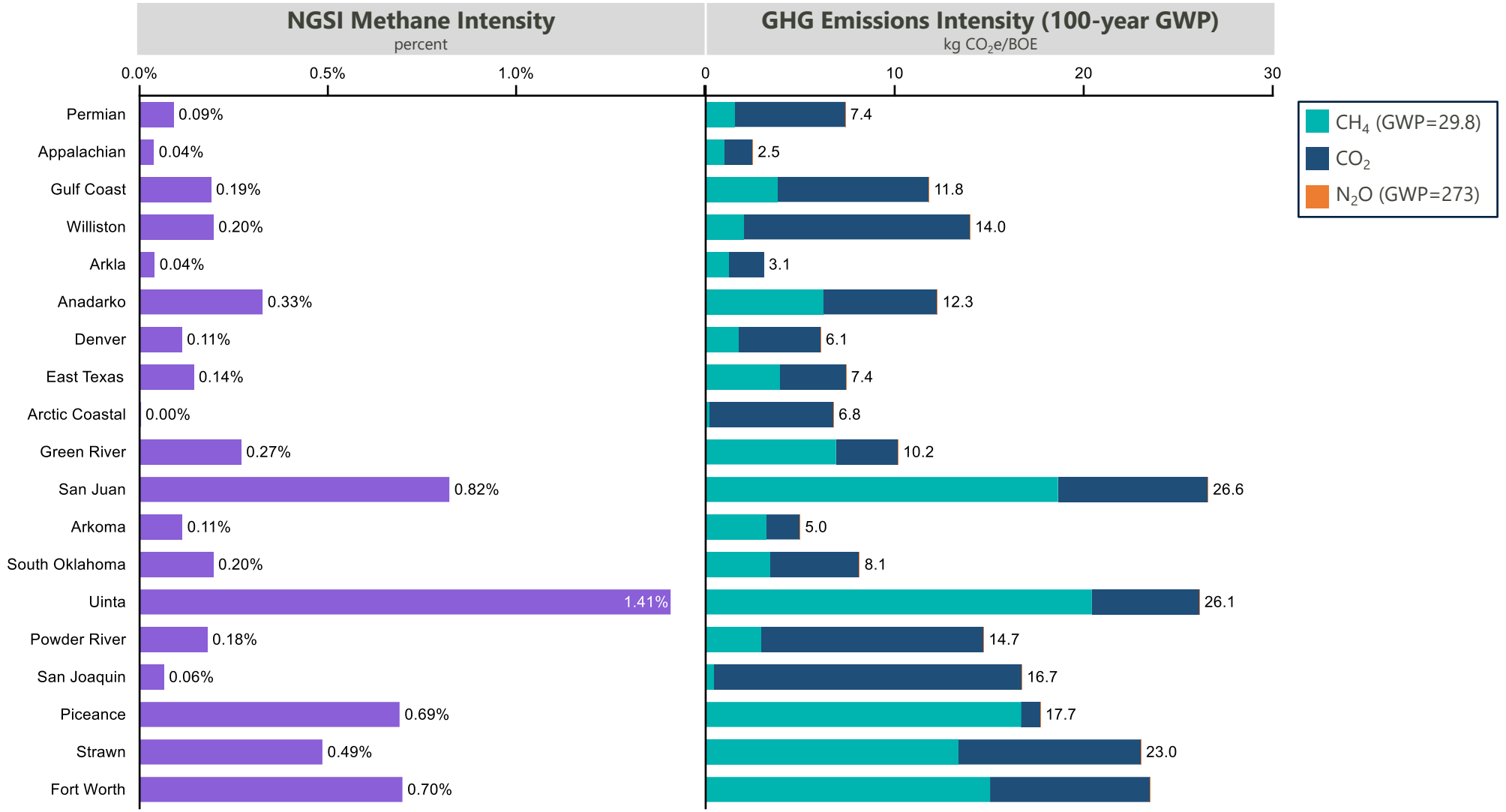
GHGRP Basin Emissions by Source



Note: Basins are ranked in descending order of hydrocarbon production (BOE)

2023 Data

GHGRP Basin Methane & GHG Intensity



Note: Basins are ranked in descending order of hydrocarbon production (BOE)

Company-Level Summary Data

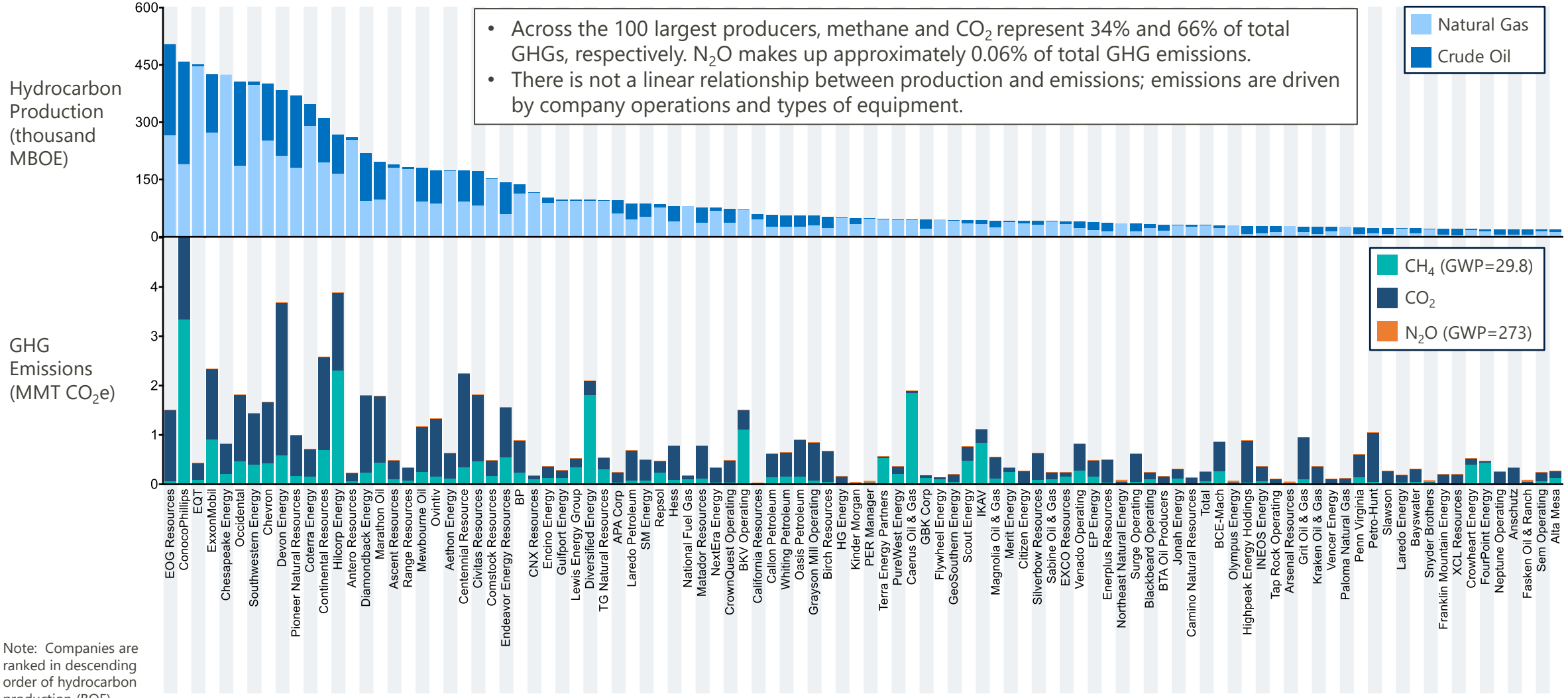
This section summarizes data on hydrocarbon production, GHG emissions, emissions intensity, and sources of emissions for the 100 largest hydrocarbon producers in the U.S. Additional graphics show the relative distribution of hydrocarbon production, GHG emissions, and methane and GHG emissions intensities across the 100 largest producers. Detailed tables list the data and associated rankings for the primary metrics included in this analysis for each of the 100 companies.

Top 100 Hydrocarbon Producers

2023 Data

Hydrocarbon Production & Emissions (100-year GWP)

- Across the 100 largest producers, methane and CO_2 represent 34% and 66% of total GHGs, respectively. N_2O makes up approximately 0.06% of total GHG emissions.
- There is not a linear relationship between production and emissions; emissions are driven by company operations and types of equipment.

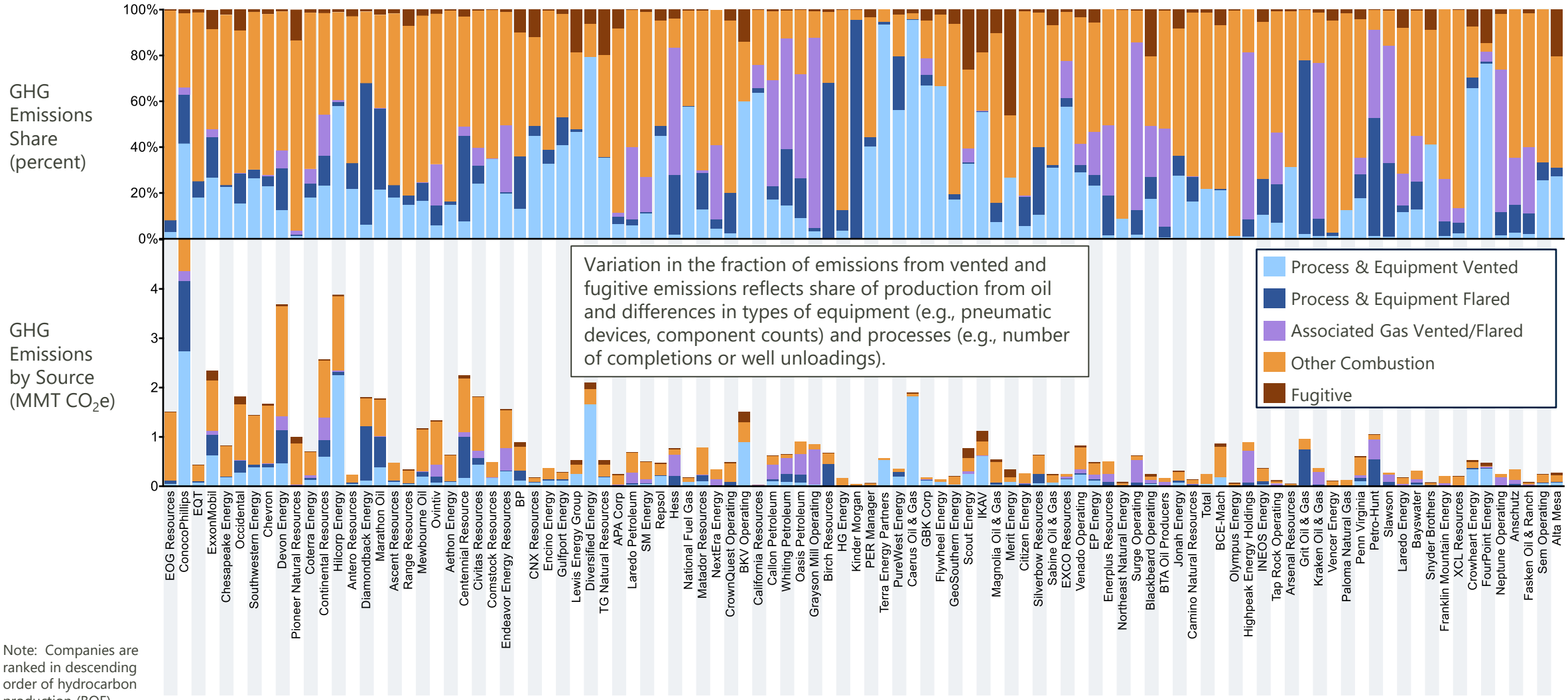


Note: Companies are ranked in descending order of hydrocarbon production (BOE)

Top 100 Hydrocarbon Producers

2023 Data

GHG Emissions by Source (100-year GWP)

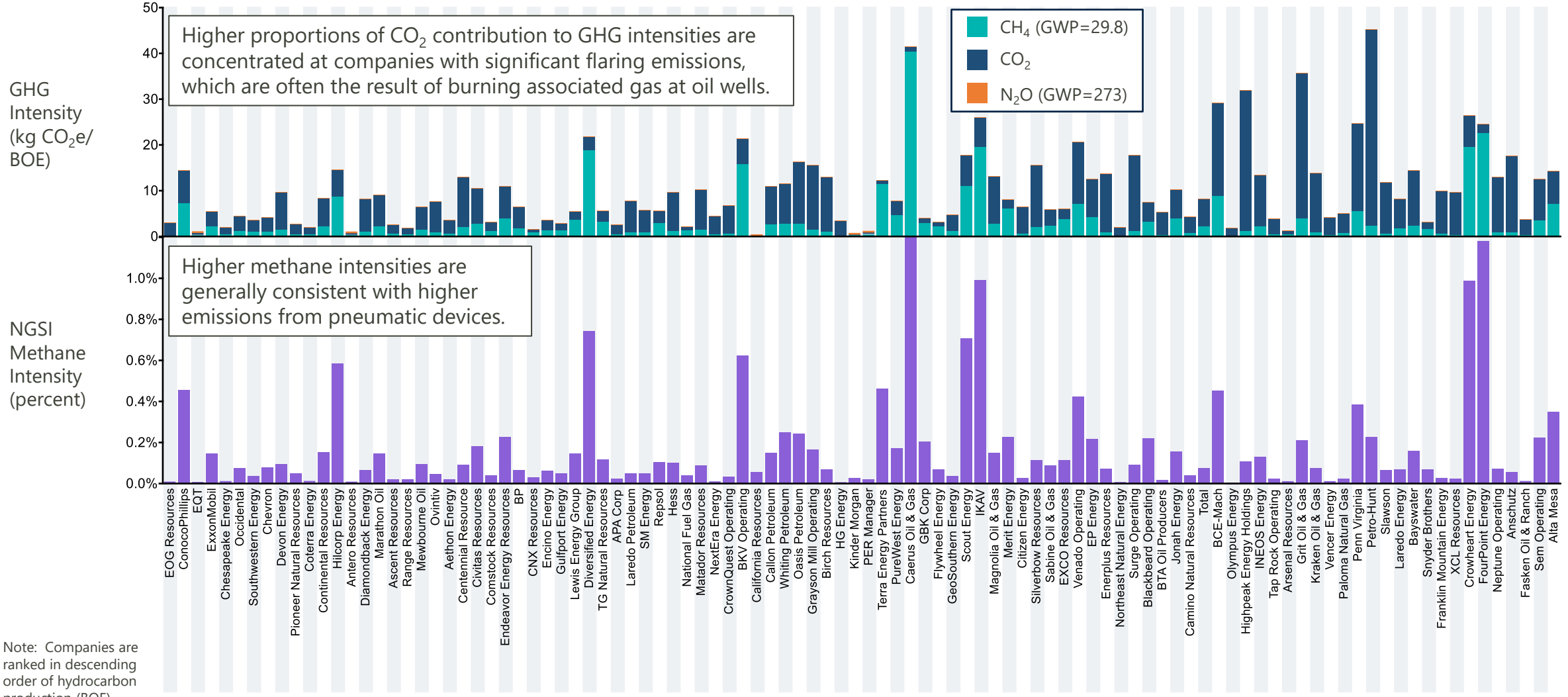


Note: Companies are ranked in descending order of hydrocarbon production (BOE)

Top 100 Hydrocarbon Producers

2023 Data

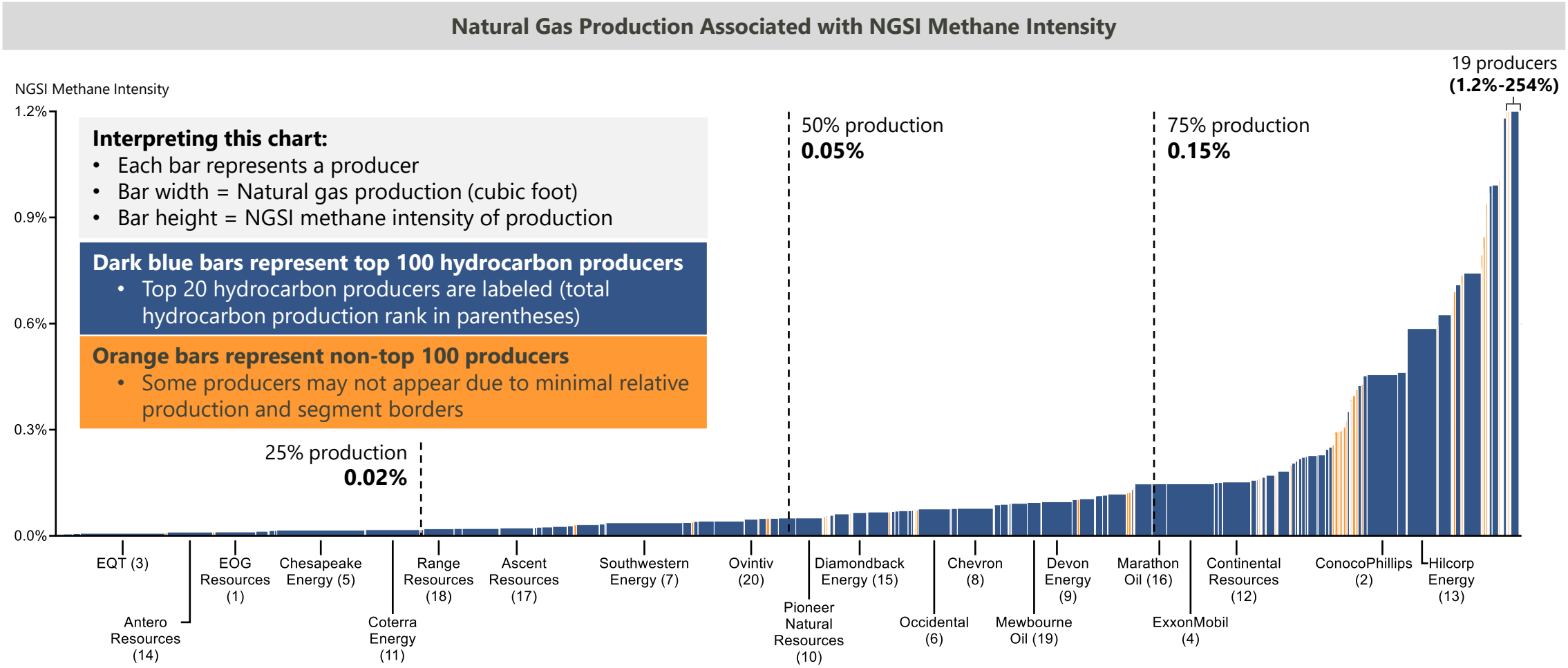
Methane & GHG Intensity (100-year GWP)



Note: Companies are ranked in descending order of hydrocarbon production (BOE)

2023 Data

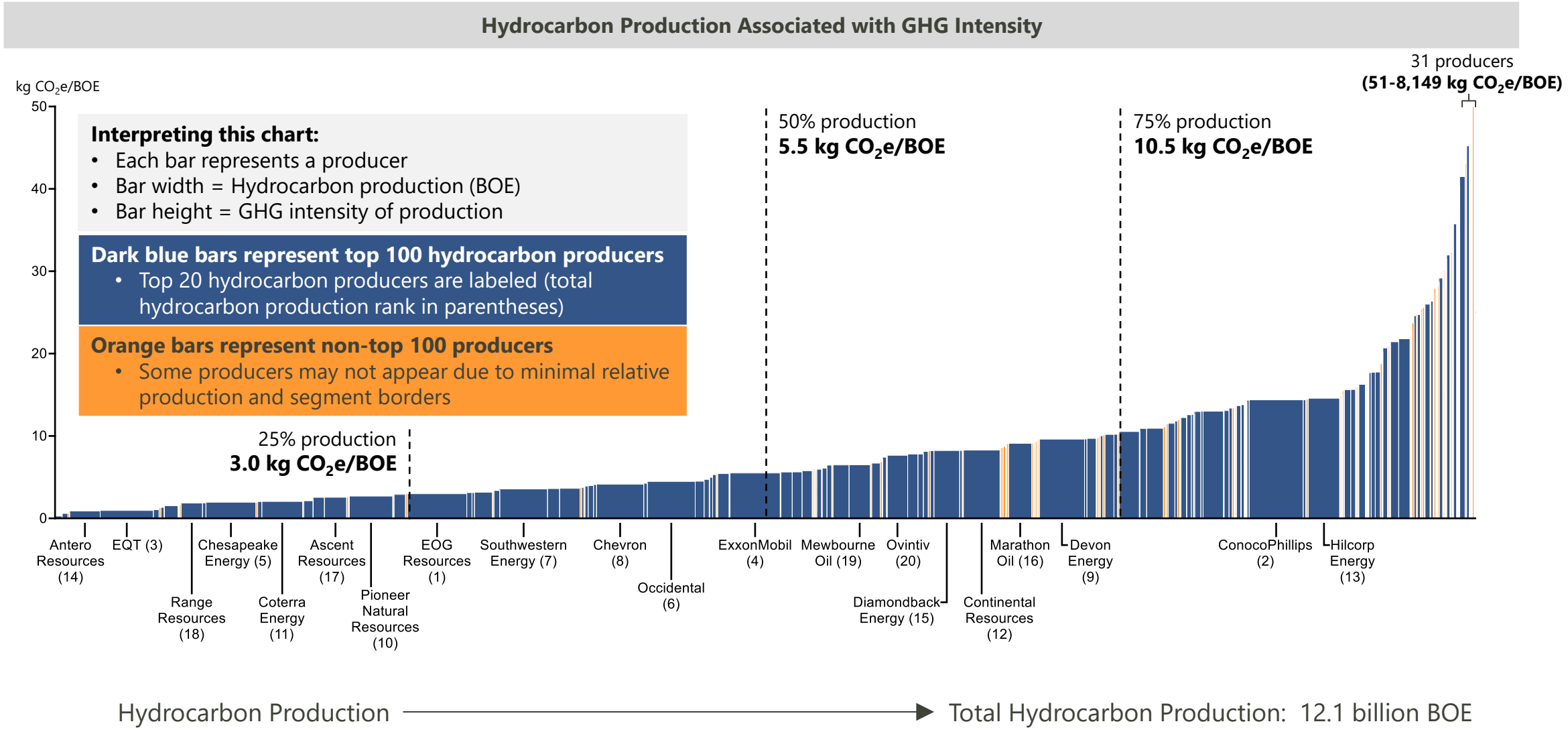
Total GHGRP Natural Gas Production, by Methane Intensity



Natural Gas Production → Total Gas Production: 39.1 trillion cubic feet

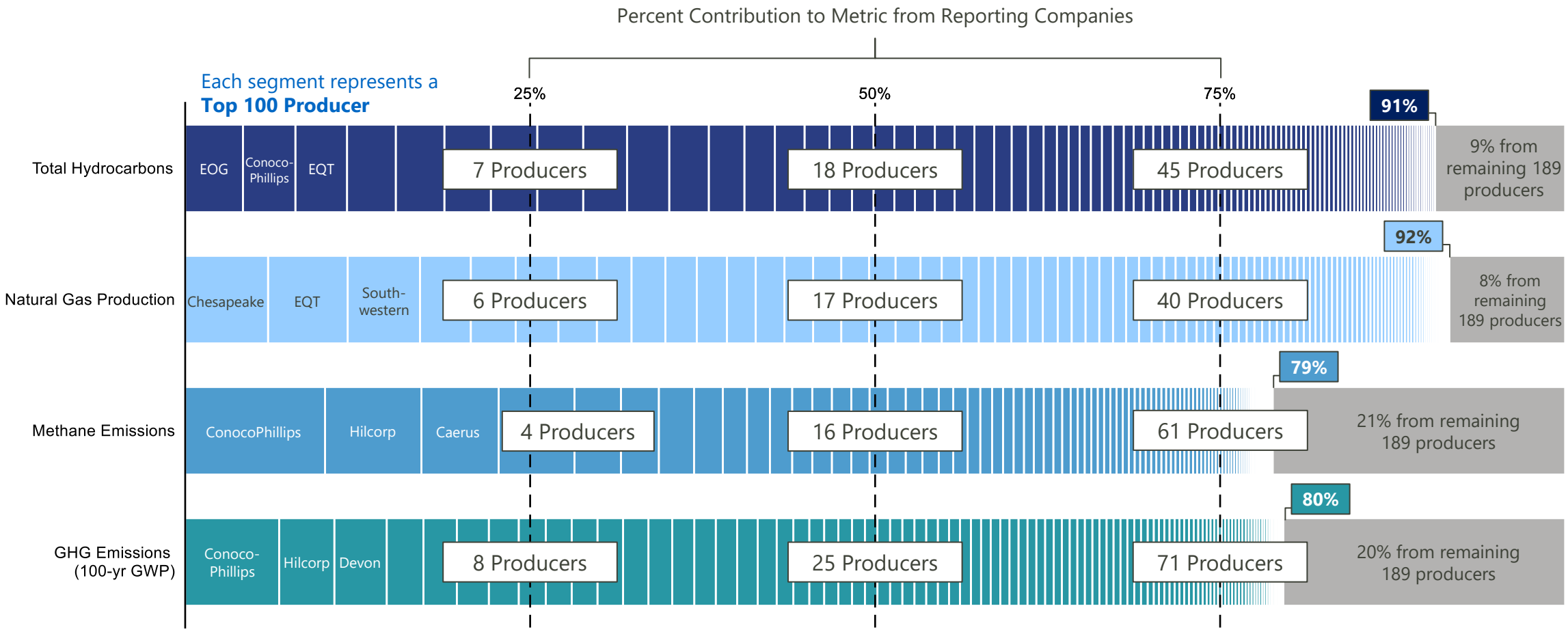
2023 Data

Total GHGRP Hydrocarbon Production, by GHG Intensity



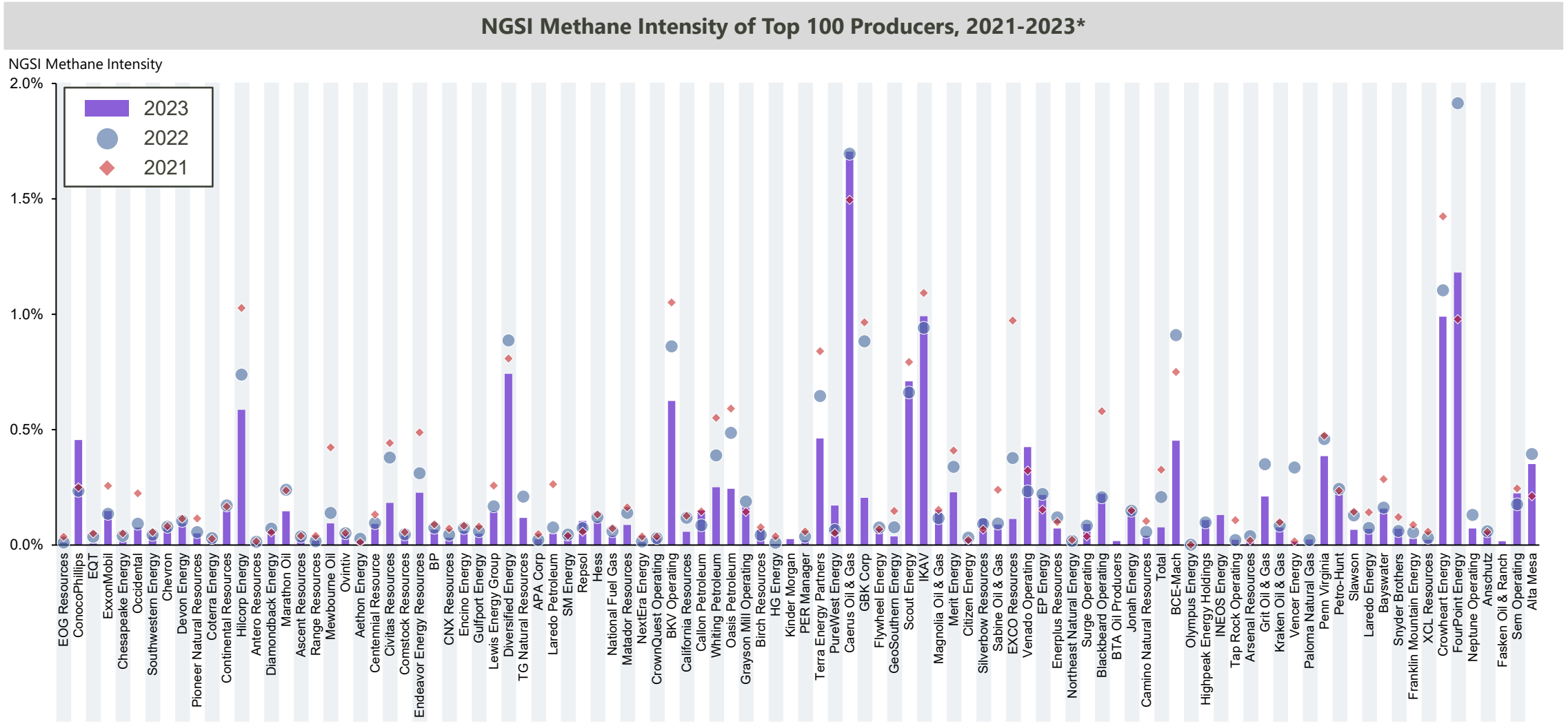
2023 Data

GHGRP Hydrocarbon Production & Emissions Contributions



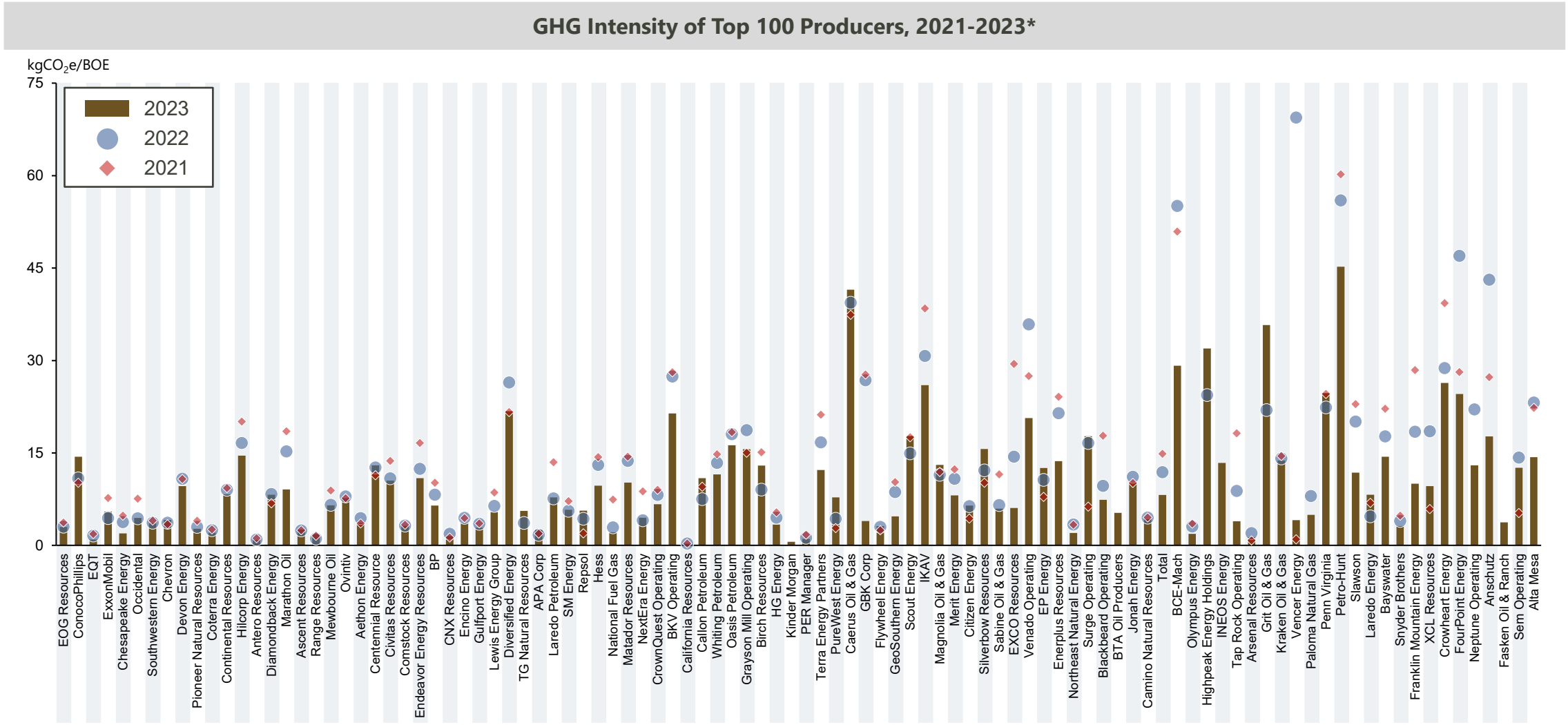
Hydrocarbon production and absolute GHG emissions reported to EPA are highly concentrated among a small number of companies. 25% of total reported hydrocarbons produced and GHG emitted are by seven and eight companies, respectively. However, the 189 companies that fall outside the top 100 are responsible for 20% of reported GHG emissions but only 9% of total hydrocarbon production.

2021-2023 Trends Analysis: Change in Methane Intensity, by Top 100 Producer



*9 of the top 100 producers in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

2021-2023 Trends Analysis: Change in GHG Intensity, by Top 100 Producer



*9 of the top 100 producers in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

2023 Data

Emissions & Emissions Intensities of the Top 100 Producers

		Production		Emissions		Intensity		Metric Rank (among top 100 producers) 1=highest, 100= lowest				
Rank	Company	Total MBOE	Gas (bcf)	MT CH4	MT GHG	NGSI Intensity	GHG Intensity	Gas (bcf)	CH4 Emissions	GHG Emissions	NGSI Intensity	GHG Intensity
1	EOG Resources	504,607	1,090	2,165	1,503,322	0.01%	2.98	7	66	16	95	83
2	ConocoPhillips	458,718	815	112,224	6,595,734	0.46%	14.38	12	1	1	10	21
3	EQT	451,774	2,256	2,800	426,330	0.01%	0.94	2	58	56	97	97
4	ExxonMobil	426,109	1,271	30,400	2,342,459	0.15%	5.50	5	6	5	33	63
5	Chesapeake Energy	424,473	2,348	6,822	826,545	0.02%	1.95	1	31	29	91	91
6	Occidental	406,384	856	15,592	1,817,693	0.08%	4.47	11	14	9	52	69
7	Southw estern Energy	405,575	2,047	13,384	1,444,625	0.04%	3.56	3	18	17	74	78
8	Chevron	401,379	959	14,426	1,662,192	0.08%	4.14	9	17	13	49	71
9	Devon Energy	382,938	812	19,416	3,679,515	0.10%	9.61	14	9	3	43	43
10	Pioneer Natural Resources	369,330	708	5,547	995,789	0.05%	2.70	18	33	22	65	85
11	Coterra Energy	345,887	1,440	4,995	707,350	0.02%	2.05	4	39	34	89	89
12	Continental Resources	311,311	751	23,095	2,578,843	0.15%	8.28	17	8	4	30	45
13	Hilcorp Energy	266,487	786	77,326	3,883,253	0.59%	14.57	16	2	2	8	19
14	Antero Resources	259,275	1,209	1,973	230,670	0.01%	0.89	6	68	78	96	98
15	Diamondback Energy	218,547	373	7,904	1,797,816	0.07%	8.23	31	28	11	61	47
16	Marathon Oil	195,968	392	14,630	1,783,324	0.15%	9.10	28	15	12	34	44
17	Ascent Resources	188,408	889	3,516	481,059	0.02%	2.55	10	51	53	84	86
18	Range Resources	181,336	814	2,691	335,350	0.02%	1.85	13	60	63	87	93
19	Mew bourne Oil	180,835	363	8,475	1,174,119	0.09%	6.49	32	25	19	44	55
20	Ovintiv	173,832	361	5,106	1,329,187	0.05%	7.65	33	35	18	69	52
21	Aethon Energy	173,238	981	3,698	628,901	0.02%	3.63	8	49	39	85	76
22	Centennial Resource	173,082	423	11,674	2,250,076	0.09%	13.00	26	20	6	45	27
23	Civitas Resources	172,067	311	15,776	1,812,709	0.18%	10.53	36	13	10	25	37
24	Comstock Resources	153,005	796	5,711	483,980	0.04%	3.16	15	32	52	70	80
25	Endeavor Energy Resources	142,569	243	18,402	1,557,386	0.23%	10.92	40	10	14	19	35
26	BP	136,554	559	7,768	884,311	0.07%	6.48	20	29	26	59	56
27	CNX Resources	116,179	601	3,420	176,557	0.03%	1.52	19	53	84	76	94
28	Encino Energy	102,308	390	4,374	368,870	0.06%	3.61	29	44	57	62	77
29	Gulfport Energy	97,495	465	4,180	281,843	0.05%	2.89	22	45	67	66	84
30	Lew is Energy Group	97,155	461	11,568	527,341	0.15%	5.43	23	21	47	35	64
31	Diversified Energy	96,490	460	60,743	2,102,499	0.74%	21.79	24	4	7	5	10
32	TG Natural Resources	95,652	490	10,093	537,313	0.12%	5.62	21	22	45	37	62
33	APA Corp	95,473	288	1,348	242,542	0.02%	2.54	37	74	75	80	87
34	Laredo Petroleum	87,262	194	2,557	680,312	0.05%	7.80	48	62	35	68	51

2023 Data

Emissions & Emissions Intensities of the Top 100 Producers

		Production		Emissions		Intensity		Metric Rank (among top 100 producers) 1=highest, 100= lowest				
Rank	Company	Total MBOE	Gas (bcf)	MT CH4	MT GHG	NGSI Intensity	GHG Intensity	Gas (bcf)	CH4 Emissions	GHG Emissions	NGSI Intensity	GHG Intensity
35	SM Energy	86,145	214	2,483	497,177	0.05%	5.77	46	63	49	67	60
36	Repsol	83,903	393	7,945	472,293	0.10%	5.63	27	27	55	41	61
37	Hess	79,789	134	3,003	773,738	0.10%	9.70	62	57	32	42	41
38	National Fuel Gas	79,591	431	3,308	169,095	0.04%	2.12	25	54	85	71	88
39	Matador Resources	76,753	157	3,841	781,392	0.09%	10.18	55	47	31	48	39
40	NextEra Energy	75,435	326	968	339,652	0.01%	4.50	35	80	61	94	68
41	Crow nQuest Operating	73,037	145	1,318	489,165	0.03%	6.70	58	75	50	75	54
42	BKV Operating	70,366	351	37,320	1,508,092	0.62%	21.43	34	5	15	7	11
43	California Resources	58,396	92	395	15,774	0.06%	0.27	71	89	100	63	100
44	Callon Petroleum	56,990	105	4,913	621,553	0.15%	10.91	66	40	40	32	36
45	Whiting Petroleum	56,079	91	5,024	645,960	0.25%	11.52	72	38	37	15	34
46	Oasis Petroleum	55,571	89	5,059	903,351	0.24%	16.26	76	36	24	16	16
47	Grayson Mill Operating	54,427	90	2,589	849,836	0.17%	15.61	75	61	28	27	18
48	Birch Resources	51,854	88	1,748	672,273	0.07%	12.96	77	69	36	58	29
49	HG Energy	49,590	244	205	167,315	0.00%	3.37	39	98	86	99	79
50	Kinder Morgan	48,883	388	285	28,699	0.03%	0.59	30	94	99	79	99
51	PER Manager	48,244	219	733	50,170	0.02%	1.04	44	84	97	86	96
52	Terra Energy Partners	46,575	226	17,849	569,454	0.46%	12.23	42	11	43	9	32
53	PureWest Energy	45,845	224	7,044	357,602	0.17%	7.80	43	30	60	26	50
54	Caerus Oil & Gas	45,813	216	61,987	1,900,703	1.71%	41.49	45	3	8	1	2
55	GBK Corp	45,533	90	4,429	180,517	0.20%	3.96	74	43	83	24	73
56	Flyw heel Energy	44,283	246	3,183	138,068	0.07%	3.12	38	56	88	56	82
57	GeoSouthern Energy	43,544	231	1,630	205,399	0.04%	4.72	41	72	79	73	67
58	Scout Energy	43,416	137	16,087	770,791	0.71%	17.75	61	12	33	6	13
59	IKAV	43,007	170	28,194	1,118,076	0.99%	26.00	52	7	20	3	7
60	Magnolia Oil & Gas	41,740	106	3,826	545,549	0.15%	13.07	65	48	44	31	26
61	Merit Energy	41,140	193	8,283	333,940	0.23%	8.12	49	26	64	17	49
62	Citizen Energy	40,703	153	755	262,737	0.03%	6.46	56	83	70	78	57
63	Silverbow Resources	40,661	131	2,785	635,789	0.11%	15.64	63	59	38	38	17
64	Sabine Oil & Gas	40,652	208	3,244	242,034	0.09%	5.95	47	55	76	47	59
65	EXCO Resources	40,631	185	5,036	246,799	0.11%	6.07	51	37	73	39	58
66	Venado Operating	39,520	90	9,463	817,309	0.42%	20.68	73	23	30	12	12
67	EP Energy	38,807	78	5,367	487,798	0.22%	12.57	78	34	51	22	31

2023 Data

Emissions & Emissions Intensities of the Top 100 Producers

		Production		Emissions		Intensity		Metric Rank (among top 100 producers) 1=highest, 100= lowest				
Rank	Company	Total MBOE	Gas (bcf)	MT CH4	MT GHG	NGSI Intensity	GHG Intensity	Gas (bcf)	CH4 Emissions	GHG Emissions	NGSI Intensity	GHG Intensity
68	Enerplus Resources	36,601	47	1,031	500,464	0.07%	13.67	88	79	48	54	24
69	Northeast Natural Energy	35,448	191	218	72,018	0.01%	2.03	50	96	93	98	90
70	Surge Operating	34,776	51	1,365	616,552	0.09%	17.73	87	73	41	46	14
71	Blackbeard Operating	33,257	96	3,607	246,630	0.22%	7.42	69	50	74	21	53
72	BTA Oil Producers	31,034	64	332	164,493	0.02%	5.30	81	93	87	88	65
73	Jonah Energy	30,628	143	4,008	312,312	0.16%	10.20	59	46	66	29	38
74	Camino Natural Resources	30,471	114	781	129,411	0.04%	4.25	64	81	89	72	70
75	Total	30,372	160	2,179	249,017	0.08%	8.20	53	65	72	50	48
76	BCE-Mach	29,563	105	8,799	862,269	0.45%	29.17	67	24	27	11	5
77	Olympus Energy	29,432	158	35	54,950	0.00%	1.87	54	100	96	100	92
78	Highpeak Energy Holdings	27,697	26	1,048	884,895	0.11%	31.95	94	78	25	40	4
79	INEOS Energy	27,532	40	2,038	368,211	0.13%	13.37	89	67	59	36	25
80	Tap Rock Operating	27,370	55	373	107,080	0.02%	3.91	84	91	91	82	74
81	Arsenal Resources	27,229	146	391	36,035	0.01%	1.32	57	90	98	93	95
82	Grit Oil & Gas	26,878	55	3,476	960,715	0.21%	35.74	83	52	23	23	3
83	Kraken Oil & Gas	26,714	28	771	368,215	0.08%	13.78	93	82	58	51	23
84	Vencer Energy	25,436	56	218	104,086	0.01%	4.09	82	97	92	92	72
85	Paloma Natural Gas	25,360	139	609	126,059	0.02%	4.97	60	85	90	81	66
86	Penn Virginia	24,725	30	4,582	611,428	0.39%	24.73	92	41	42	13	8
87	Petro-Hunt	23,103	31	1,734	1,044,683	0.23%	45.22	91	70	21	18	1
88	Slaw son	22,725	25	490	268,175	0.07%	11.80	96	88	68	60	33
89	Laredo Energy	22,063	104	1,299	181,691	0.07%	8.24	68	76	82	57	46
90	Baysw ater	21,823	33	1,692	313,876	0.16%	14.38	90	71	65	28	20
91	Snyder Brothers	20,786	95	1,093	64,865	0.07%	3.12	70	77	95	55	81
92	Franklin Mountain Energy	20,406	25	371	204,431	0.03%	10.02	97	92	80	77	40
93	XCL Resources	20,377	15	235	196,318	0.02%	9.63	100	95	81	83	42
94	Crow heart Energy	20,025	76	13,091	527,937	0.99%	26.36	79	19	46	4	6
95	FourPoint Energy	19,341	73	14,592	475,527	1.18%	24.59	80	16	54	2	9
96	Neptune Operating	19,206	22	526	249,323	0.07%	12.98	99	87	71	53	28
97	Anschutz	19,092	23	542	337,590	0.06%	17.68	98	86	62	64	15
98	Fasken Oil & Ranch	19,048	26	157	71,348	0.02%	3.75	95	99	94	90	75
99	Sem Operating	18,819	54	2,184	237,018	0.22%	12.59	86	64	77	20	30
100	Alta Mesa	18,689	54	4,433	267,752	0.35%	14.33	85	42	69	14	22

Company- & Basin-Level Summary Data

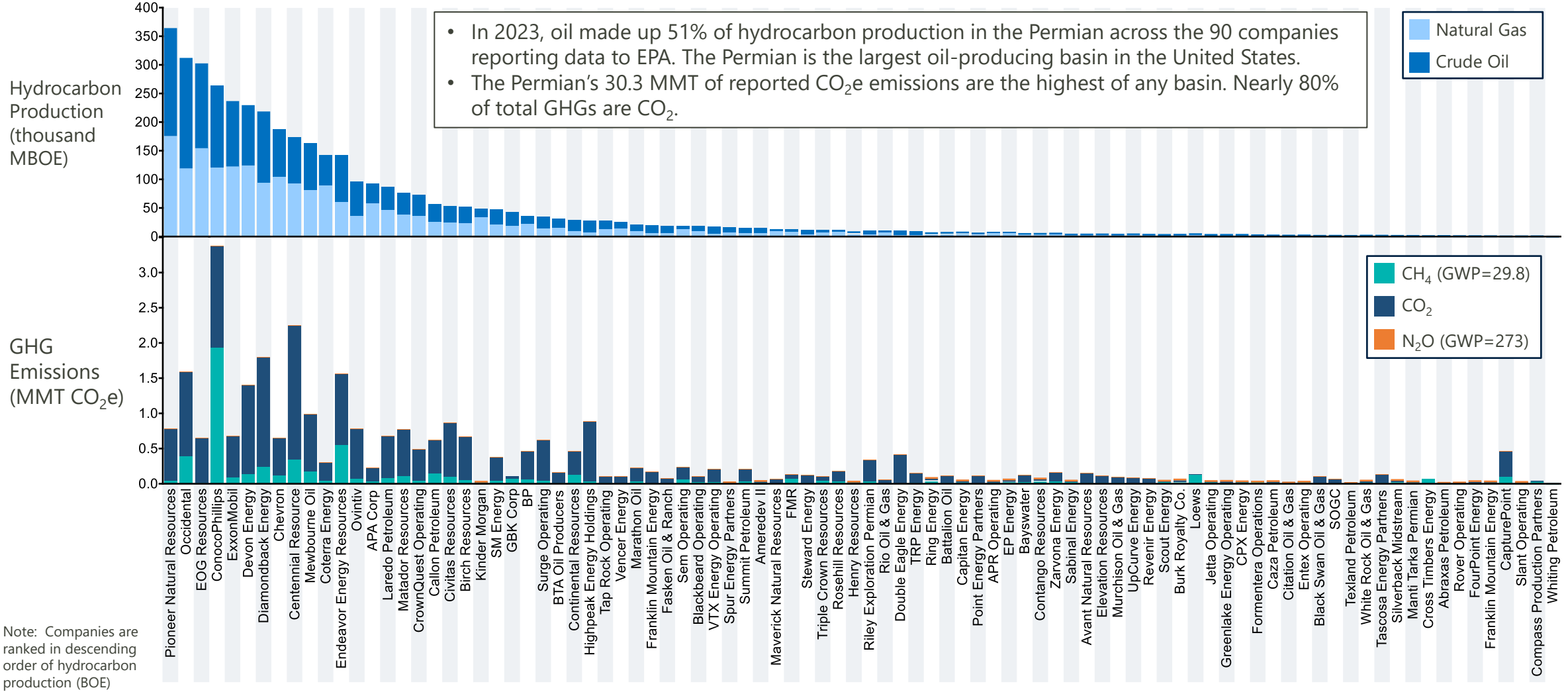
This section summarizes company-level data on hydrocarbon production, GHG emissions, emissions intensity, and sources of emissions for each of the following basins: Permian, Appalachian, Gulf Coast, and Williston. Additional data show the distribution of methane and GHG emissions intensities by volume in each basin.

Permian Basin Producers

2023 Data

Hydrocarbon Production & Emissions (100-year GWP)

- In 2023, oil made up 51% of hydrocarbon production in the Permian across the 90 companies reporting data to EPA. The Permian is the largest oil-producing basin in the United States.
- The Permian's 30.3 MMT of reported CO_2e emissions are the highest of any basin. Nearly 80% of total GHGs are CO_2.

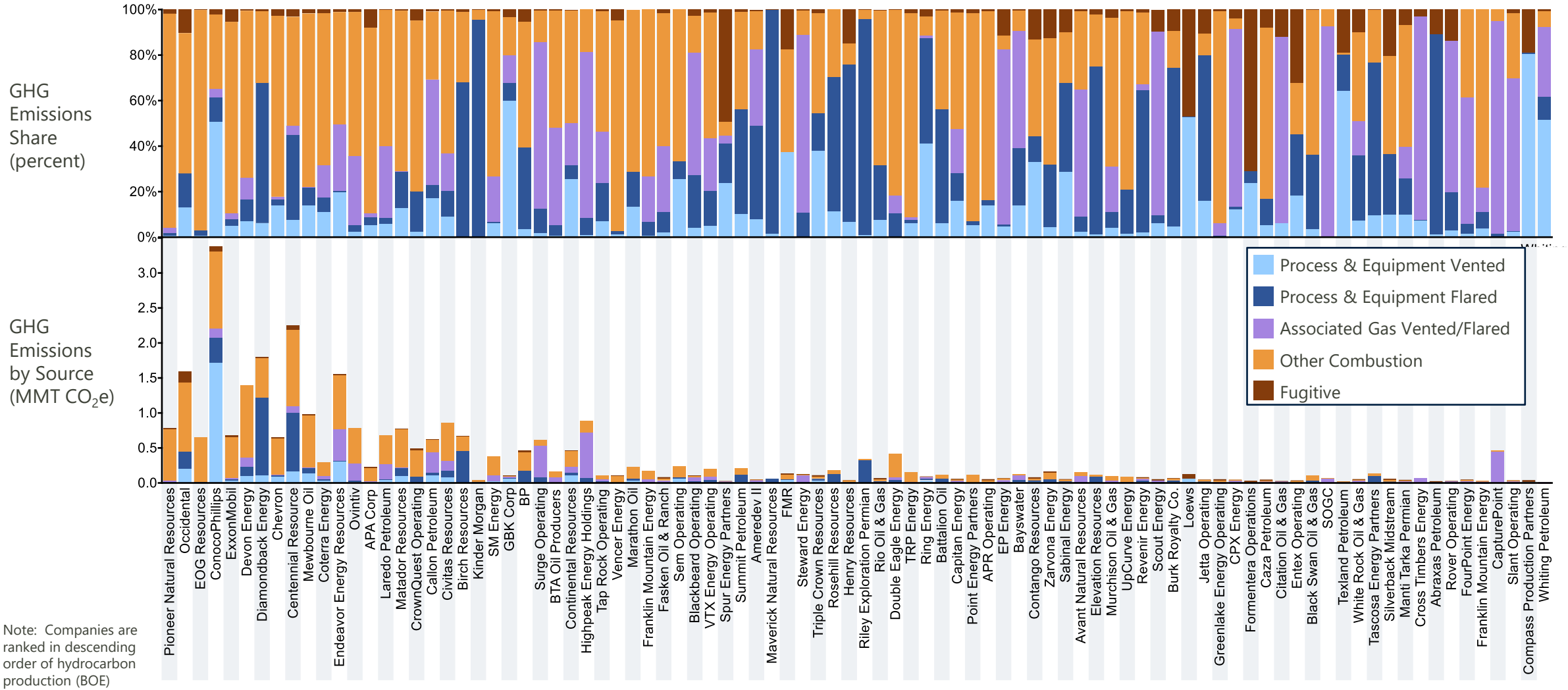


Note: Companies are ranked in descending order of hydrocarbon production (BOE) within basin

Permian Basin Producers

2023 Data

GHG Emissions by Source (100-year GWP)

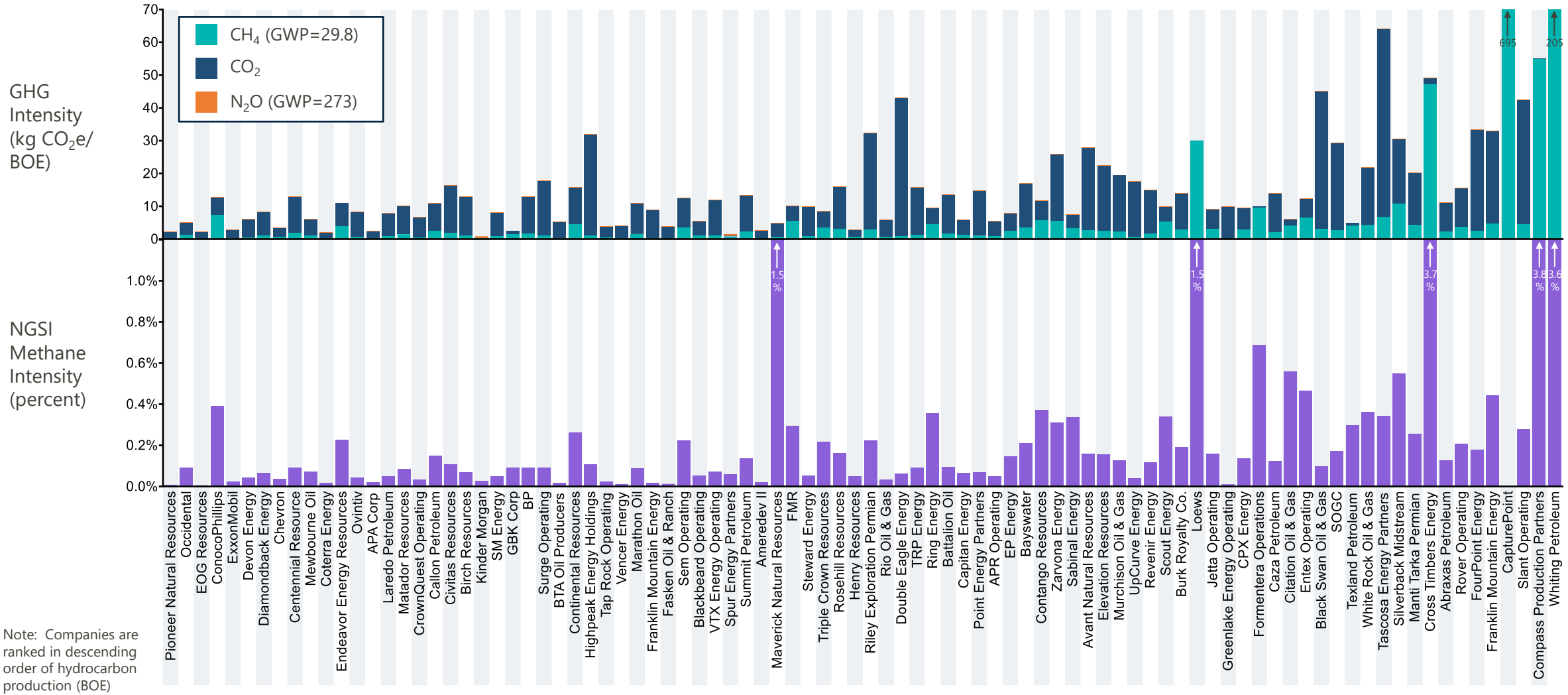


Note: Companies are ranked in descending order of hydrocarbon production (BOE) within basin

Permian Basin Producers

2023 Data

Methane & GHG Intensity (100-year GWP)

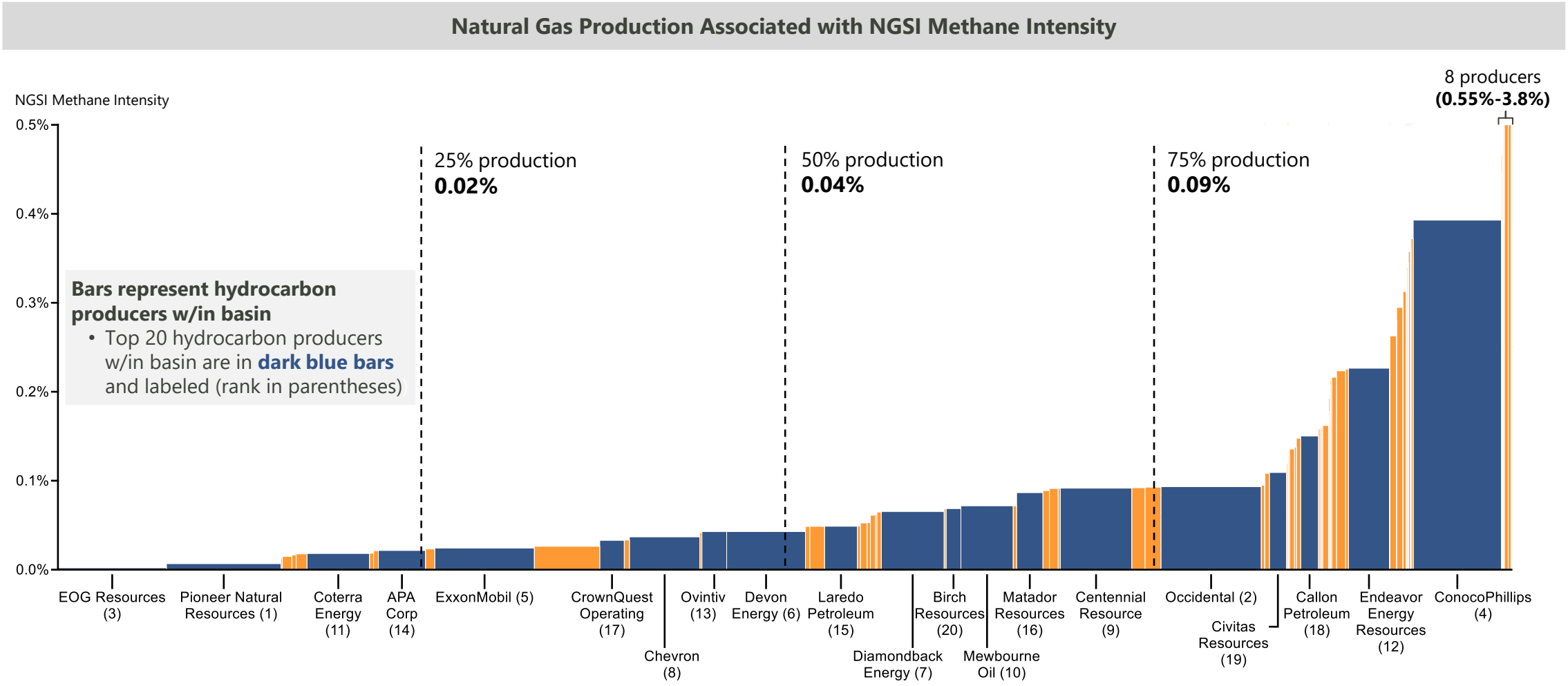


Note: Companies are ranked in descending order of hydrocarbon production (BOE) within basin

Permian Basin Producers

2023 Data

Total GHGRP Natural Gas Production, by Methane Intensity

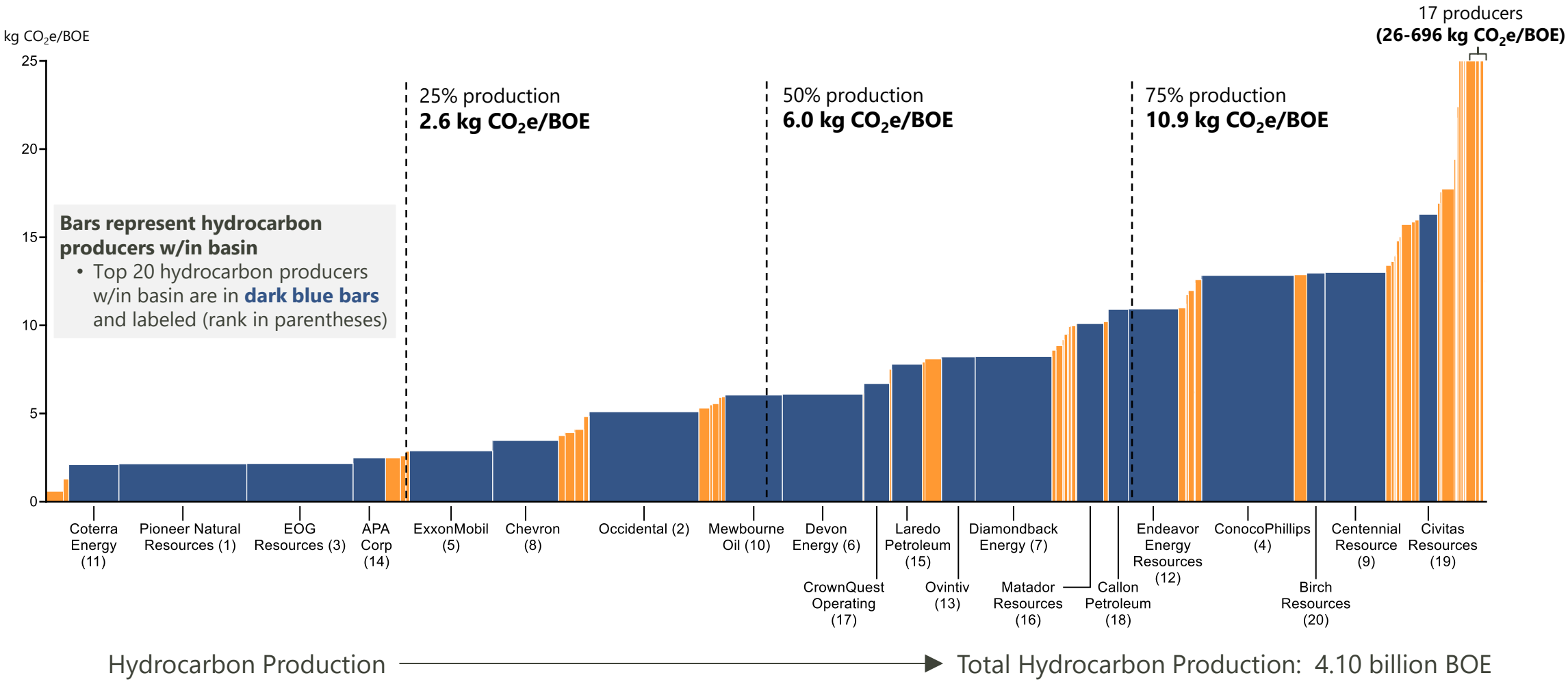


Natural Gas Production → Total Gas Production: 8.6 trillion cubic feet

Permian Basin Producers

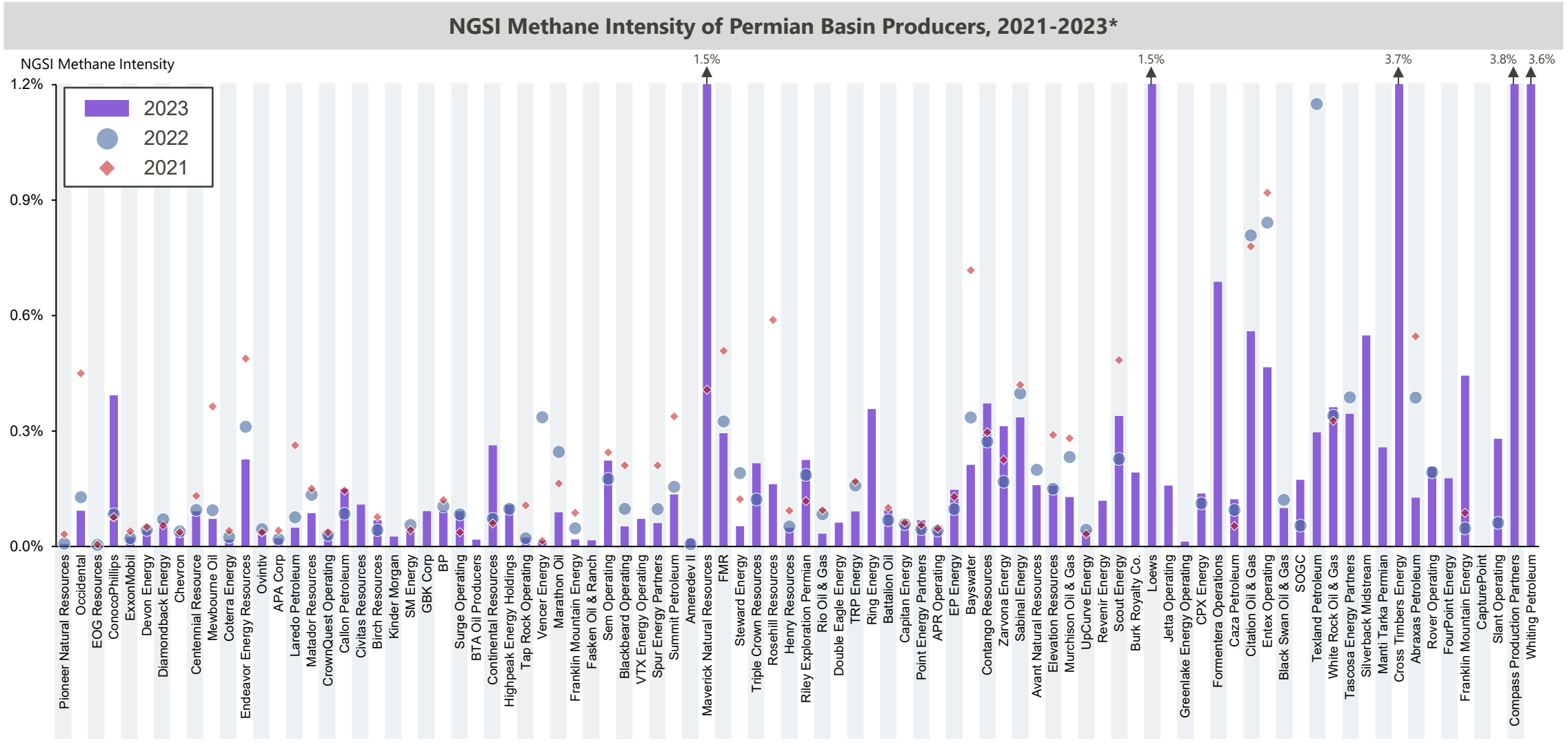
2023 Data

Total GHGRP Hydrocarbon Production, by GHG Intensity



Permian Basin Producers

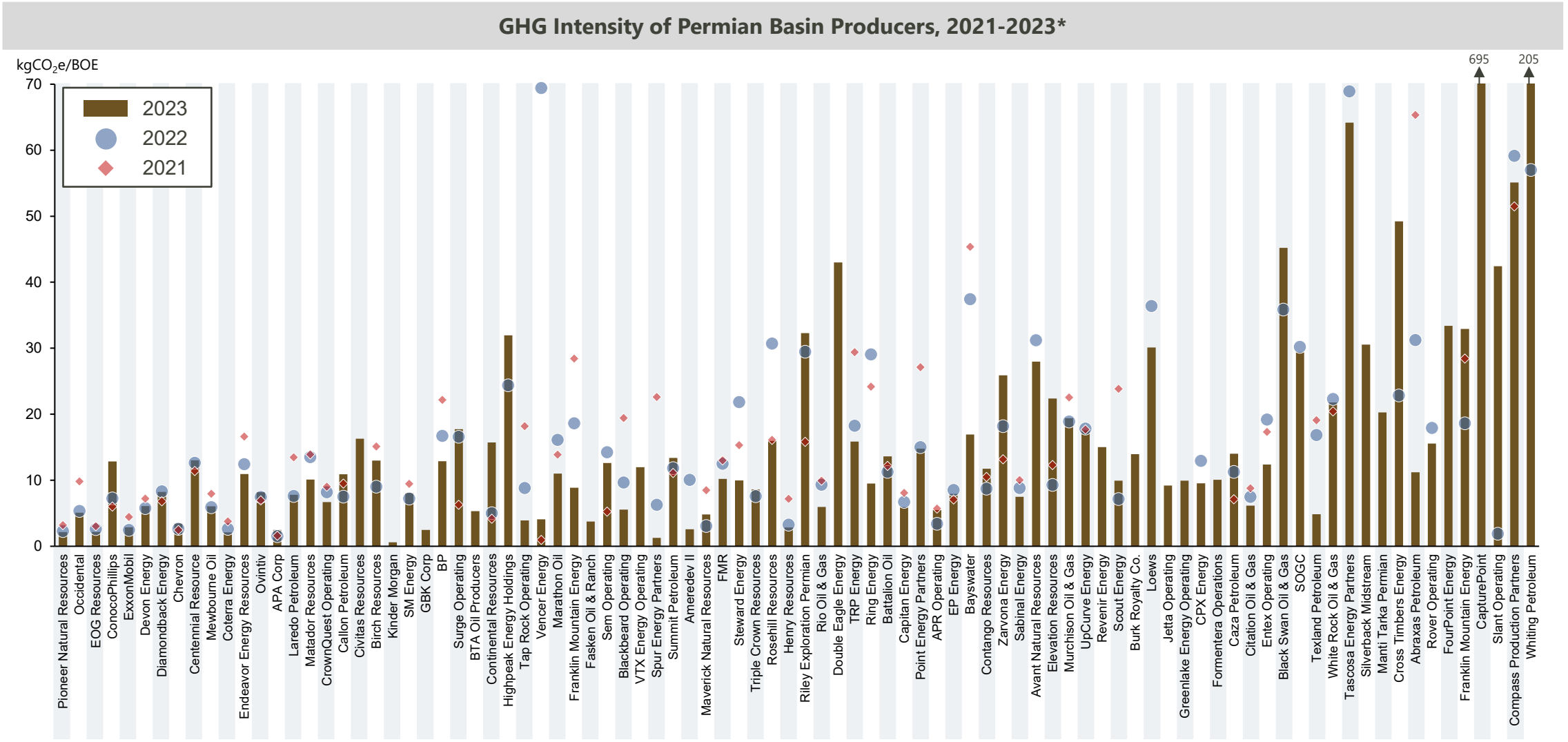
2021-2023 Trends Analysis: Change in Methane Intensity



*Note that some producers in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Permian Basin Producers

2021-2023 Trends Analysis: Change in GHG Intensity



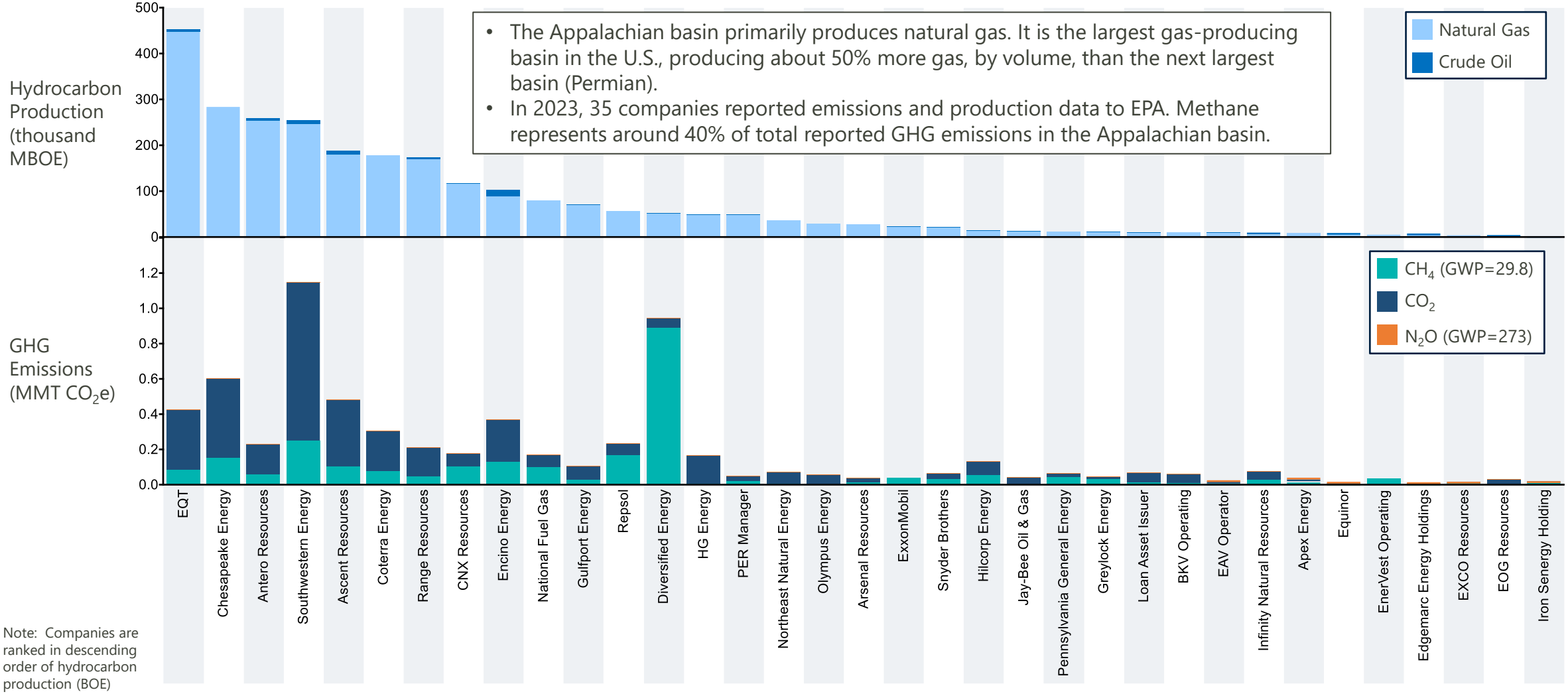
*Note that some producers in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Appalachian Basin Producers

2023 Data

Hydrocarbon Production & Emissions (100-year GWP)

- The Appalachian basin primarily produces natural gas. It is the largest gas-producing basin in the U.S., producing about 50% more gas, by volume, than the next largest basin (Permian).
- In 2023, 35 companies reported emissions and production data to EPA. Methane represents around 40% of total reported GHG emissions in the Appalachian basin.

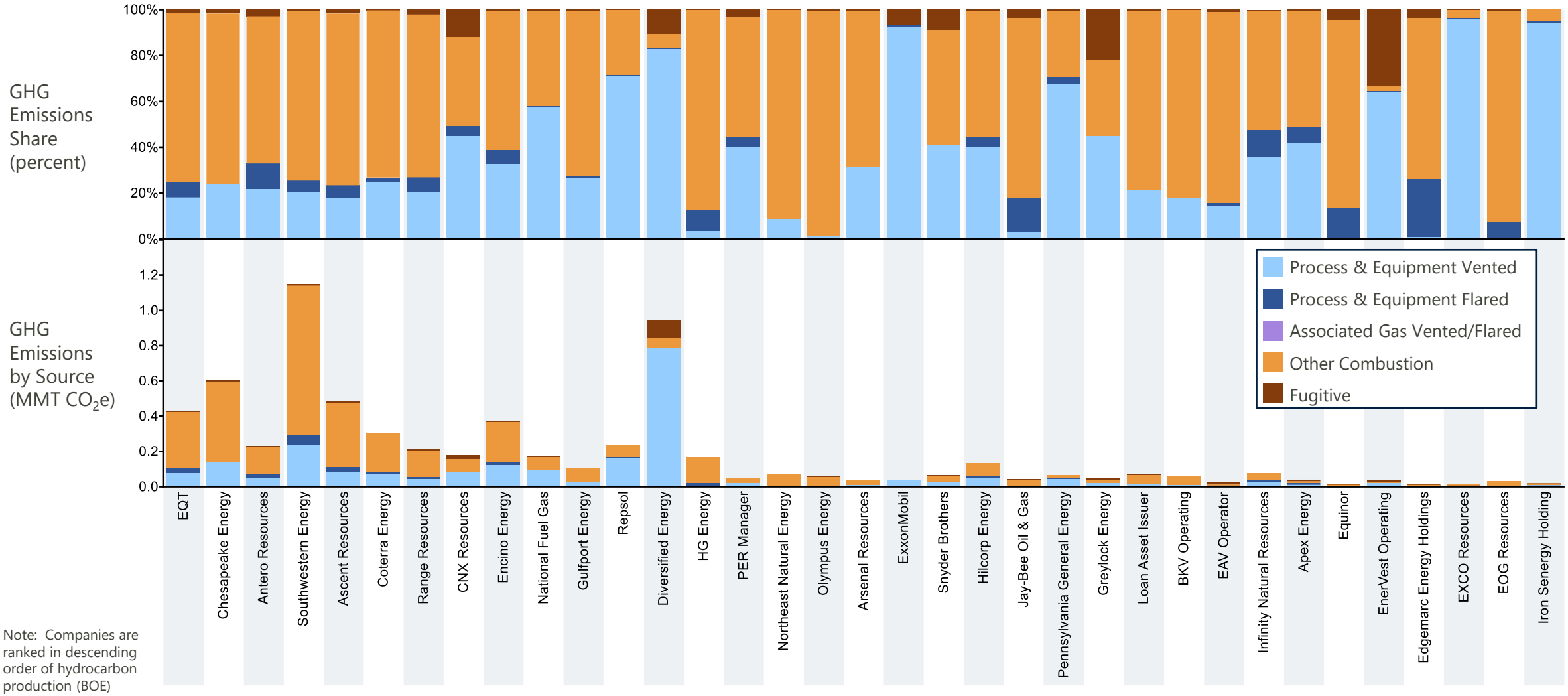


Note: Companies are ranked in descending order of hydrocarbon production (BOE) within basin

Appalachian Basin Producers

2023 Data

GHG Emissions by Source (100-year GWP)

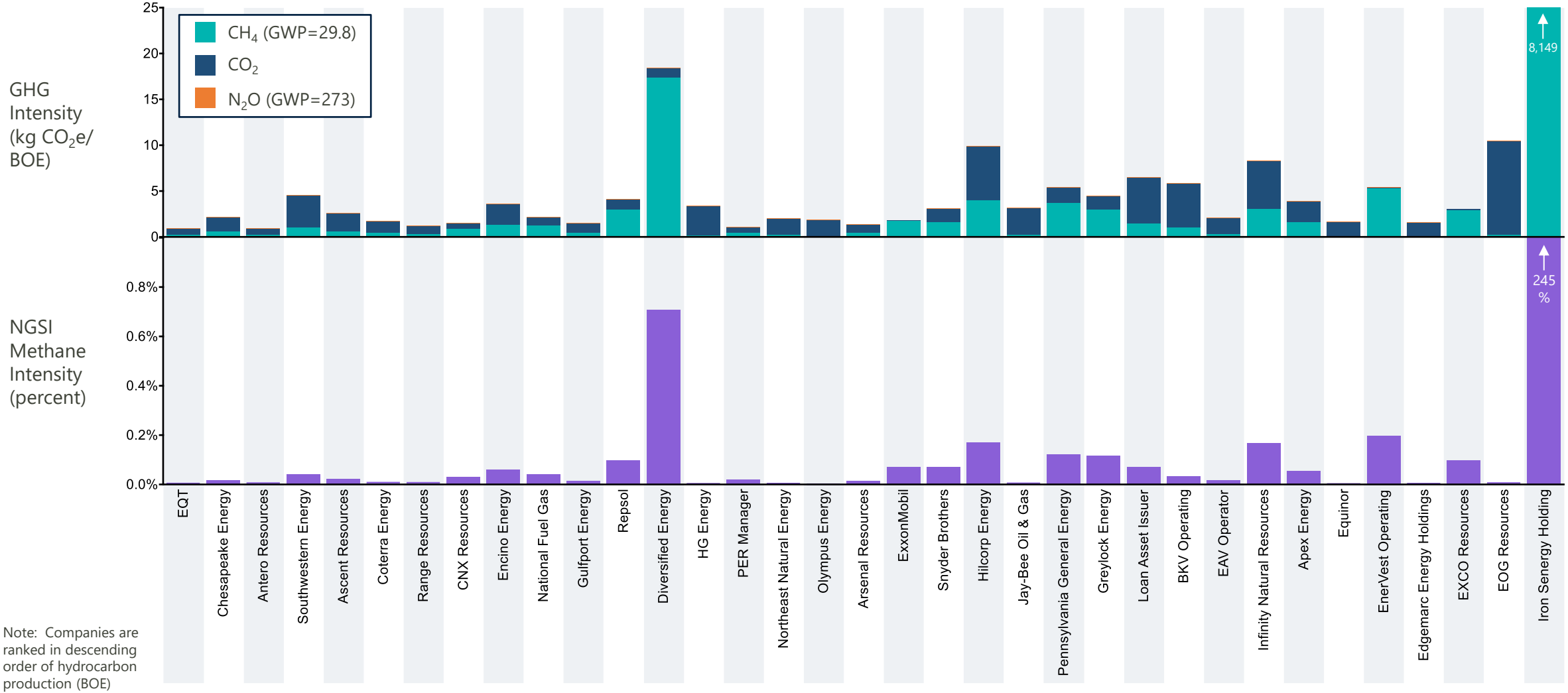


Note: Companies are ranked in descending order of hydrocarbon production (BOE) within basin

Appalachian Basin Producers

2023 Data

Methane & GHG Intensity (100-year GWP)

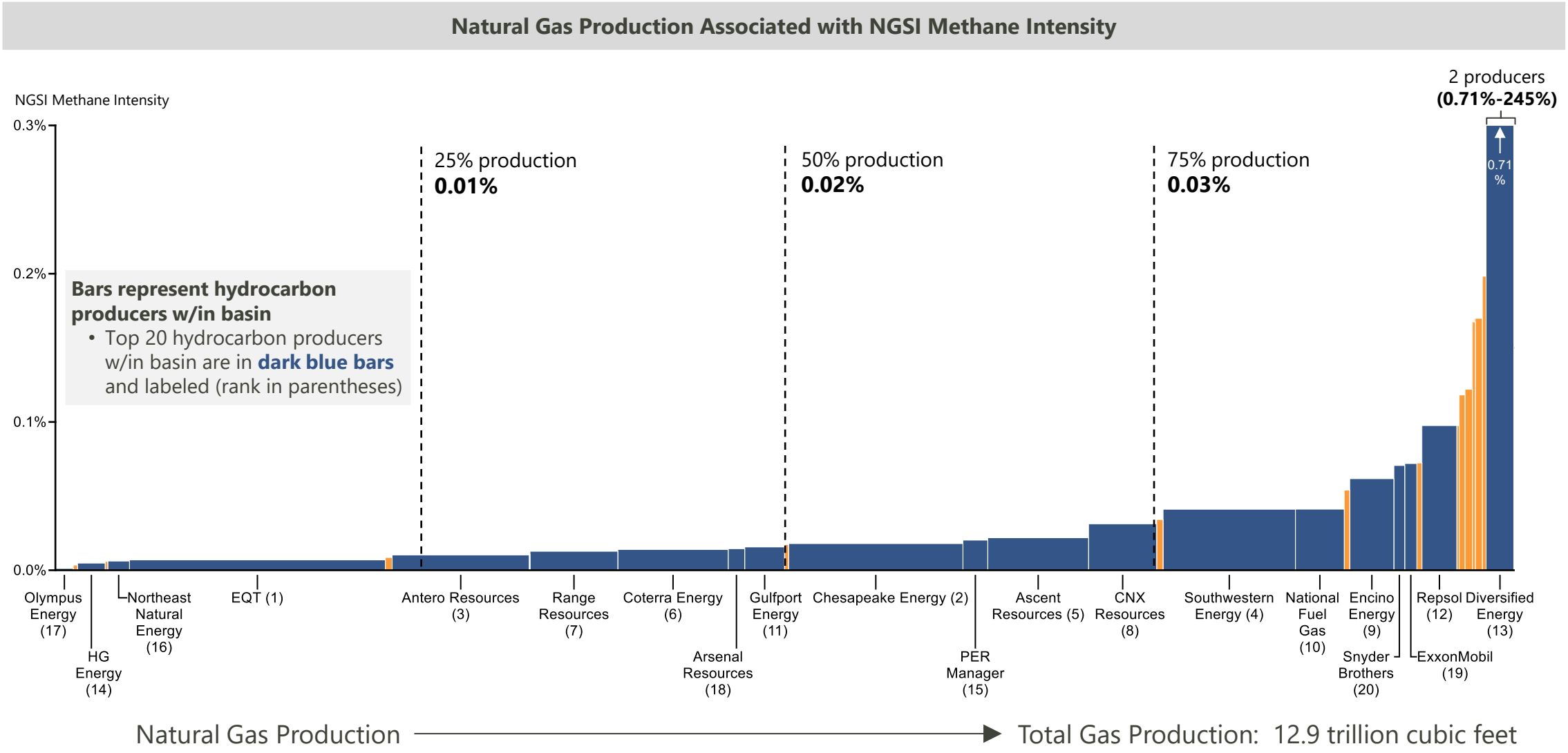


Note: Companies are ranked in descending order of hydrocarbon production (BOE) within basin

Appalachian Basin Producers

2023 Data

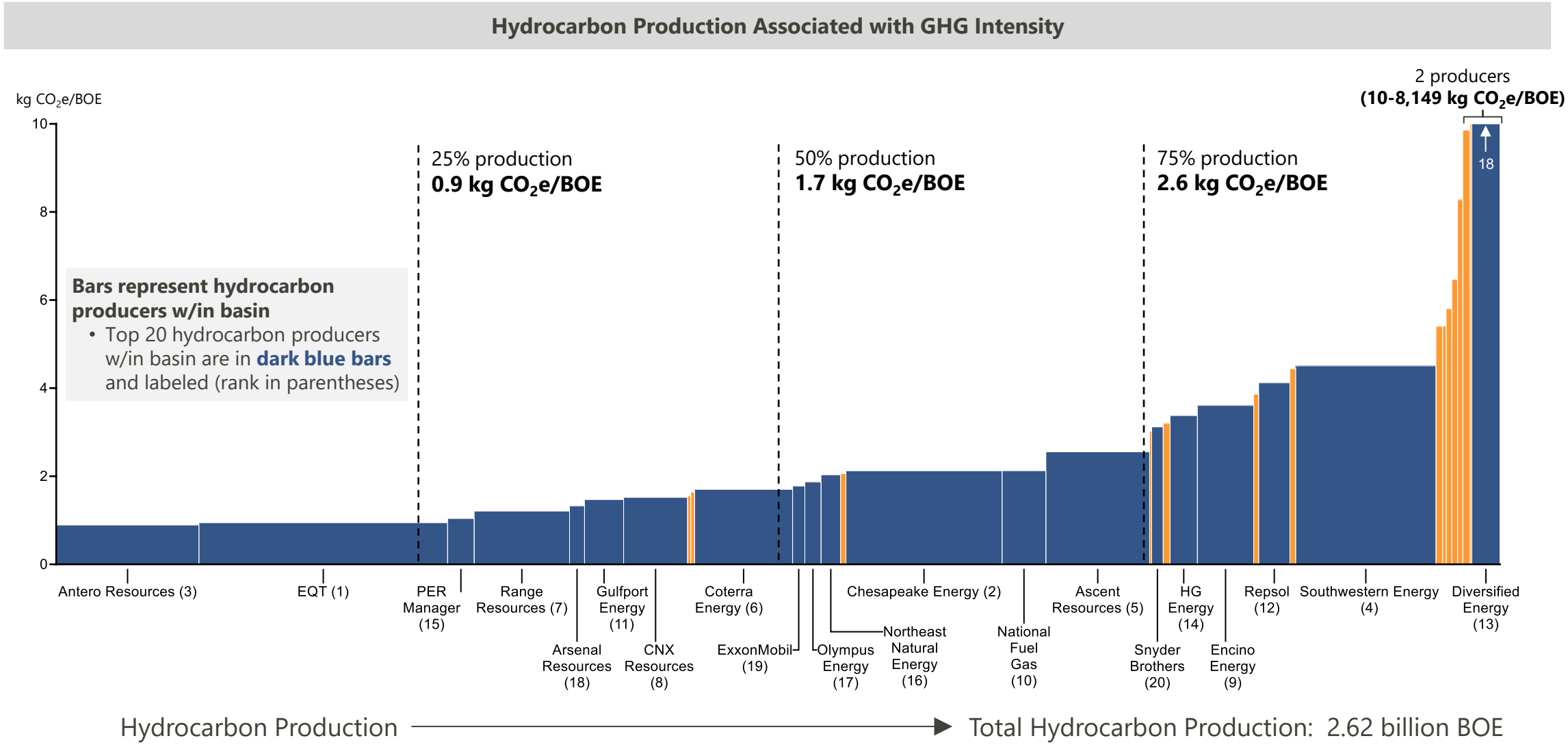
Total GHGRP Natural Gas Production, by Methane Intensity



Appalachian Basin Producers

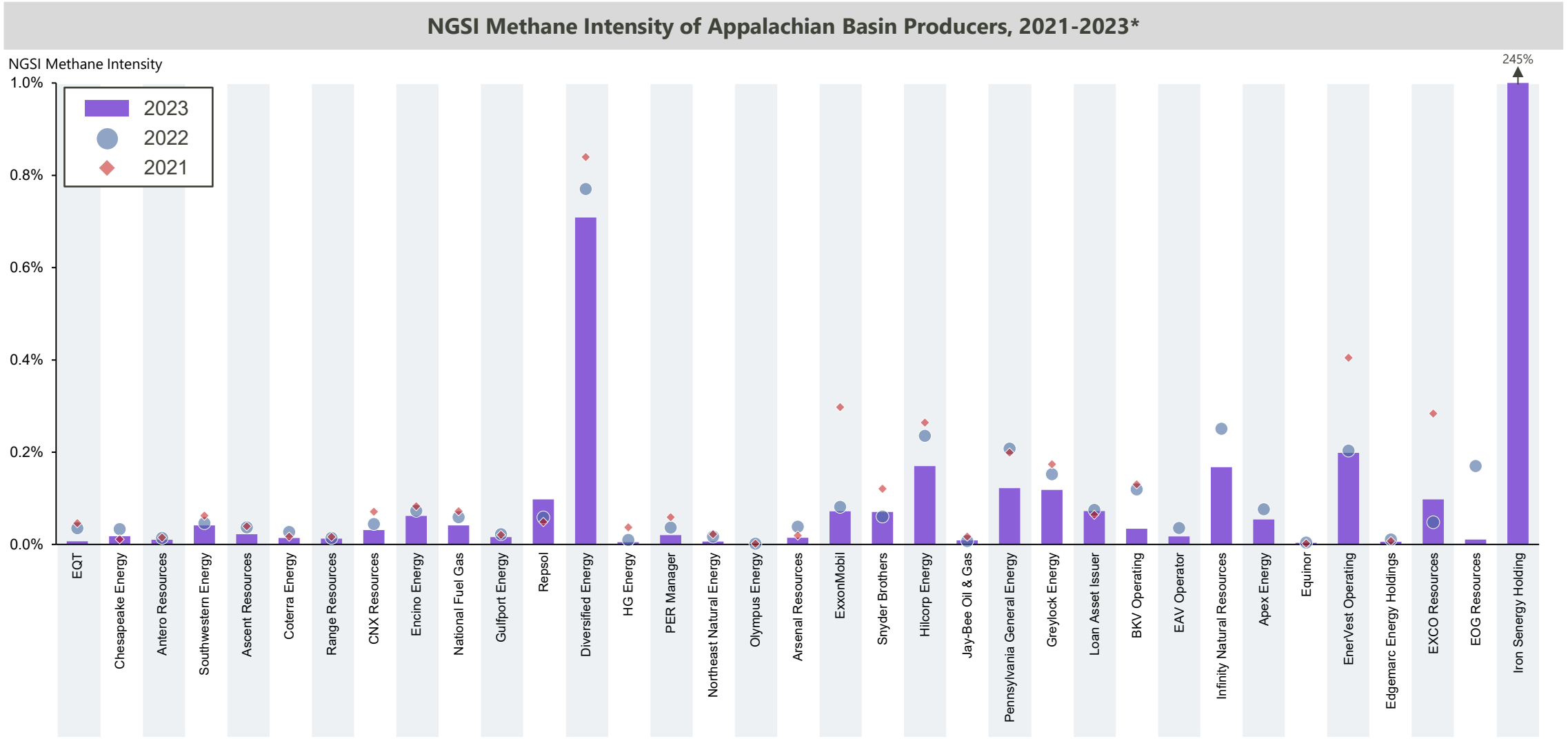
2023 Data

Total GHGRP Hydrocarbon Production, by GHG Intensity



Appalachian Basin Producers

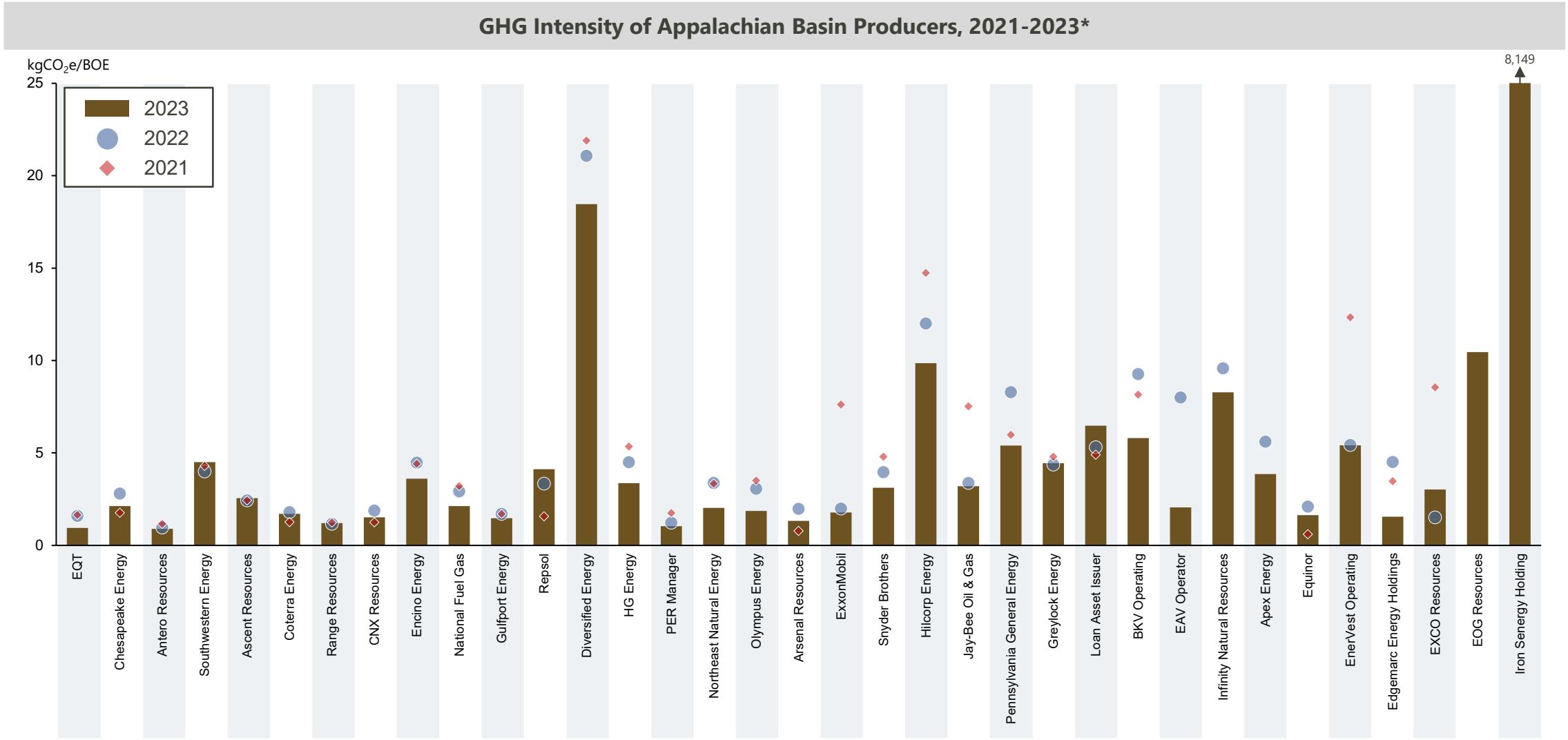
2021-2023 Trends Analysis: Change in Methane Intensity



*Note that some producers in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Appalachian Basin Producers

2021-2023 Trends Analysis: Change in GHG Intensity



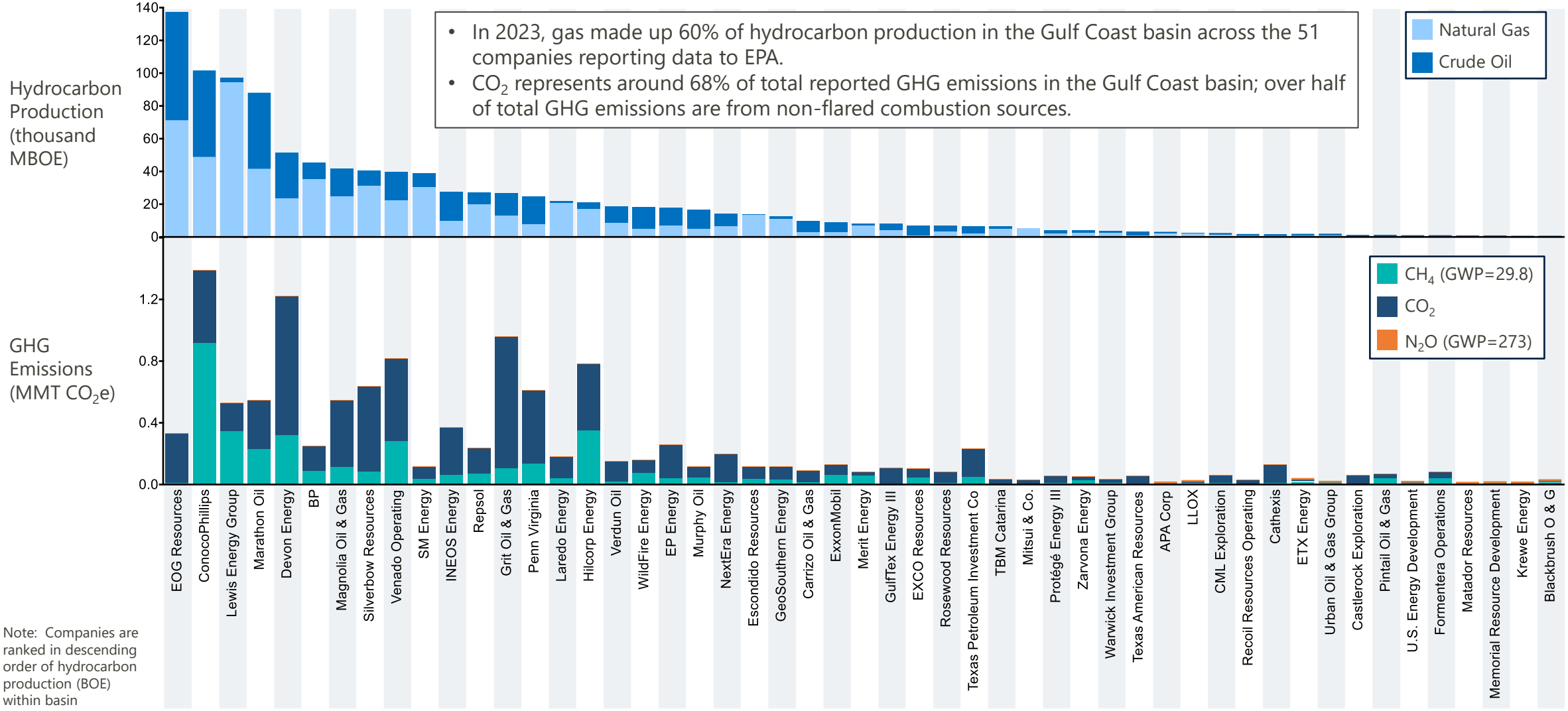
*Note that some producers in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Gulf Coast Basin Producers

2023 Data

Hydrocarbon Production & Emissions (100-year GWP)

- In 2023, gas made up 60% of hydrocarbon production in the Gulf Coast basin across the 51 companies reporting data to EPA.
- CO_2 represents around 68% of total reported GHG emissions in the Gulf Coast basin; over half of total GHG emissions are from non-flared combustion sources.

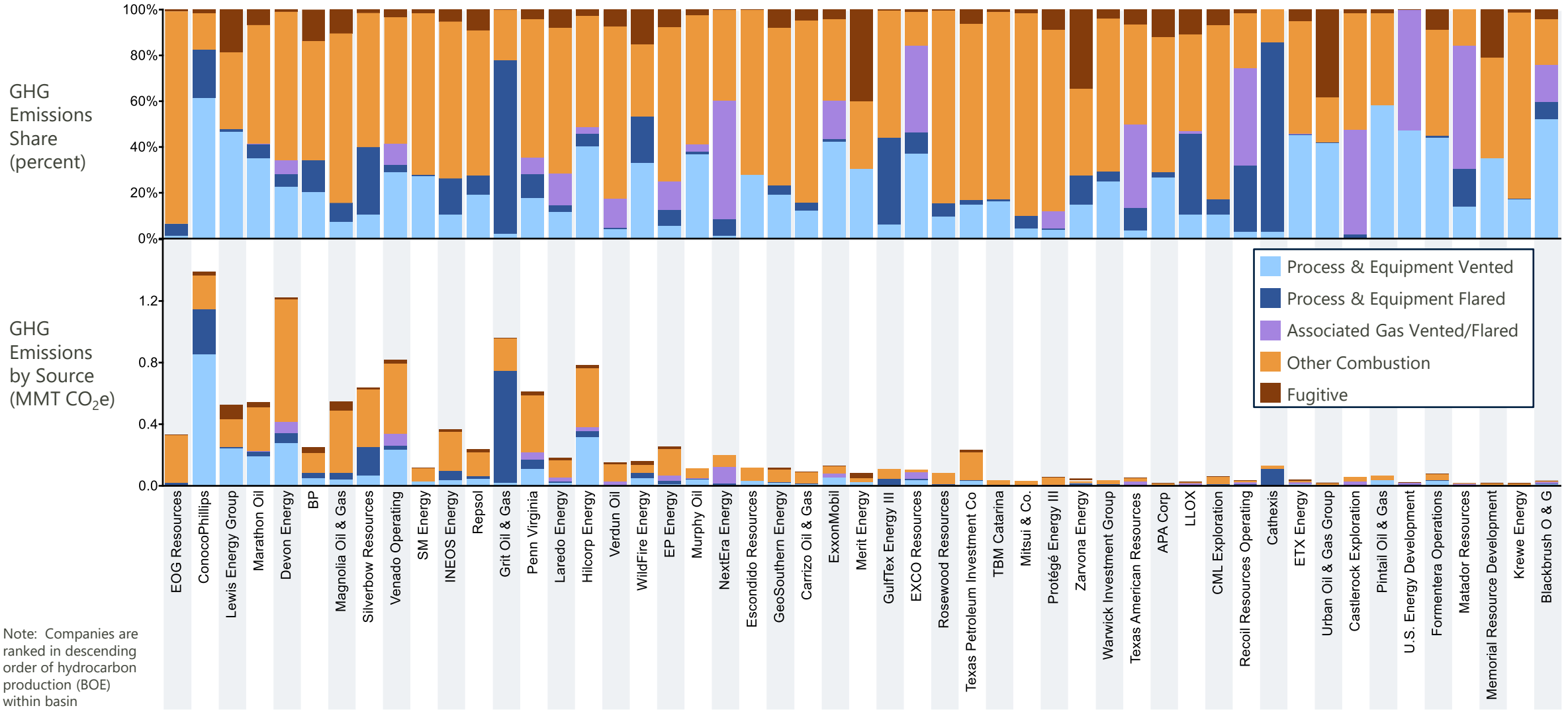


Note: Companies are ranked in descending order of hydrocarbon production (BOE) within basin

Gulf Coast Basin Producers

2023 Data

GHG Emissions by Source (100-year GWP)

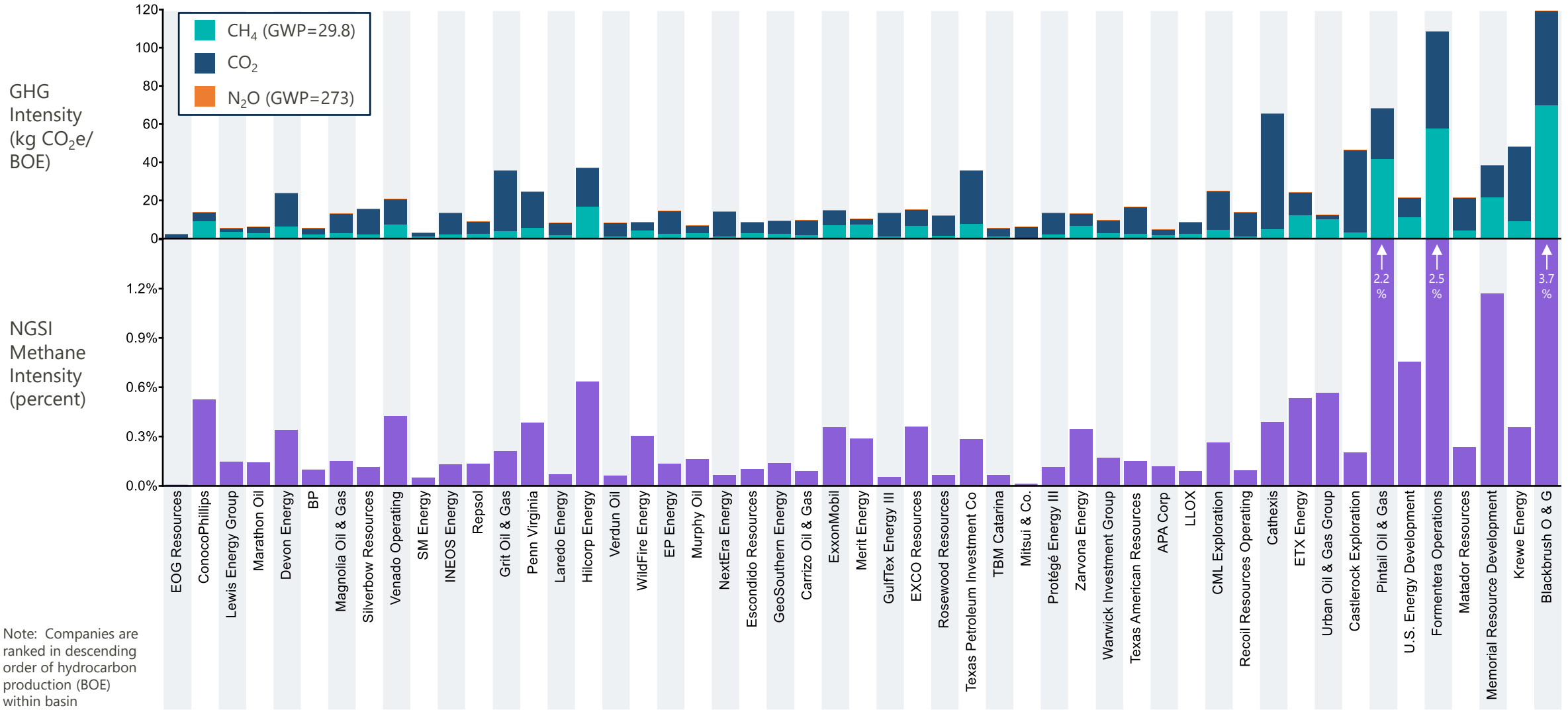


Note: Companies are ranked in descending order of hydrocarbon production (BOE) within basin

Gulf Coast Basin Producers

2023 Data

Methane & GHG Intensity (100-year GWP)

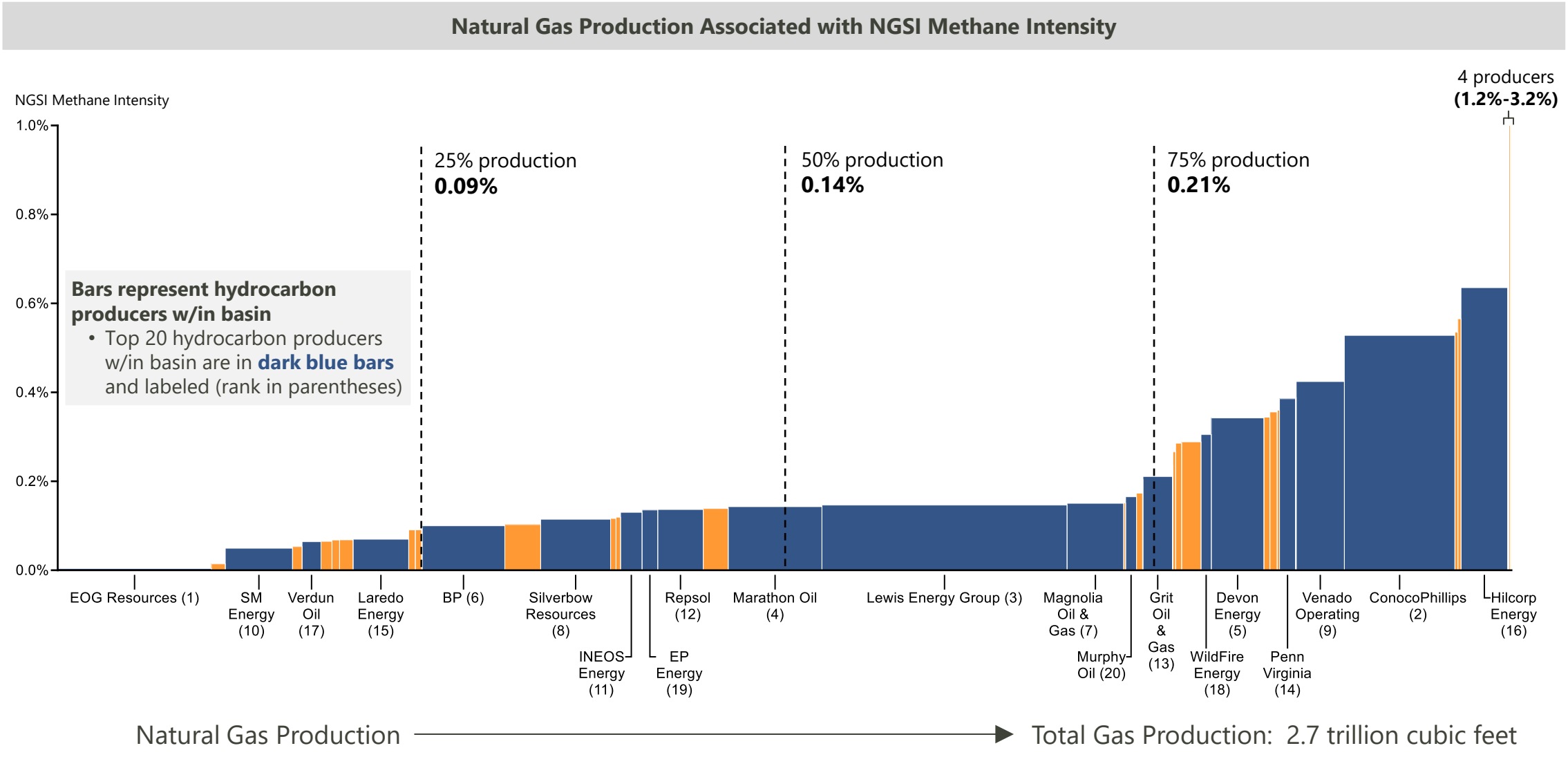


Note: Companies are ranked in descending order of hydrocarbon production (BOE) within basin

Gulf Coast Basin Producers

2023 Data

Total GHGRP Natural Gas Production, by Methane Intensity

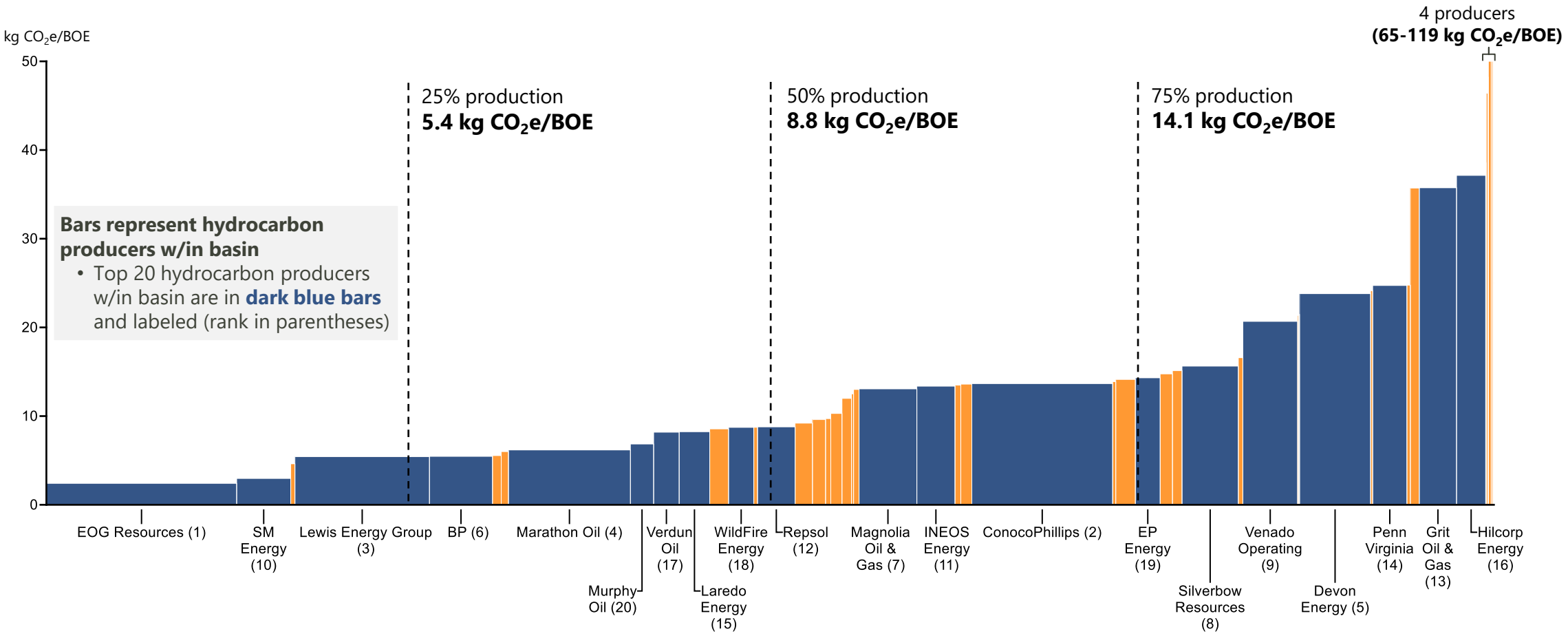


Gulf Coast Basin Producers

2023 Data

Total GHGRP Hydrocarbon Production, by GHG Intensity

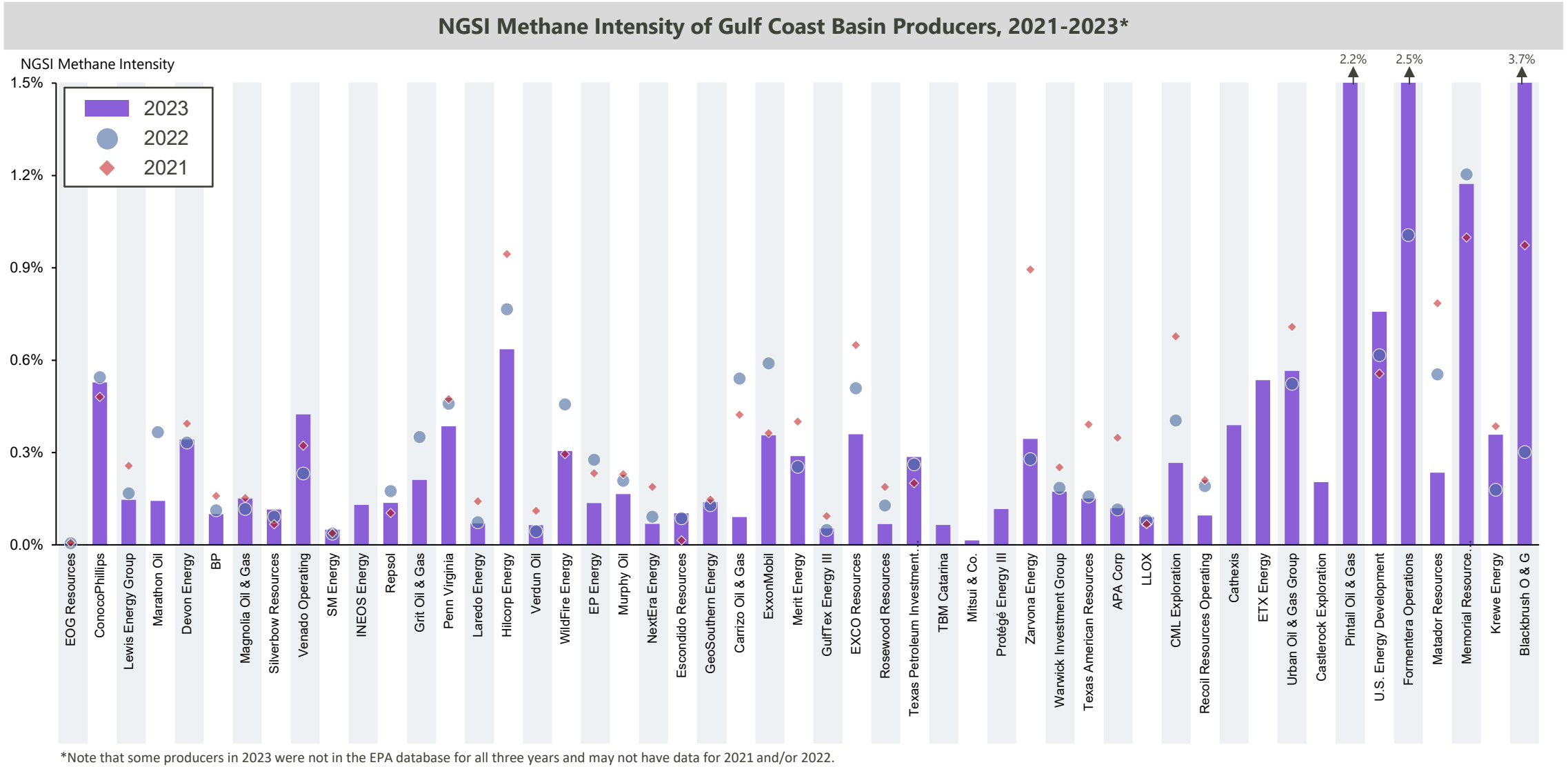
Hydrocarbon Production Associated with GHG Intensity



Hydrocarbon Production → Total Hydrocarbon Production: 1.05 billion BOE

Gulf Coast Basin Producers

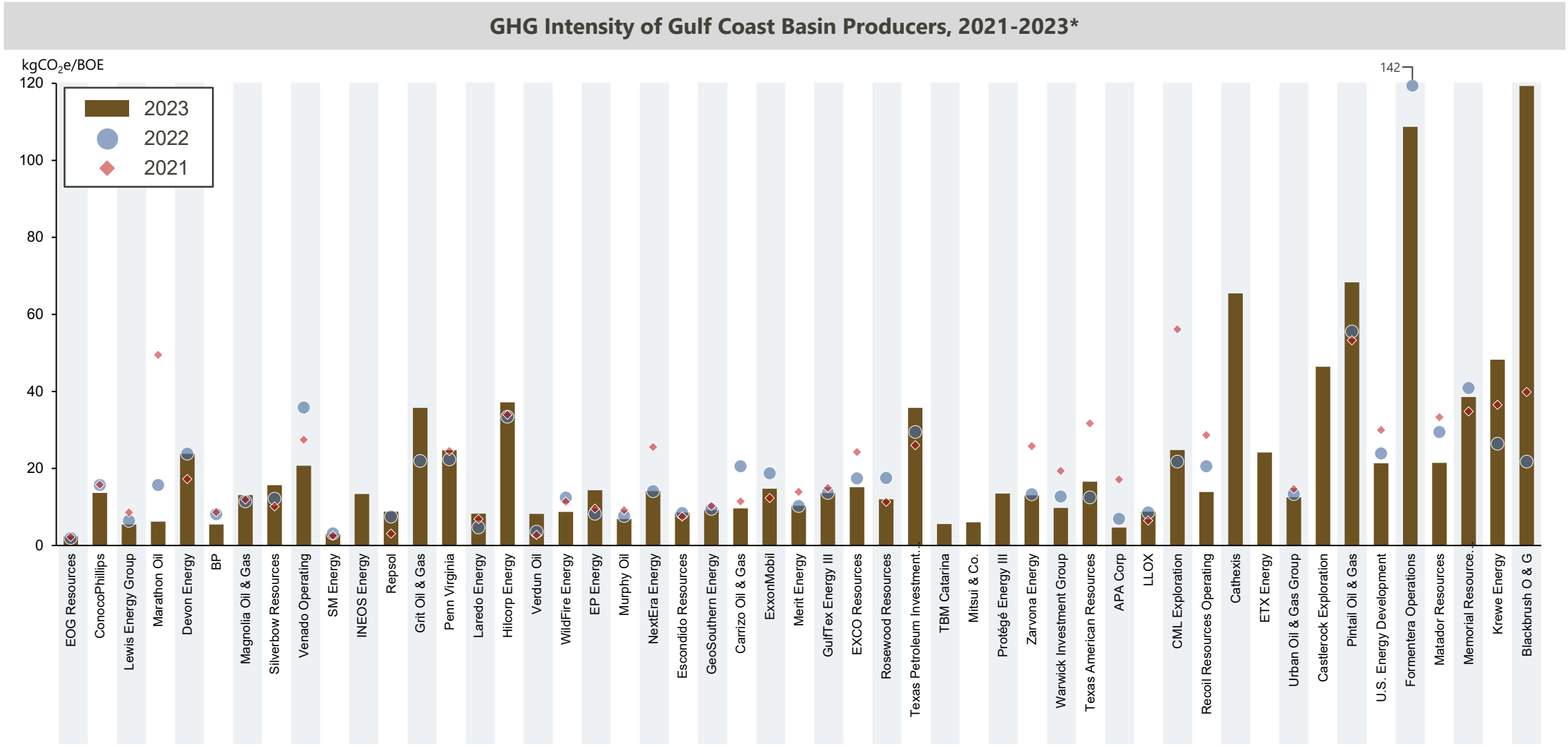
2021-2023 Trends Analysis: Change in Methane Intensity



*Note that some producers in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Gulf Coast Basin Producers

2021-2023 Trends Analysis: Change in GHG Intensity



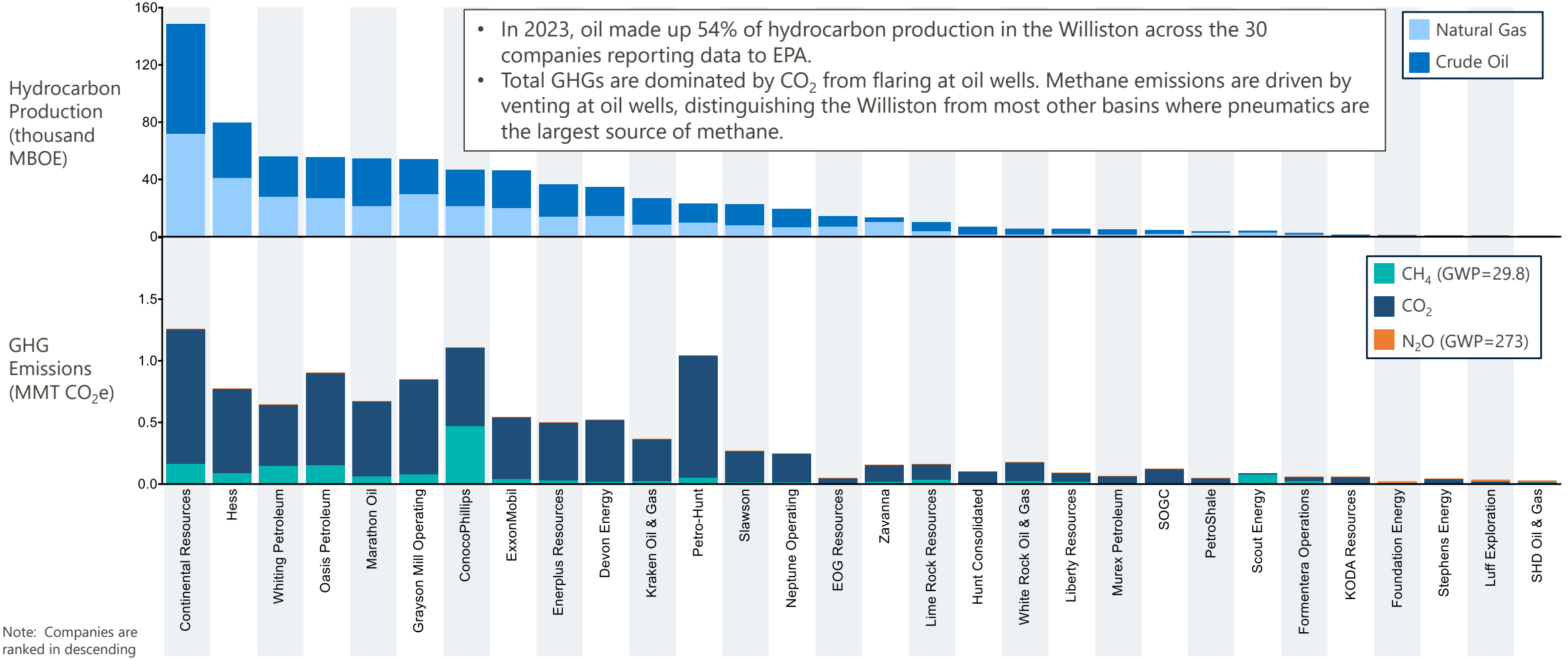
*Note that some producers in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Williston Basin Producers

2023 Data

Hydrocarbon Production & Emissions (100-year GWP)

- In 2023, oil made up 54% of hydrocarbon production in the Williston across the 30 companies reporting data to EPA.
- Total GHGs are dominated by CO_2 from flaring at oil wells. Methane emissions are driven by venting at oil wells, distinguishing the Williston from most other basins where pneumatics are the largest source of methane.

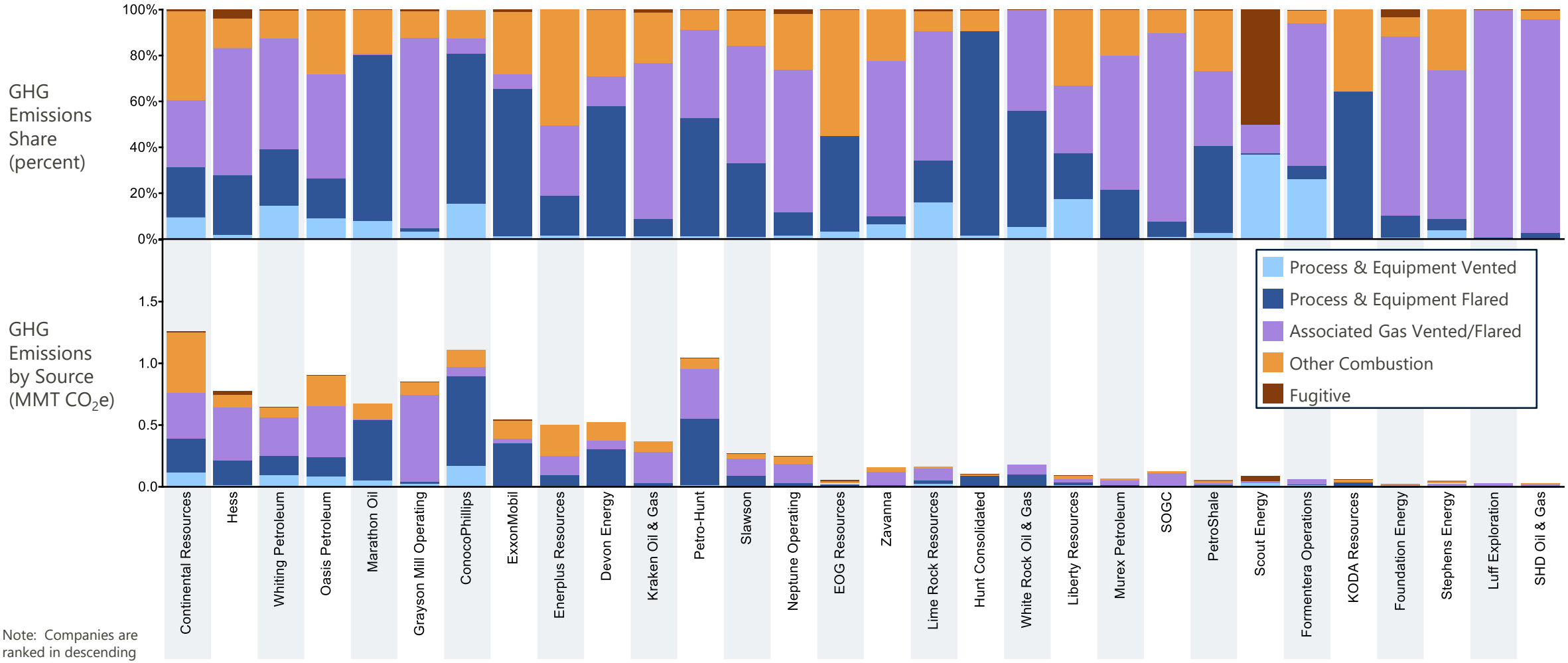


Note: Companies are ranked in descending order of hydrocarbon production (BOE) within basin

Williston Basin Producers

2023 Data

GHG Emissions by Source (100-year GWP)

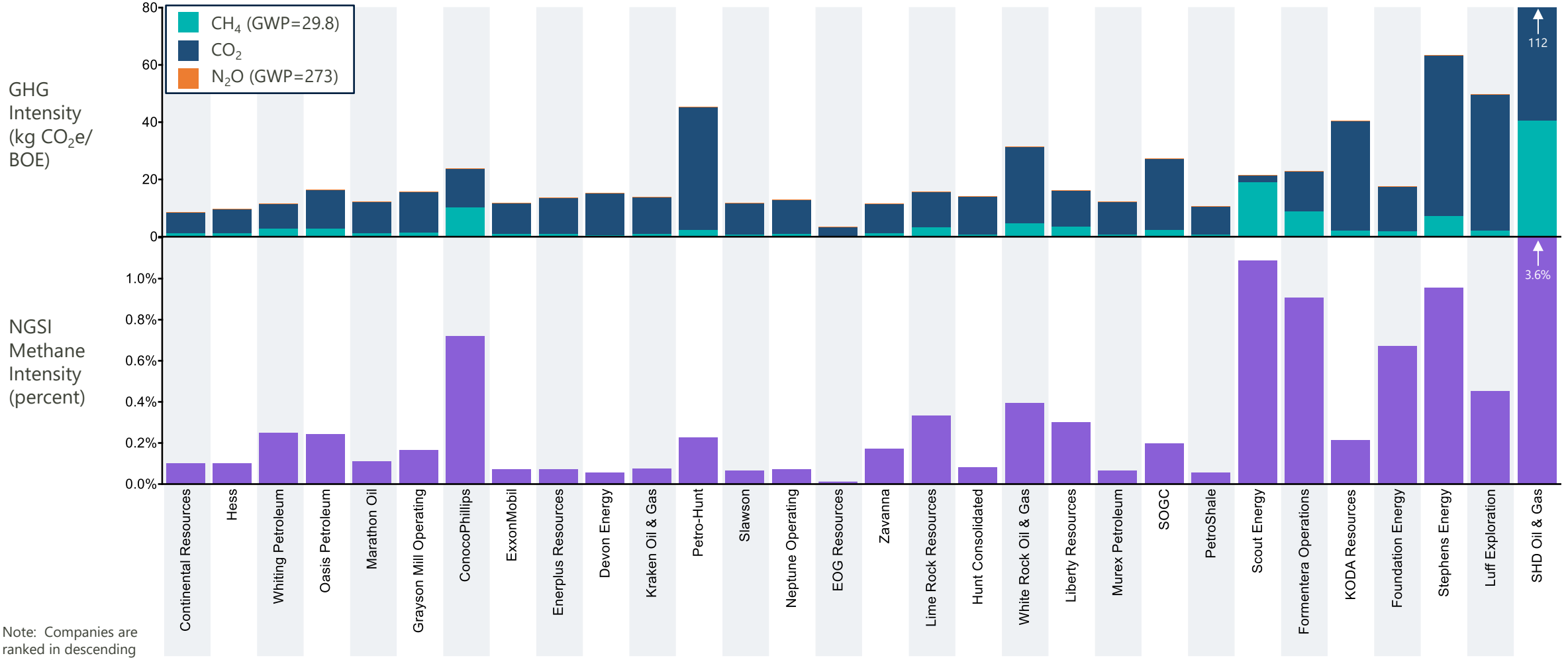


Note: Companies are ranked in descending order of hydrocarbon production (BOE) within basin

Williston Basin Producers

2023 Data

Methane & GHG Intensity (100-year GWP)



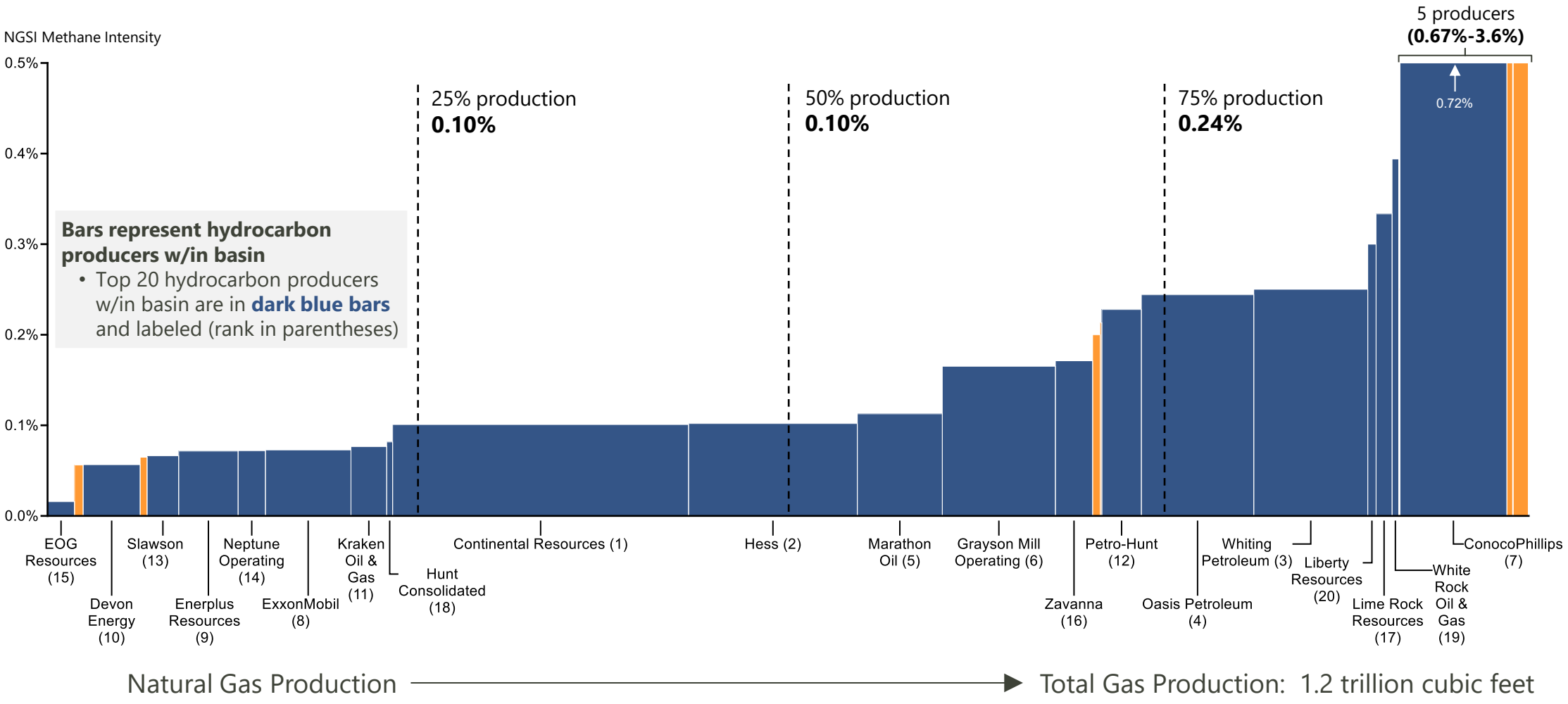
Note: Companies are ranked in descending order of hydrocarbon production (BOE) within basin

Williston Basin Producers

2023 Data

Total GHGRP Natural Gas Production, by Methane Intensity

Natural Gas Production Associated with NGSI Methane Intensity

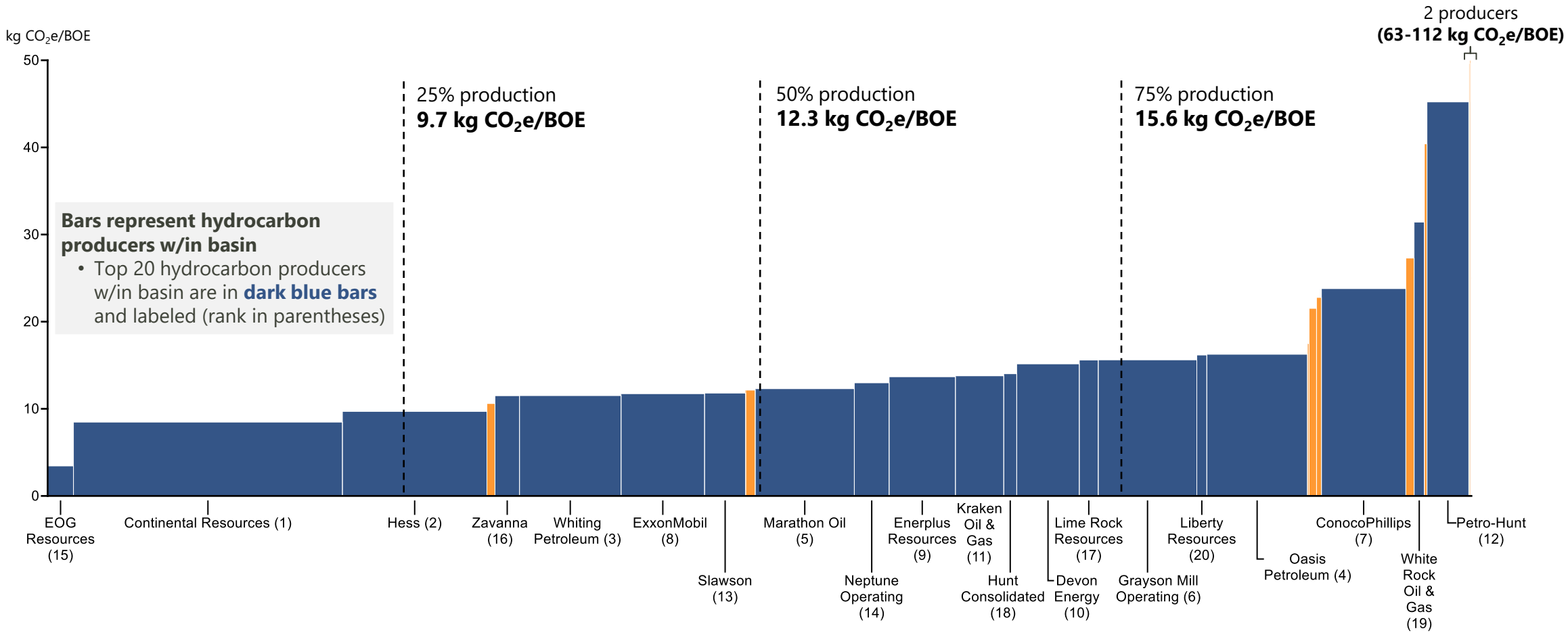


Williston Basin Producers

2023 Data

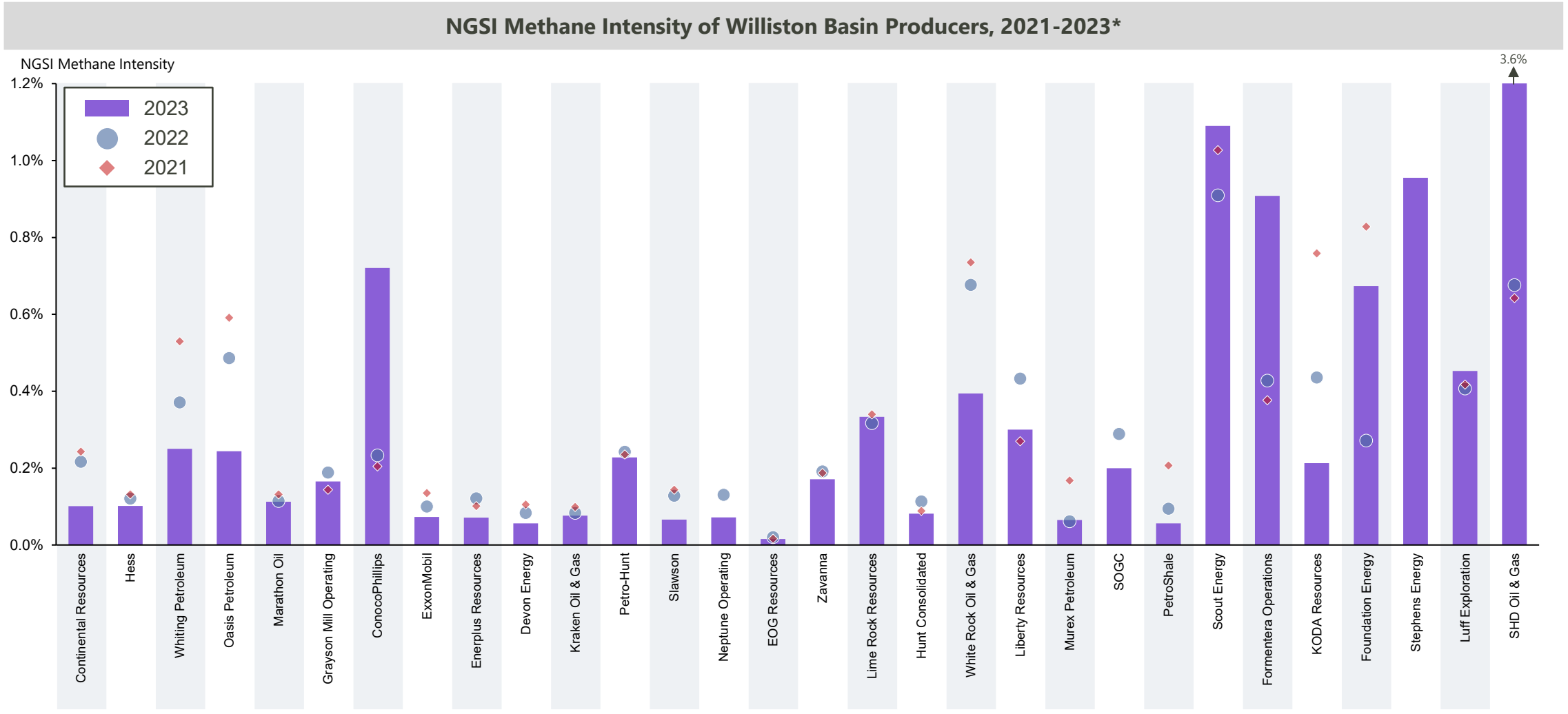
Total GHGRP Hydrocarbon Production, by GHG Intensity

Hydrocarbon Production Associated with GHG Intensity



Williston Basin Producers

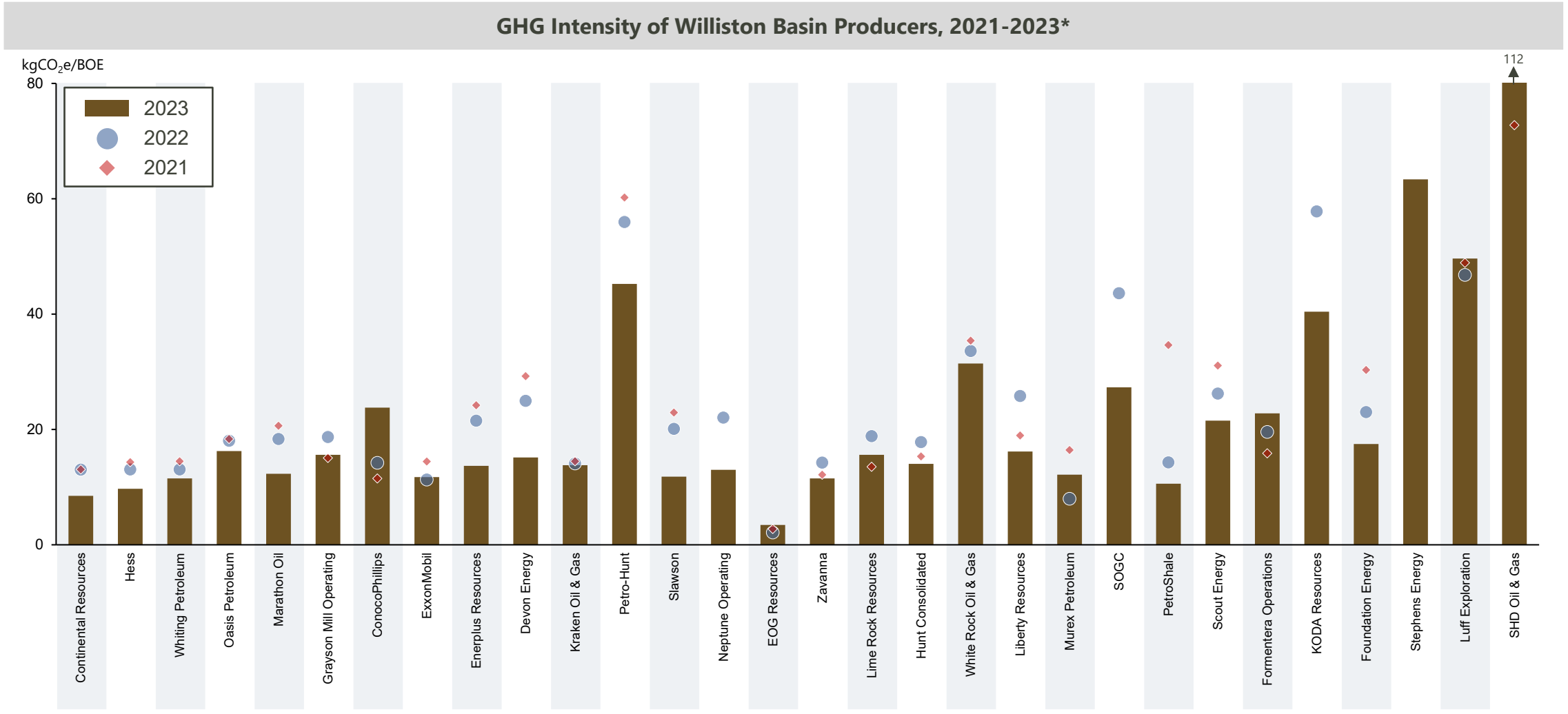
2021-2023 Trends Analysis: Change in Methane Intensity



*Note that some producers in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Williston Basin Producers

2021-2023 Trends Analysis: Change in GHG Intensity



*Note that some producers in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

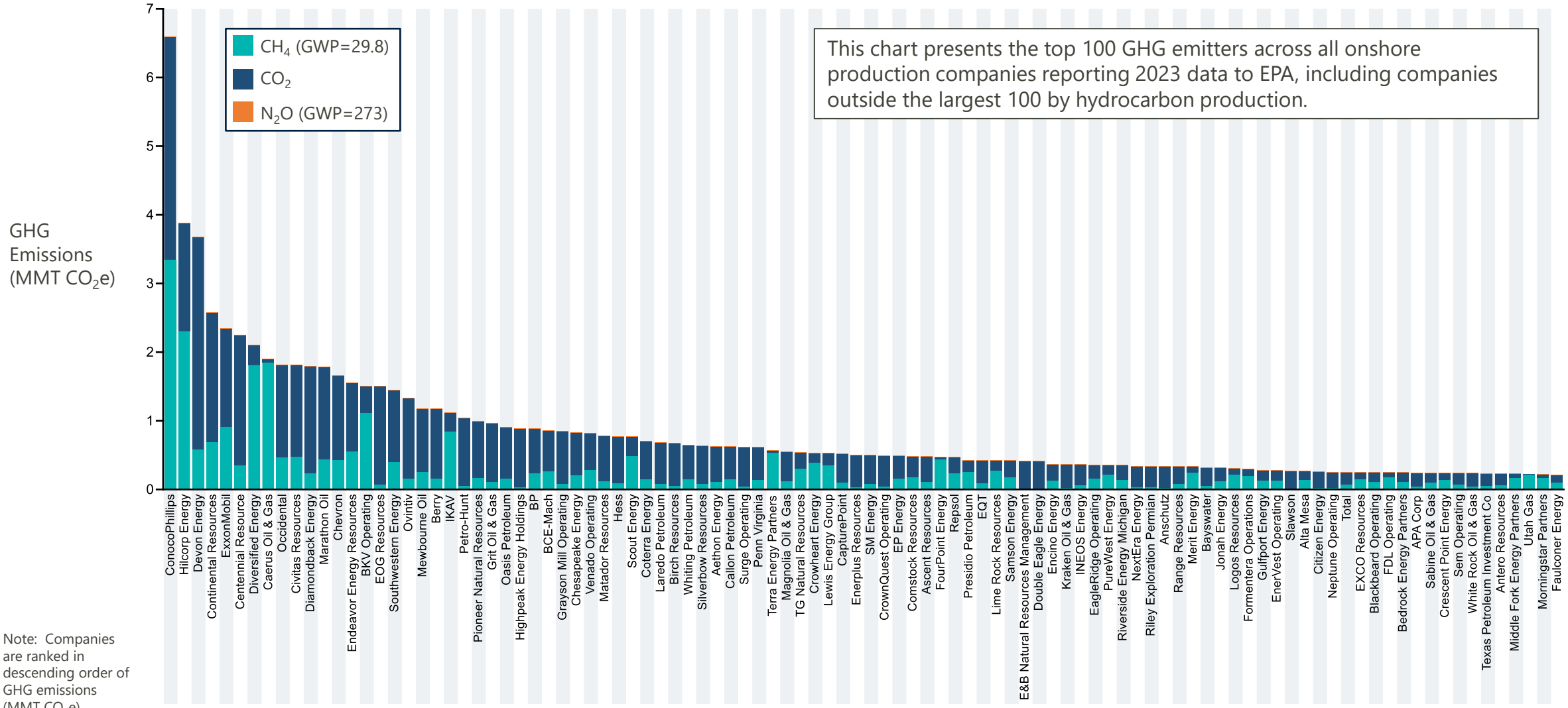
Additional Production Segment Data

The following charts present emissions and emissions intensity data rankings for key metrics. They include companies inside and outside of the top 100 companies by total hydrocarbon production.

Top 100 GHG Emitters

2023 Data

GHG Emissions (100-year GWP)



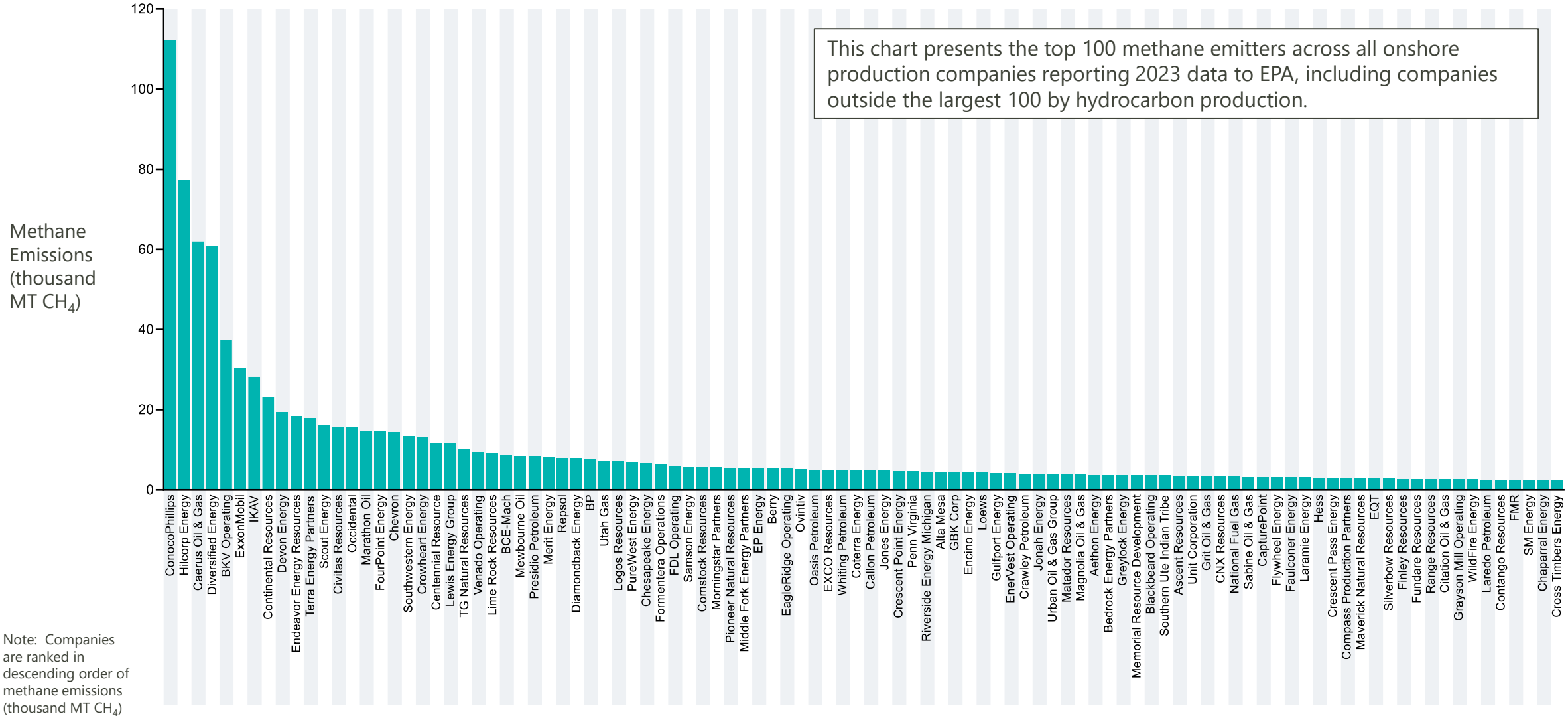
Note: Companies are ranked in descending order of GHG emissions (MMT CO_2e)

Top 100 Methane Emitters

Methane Emissions

2023 Data

This chart presents the top 100 methane emitters across all onshore production companies reporting 2023 data to EPA, including companies outside the largest 100 by hydrocarbon production.

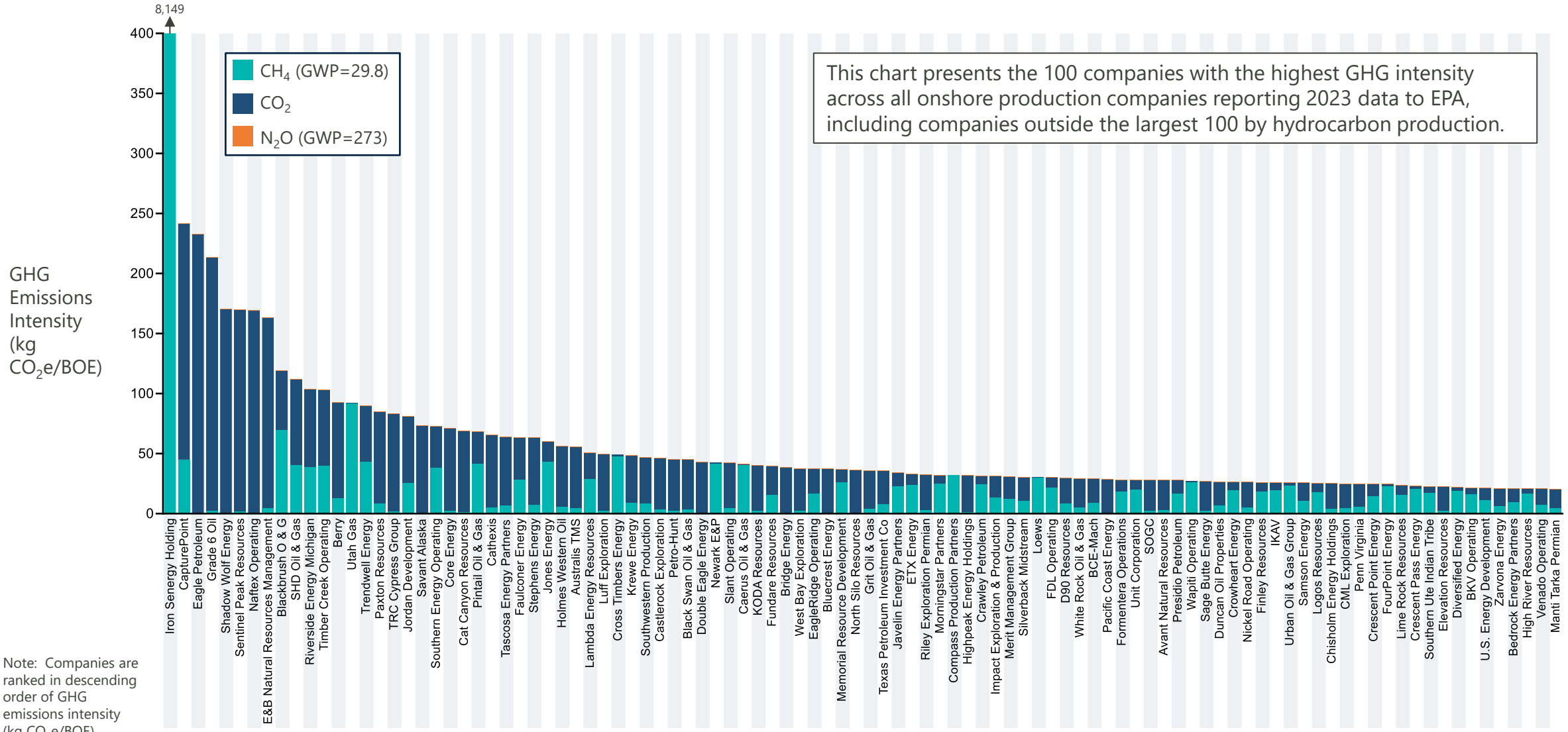


Note: Companies are ranked in descending order of methane emissions (thousand MT CH_4)

Top 100 Highest GHG Emissions Intensities

2023 Data

GHG Emissions Intensity

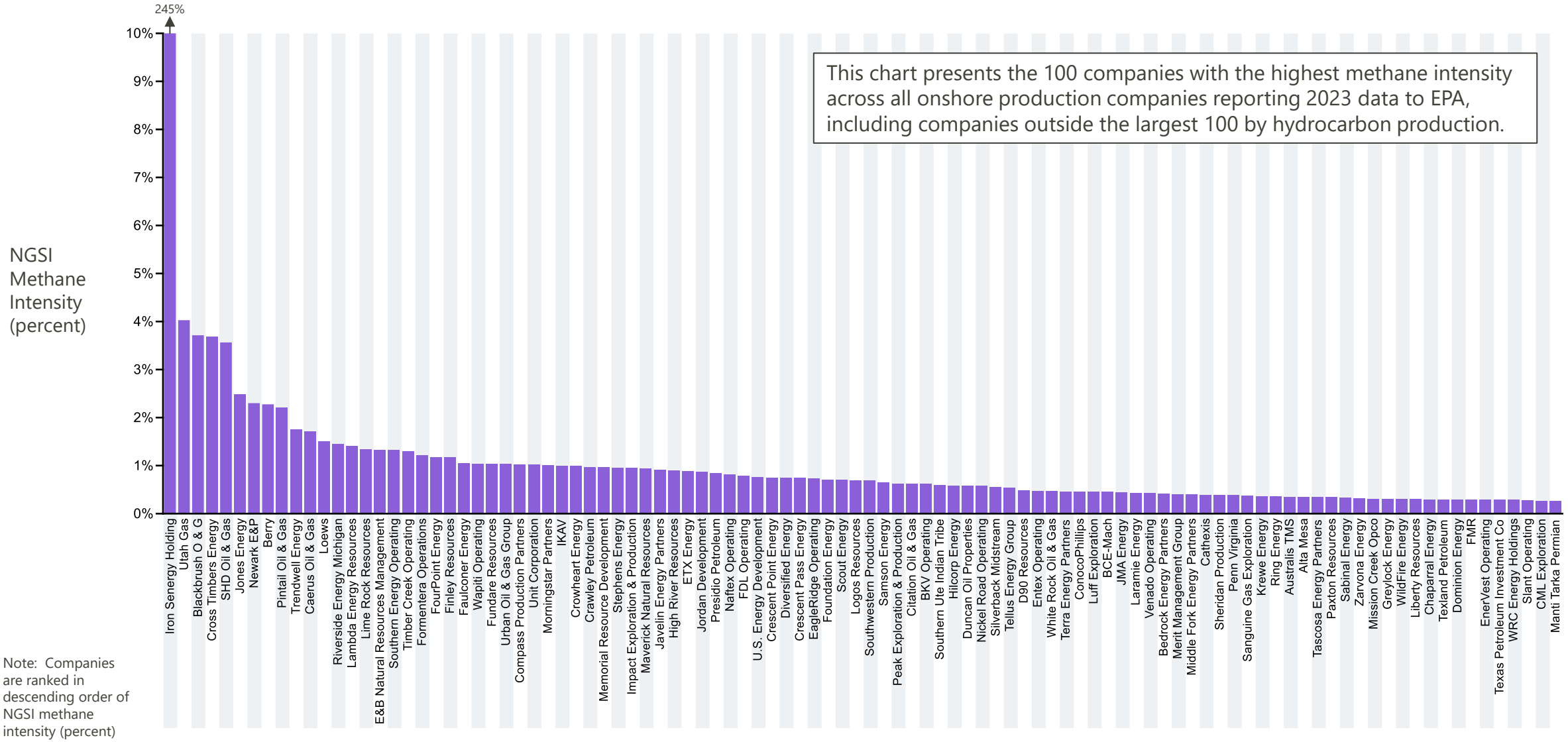


Note: Companies are ranked in descending order of GHG emissions intensity (kg CO_2e/BOE)

Top 100 Highest NGSI Methane Intensities

2023 Data

Methane Intensity



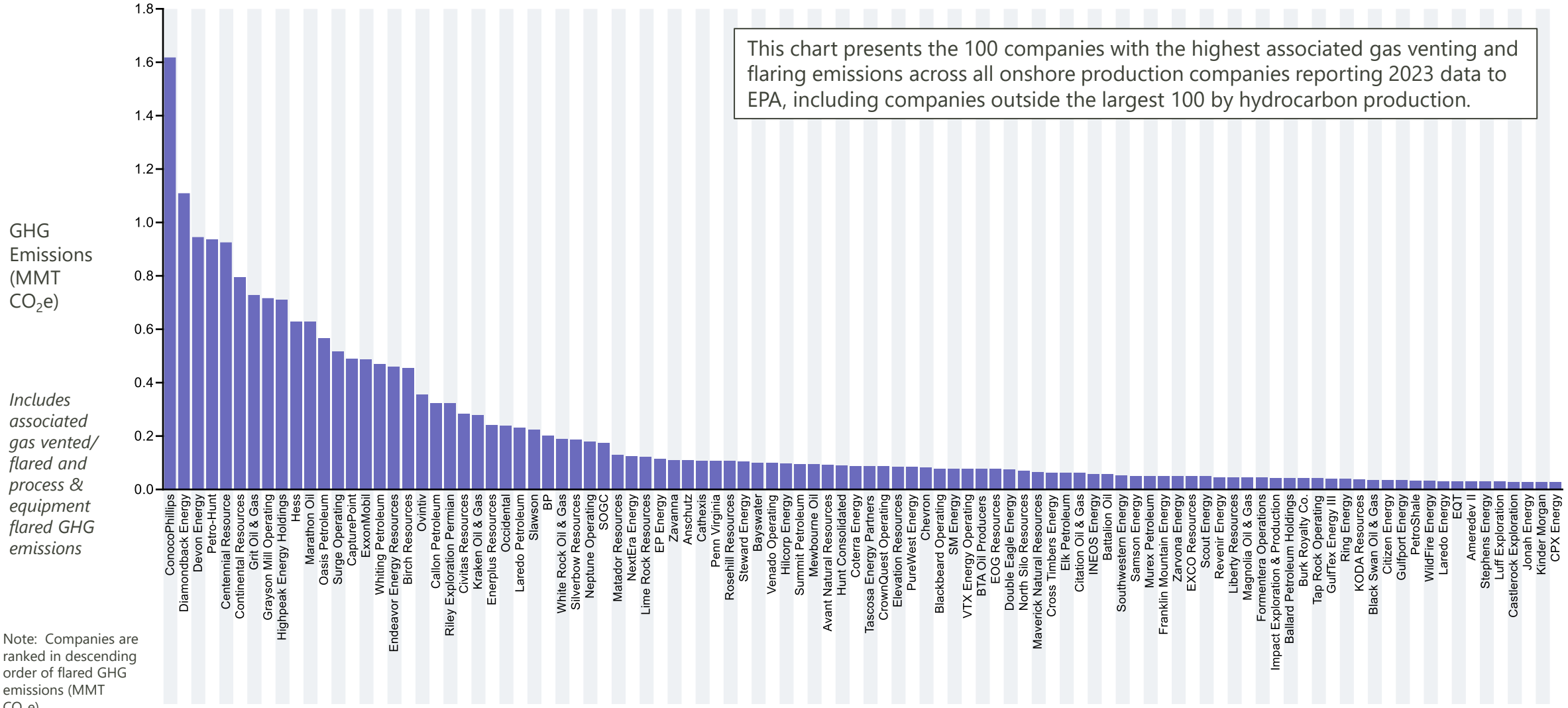
Note: Companies are ranked in descending order of NGSI methane intensity (percent)

Top 100 Flared GHG Emissions

2023 Data

Associated Gas Venting/Flaring and Other Flaring GHG Emissions (100-year GWP)

This chart presents the 100 companies with the highest associated gas venting and flaring emissions across all onshore production companies reporting 2023 data to EPA, including companies outside the largest 100 by hydrocarbon production.



Includes associated gas vented/ flared and process & equipment flared GHG emissions

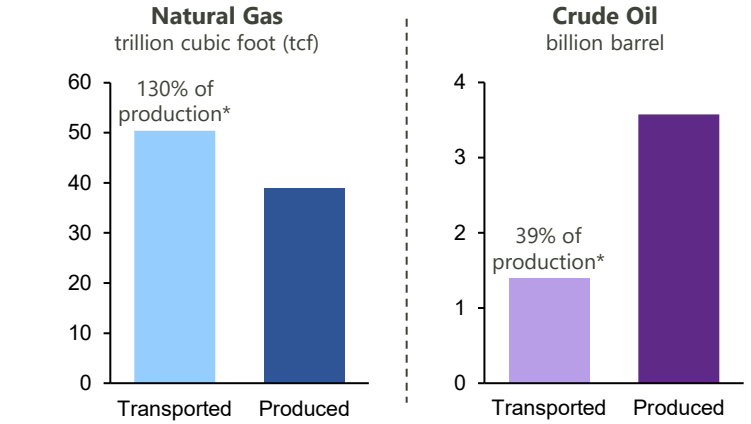
Note: Companies are ranked in descending order of flared GHG emissions (MMT CO_2e)

2023 Gathering & Boosting Segment

Relative Scope of Data Analyzed (2023)

- Reported hydrocarbon liquids transported represent 39% of total reported subpart W production
- Gas volumes transported by G&B facilities were 130% total subpart W production, reflecting the same gas moving through multiple facilities and gathering from production facilities that do not report under the GHGRP
- Reported G&B segment methane represents 21% of total methane reported under subpart W
- Reported G&B segment CO_2e represents 40% of total CO_2e reported under subpart W

2023 Transported vs. Produced*
GHGRP

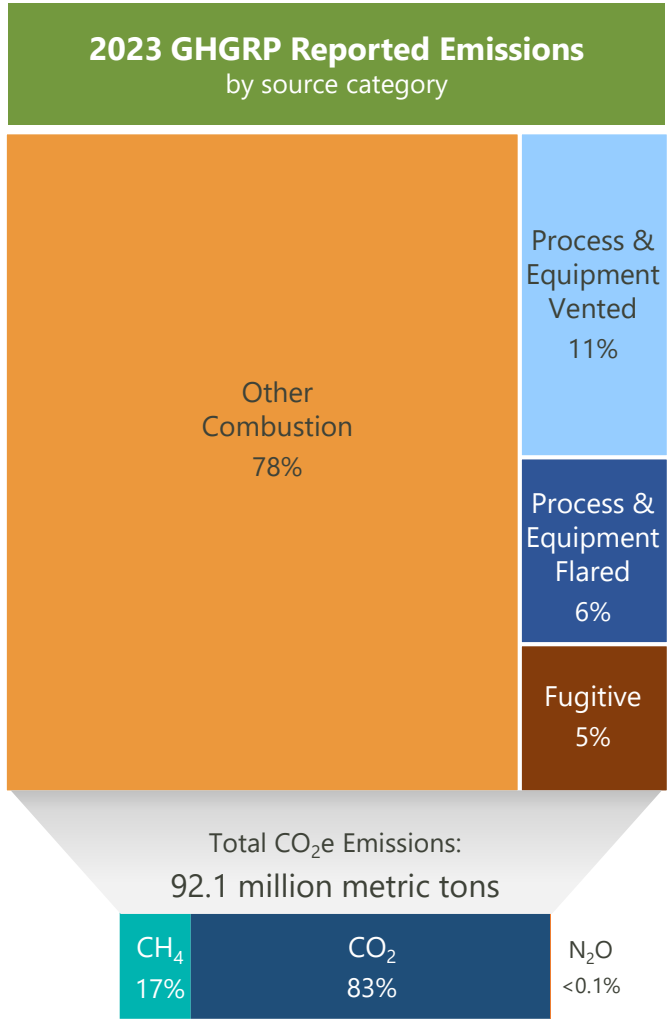


*Data reported to GHGRP; not reflective of total U.S. oil/gas production (see slide 4)

Types of Emissions Associated with Gathering & Boosting

The GHGRP includes reporting on emissions from 12 emissions sources. In addition, this report attributes emissions associated with four additional sources that are estimated at the national level by EPA in the GHG Inventory, but not included in GHGRP. The relative contribution of GHG emissions from oil and gas gathering and boosting can vary widely by both type of hydrocarbons gathered and emissions source. For purposes of comparison within this report, G&B segment emissions sources are grouped into four categories:

- **Process & Equipment Vented** Vented emissions are intentional releases of natural gas from equipment and processes. Common sources of vented emissions include gas-driven pneumatic devices, compressor seals, acid gas removal units, and equipment blowdowns.
- **Process & Equipment Flared** Flared emissions consist primarily of CO_2 from the combustion of gas that is captured from equipment and processes. Flaring also results in methane emissions from uncombusted gas that escapes through the flare stack.
- **Fugitive** Fugitive emissions are unintentional releases, or leaks, of natural gas. These emissions are often caused by faulty or worn-out equipment. Sources of fugitive emissions include seals and cracks on equipment such as tanks and piping, and leakage from infrastructure components such as valves and connectors.
- **Other Combustion** Non-flaring combustion is a significant source of CO_2 emissions from oil and gas gathering and boosting operations. Natural gas engines used to power compressors represent the largest source of other combustion emissions. Other combustion also includes methane emissions from uncombusted gas.

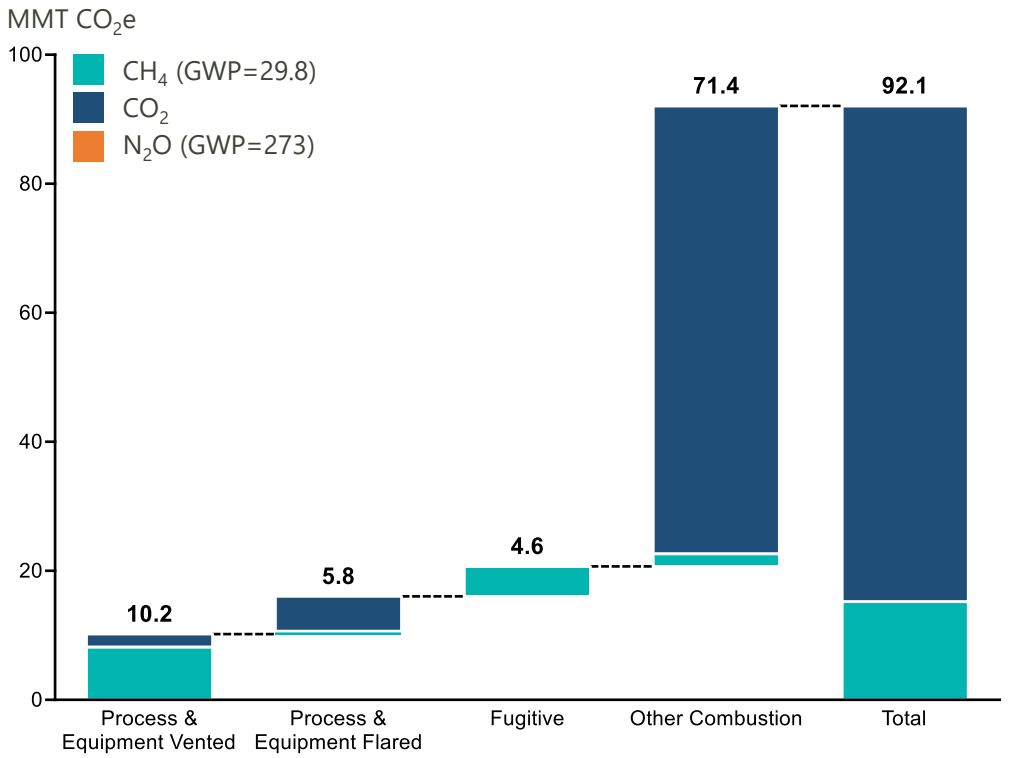


Sources of Methane Emissions

Process and equipment vented, and fugitive methane emissions make up approximately 84% and 14% of the total methane and GHG emissions, respectively, reported across all sources included in this report. Equipment leaks (fugitive) and pneumatic devices account for nearly 60% of reported methane emissions.

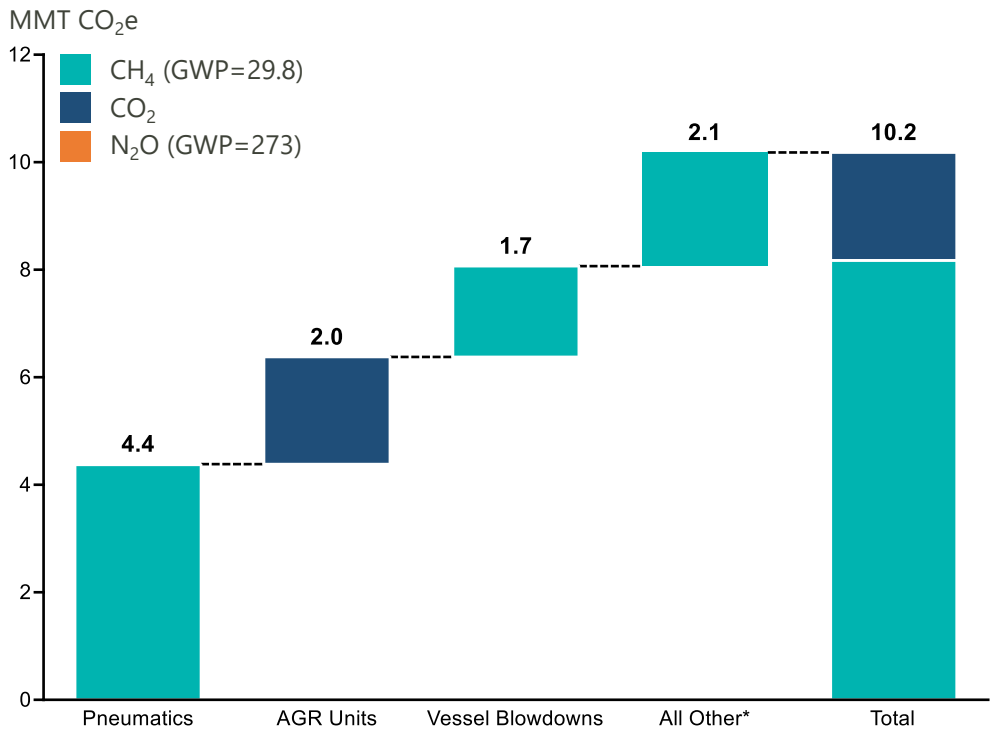
2023 Reported G&B Emissions, by Source Category

million metric ton CO_2e (MMT CO_2e)



2023 Reported Process & Equipment Vented Emissions, by Source

million metric ton CO_2e (MMT CO_2e)

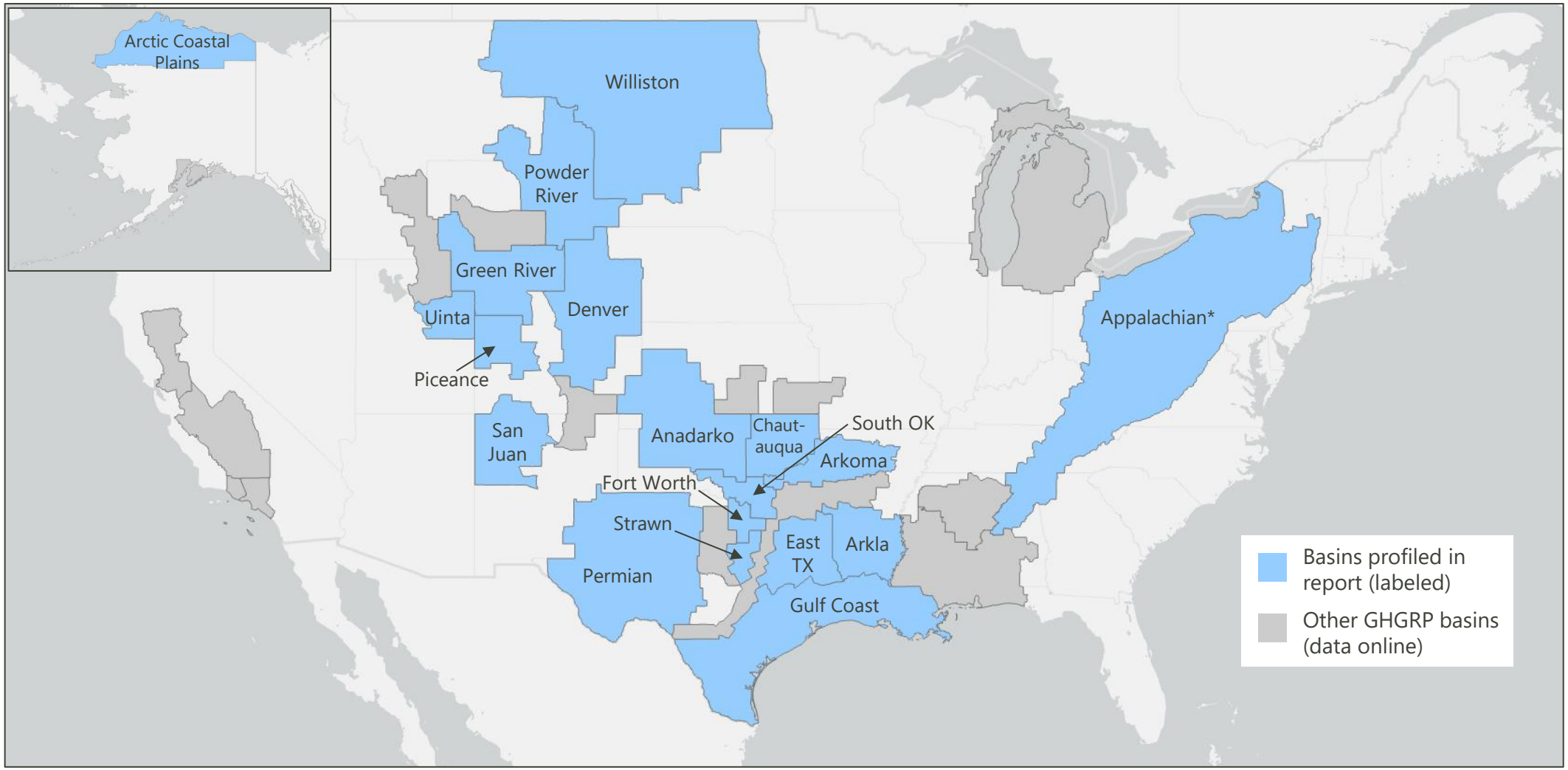


*Includes: Centrifugal compressors, dehydrators, reciprocating compressors, compressor blowdowns and starts, and pressure relief valves

Basin-Level Summary Data

This section provides data on transported hydrocarbons, GHG emissions, emissions intensity, and sources of emissions for the 19 largest G&B basins in the U.S. by 2023 transported volume. Together these basins represent 99.5% and 99.3% of total 2023 transported natural gas and hydrocarbon liquids, respectively, in the EPA data.

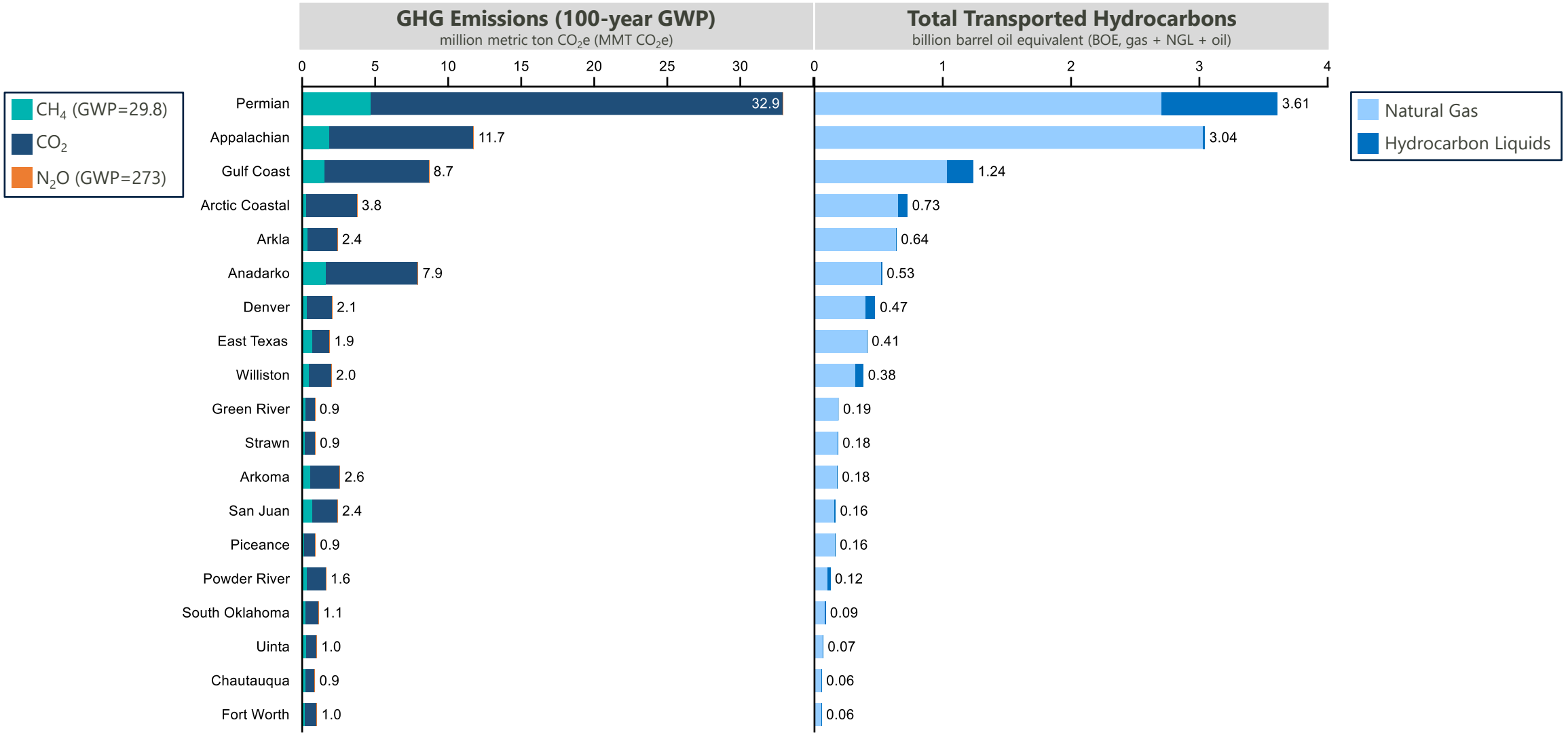
GHGRP Basins



* GHGRP data contain two distinct Appalachian basins (160 & 160A). This analysis combines data reported across both basins and presents them as a single basin.
Note: Basin boundaries defined by geologic provinces published by the American Association of Petroleum Geologists; data provided by U.S. EPA.

2023 Data

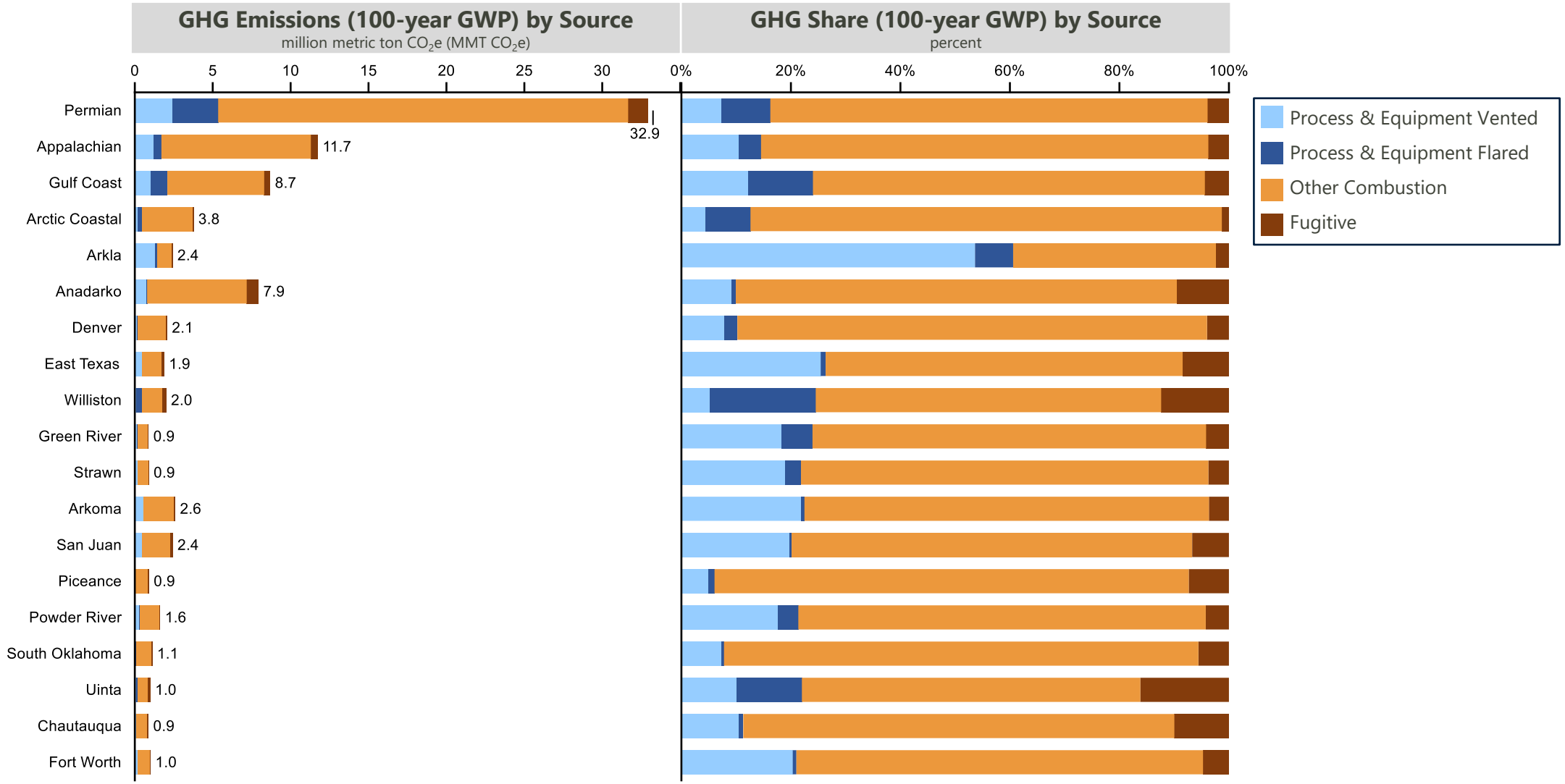
GHGRP Basin Transported Hydrocarbons & Emissions



Note: Basins are ranked in descending order of transported hydrocarbons (BOE)

2023 Data

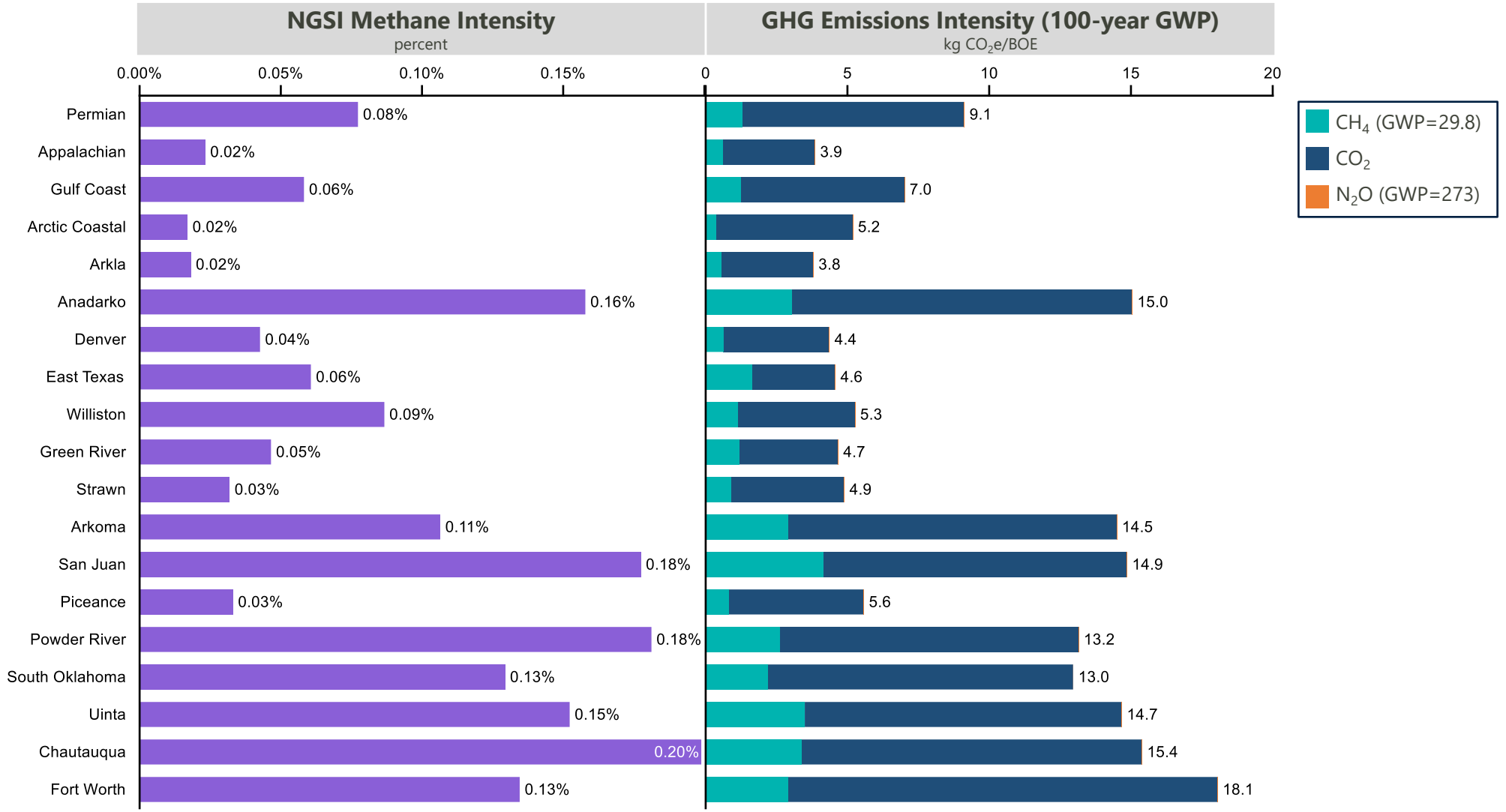
GHGRP Basin Emissions by Source



Note: Basins are ranked in descending order of transported hydrocarbons (BOE)

2023 Data

GHGRP Basin Methane & GHG Intensity



Note: Basins are ranked in descending order of transported hydrocarbons (BOE)

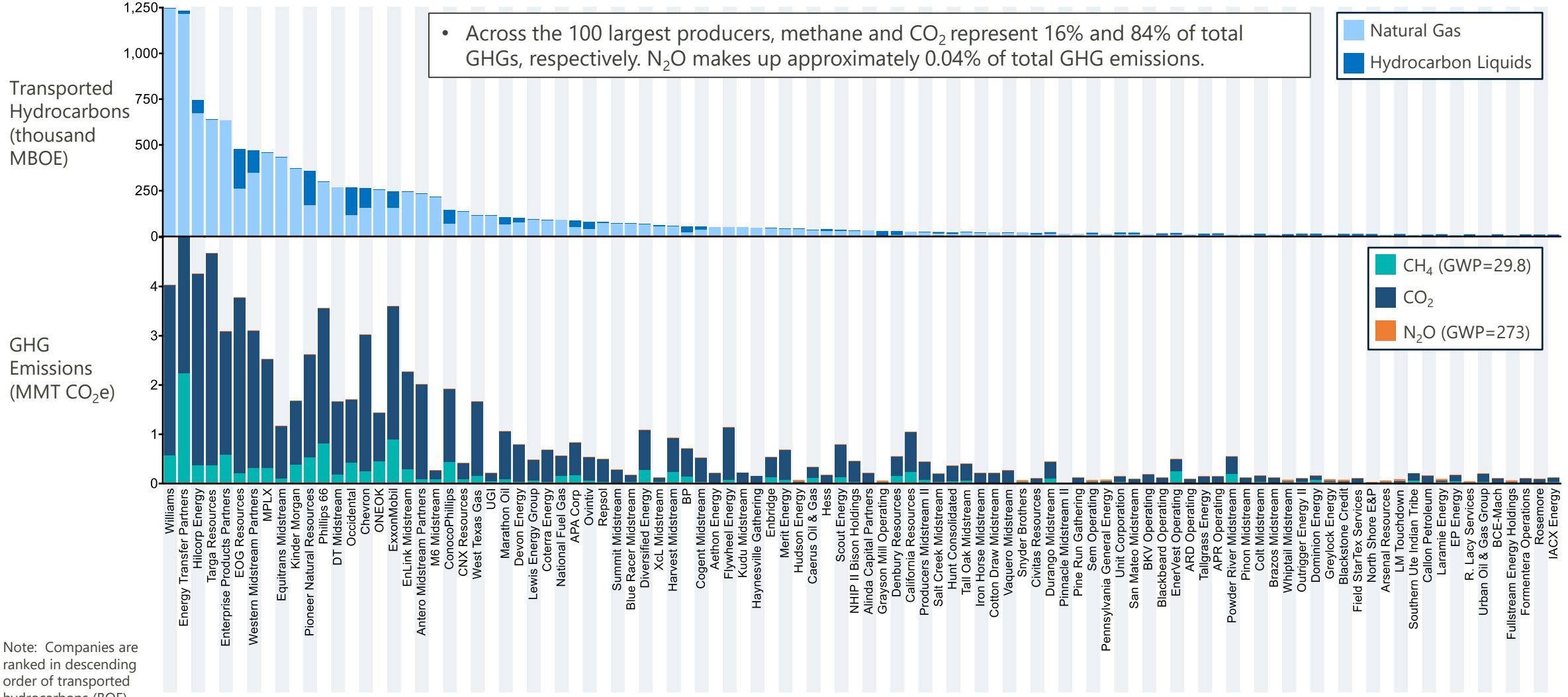
Company-Level Summary Data

This section summarizes data on transported hydrocarbons, GHG emissions, emissions intensity, and sources of emissions for the 100 largest G&B companies in the U.S. Additional graphics show the relative distribution of transported hydrocarbons, GHG emissions, and methane and GHG emissions intensities across the 100 largest companies. Detailed tables list the data and associated rankings for the primary metrics included in this analysis for each of the 100 companies.

Top 100 G&B Companies

2023 Data

Transported Hydrocarbons & Emissions (100-year GWP)

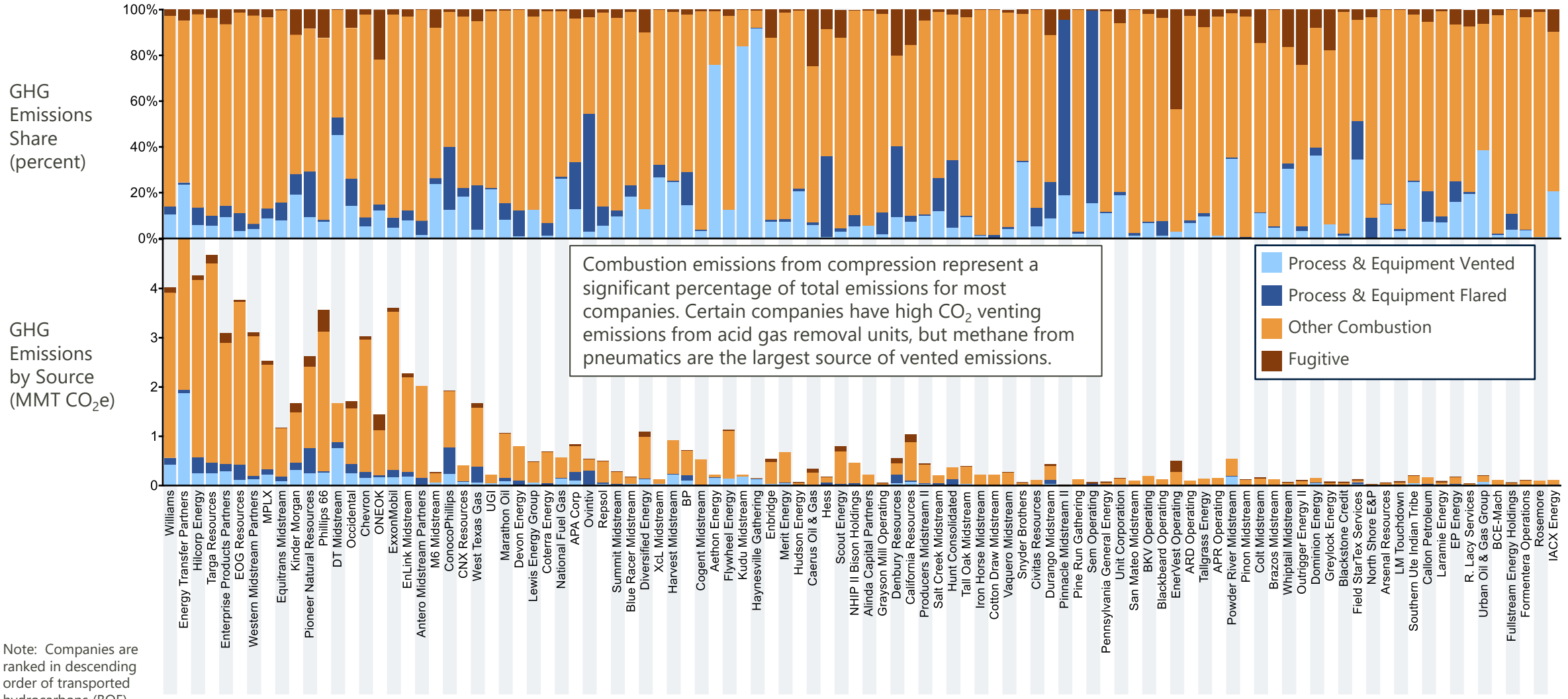


Note: Companies are ranked in descending order of transported hydrocarbons (BOE)

Top 100 G&B Companies

2023 Data

GHG Emissions by Source (100-year GWP)

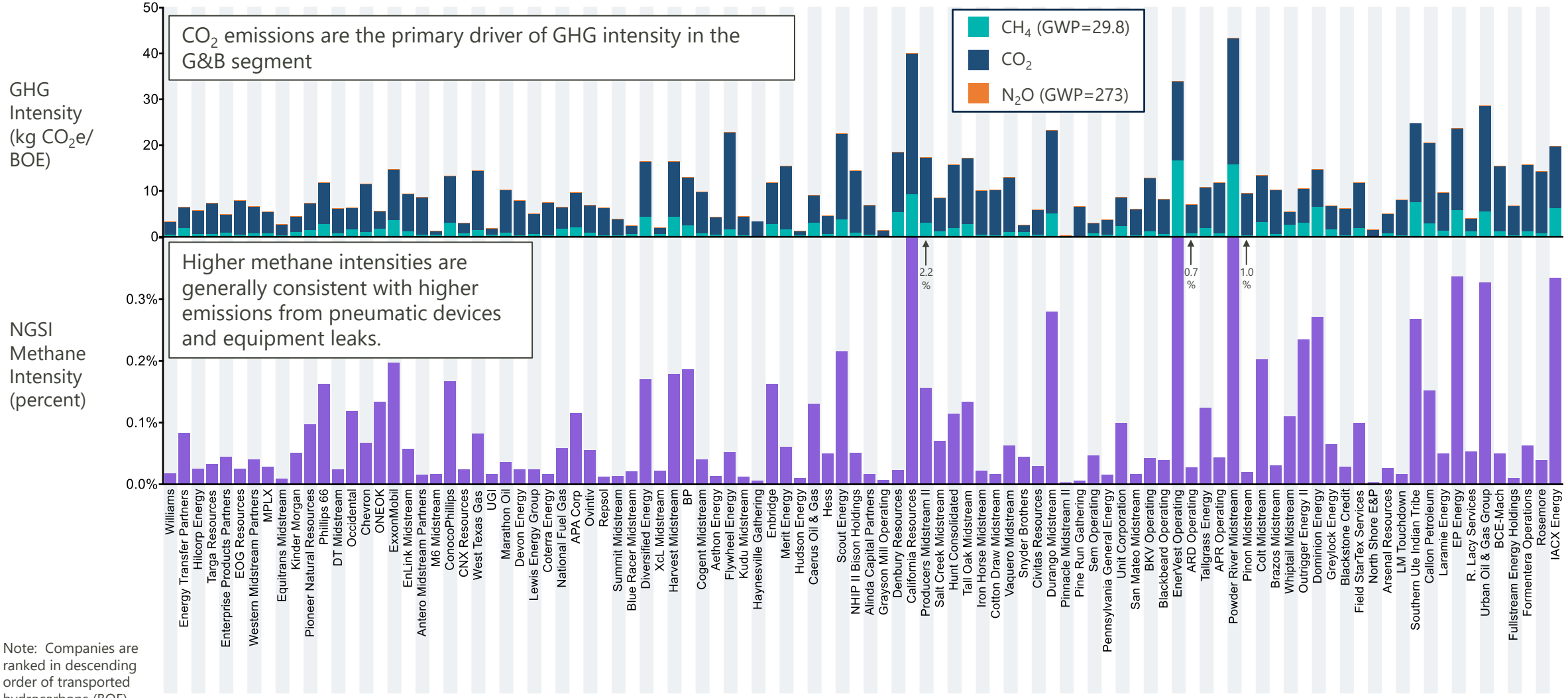


Note: Companies are ranked in descending order of transported hydrocarbons (BOE)

Top 100 G&B Companies

2023 Data

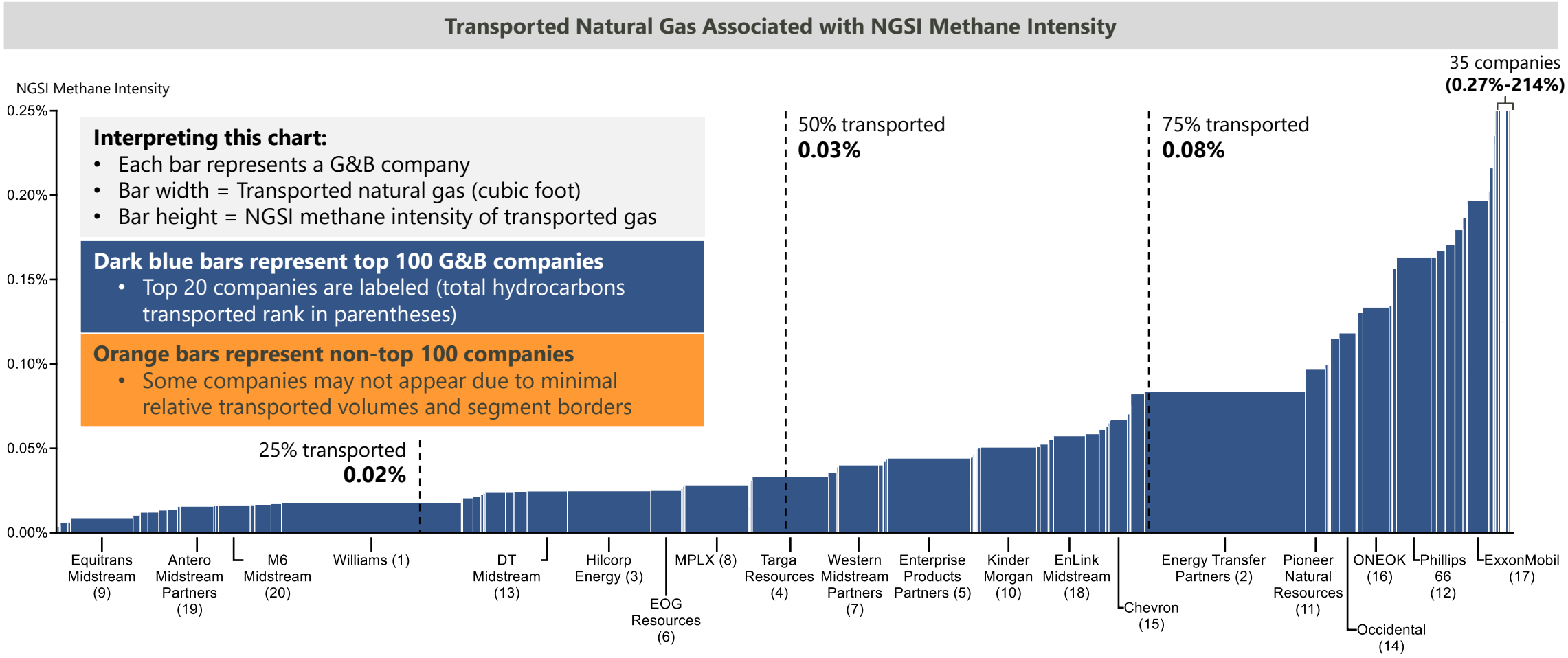
Methane & GHG Intensity (100-year GWP)



Note: Companies are ranked in descending order of transported hydrocarbons (BOE)

2023 Data

Total GHGRP Transported Natural Gas, by Methane Intensity

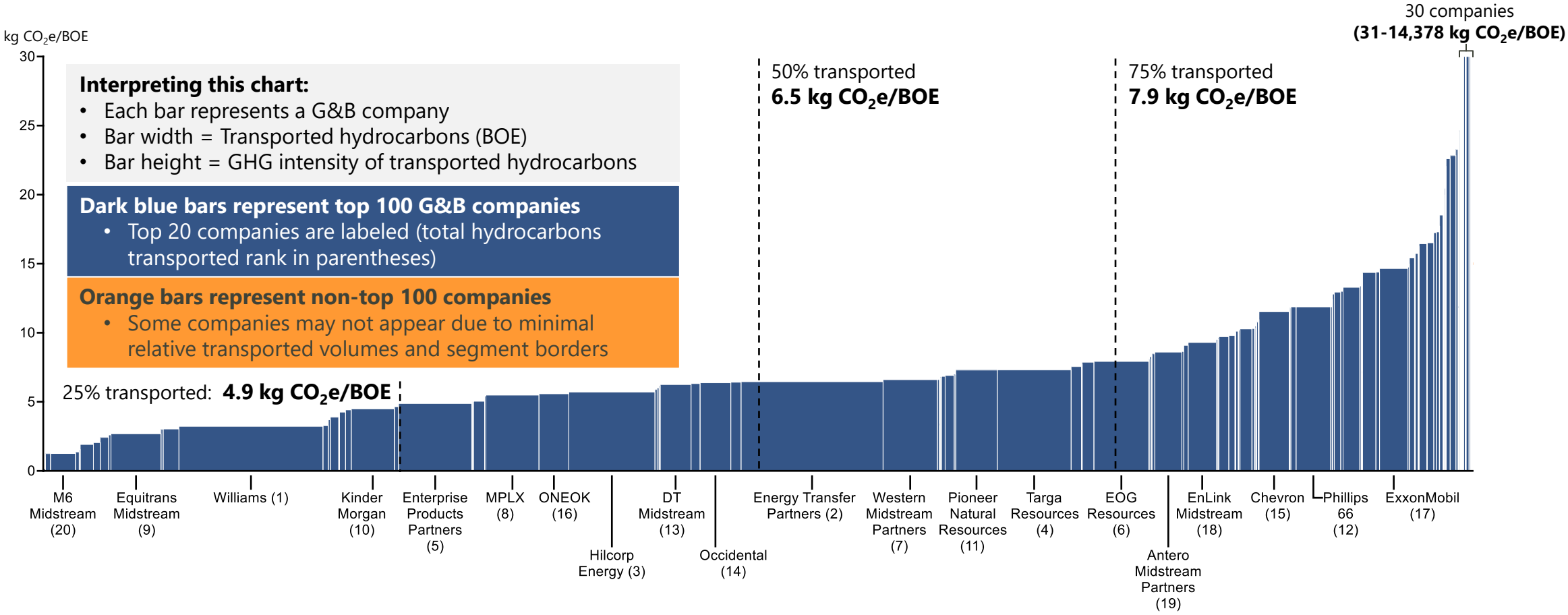


Natural Gas Transported → Total Gas Transported: 50.4 trillion cubic feet

2023 Data

Total GHGRP Transported Hydrocarbons, by GHG Intensity

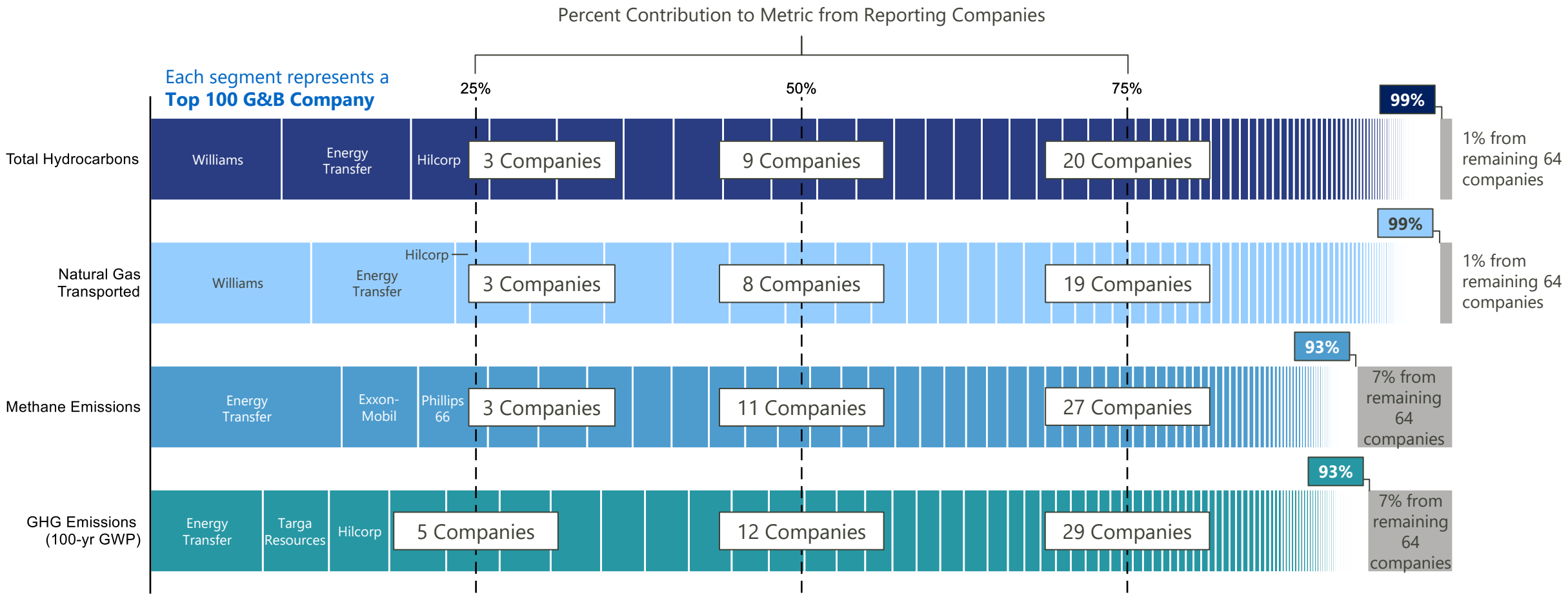
Transported Hydrocarbons Associated with GHG Intensity



Hydrocarbons Transported → Total Hydrocarbons Transported: 12.4 billion BOE

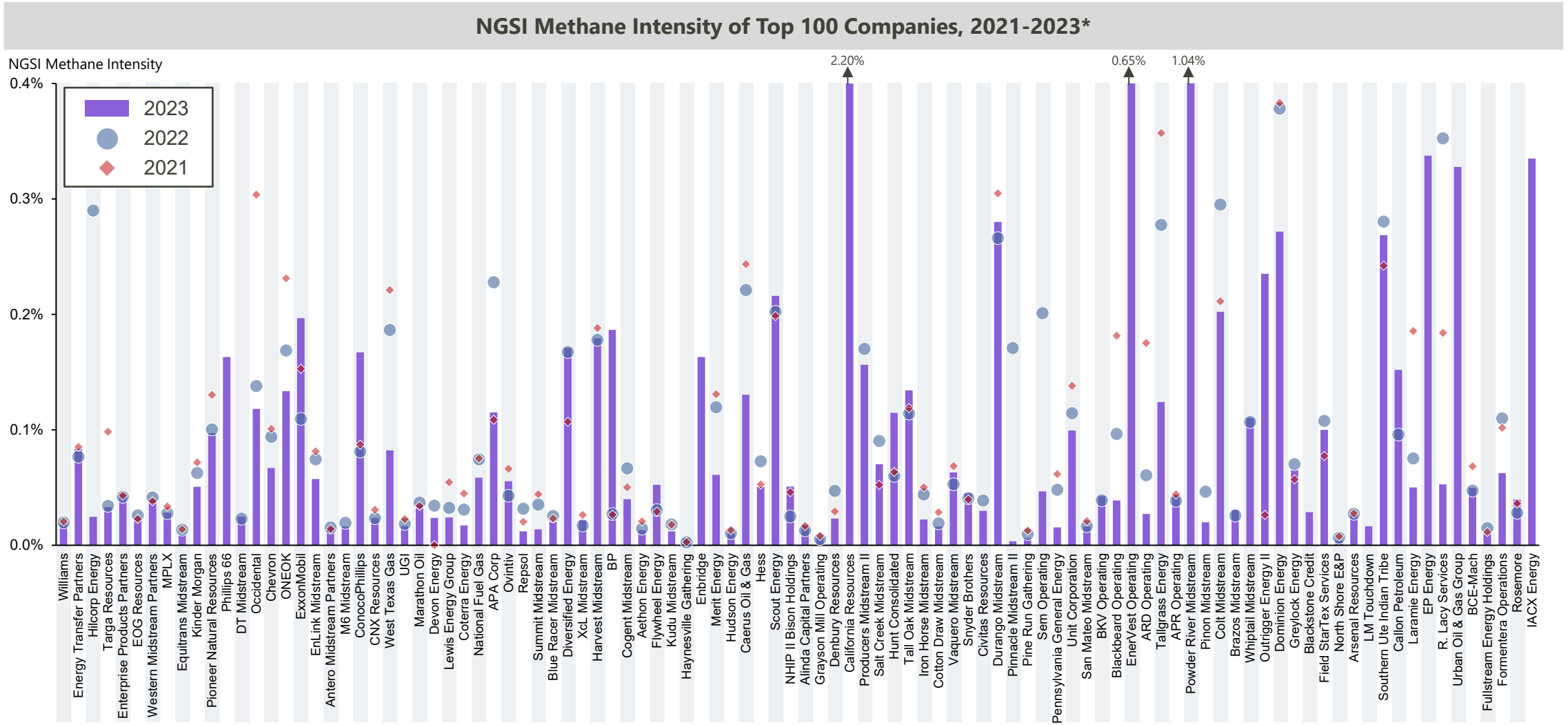
2023 Data

GHGRP Transported Hydrocarbons & Emissions Contributions



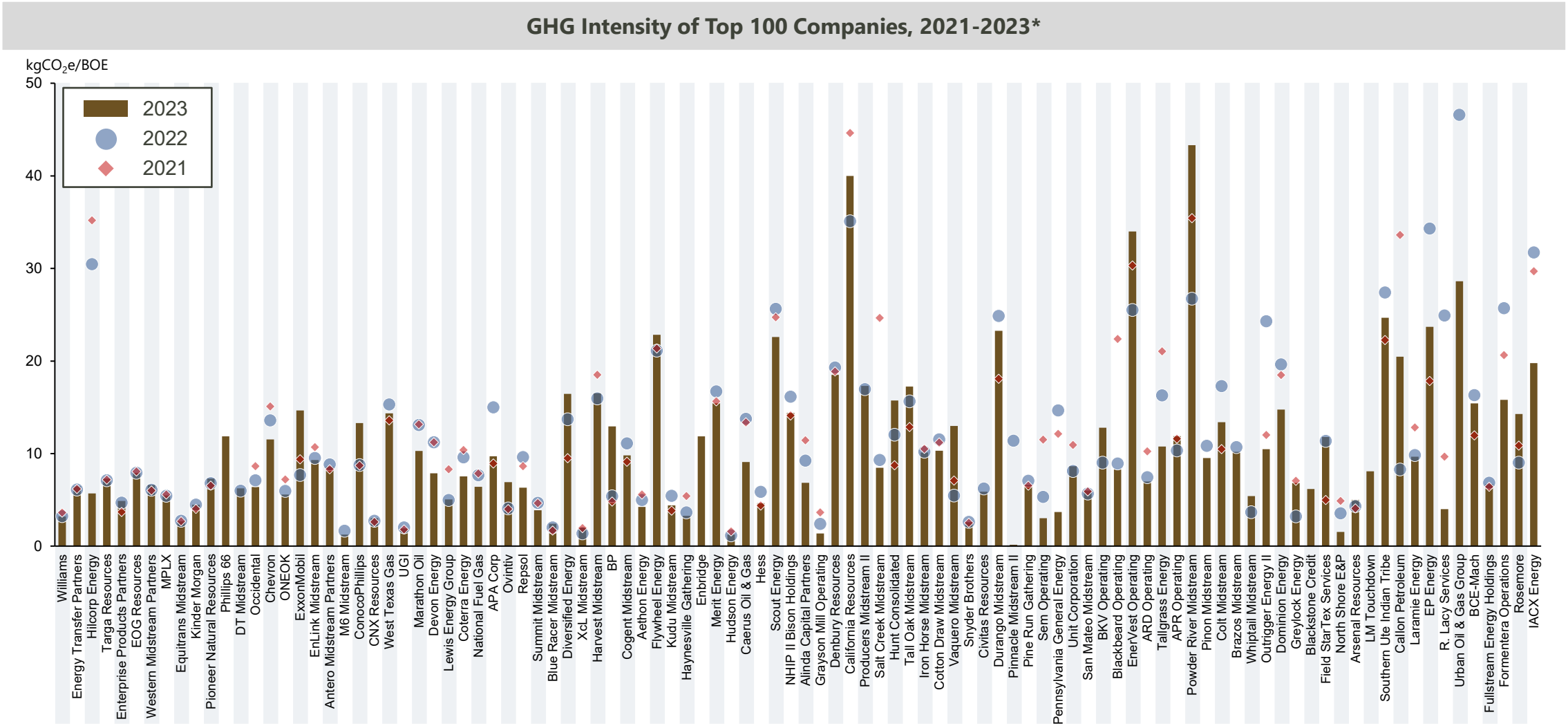
Transported hydrocarbons and absolute GHG emissions reported to EPA are highly concentrated among a small number of companies. 25% of total reported transported hydrocarbons and GHG emitted are by three and five companies, respectively. In general, only 20-30 companies are responsible for 75% of transported hydrocarbons and GHG emissions.

2021-2023 Trends Analysis: Change in Methane Intensity, by Top 100 G&B Company



*14 of the top 100 companies in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

2021-2023 Trends Analysis: Change in GHG Intensity, by Top 100 G&B Company



*14 of the top 100 companies in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

2023 Data

Emissions & Emissions Intensities of the Top 100 G&B Companies

		Transported		Emissions		Intensity		Metric Rank (among top 100 G&B companies) 1=highest, 100= lowest				
Rank	Company	Total MBOE	Gas (bcf)	MT CH4	MT GHG	NGSI Intensity	GHG Intensity	Gas (bcf)	CH4 Emissions	GHG Emissions	NGSI Intensity	GHG Intensity
1	Williams	1,248,865	6,219	19,136	4,026,475	0.02%	3.22	1	5	4	79	88
2	Energy Transfer Partners	1,231,202	5,572	74,978	7,946,857	0.08%	6.45	2	1	1	33	65
3	Hilcorp Energy	746,788	2,887	12,610	4,260,830	0.02%	5.71	3	11	3	69	73
4	Targa Resources	640,388	2,638	12,277	4,678,489	0.03%	7.31	5	12	2	61	56
5	Enterprise Products Partners	634,918	2,876	19,755	3,097,220	0.04%	4.88	4	4	9	53	79
6	EOG Resources	476,037	1,066	6,819	3,772,229	0.03%	7.92	15	21	5	68	53
7	Western Midstream Partners	470,776	1,379	10,512	3,107,834	0.04%	6.60	10	14	8	57	64
8	MPLX	460,105	2,211	10,573	2,523,900	0.03%	5.49	6	13	12	65	75
9	Equitrans Midstream	434,033	2,157	3,297	1,165,308	0.01%	2.68	7	32	21	95	91
10	Kinder Morgan	373,442	1,935	12,783	1,675,774	0.05%	4.49	8	10	17	47	81
11	Pioneer Natural Resources	359,876	676	17,765	2,627,070	0.10%	7.30	19	6	11	32	57
12	Phillips 66	300,183	1,196	27,328	3,564,481	0.16%	11.87	11	3	7	19	32
13	DT Midstream	267,543	1,389	6,046	1,672,458	0.02%	6.25	9	23	18	70	69
14	Occidental	266,664	578	14,225	1,702,177	0.12%	6.38	21	9	16	26	67
15	Chevron	262,587	604	8,513	3,024,847	0.07%	11.52	20	17	10	36	35
16	ONEOK	258,745	914	15,294	1,444,066	0.13%	5.58	16	7	20	23	74
17	ExxonMobil	246,090	742	29,910	3,605,051	0.20%	14.65	17	2	6	13	22
18	EnLink Midstream	244,195	1,093	9,772	2,269,977	0.06%	9.30	13	15	13	42	46
19	Antero Midstream Partners	234,291	1,163	3,154	2,014,322	0.02%	8.60	12	34	14	87	49
20	M6 Midstream	216,979	1,068	2,920	272,693	0.02%	1.26	14	36	50	84	98
21	ConocoPhillips	144,929	303	14,598	1,926,063	0.17%	13.29	31	8	15	17	27
22	CNX Resources	136,895	704	3,031	414,985	0.02%	3.03	18	35	45	73	89
23	West Texas Gas	115,892	472	5,386	1,664,366	0.08%	14.36	24	26	19	34	24
24	UGI	114,133	563	1,649	218,258	0.02%	1.91	22	46	56	81	95
25	Marathon Oil	102,995	289	2,816	1,058,601	0.04%	10.28	34	37	24	60	39
26	Devon Energy	101,438	292	1,134	797,872	0.02%	7.87	32	55	28	72	54
27	Lewis Energy Group	96,066	455	1,887	484,282	0.02%	5.04	25	45	41	71	77
28	Coterra Energy	90,354	362	930	682,082	0.02%	7.55	27	60	31	80	55
29	National Fuel Gas	88,716	476	5,166	569,465	0.06%	6.42	23	27	33	41	66
30	APA Corp	85,554	247	5,694	830,945	0.12%	9.71	40	24	27	27	43
31	Ovintiv	78,457	160	2,220	542,062	0.06%	6.91	45	42	37	43	59
32	Repsol	78,322	376	913	495,041	0.01%	6.32	26	62	40	91	68
33	Summit Midstream	72,608	360	836	282,083	0.01%	3.88	28	64	49	89	85
34	Blue Racer Midstream	72,464	354	1,287	175,453	0.02%	2.42	29	52	63	77	93

2023 Data

Emissions & Emissions Intensities of the Top 100 G&B Companies

		Transported		Emissions		Intensity		Metric Rank (among top 100 G&B companies) 1=highest, 100= lowest				
Rank	Company	Total MBOE	Gas (bcf)	MT CH4	MT GHG	NGSI Intensity	GHG Intensity	Gas (bcf)	CH4 Emissions	GHG Emissions	NGSI Intensity	GHG Intensity
35	Diversified Energy	66,122	324	9,460	1,087,474	0.17%	16.45	30	16	23	16	16
36	XcL Midstream	60,045	270	1,117	122,939	0.02%	2.05	37	56	73	76	94
37	Harvest Midstream	55,879	272	8,024	922,857	0.18%	16.52	36	20	26	15	15
38	BP	55,301	113	4,594	715,646	0.19%	12.94	50	28	30	14	29
39	Cogent Midstream	53,605	159	1,217	525,313	0.04%	9.80	46	54	38	56	42
40	Aethon Energy	51,790	290	712	220,212	0.01%	4.25	33	67	53	90	83
41	Flyw heel Energy	49,781	273	2,616	1,136,376	0.05%	22.83	35	38	22	45	8
42	Kudu Midstream	49,526	258	539	218,686	0.01%	4.42	39	73	55	92	82
43	Haynesville Gathering	46,451	259	275	152,079	0.01%	3.27	38	83	69	98	87
44	Enbridge	45,650	182	4,156	542,064	0.16%	11.87	43	30	36	18	33
45	Merit Energy	44,194	208	2,369	681,242	0.06%	15.41	42	40	32	40	20
46	Hudson Energy	44,025	219	390	54,952	0.01%	1.25	41	76	93	94	99
47	Caerus Oil & Gas	37,525	172	3,815	340,894	0.13%	9.08	44	31	48	24	47
48	Hess	37,250	97	694	172,830	0.05%	4.64	53	68	64	48	80
49	Scout Energy	34,892	114	4,385	788,489	0.22%	22.60	49	29	29	11	9
50	NHIP II Bison Holdings	31,959	128	921	459,798	0.05%	14.39	48	61	42	46	23
51	Alinda Capital Partners	31,505	157	447	215,597	0.02%	6.84	47	74	57	82	60
52	Grayson Mill Operating	31,324	8	59	42,828	0.01%	1.37	100	98	97	96	97
53	Denbury Resources	29,797	57	5,394	551,849	0.02%	18.52	69	25	34	74	12
54	California Resources	26,057	57	8,034	1,042,242	2.20%	40.00	68	19	25	1	2
55	Producers Midstream II	25,521	107	2,559	441,611	0.16%	17.30	51	39	43	20	13
56	Salt Creek Midstream	24,265	61	966	205,574	0.07%	8.47	67	59	58	35	50
57	Hunt Consolidated	23,362	49	1,519	367,689	0.11%	15.74	74	47	47	28	18
58	Tall Oak Midstream	23,260	101	2,096	401,062	0.13%	17.24	52	43	46	22	14
59	Iron Horse Midstream	21,702	93	321	219,439	0.02%	10.11	54	79	54	75	41
60	Cotton Draw Midstream	21,420	88	197	220,670	0.02%	10.30	58	90	52	85	38
61	Vaquero Midstream	20,559	82	735	267,208	0.06%	13.00	59	66	51	38	28
62	Snyder Brothers	19,959	92	667	51,900	0.04%	2.60	55	69	94	52	92
63	Civitas Resources	19,048	35	270	112,146	0.03%	5.89	88	84	80	63	72
64	Durango Midstream	18,863	75	3,203	439,041	0.28%	23.27	63	33	44	7	7
65	Pinnacle Midstream II	18,555	76	37	2,885	0.00%	0.16	62	99	100	100	100
66	Pine Run Gathering	18,278	91	97	120,810	0.01%	6.61	56	95	74	97	63
67	Sem Operating	18,272	52	442	55,081	0.05%	3.01	70	75	92	51	90

2023 Data

Emissions & Emissions Intensities of the Top 100 G&B Companies

		Transported		Emissions		Intensity		Metric Rank (among top 100 G&B companies) 1=highest, 100= lowest				
Rank	Company	Total MBOE	Gas (bcf)	MT CH4	MT GHG	NGSI Intensity	GHG Intensity	Gas (bcf)	CH4 Emissions	GHG Emissions	NGSI Intensity	GHG Intensity
68	Pennsylvania General Energy	17,193	91	257	63,568	0.02%	3.70	57	87	89	88	86
69	Unit Corporation	17,148	79	1,294	148,195	0.10%	8.64	61	51	70	31	48
70	San Mateo Midstream	16,393	67	150	98,480	0.02%	6.01	66	92	83	86	71
71	BKV Operating	15,154	80	591	193,991	0.04%	12.80	60	71	61	55	30
72	Blackbeard Operating	14,903	38	315	123,237	0.04%	8.27	83	81	72	59	51
73	EnerVest Operating	14,572	73	8,145	495,374	0.65%	33.99	64	18	39	3	3
74	ARD Operating	13,456	67	317	94,186	0.03%	7.00	65	80	85	66	58
75	Tallgrass Energy	13,375	31	847	144,030	0.12%	10.77	93	63	71	25	36
76	APR Operating	12,926	47	338	153,523	0.04%	11.88	77	77	68	54	31
77	Pow der River Midstream	12,593	48	6,680	545,599	1.04%	43.33	76	22	35	2	1
78	Pinon Midstream	12,363	51	140	117,617	0.02%	9.51	73	93	75	78	45
79	Colt Midstream	12,029	37	1,301	161,000	0.20%	13.38	85	50	66	12	26
80	Brazos Midstream	11,481	47	201	117,022	0.03%	10.19	78	89	76	62	40
81	Whiptail Midstream	11,262	23	993	61,048	0.11%	5.42	97	58	90	29	76
82	Outrigger Energy II	10,786	37	1,081	113,141	0.24%	10.49	84	57	79	10	37
83	Dominion Energy	10,727	51	2,346	158,188	0.27%	14.75	71	41	67	8	21
84	Greylock Energy	10,451	51	572	71,347	0.06%	6.83	72	72	88	37	61
85	Blackstone Credit	9,790	31	100	60,381	0.03%	6.17	92	94	91	64	70
86	Field StarTex Services	9,701	41	624	114,409	0.10%	11.79	80	70	78	30	34
87	North Shore E&P	9,041	40	27	13,879	0.00%	1.54	81	100	99	99	96
88	Arsenal Resources	8,941	48	230	44,815	0.03%	5.01	75	88	96	67	78
89	LM Touchdow n	8,933	36	83	72,220	0.02%	8.08	86	96	87	83	52
90	Southern Ute Indian Tribe	8,228	47	2,056	202,957	0.27%	24.67	79	44	60	9	5
91	Callon Petroleum	8,165	11	799	167,094	0.15%	20.46	99	65	65	21	10
92	Laramie Energy	7,952	40	330	76,871	0.05%	9.67	82	78	86	49	44
93	EP Energy	7,595	31	1,463	180,000	0.34%	23.70	94	48	62	4	6
94	R. Lacy Services	7,212	33	287	28,902	0.05%	4.01	90	82	98	44	84
95	Urban Oil & Gas Group	7,172	34	1,330	205,277	0.33%	28.62	89	49	59	6	4
96	BCE-Mach	7,104	32	259	109,655	0.05%	15.43	91	86	81	50	19
97	Fullstream Energy Holdings	7,096	35	66	47,596	0.01%	6.71	87	97	95	93	62
98	Formentera Operations	6,815	28	267	107,648	0.06%	15.80	95	85	82	39	17
99	Rosemore	6,785	21	152	96,866	0.04%	14.28	98	91	84	58	25
100	IACX Energy	5,904	25	1,236	116,704	0.33%	19.77	96	53	77	5	11

Company- & Basin-Level Summary Data

This section summarizes company-level data on transported hydrocarbons, GHG emissions, emissions intensity, and sources of emissions for each of the following basins: Permian, Appalachian, Gulf Coast, and Arkla. Additional data show the distribution of methane and GHG emissions intensities by volume in each basin.

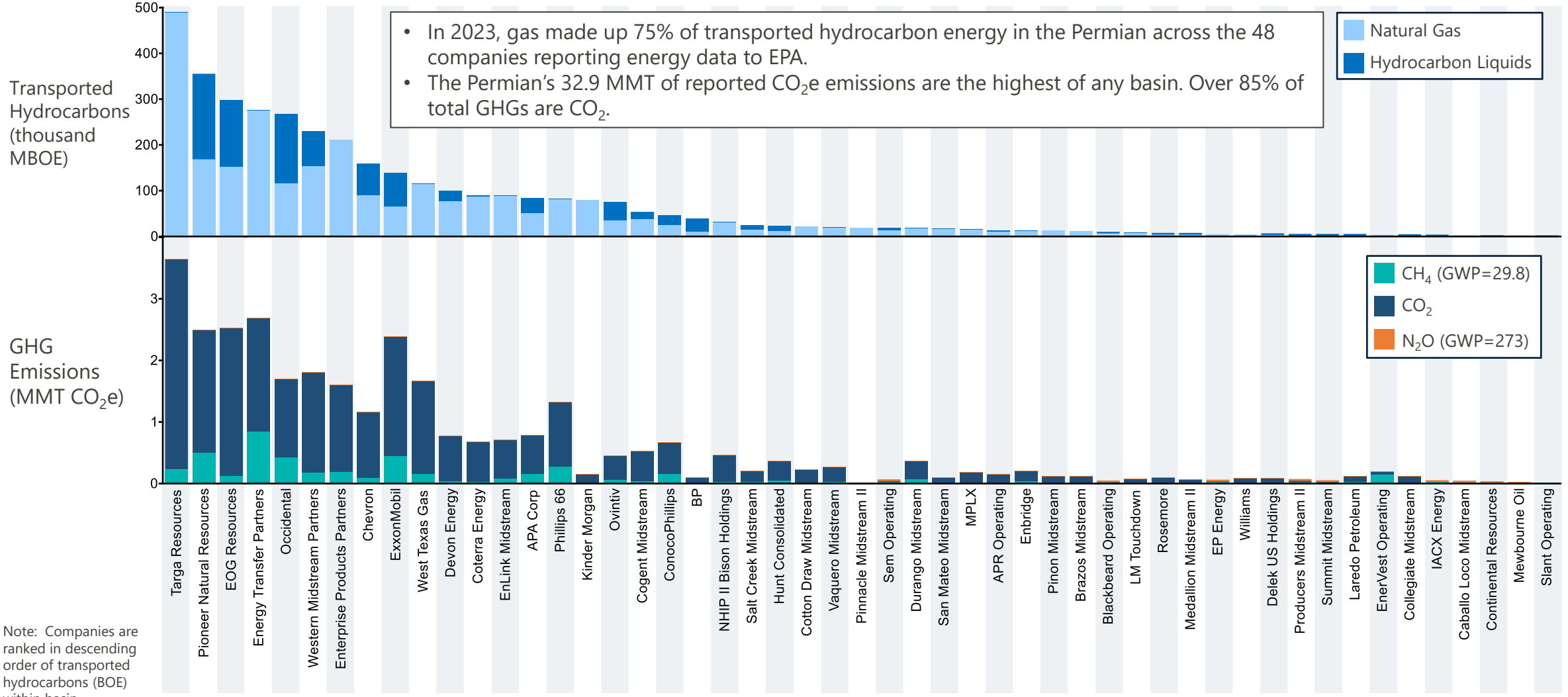
Note that the Arctic Coastal basin has more reported transported hydrocarbons than the Arkla basin. The Arctic Coastal basin in Alaska represents unique operations and only one company reported G&B operations there in 2023. This section includes information on the Arkla basin rather than the Arctic Coastal basin for the G&B segment to facilitate benchmarking and provide more detailed data for a larger number of companies.

Permian Basin Companies

2023 Data

Transported Hydrocarbons & Emissions (100-year GWP)

- In 2023, gas made up 75% of transported hydrocarbon energy in the Permian across the 48 companies reporting energy data to EPA.
- The Permian's 32.9 MMT of reported CO_2e emissions are the highest of any basin. Over 85% of total GHGs are CO_2.

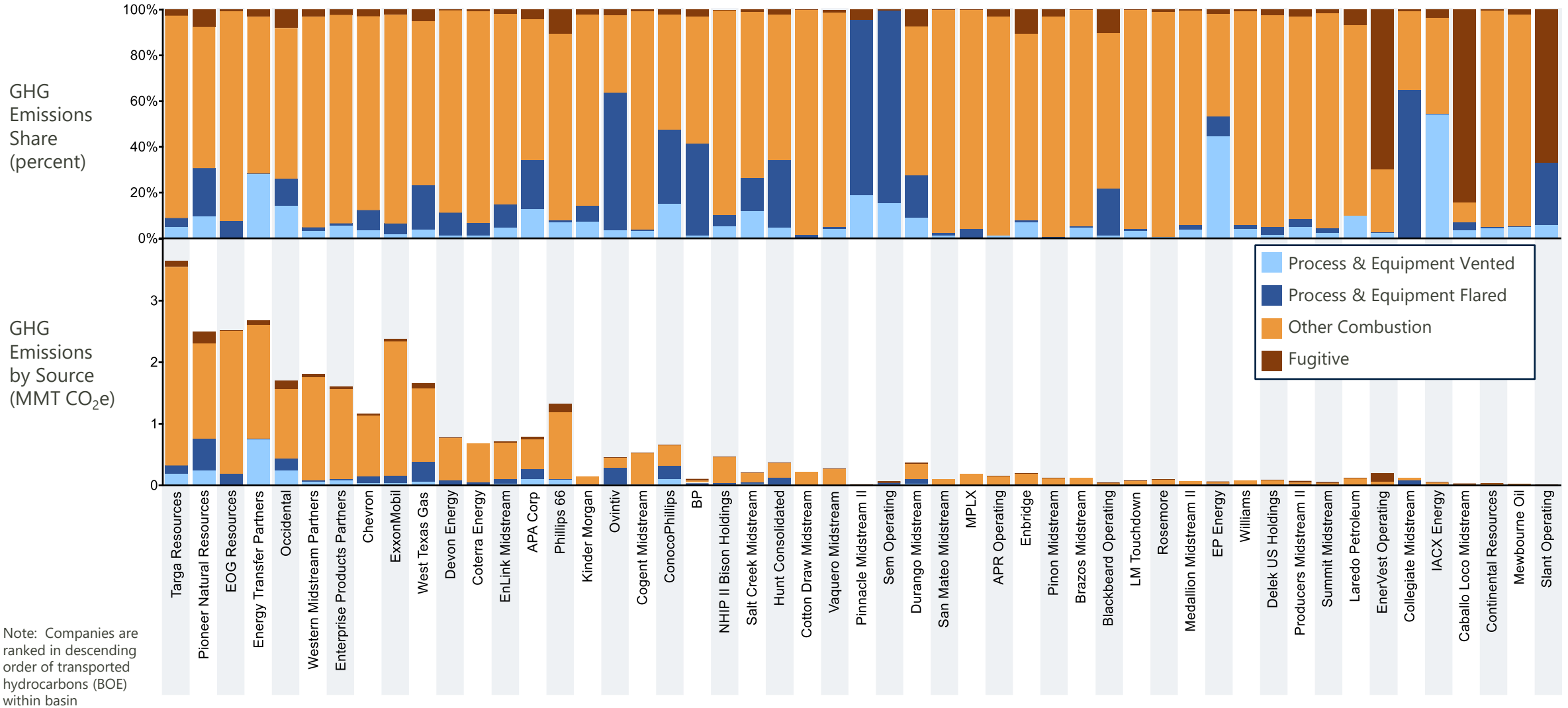


Note: Companies are ranked in descending order of transported hydrocarbons (BOE) within basin

Permian Basin Companies

2023 Data

GHG Emissions by Source (100-year GWP)

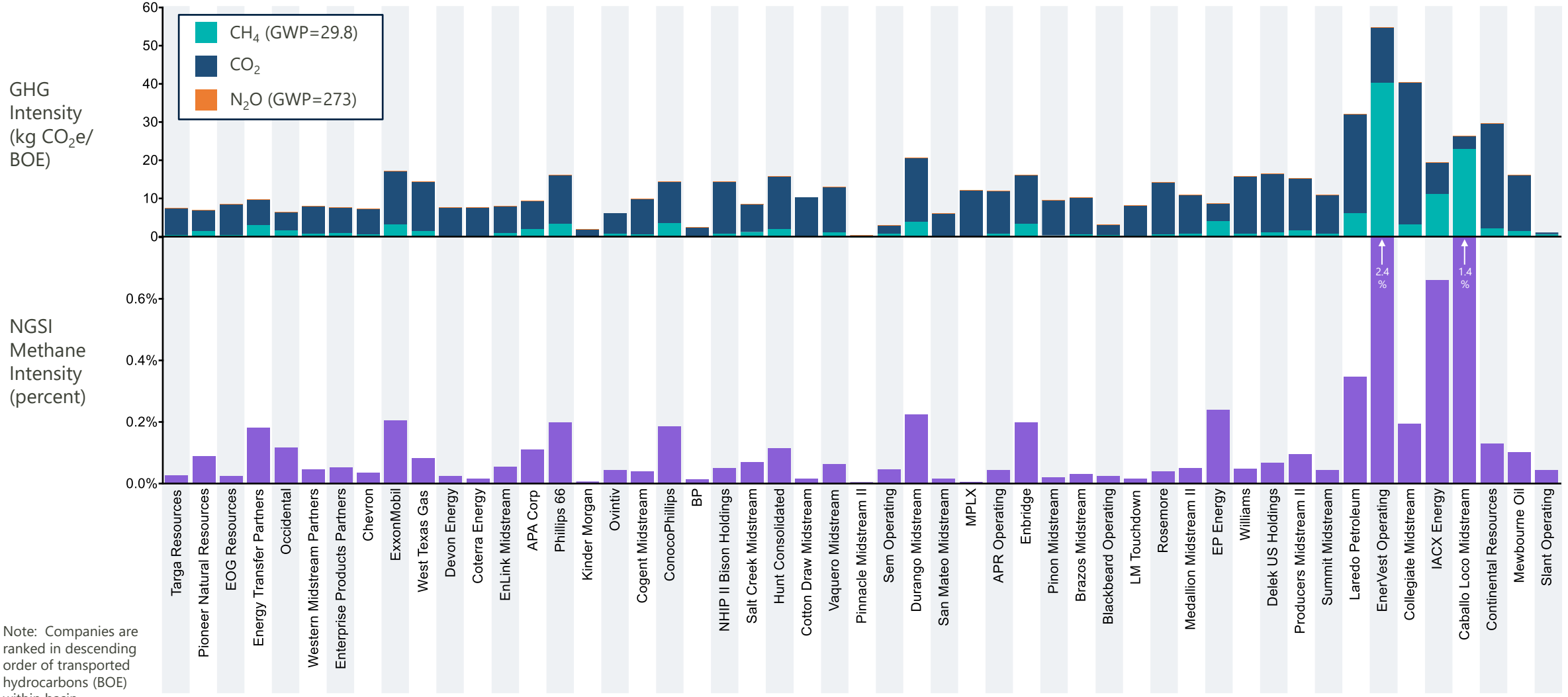


Note: Companies are ranked in descending order of transported hydrocarbons (BOE) within basin

Permian Basin Companies

2023 Data

Methane & GHG Intensity (100-year GWP)

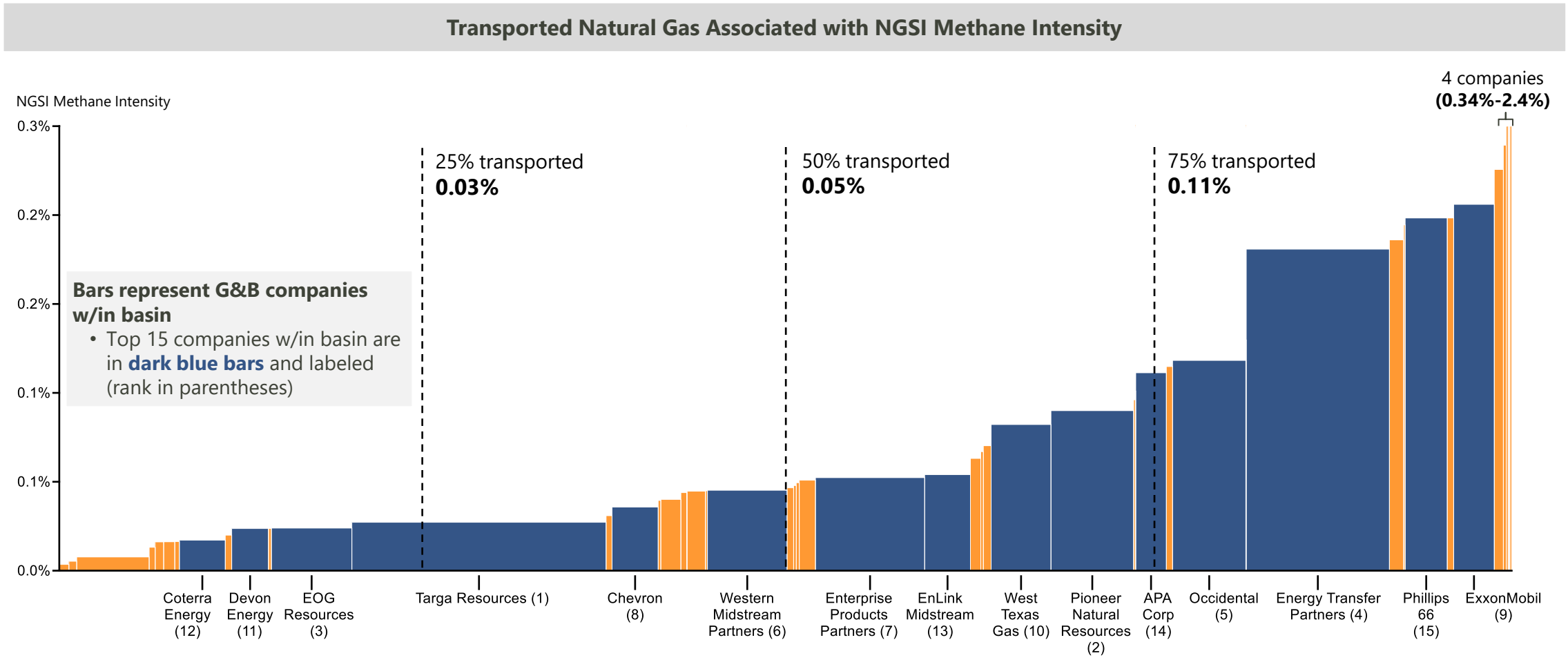


Note: Companies are ranked in descending order of transported hydrocarbons (BOE) within basin

Permian Basin Companies

2023 Data

Total GHGRP Transported Natural Gas, by Methane Intensity



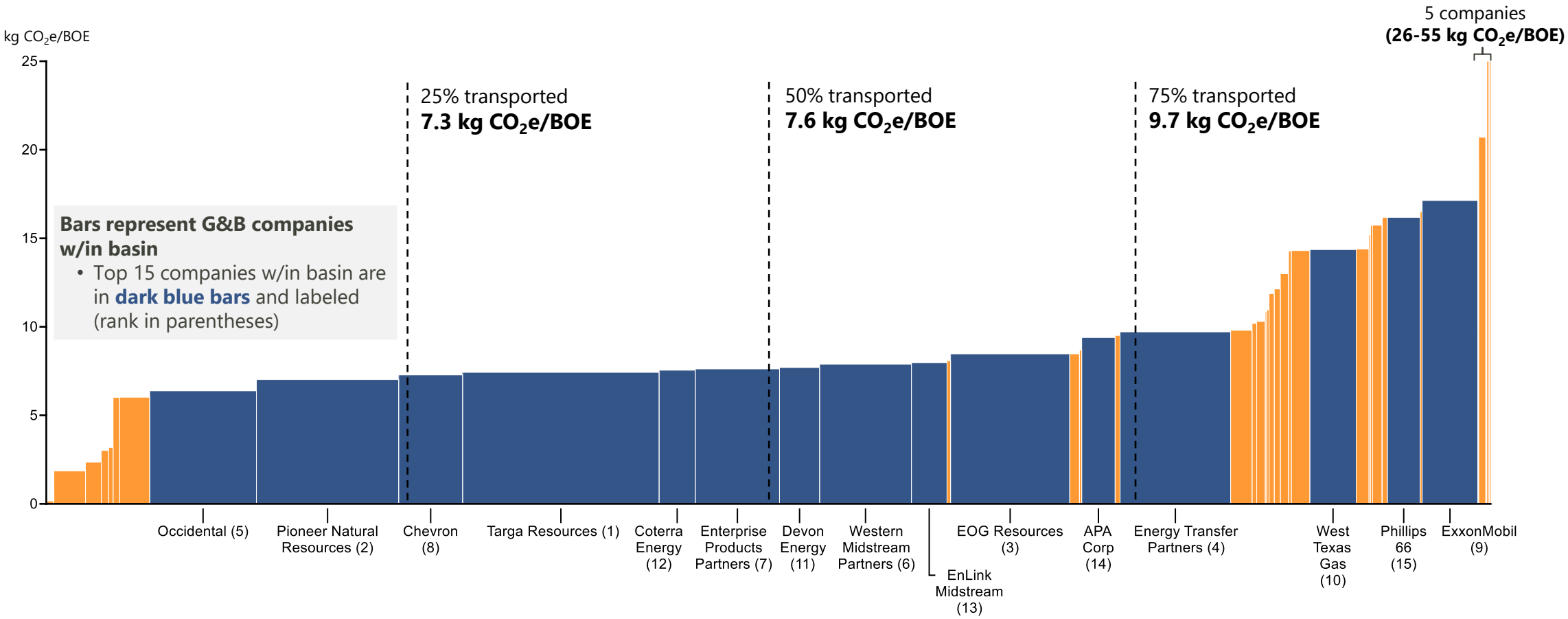
Transported Natural Gas ⟶ Total Gas Transported: 11.5 trillion cubic feet

Permian Basin Companies

2023 Data

Total GHGRP Transported Hydrocarbons, by GHG Intensity

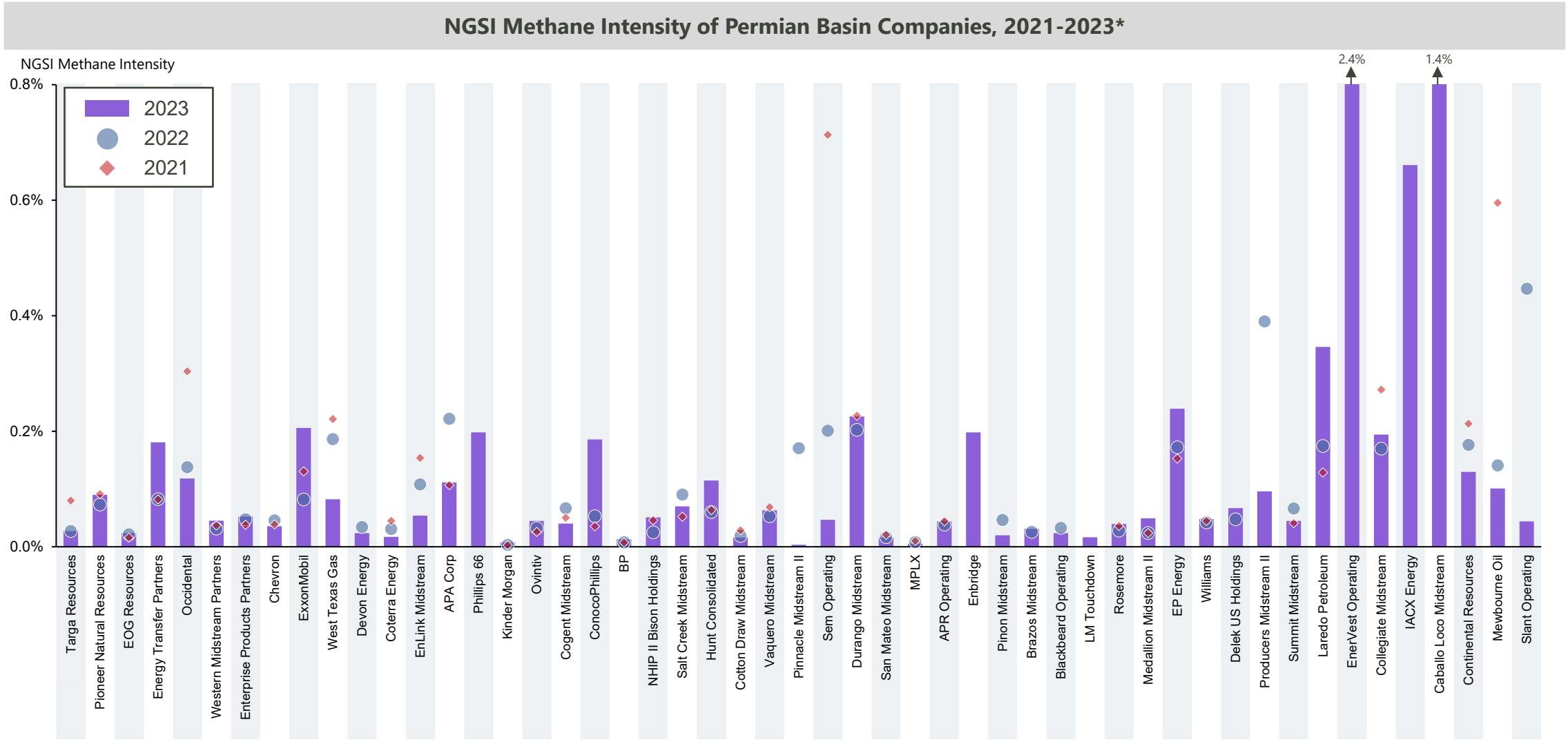
Transported Hydrocarbons Associated with GHG Intensity



Transported Hydrocarbons ⟶ Total Hydrocarbons Transported: 3.61 billion BOE

Permian Basin Companies

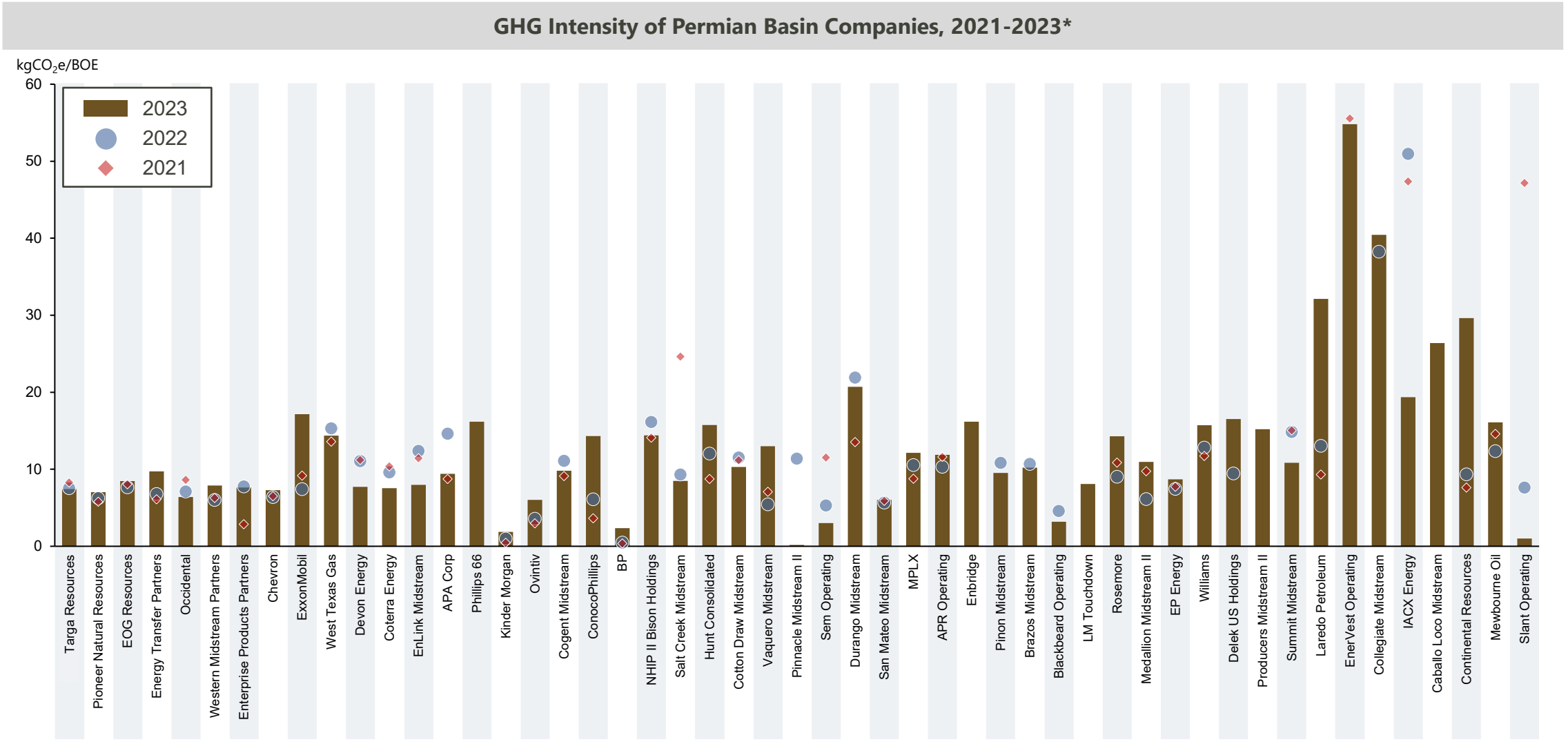
2021-2023 Trends Analysis: Change in Methane Intensity



*Note that some companies in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Permian Basin Companies

2021-2023 Trends Analysis: Change in GHG Intensity



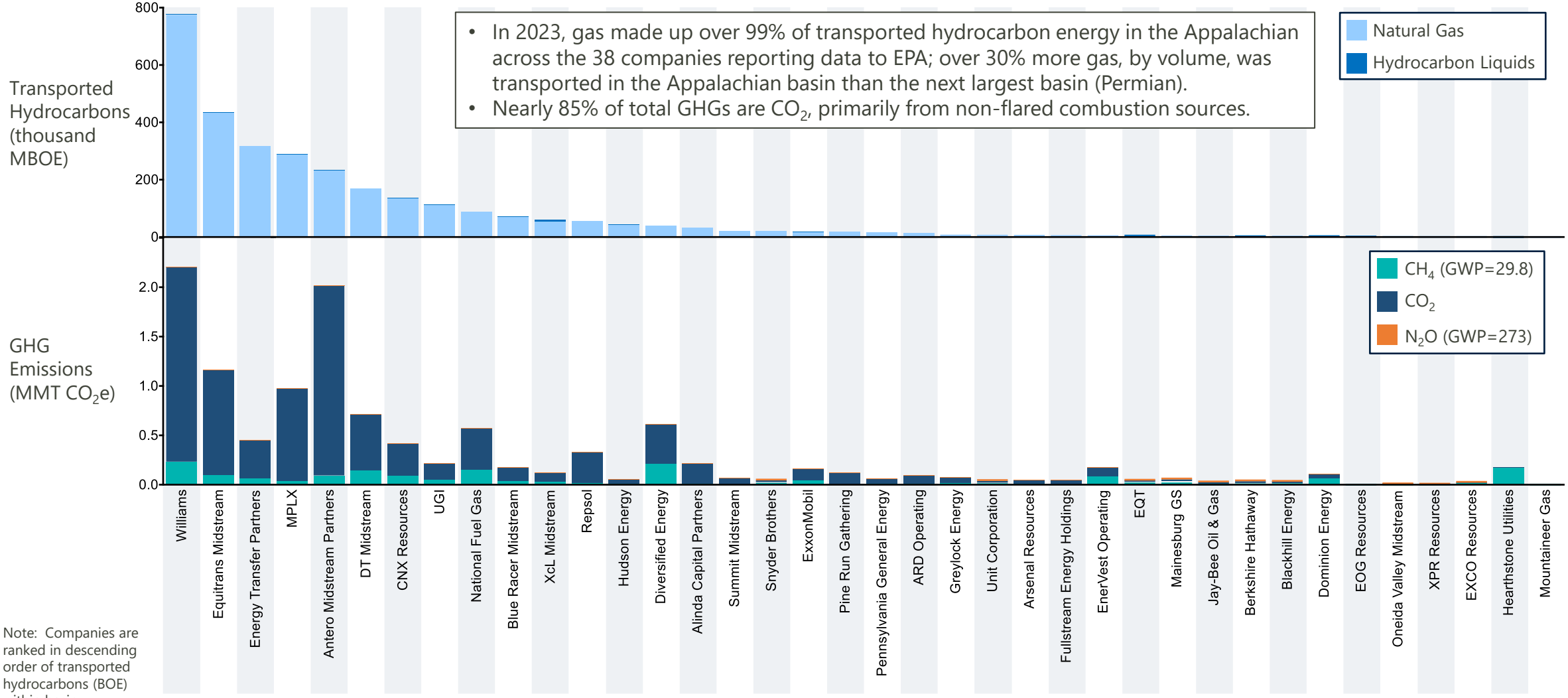
*Note that some companies in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Appalachian Basin Companies

2023 Data

Transported Hydrocarbons & Emissions (100-year GWP)

- In 2023, gas made up over 99% of transported hydrocarbon energy in the Appalachian across the 38 companies reporting data to EPA; over 30% more gas, by volume, was transported in the Appalachian basin than the next largest basin (Permian).
- Nearly 85% of total GHGs are CO_2, primarily from non-flared combustion sources.

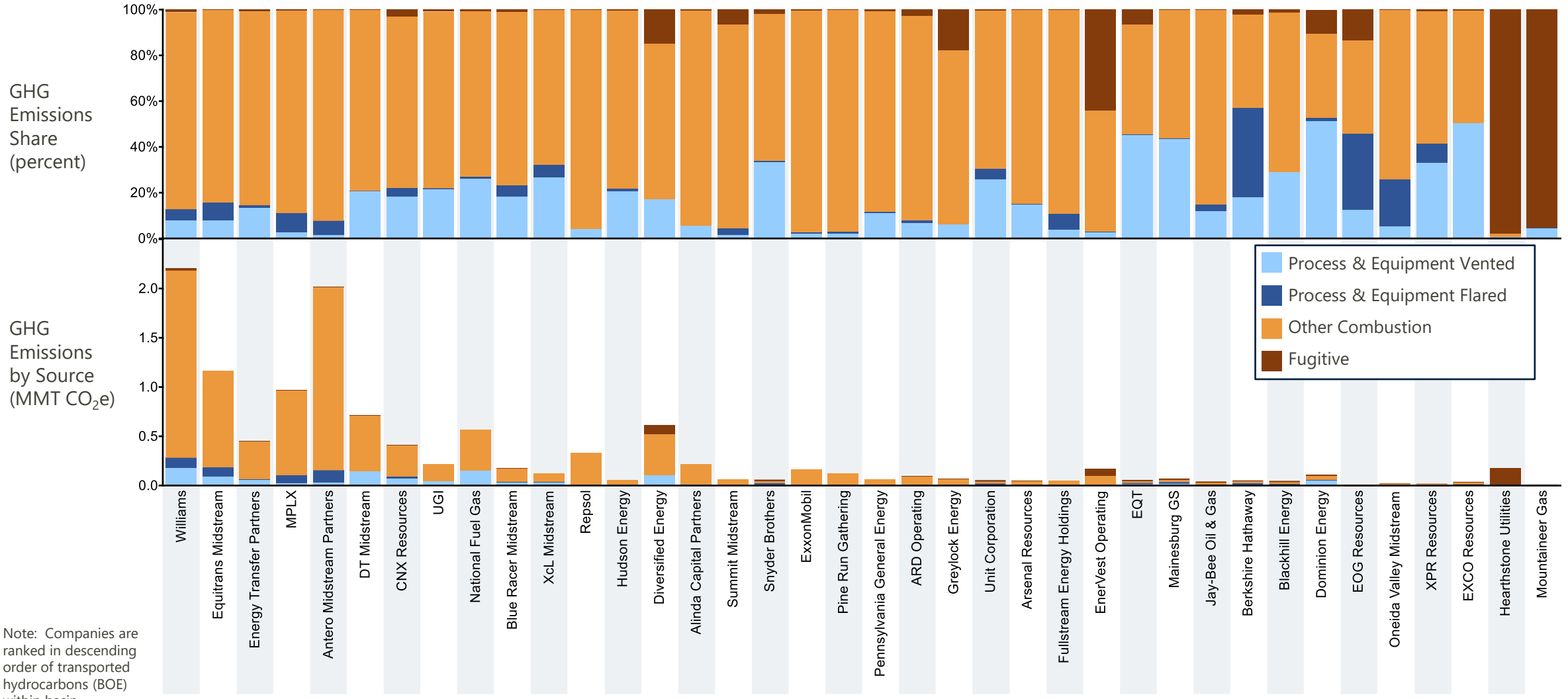


Note: Companies are ranked in descending order of transported hydrocarbons (BOE) within basin

Appalachian Basin Companies

2023 Data

GHG Emissions by Source (100-year GWP)

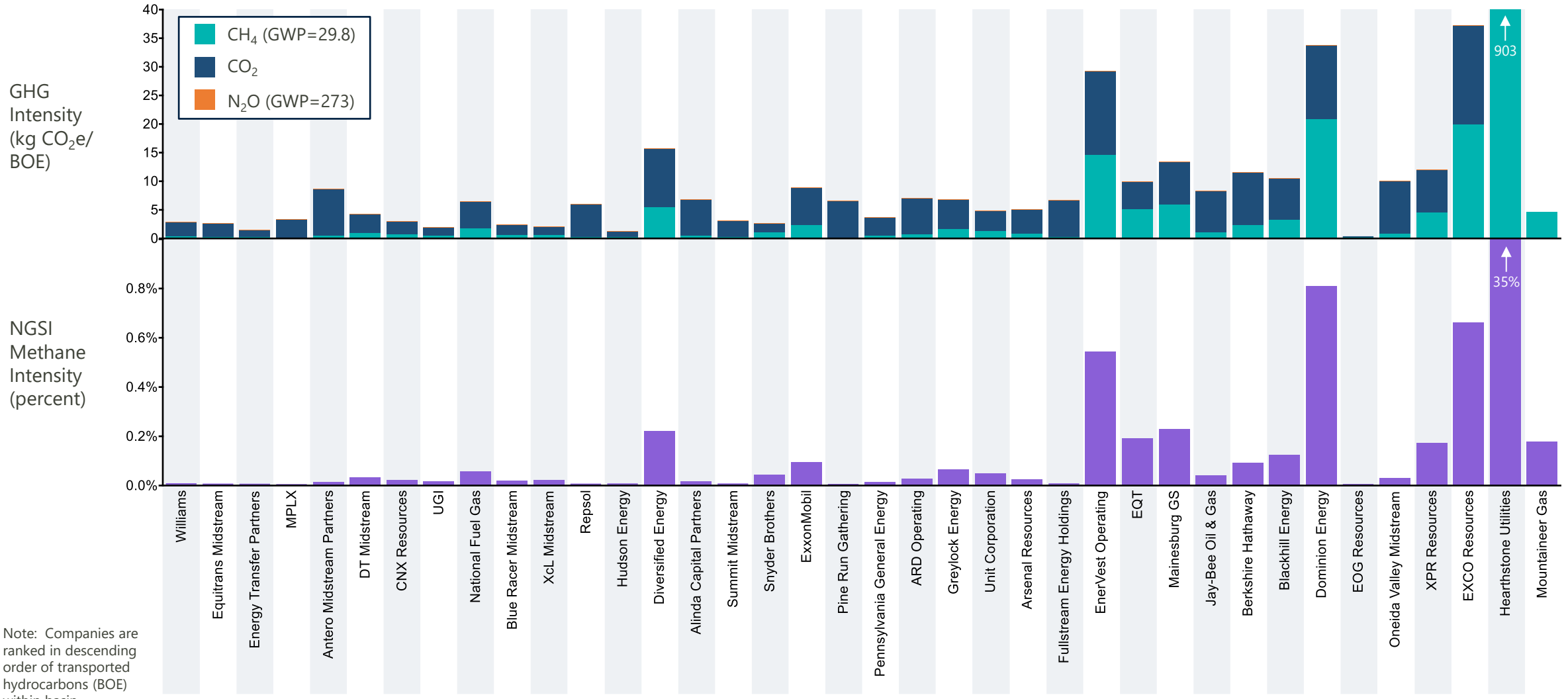


Note: Companies are ranked in descending order of transported hydrocarbons (BOE) within basin

Appalachian Basin Companies

2023 Data

Methane & GHG Intensity (100-year GWP)

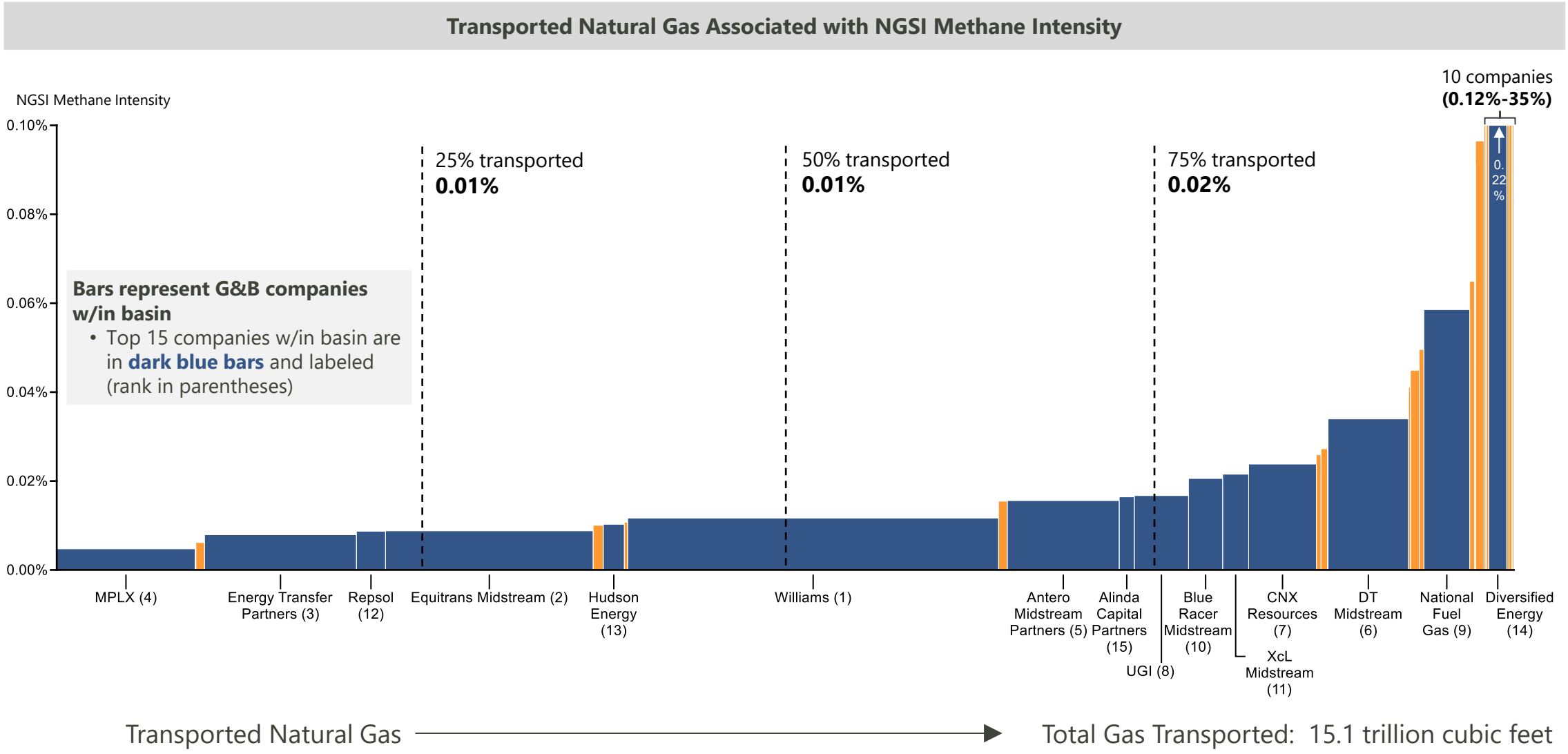


Note: Companies are ranked in descending order of transported hydrocarbons (BOE) within basin

Appalachian Basin Companies

2023 Data

Total GHGRP Transported Natural Gas, by Methane Intensity

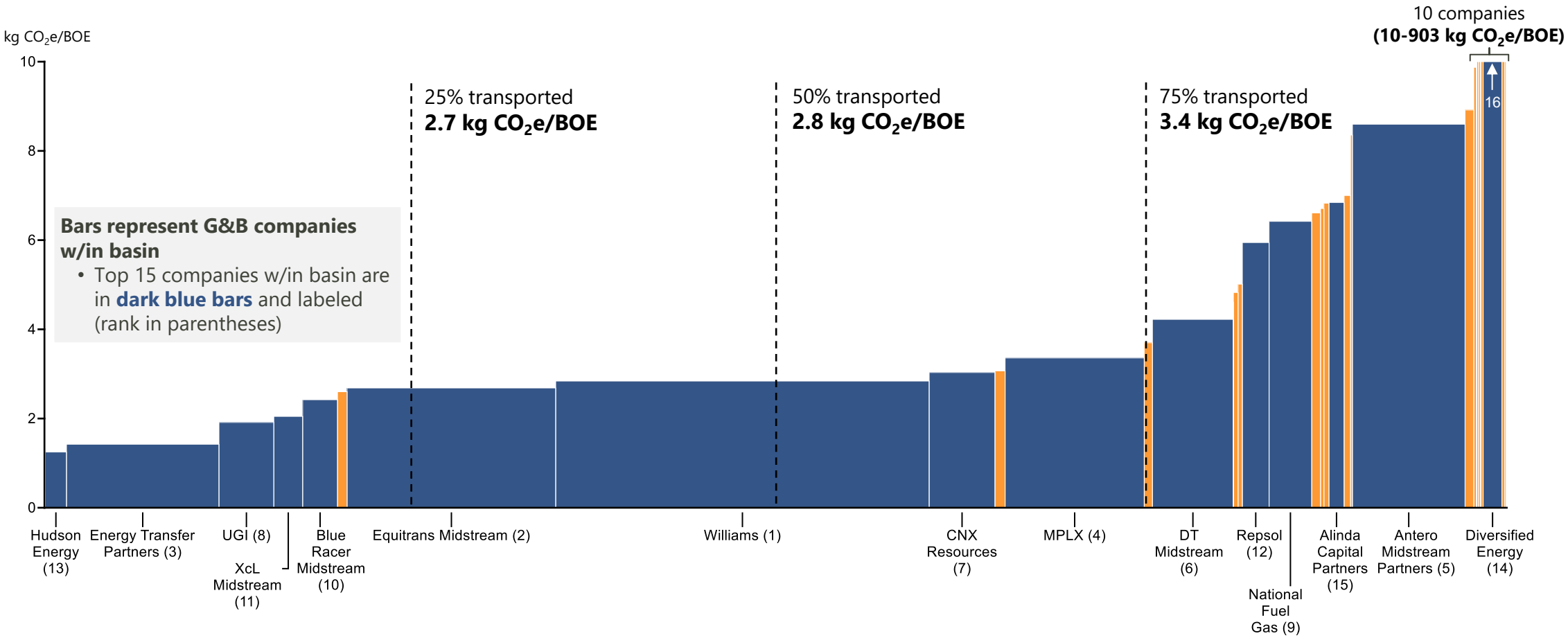


Appalachian Basin Companies

2023 Data

Total GHGRP Transported Hydrocarbons, by GHG Intensity

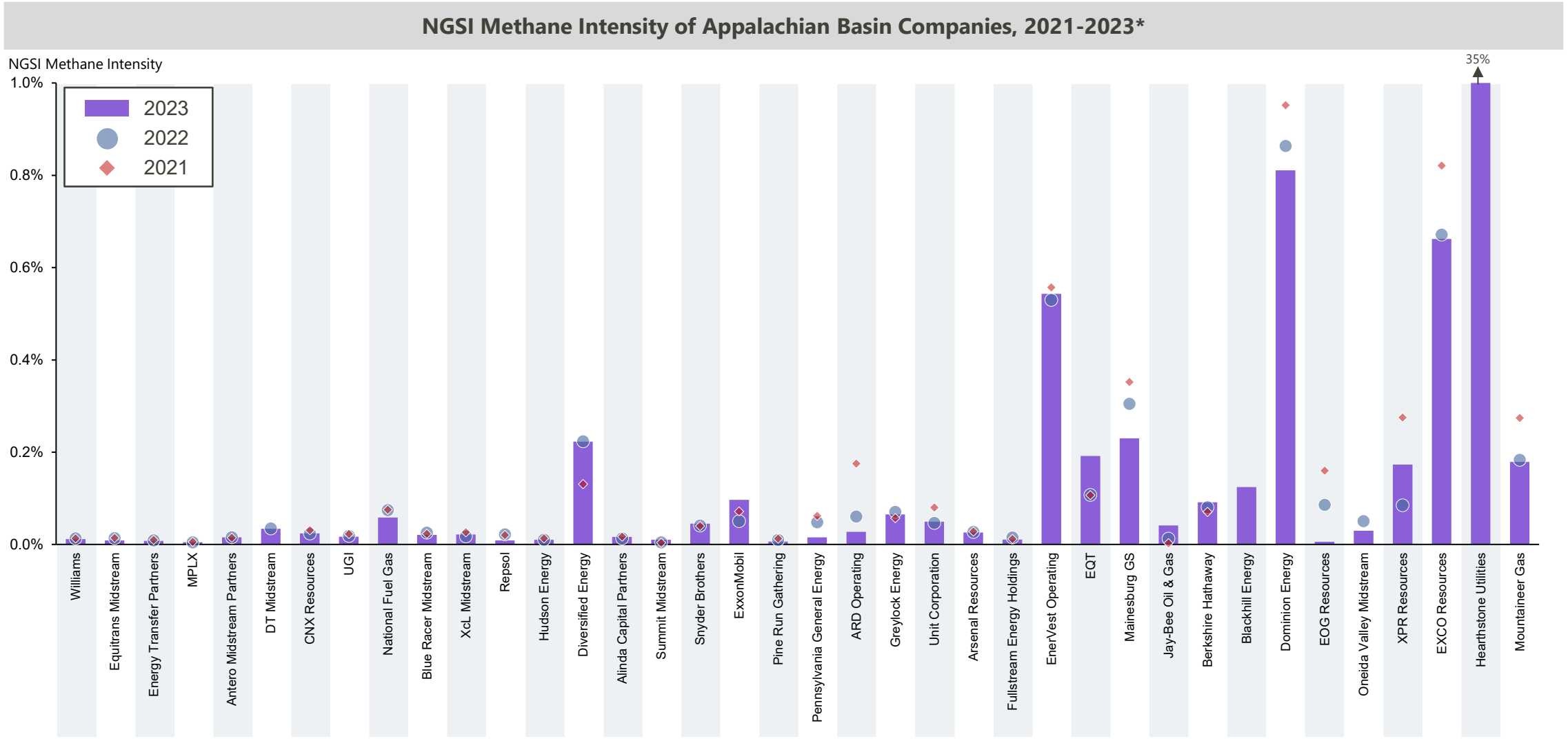
Transported Hydrocarbons Associated with GHG Intensity



Transported Hydrocarbons → Total Hydrocarbons Transported: 3.04 billion BOE

Appalachian Basin Companies

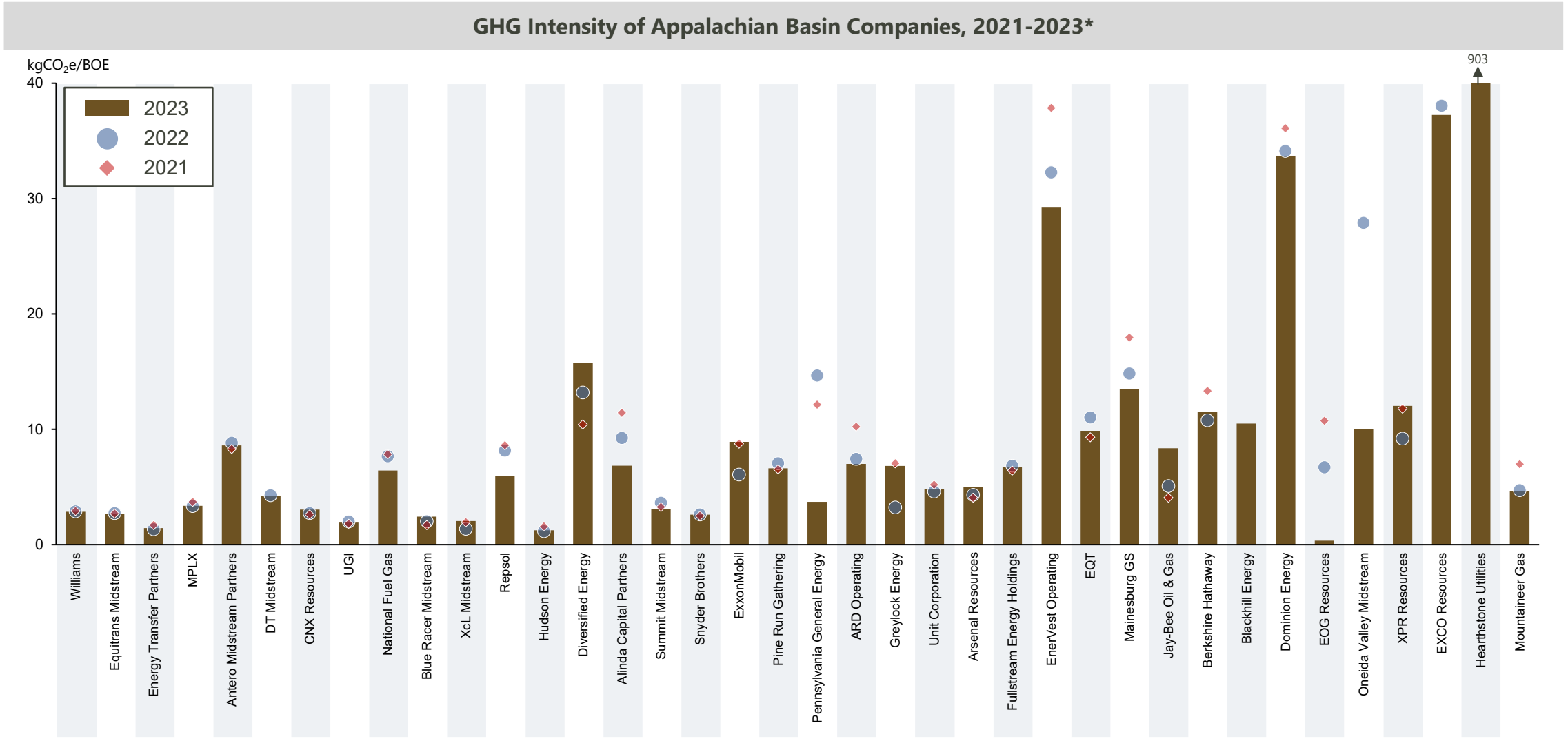
2021-2023 Trends Analysis: Change in Methane Intensity



*Note that some companies in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Appalachian Basin Companies

2021-2023 Trends Analysis: Change in GHG Intensity



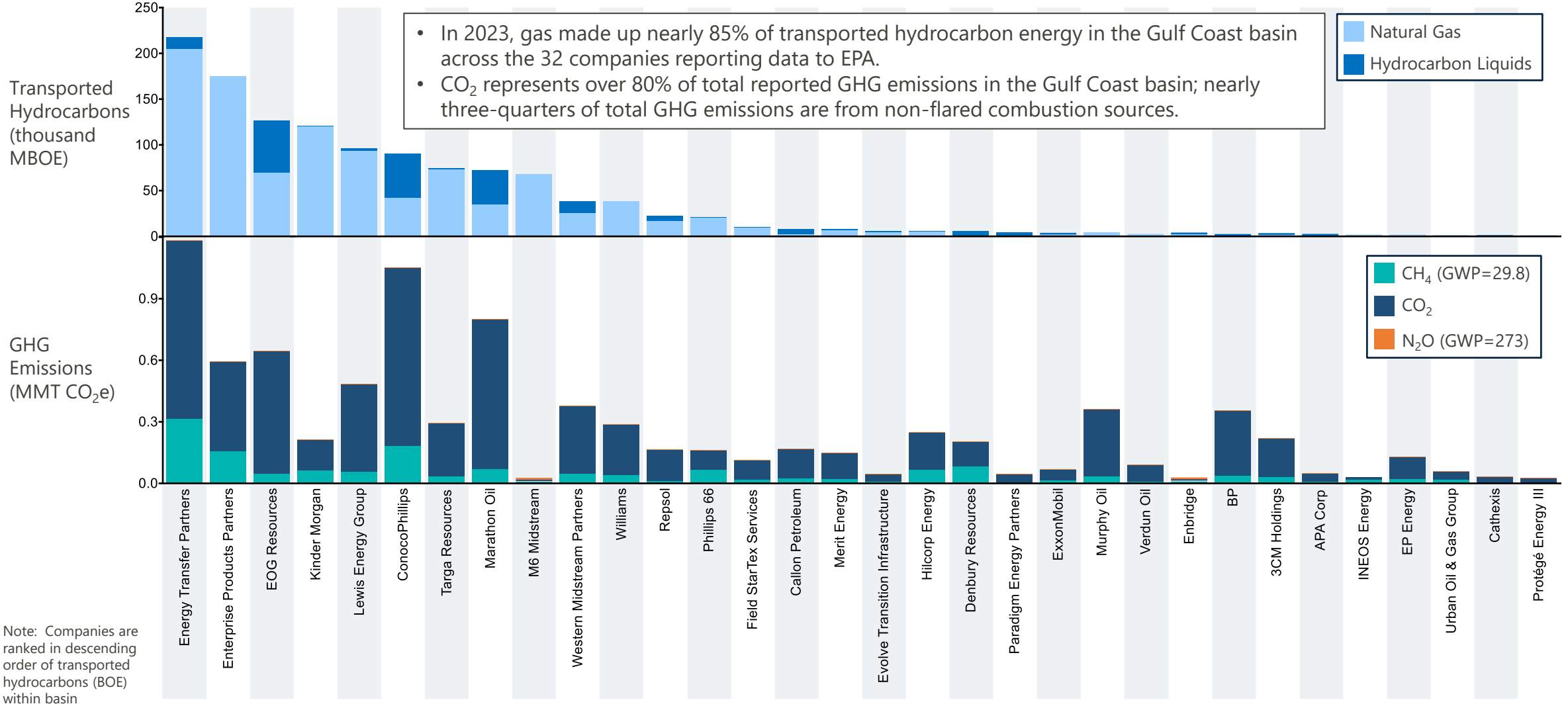
*Note that some companies in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Gulf Coast Basin Companies

2023 Data

Transported Hydrocarbons & Emissions (100-year GWP)

- In 2023, gas made up nearly 85% of transported hydrocarbon energy in the Gulf Coast basin across the 32 companies reporting data to EPA.
- CO_2 represents over 80% of total reported GHG emissions in the Gulf Coast basin; nearly three-quarters of total GHG emissions are from non-flared combustion sources.

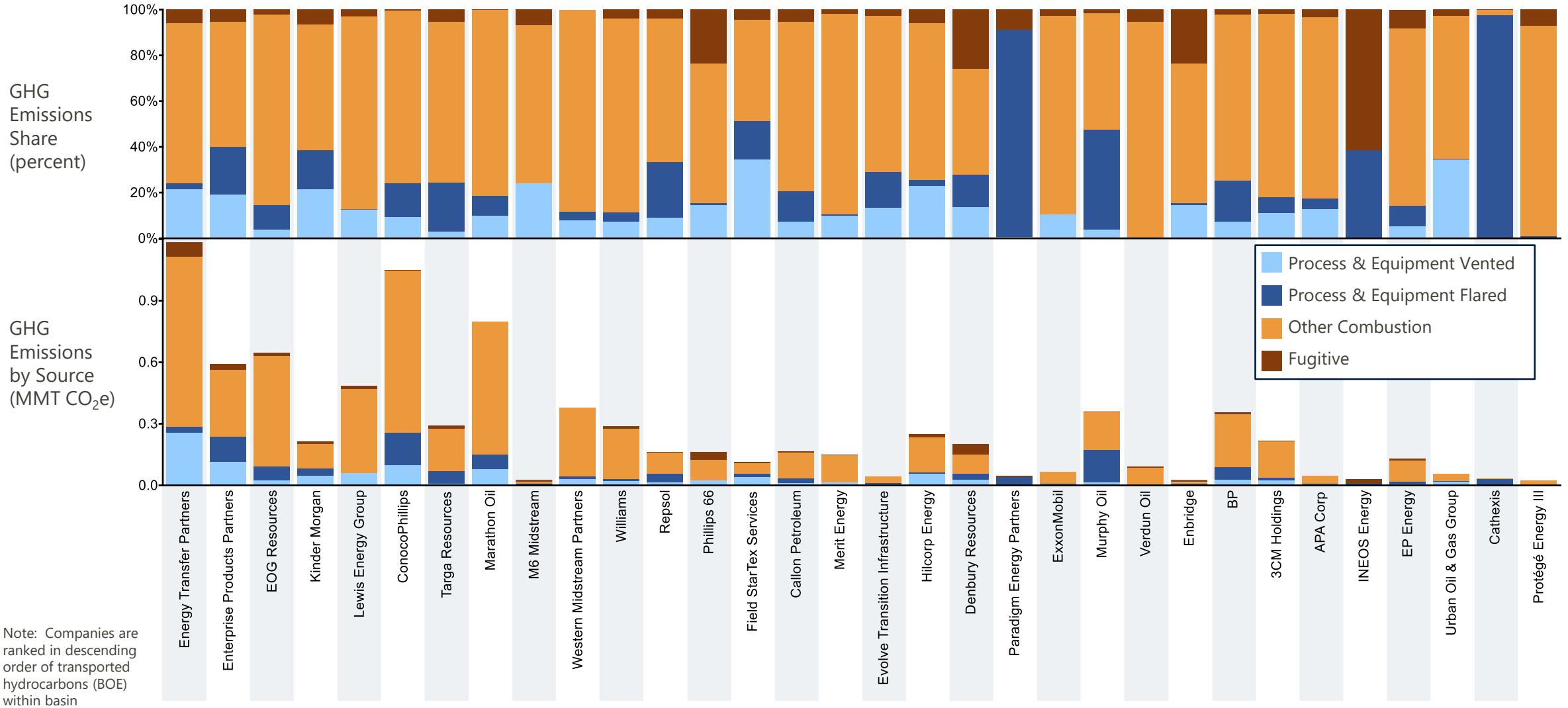


Note: Companies are ranked in descending order of transported hydrocarbons (BOE) within basin

Gulf Coast Basin Companies

2023 Data

GHG Emissions by Source (100-year GWP)

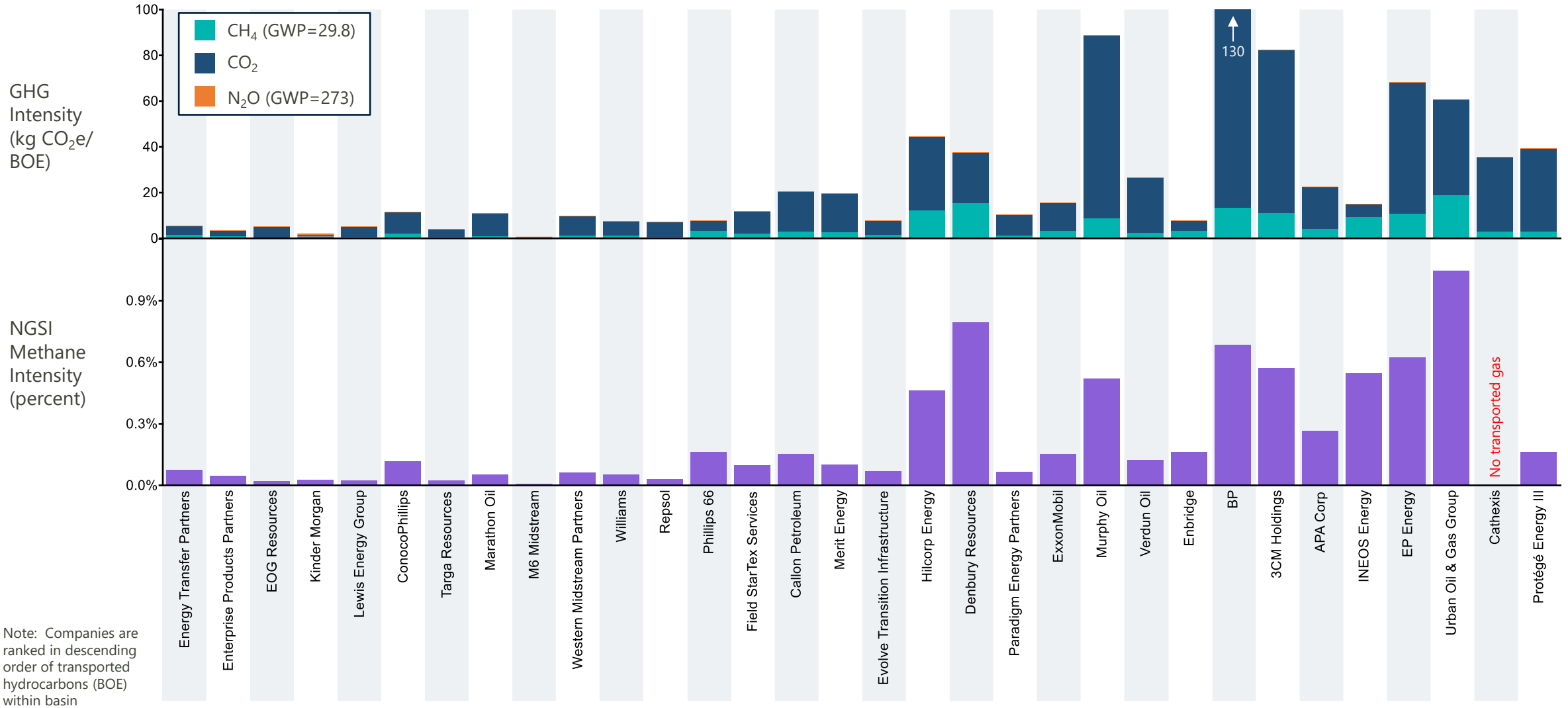


Note: Companies are ranked in descending order of transported hydrocarbons (BOE) within basin

Gulf Coast Basin Companies

2023 Data

Methane & GHG Intensity (100-year GWP)

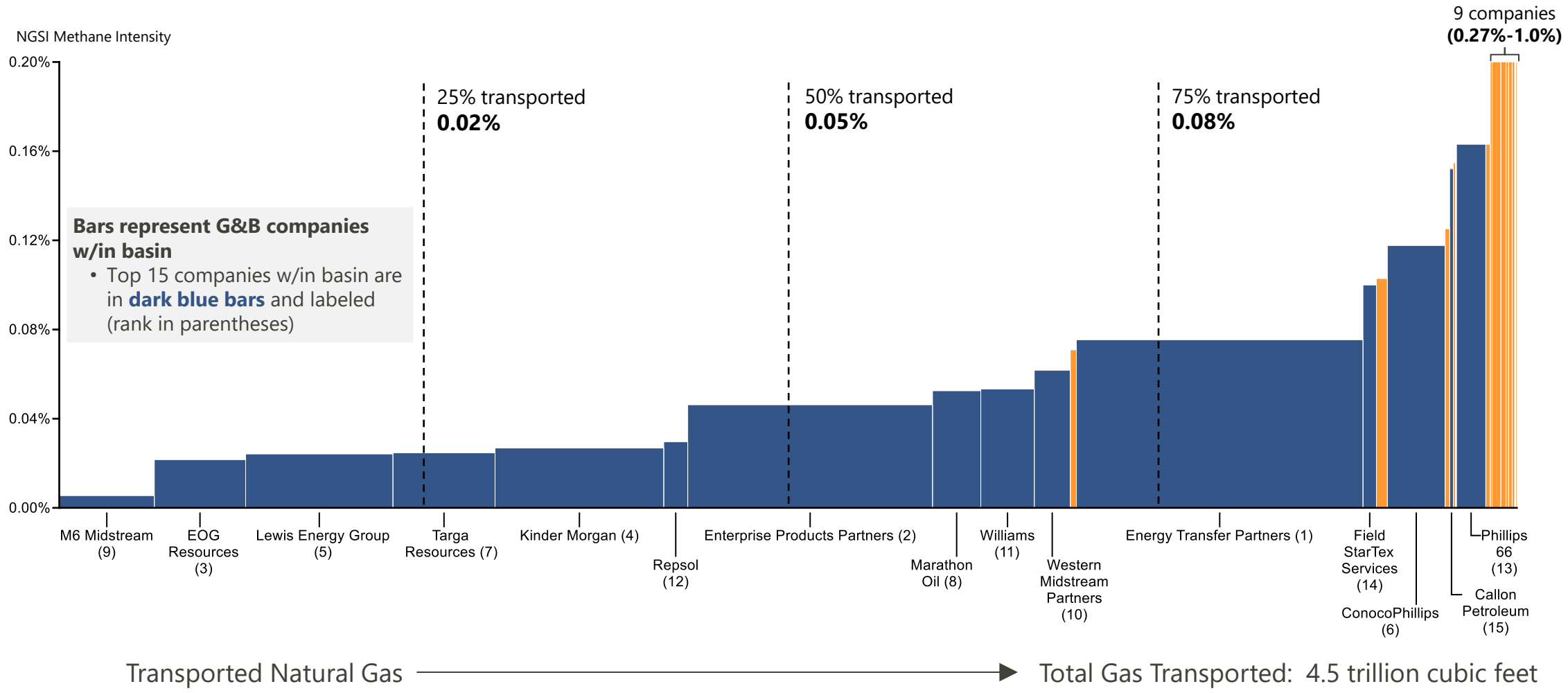


Note: Companies are ranked in descending order of transported hydrocarbons (BOE) within basin

Gulf Coast Basin Companies

2023 Data

Total GHGRP Transported Natural Gas, by Methane Intensity

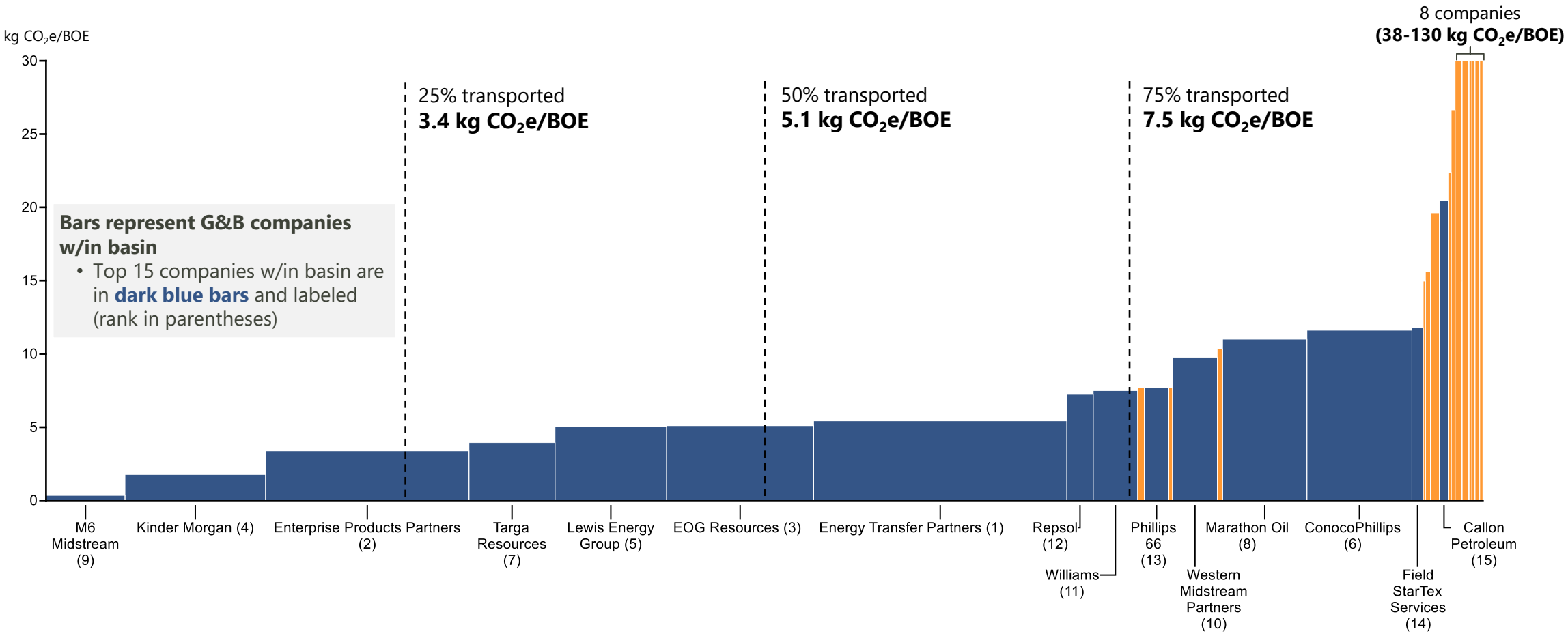


Gulf Coast Basin Companies

2023 Data

Total GHGRP Transported Hydrocarbons, by GHG Intensity

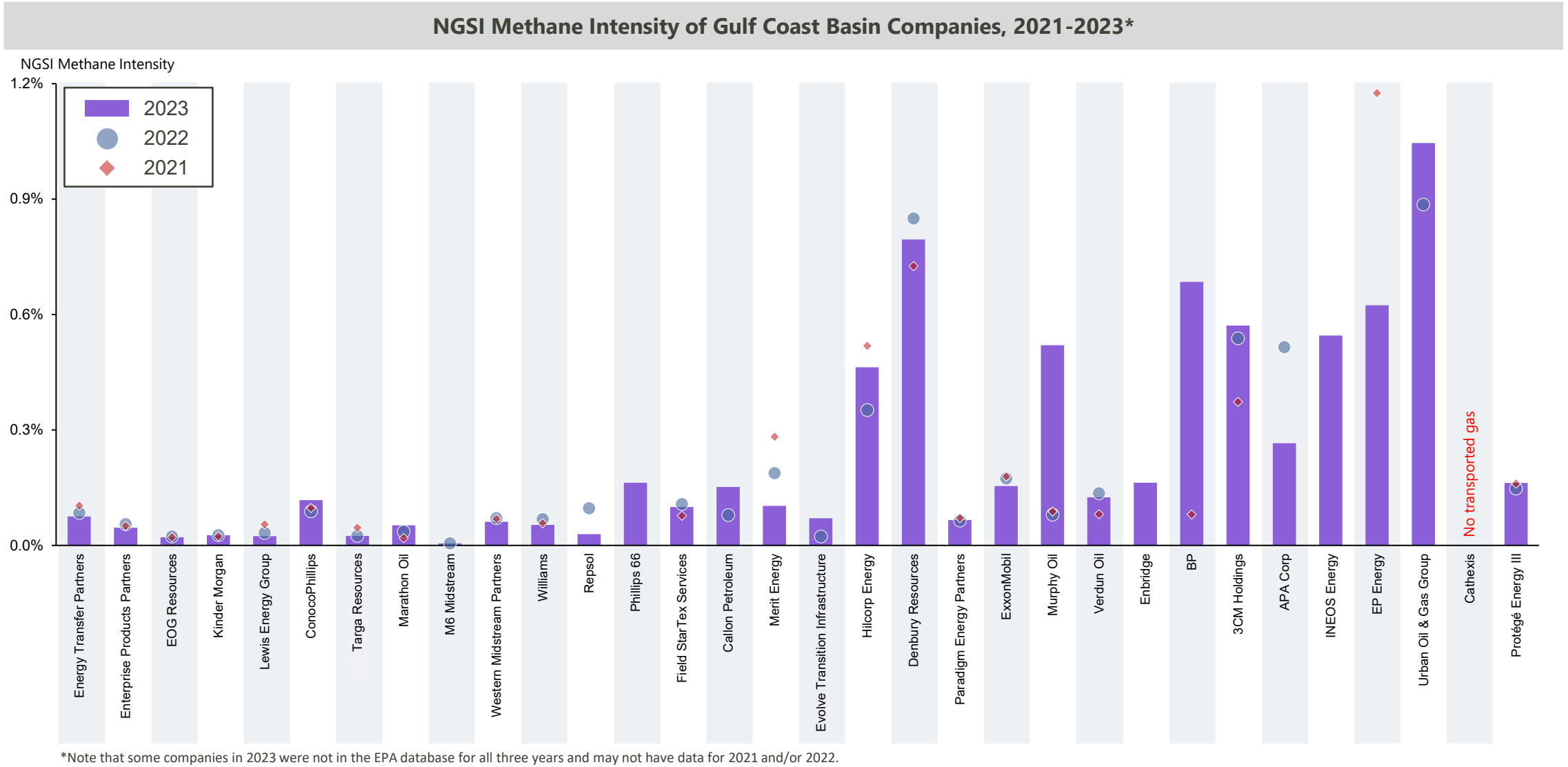
Transported Hydrocarbons Associated with GHG Intensity



Transported Hydrocarbons → Total Hydrocarbons Transported: 1.24 billion BOE

Gulf Coast Basin Companies

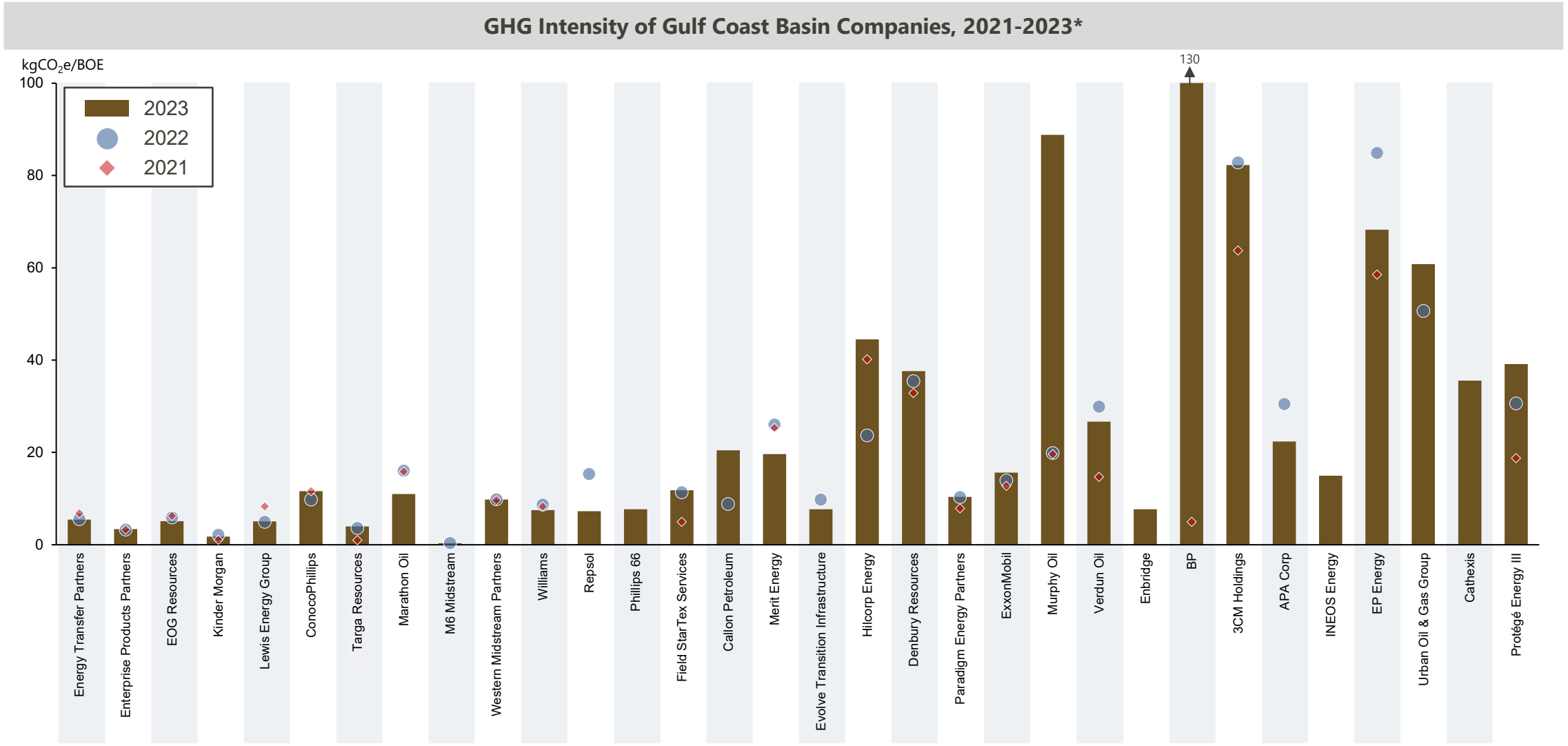
2021-2023 Trends Analysis: Change in Methane Intensity



*Note that some companies in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Gulf Coast Basin Companies

2021-2023 Trends Analysis: Change in GHG Intensity

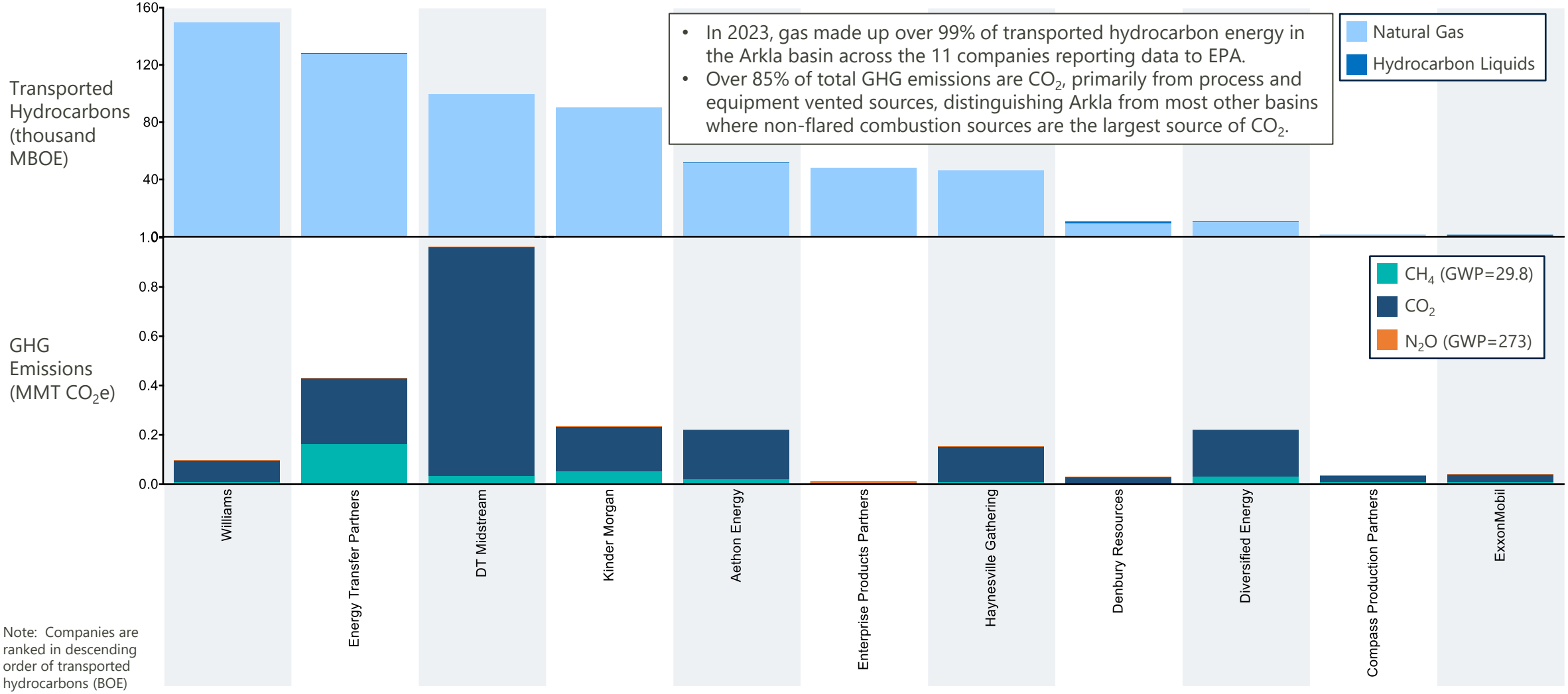


*Note that some companies in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Arkla Basin Companies

2023 Data

Transported Hydrocarbons & Emissions (100-year GWP)



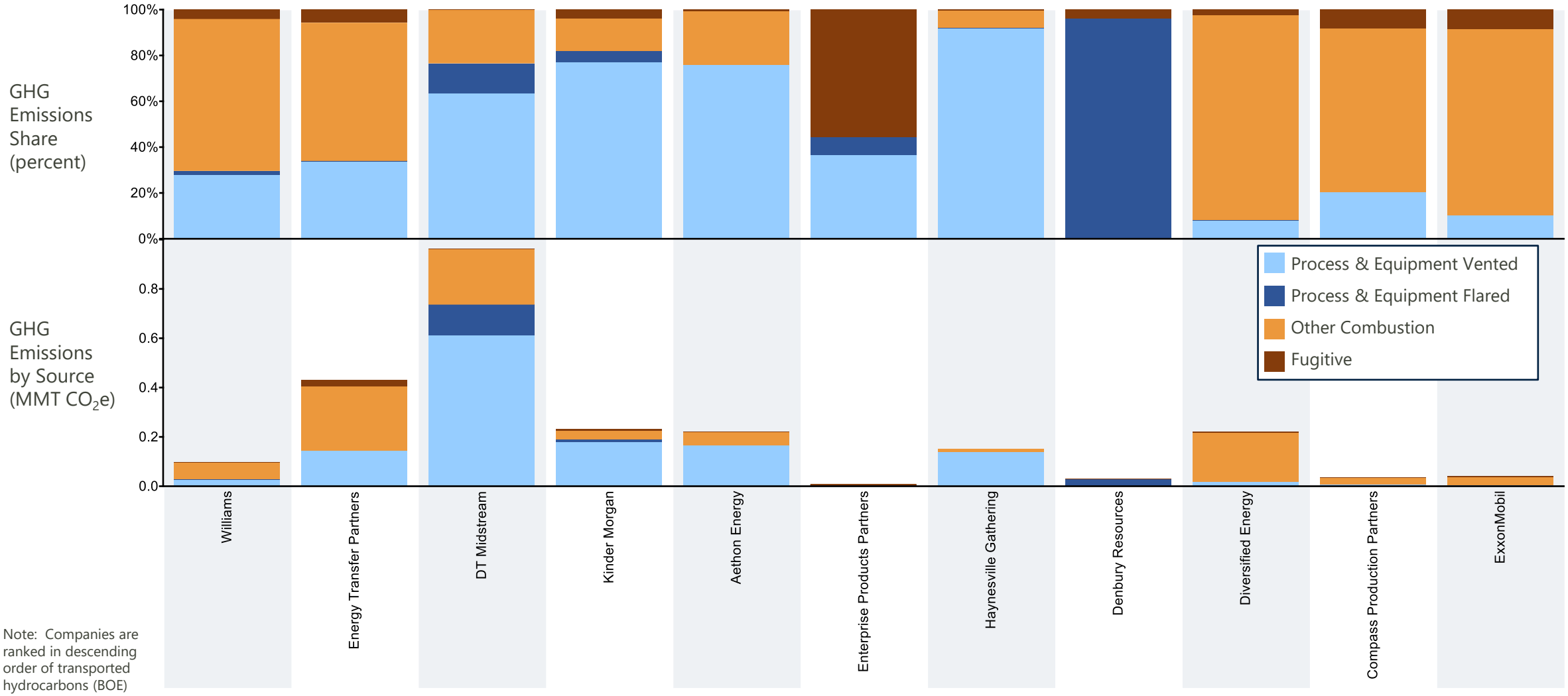
- In 2023, gas made up over 99% of transported hydrocarbon energy in the Arkla basin across the 11 companies reporting data to EPA.
- Over 85% of total GHG emissions are CO_2, primarily from process and equipment vented sources, distinguishing Arkla from most other basins where non-flared combustion sources are the largest source of CO_2.

Note: Companies are ranked in descending order of transported hydrocarbons (BOE) within basin

Arkla Basin Companies

2023 Data

GHG Emissions by Source (100-year GWP)

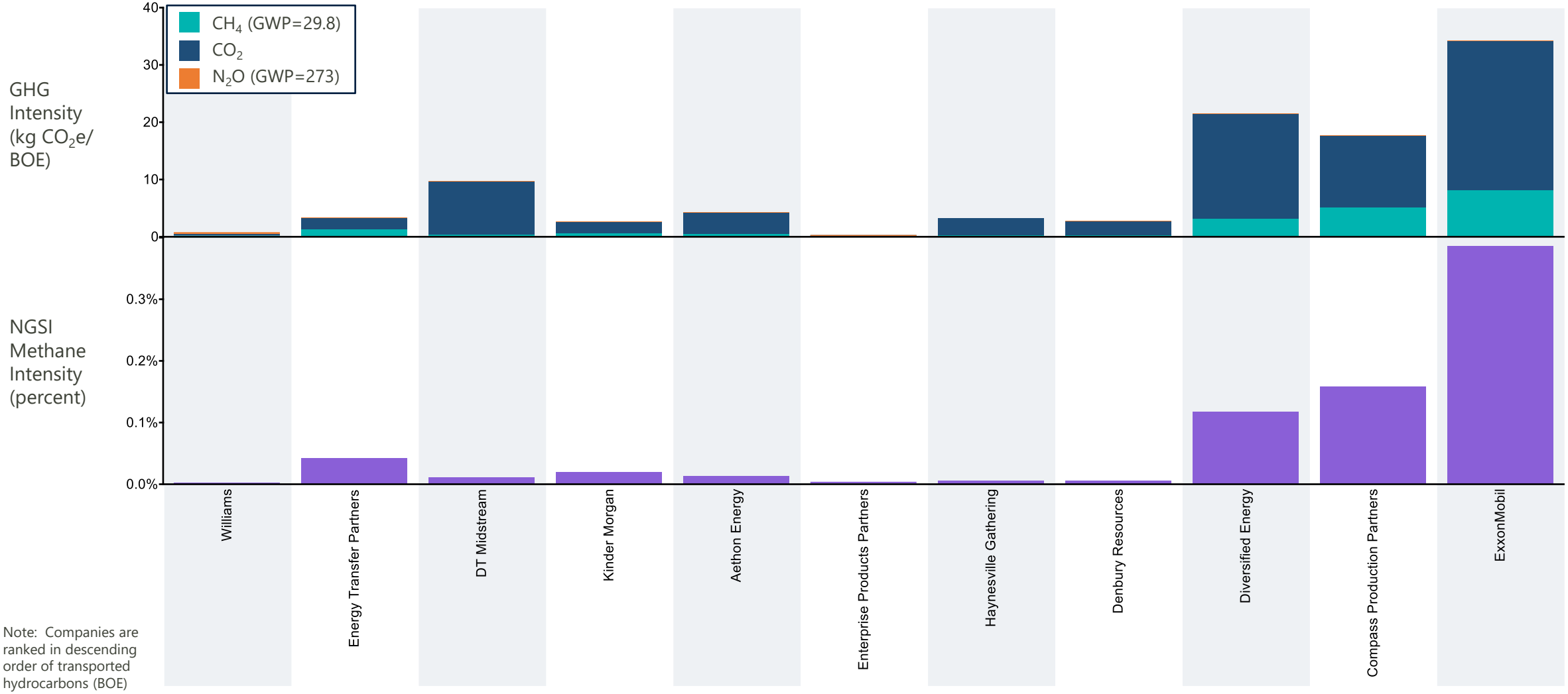


Note: Companies are ranked in descending order of transported hydrocarbons (BOE) within basin

Arkla Basin Companies

2023 Data

Methane & GHG Intensity (100-year GWP)

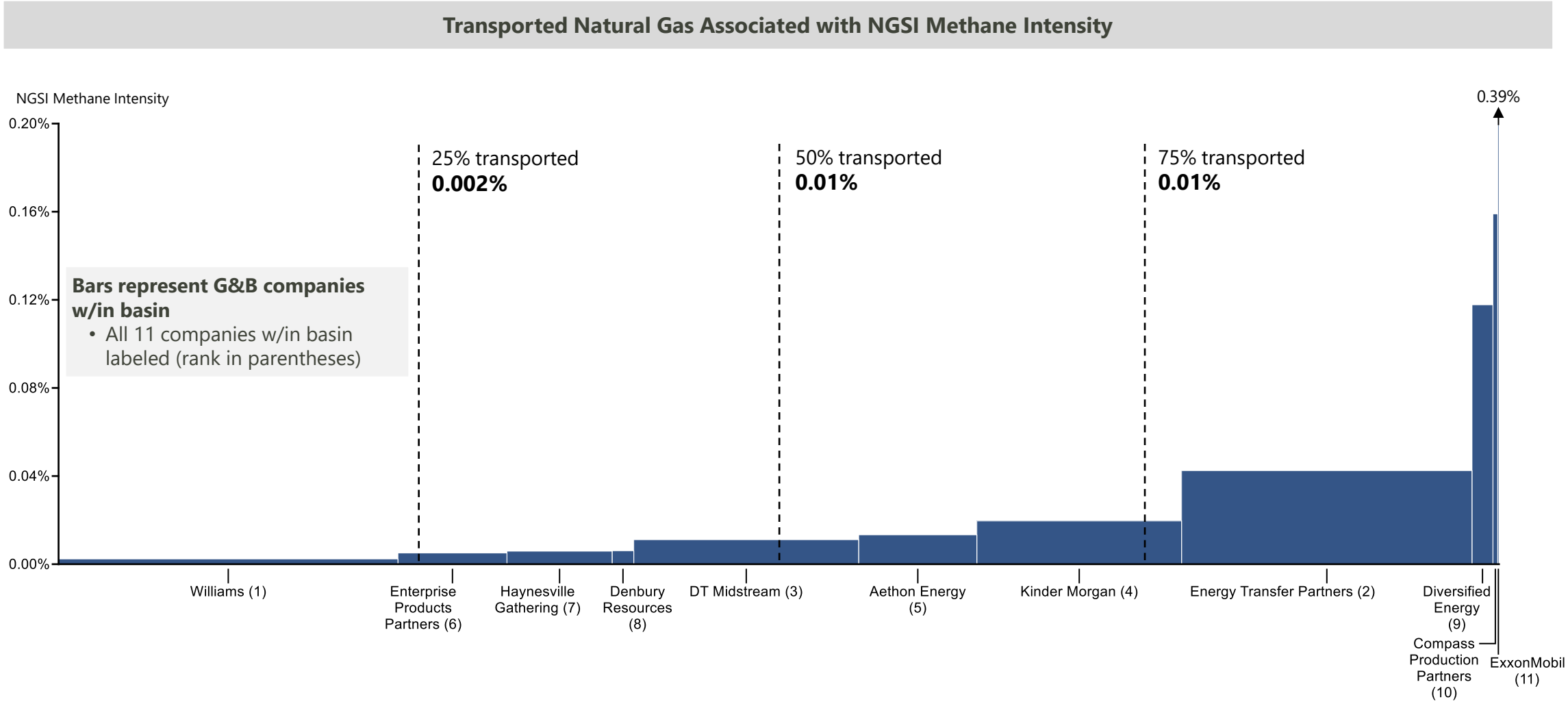


Note: Companies are ranked in descending order of transported hydrocarbons (BOE) within basin

Arkla Basin Companies

2023 Data

Total GHGRP Transported Natural Gas, by Methane Intensity

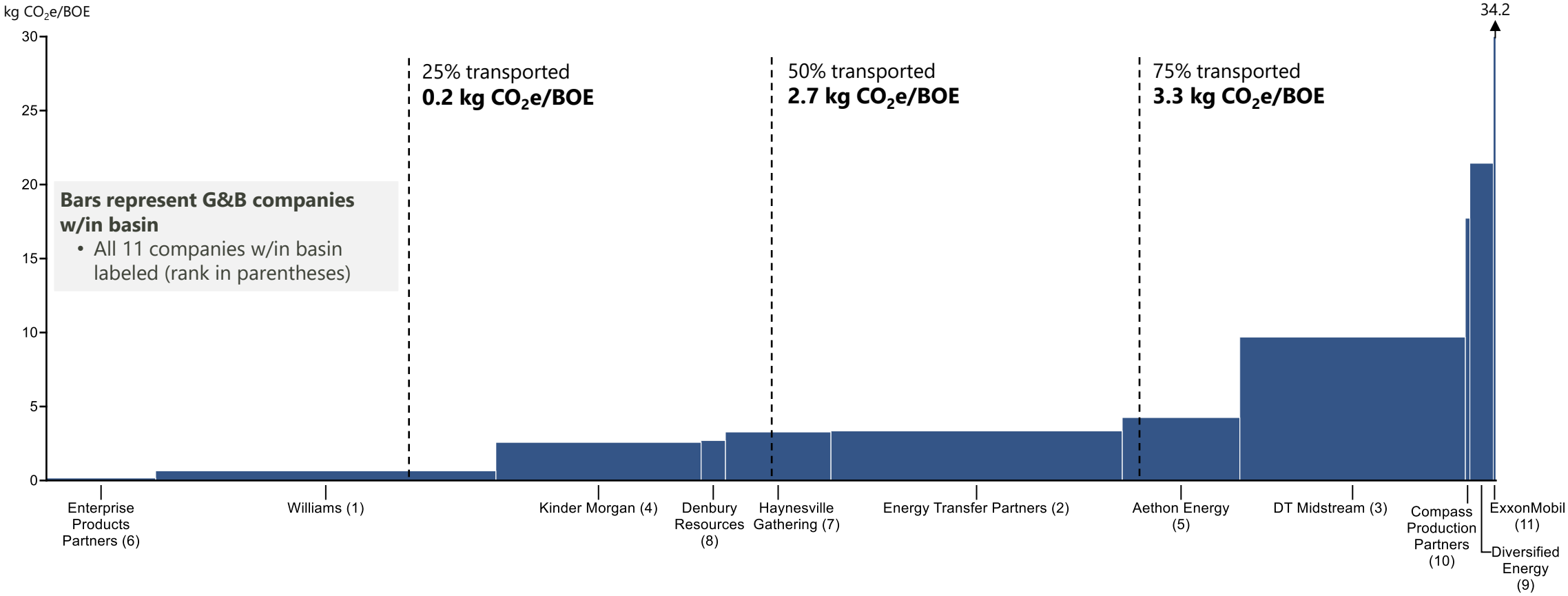


Arkla Basin Companies

2023 Data

Total GHGRP Transported Hydrocarbons, by GHG Intensity

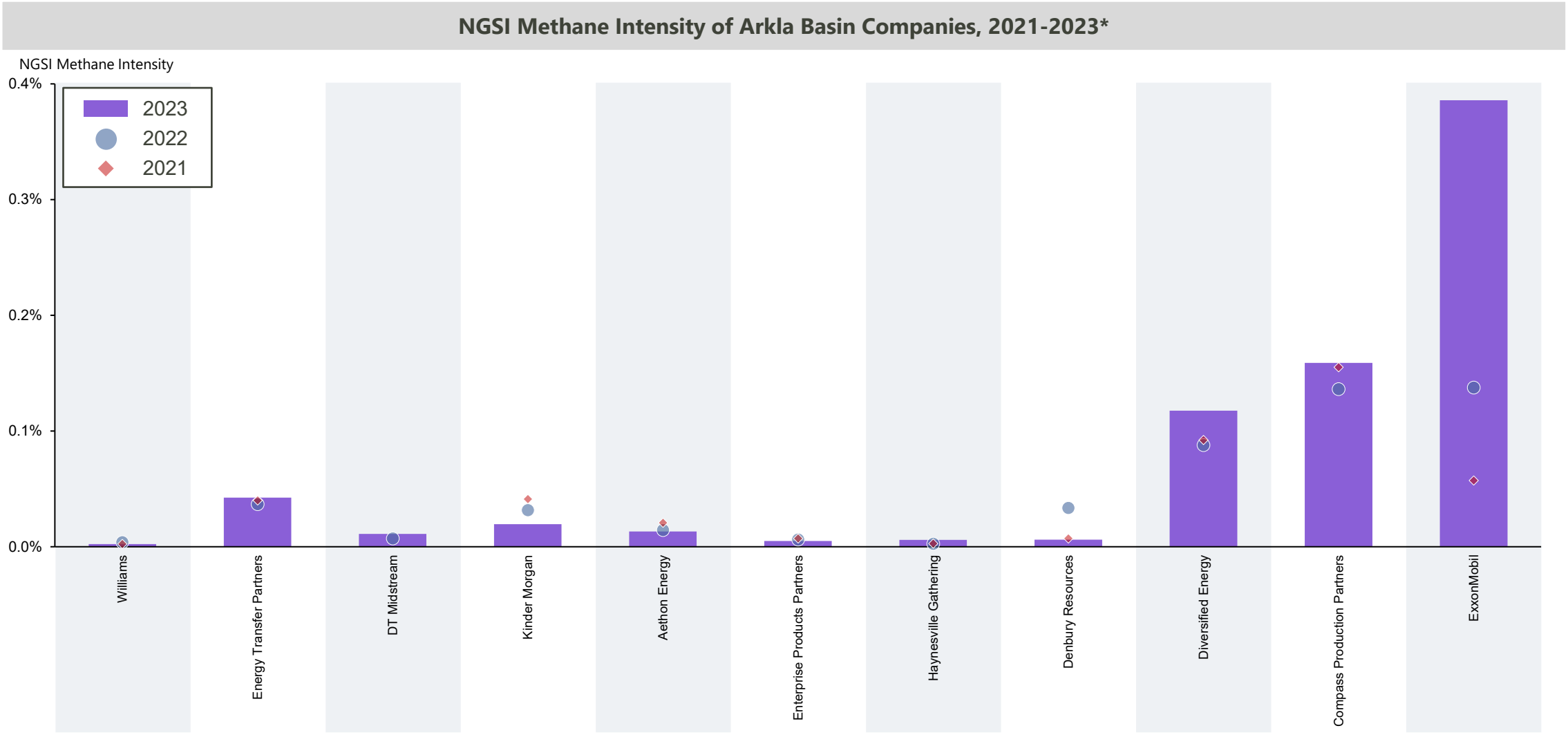
Transported Hydrocarbons Associated with GHG Intensity



Transported Hydrocarbons ⟶ Total Hydrocarbons Transported: 0.64 billion BOE

Arkla Basin Companies

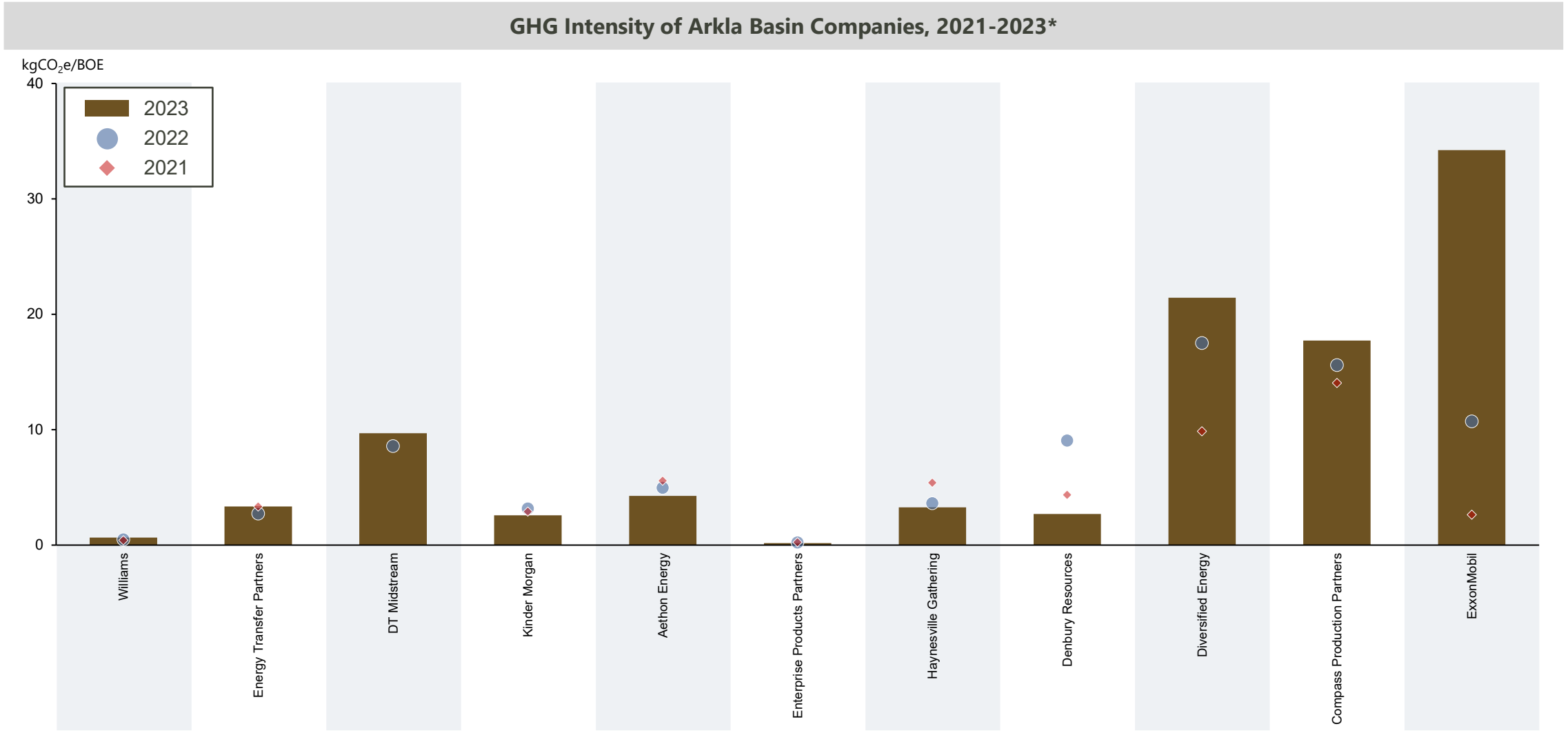
2021-2023 Trends Analysis: Change in Methane Intensity



*Note that some companies in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Arkla Basin Companies

2021-2023 Trends Analysis: Change in GHG Intensity



*Note that some companies in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

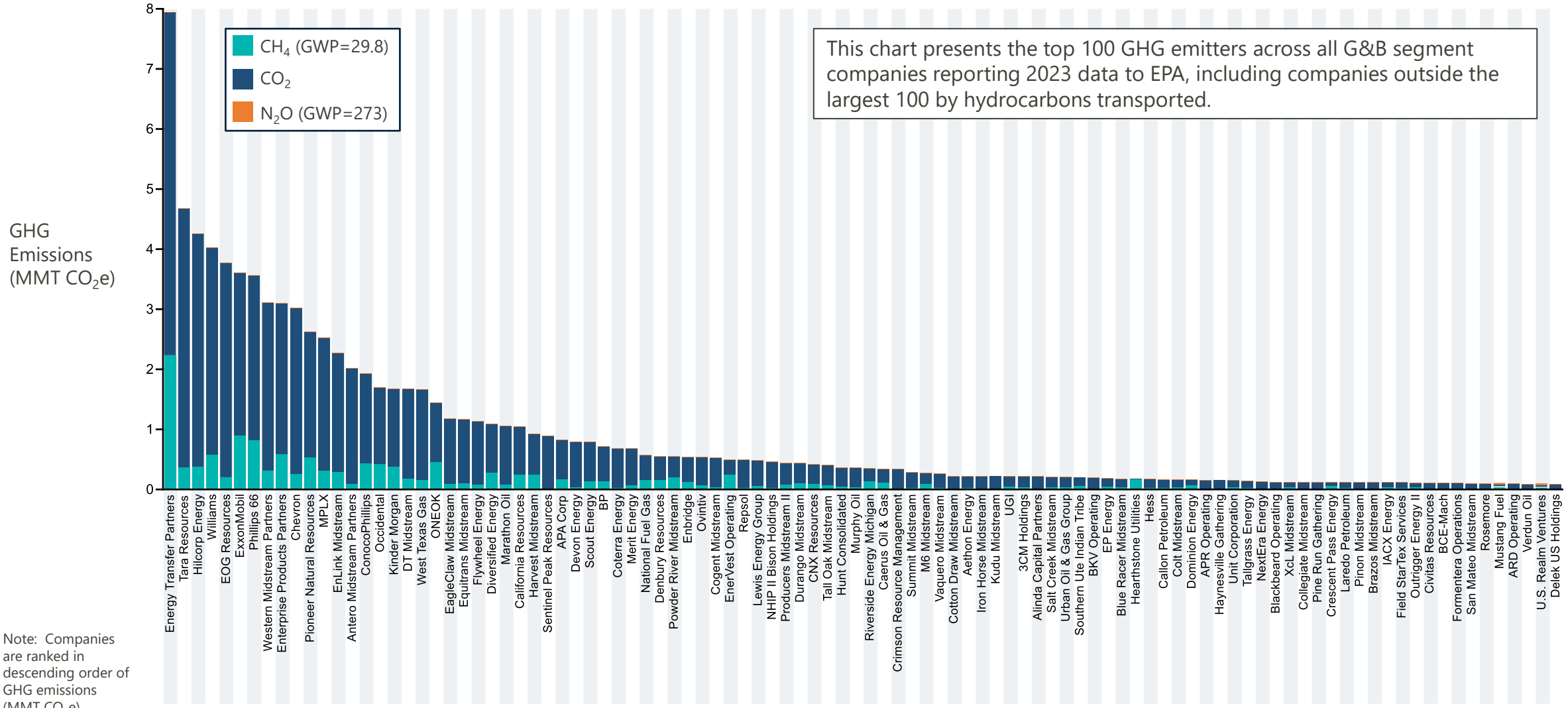
Additional G&B Segment Data

The following charts present emissions and emissions intensity data rankings for key metrics. They include companies inside and outside of the top 100 companies by total hydrocarbons transported.

Top 100 GHG Emitters

2023 Data

GHG Emissions (100-year GWP)

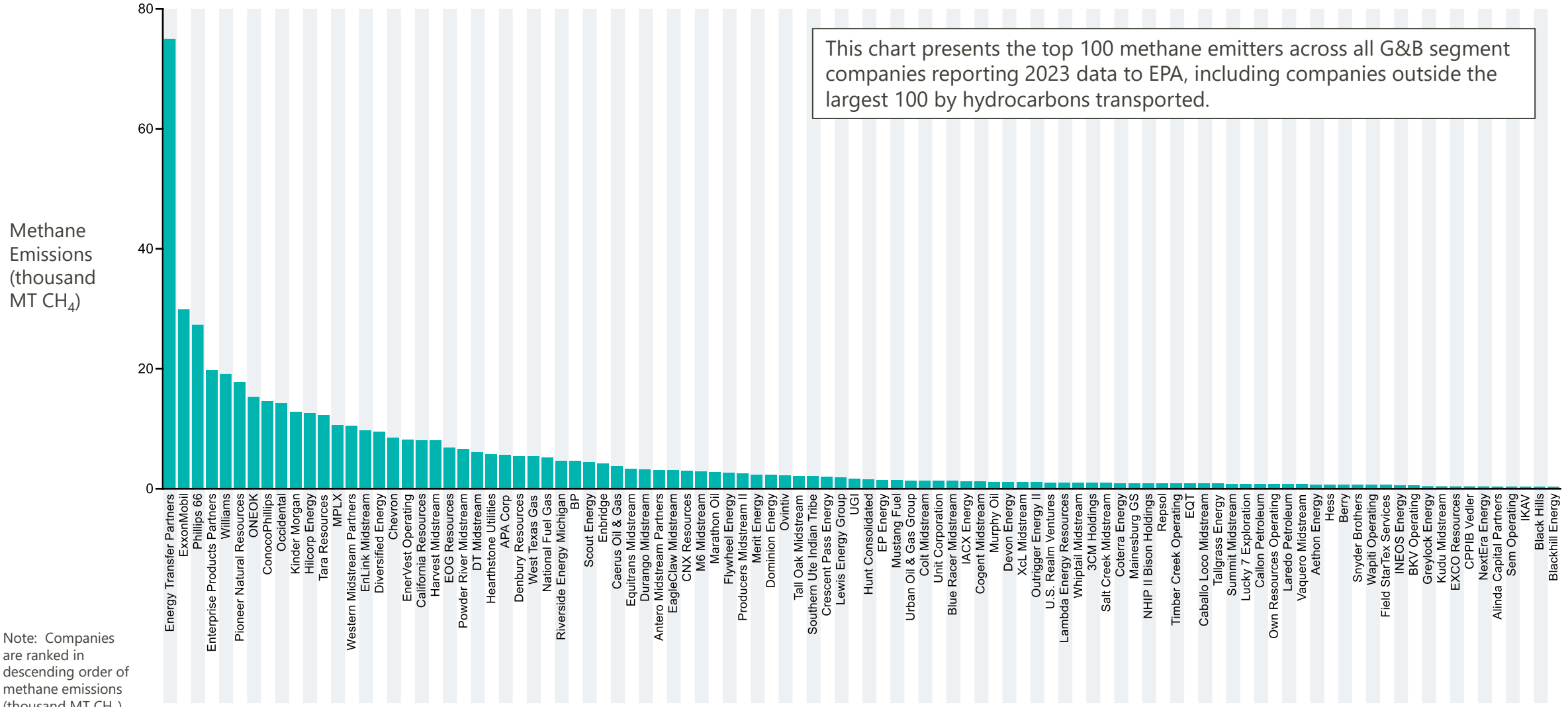


Note: Companies are ranked in descending order of GHG emissions (MMT CO_2e)

Top 100 Methane Emitters

2023 Data

Methane Emissions

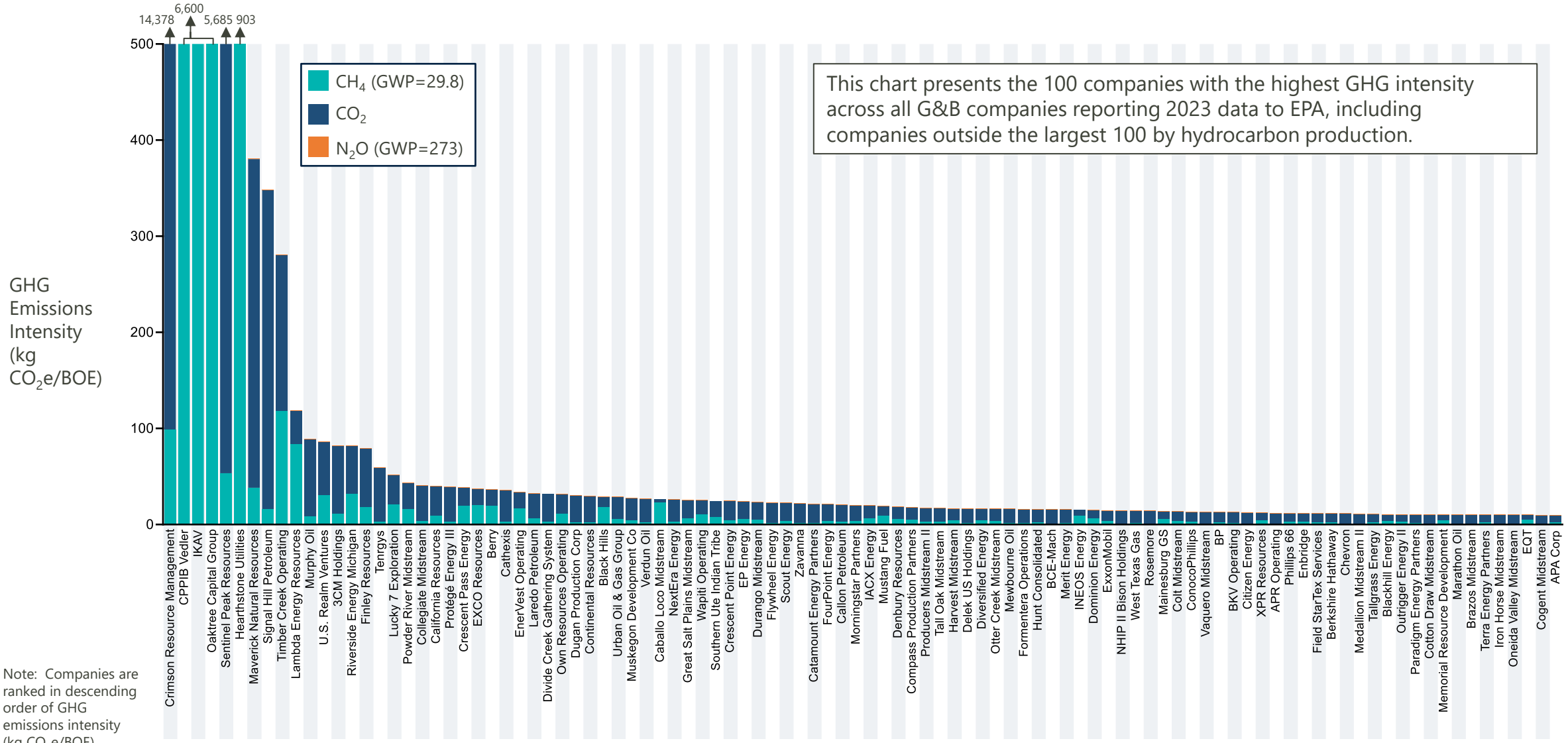


Note: Companies are ranked in descending order of methane emissions (thousand MT CH_4)

Top 100 Highest GHG Emissions Intensities

2023 Data

GHG Emissions Intensity



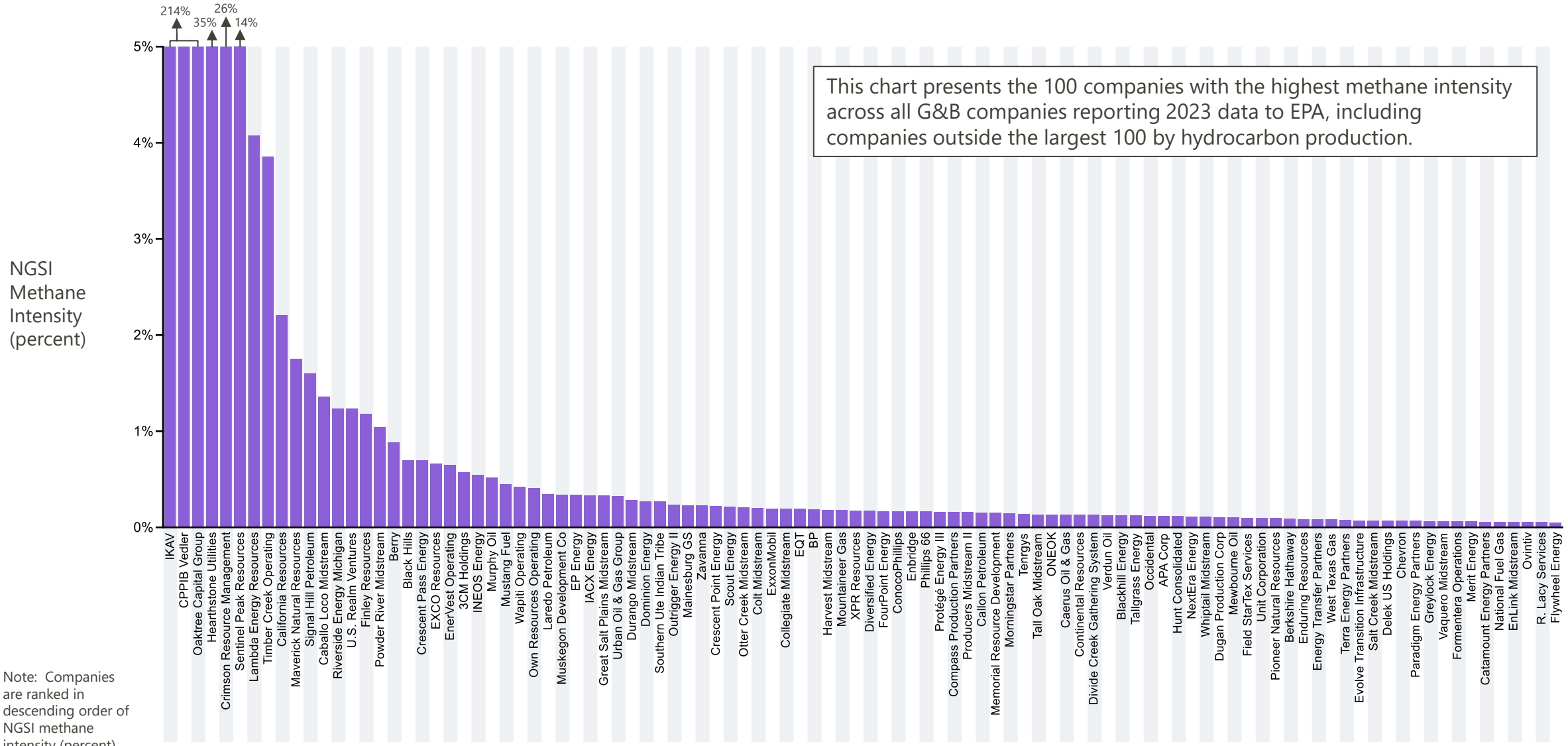
This chart presents the 100 companies with the highest GHG intensity across all G&B companies reporting 2023 data to EPA, including companies outside the largest 100 by hydrocarbon production.

Note: Companies are ranked in descending order of GHG emissions intensity (kg CO_2e/BOE)

Top 100 Highest NGSI Methane Intensities

2023 Data

Methane Intensity



This chart presents the 100 companies with the highest methane intensity across all G&B companies reporting 2023 data to EPA, including companies outside the largest 100 by hydrocarbon production.

Note: Companies are ranked in descending order of NGSI methane intensity (percent)

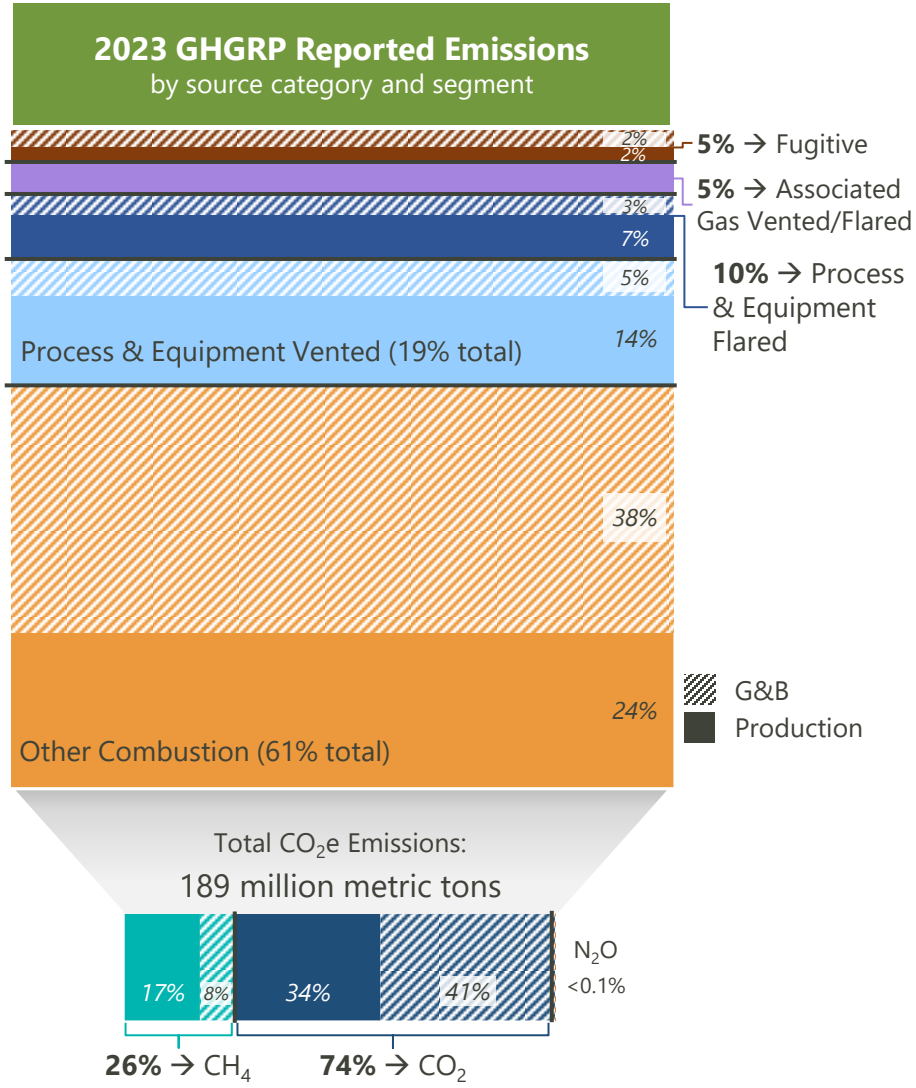
2023 Combined Production and Gathering & Boosting Segment

Types of Emissions Associated with Oil & Gas Production and Gathering & Boosting

The GHGRP includes reporting on emissions from 18 emissions sources across the production and G&B segments. In addition, this report attributes emissions associated with six additional sources that are estimated at the national level by EPA in the GHG Inventory, but not included in GHGRP. The relative contribution of GHG emissions from oil and gas production and gathering can vary widely by both type of gas and emissions source. Factors influencing the relative contribution of emissions include geology, targeted hydrocarbons (e.g., dry gas vs. wet gas), available infrastructure, and company policies and practices.

For purposes of comparison within this report, emissions sources are grouped into five categories:

- **Process & Equipment Vented** Vented emissions are intentional releases of natural gas from equipment and processes. Common sources of vented emissions include gas-driven pneumatic devices, compressor seals, tanks, and liquids unloading.
- **Process & Equipment Flared** Flared emissions consist primarily of CO_2 from the combustion of gas that is captured from equipment and processes. Flaring also results in methane emissions from uncombusted gas that escapes through the flare stack.
- **Associated Gas Vented & Flared** Associated gas vented and flared emissions occur at oil wells that do not capture a portion or any of the gas that is produced alongside oil. The gas is directly released to the atmosphere or combusted in a flare rather than captured for sale, on-site use, or reinjection. Note that associated gas emissions only occur in the onshore production segment.
- **Fugitive** Fugitive emissions are unintentional releases, or leaks, of natural gas. These emissions are often caused by faulty or worn-out equipment. Sources of fugitive emissions include seals and cracks on equipment such as tanks and piping, and leakage from infrastructure components such as valves and connectors.
- **Other Combustion** Non-flaring combustion is a significant source of CO_2 emissions from oil and gas production. Diesel and natural gas engines used to power equipment and provide electricity represent the largest source of other combustion emissions. Other combustion also includes methane emissions from uncombusted gas.

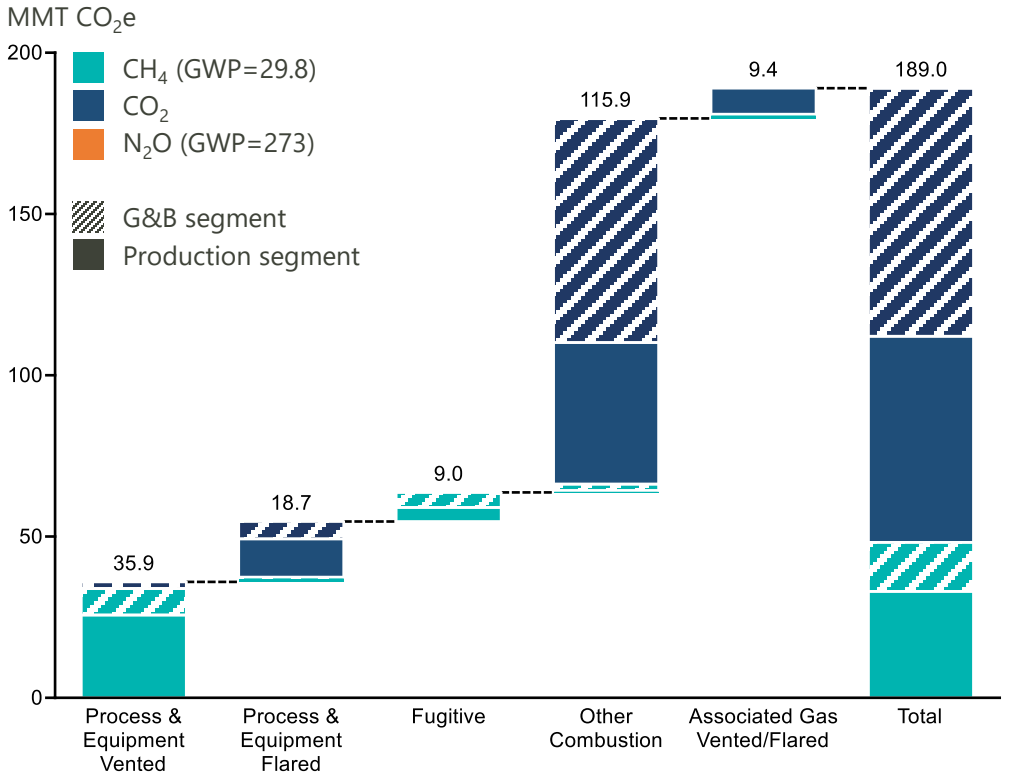


Sources of Emissions

Process and equipment vented, and fugitive methane emissions make up approximately 89% and 24% of the total methane and GHG emissions, respectively, reported from all sources across the onshore production and G&B segments. Pneumatic devices are the largest source of reported methane emissions.

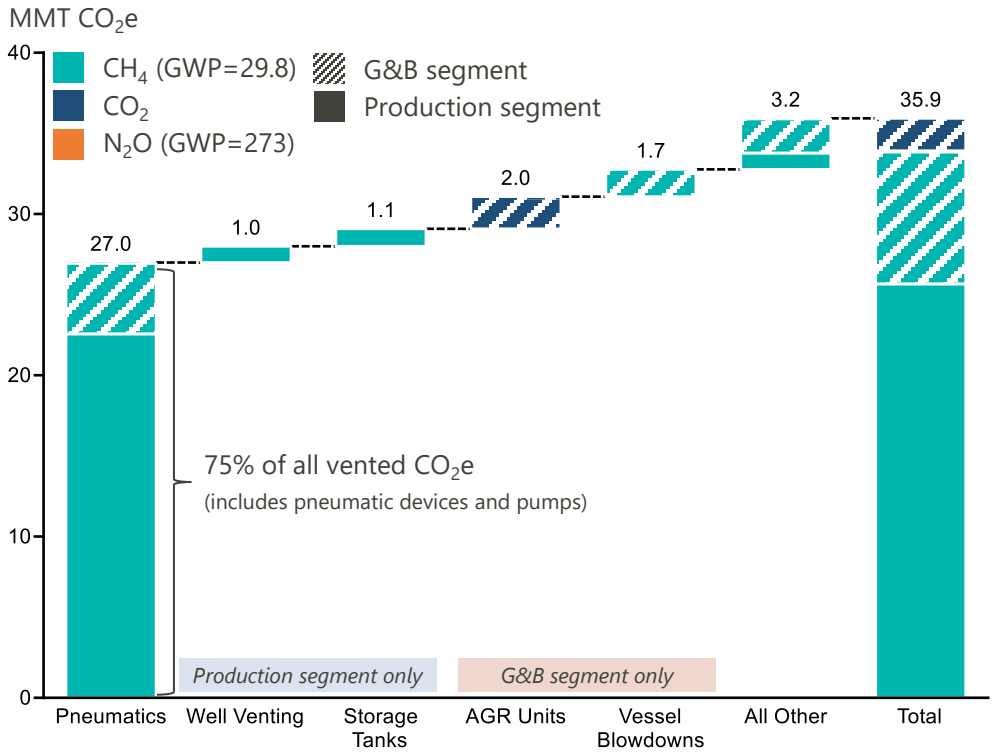
2023 Reported Production and G&B Emissions

by source category and segment; million metric ton CO_2e (MMT CO_2e)



2023 Reported Process & Equipment Vented Emissions

by source and segment; million metric ton CO_2e (MMT CO_2e)

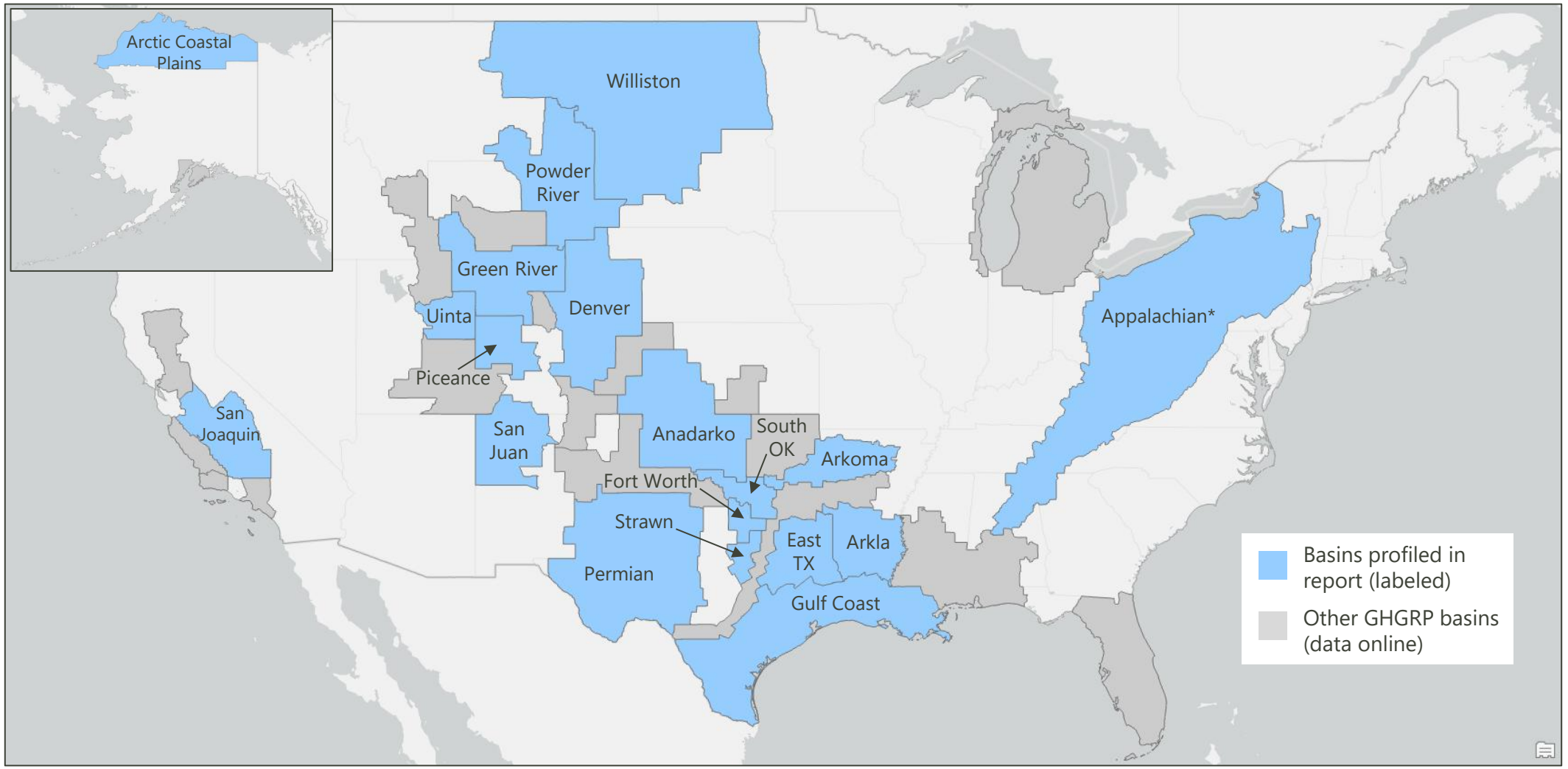


*Includes: Centrifugal compressors, Completions/workovers, dehydrators, reciprocating compressors, compressor blowdowns and starts, well drilling, pressure relief valves, well testing, and acid gas removal units (production segment), well venting (G&B), and storage tanks (G&B)

Basin-Level Summary Data

This section provides data on hydrocarbon energy, GHG emissions, emissions intensity, and sources of emissions for the 19 largest hydrocarbon basins in the U.S. by 2023 energy handled (produced and transported). Together these basins represent 99.1% and 99.3% of total 2023 natural gas and hydrocarbon energy handled, respectively, across the production and G&B segments in the EPA data.

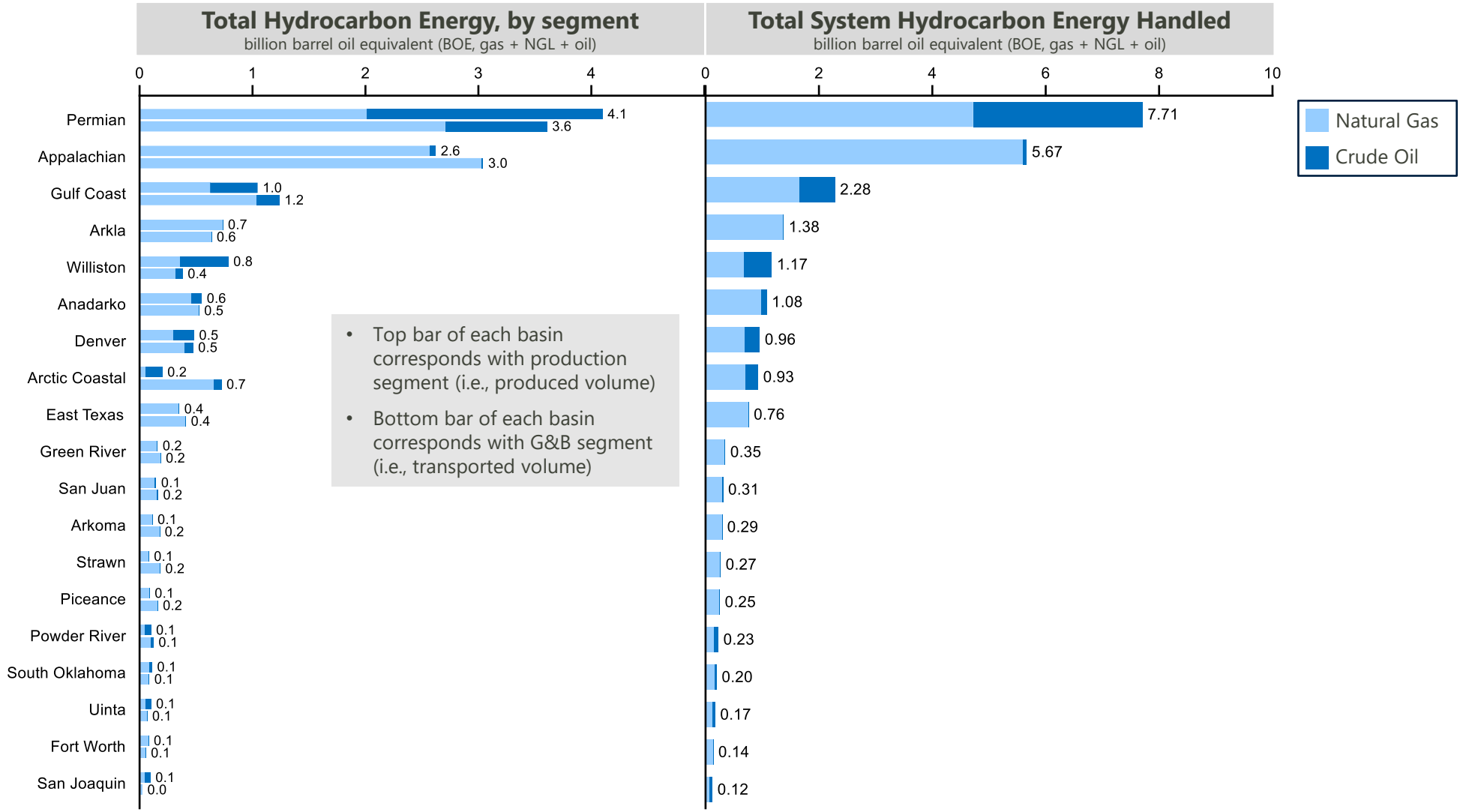
GHGRP Basins



* GHGRP data contain two distinct Appalachian basins (160 & 160A). This analysis combines data reported across both basins and presents them as a single basin.
Note: Basin boundaries defined by geologic provinces published by the American Association of Petroleum Geologists; data provided by U.S. EPA.

2023 Data

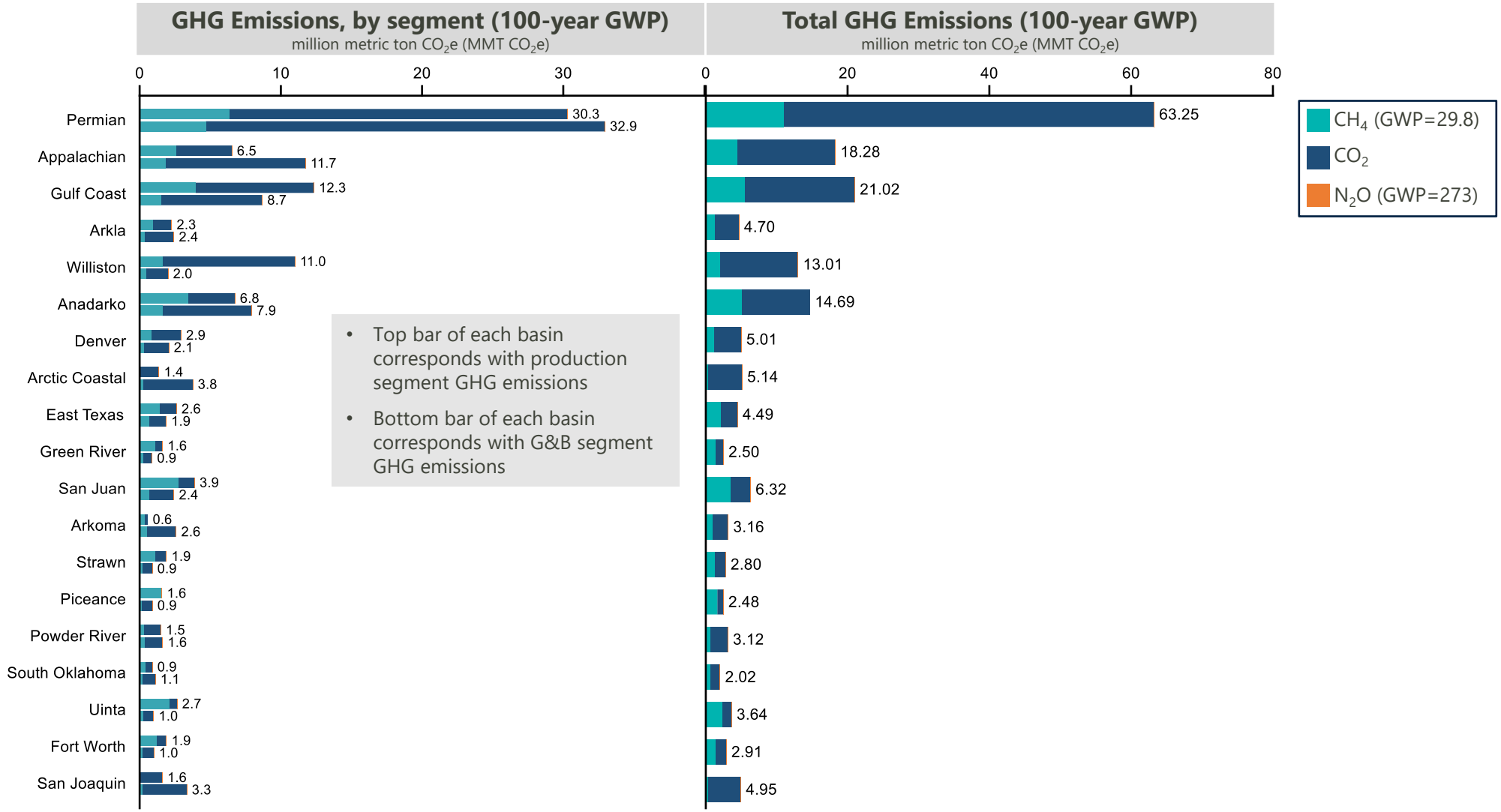
GHGRP Basin Hydrocarbon Energy



Note: Basins are ranked in descending order of hydrocarbon energy handled (BOE, produced + transported)

2023 Data

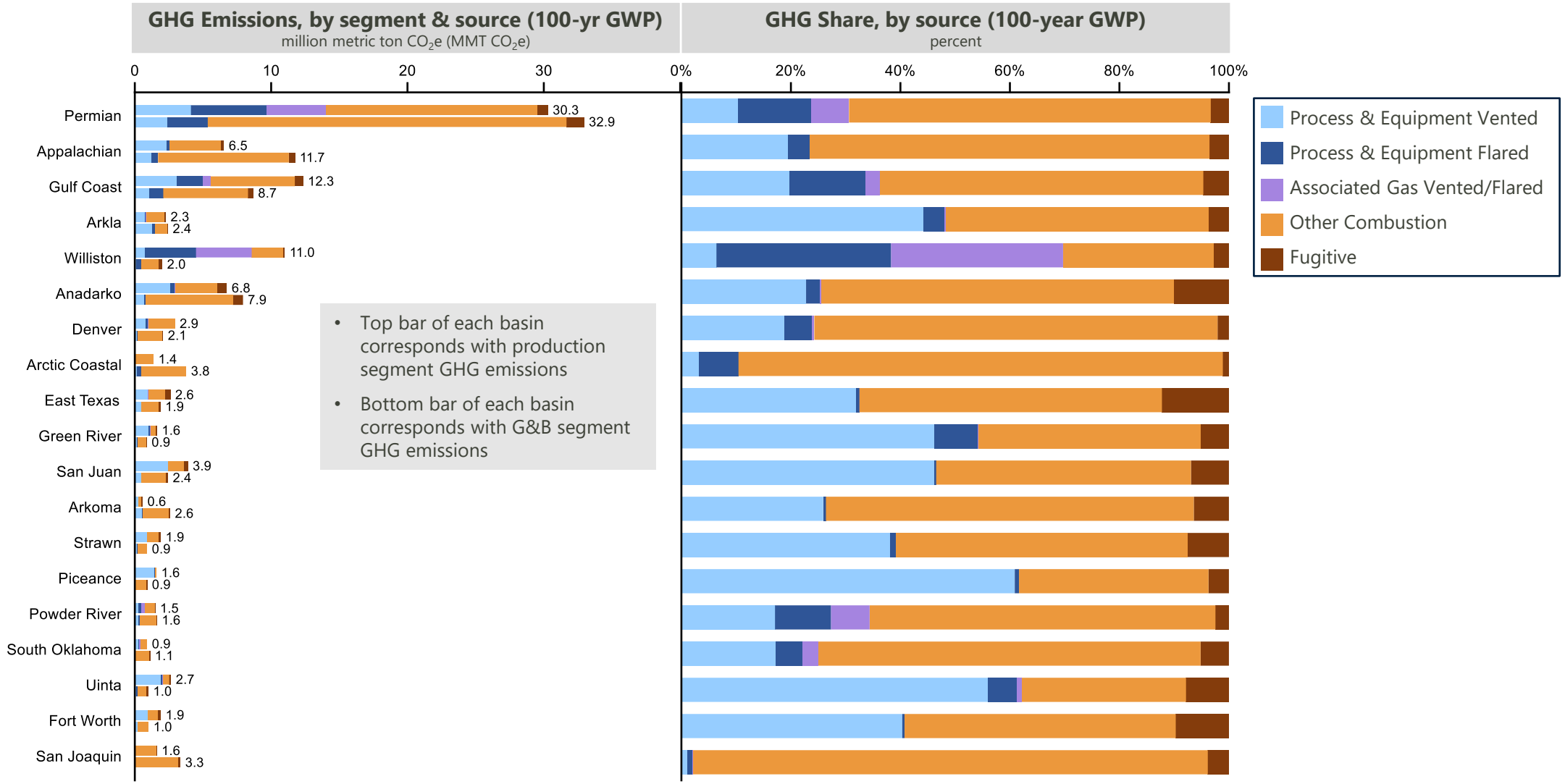
GHGRP Basin Emissions



Note: Basins are ranked in descending order of hydrocarbon energy handled (BOE, produced + transported)

2023 Data

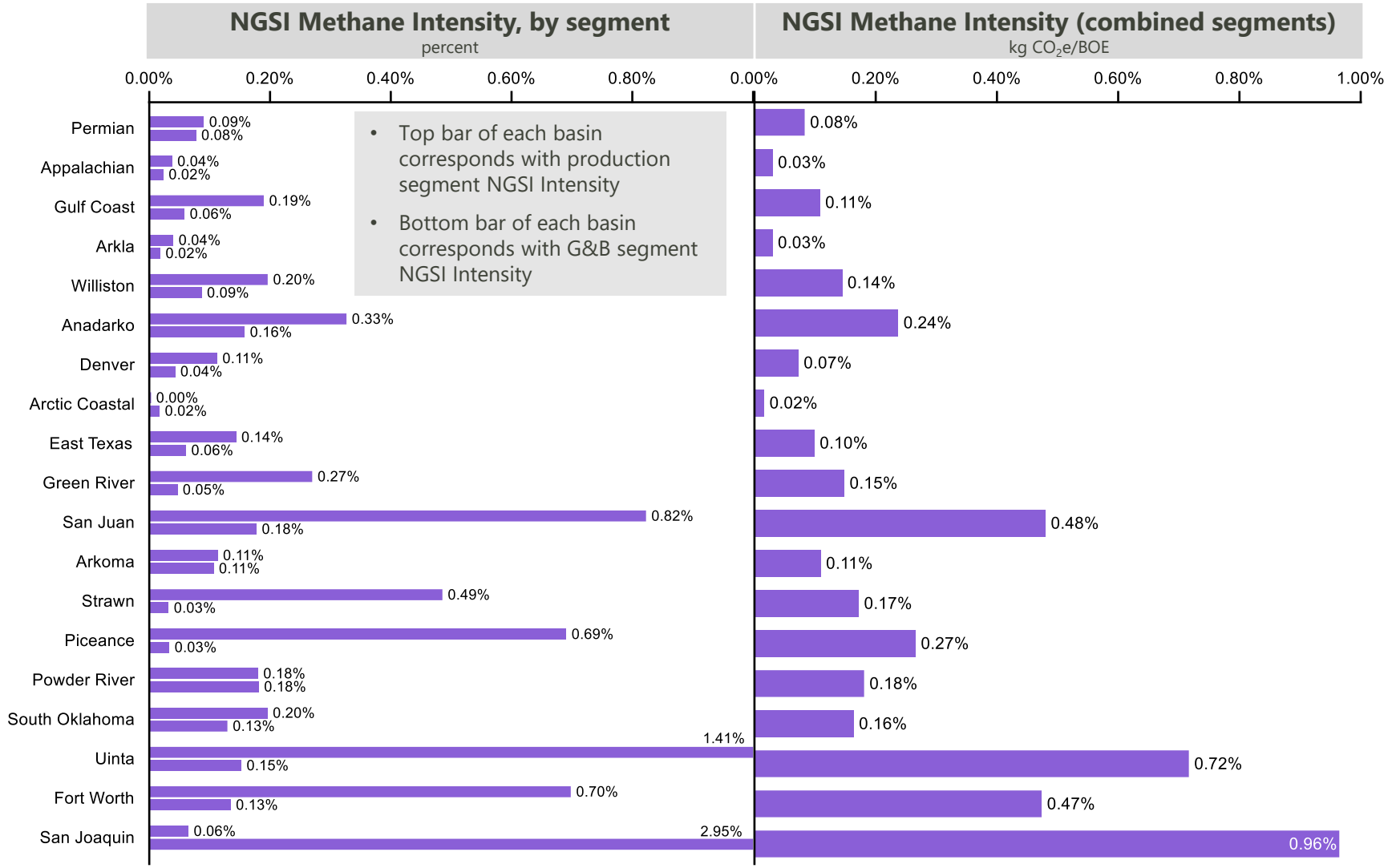
GHGRP Basin Emissions by Source



Note: Basins are ranked in descending order of hydrocarbon energy handled (BOE, produced + transported)

2023 Data

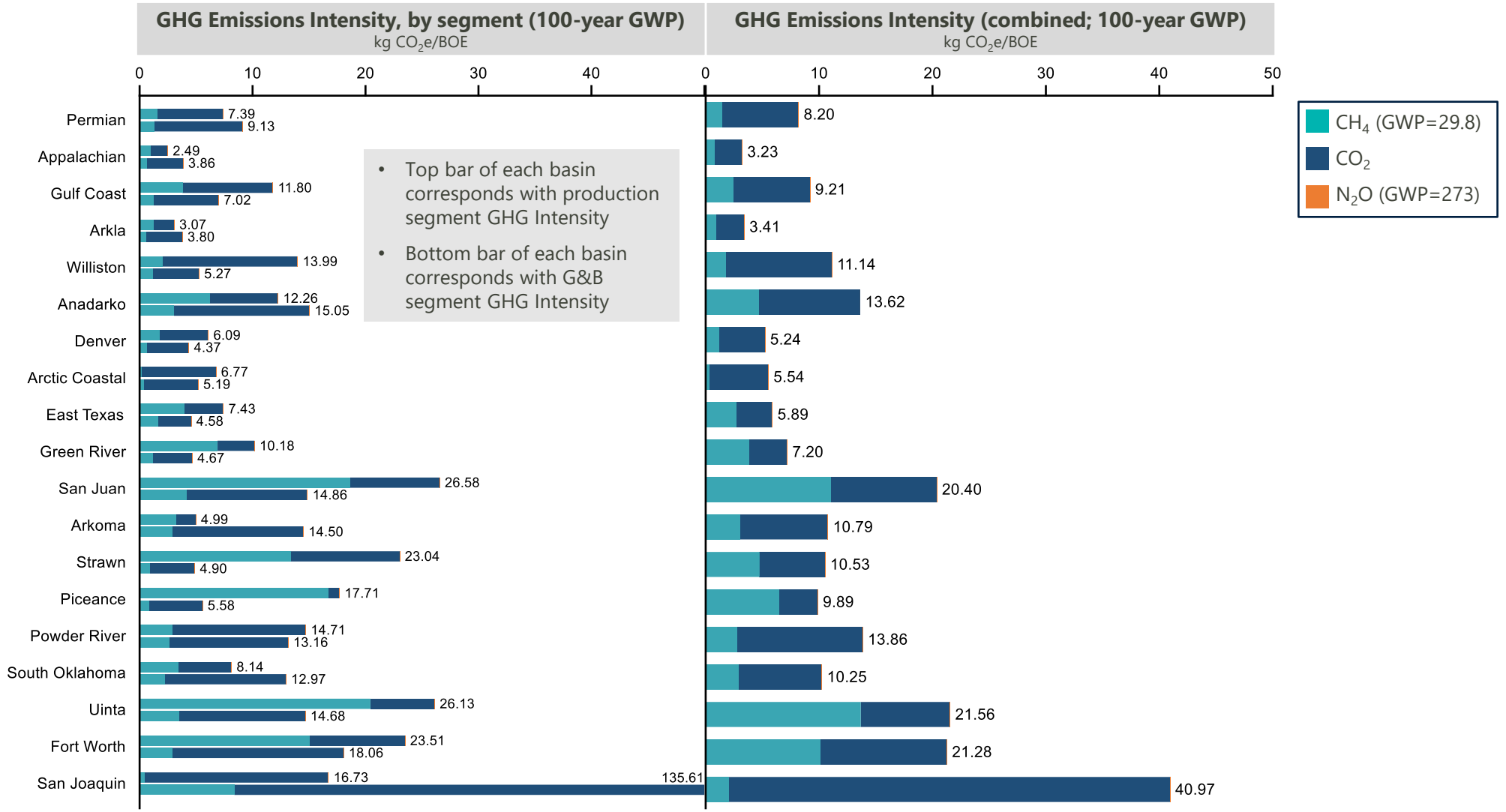
GHGRP Basin Methane Intensity



Note: Basins are ranked in descending order of hydrocarbon energy handled (BOE, produced + transported)

2023 Data

GHGRP Basin GHG Intensity



Note: Basins are ranked in descending order of hydrocarbon energy handled (BOE, produced + transported)

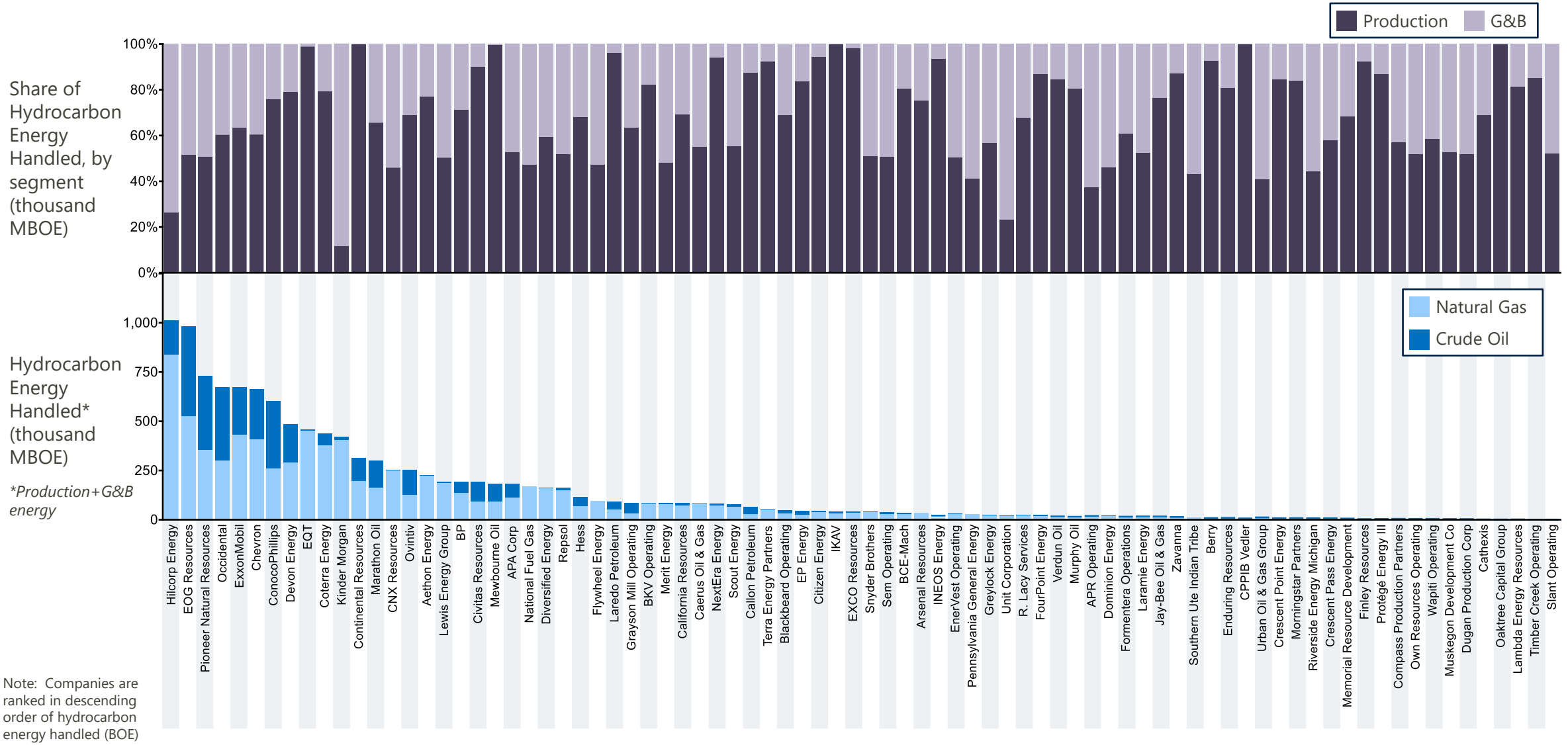
Company-Level Summary Data

This section summarizes data on hydrocarbon energy, GHG emissions, emissions intensity, and sources of emissions for companies that own assets in both the production and gathering & boosting segments. Additional graphics show the relative distribution of hydrocarbon energy, GHG emissions, and methane and GHG emissions intensities across these 82 upstream companies (in 2023). Detailed tables list the data and associated rankings for the primary metrics included in this analysis for each of these companies.

Upstream Companies: Owners of assets in both production and G&B segments

2023 Data

Total Hydrocarbon Energy Handled

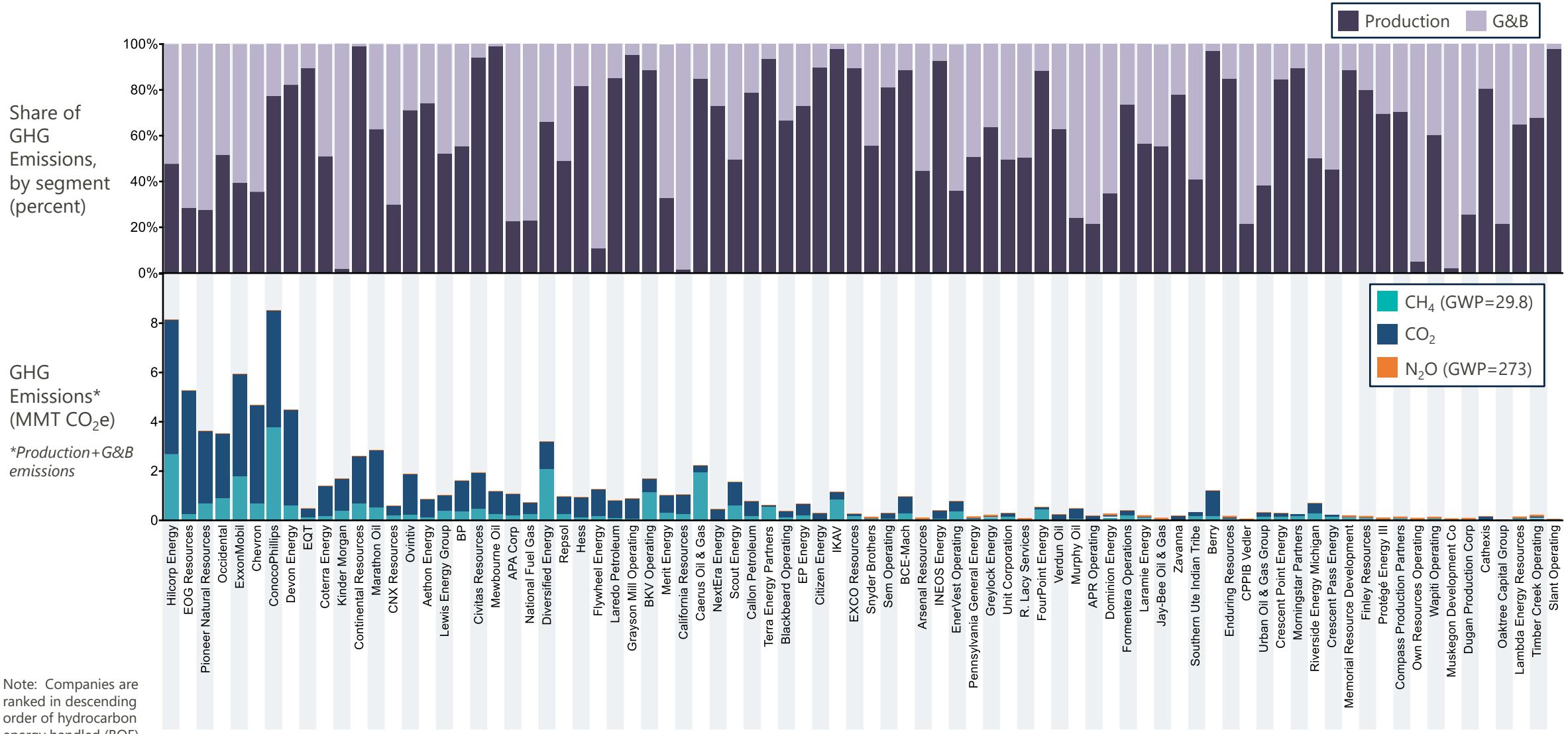


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Upstream Companies: Owners of assets in both production and G&B segments

2023 Data

Total GHG Emissions (100-year GWP)

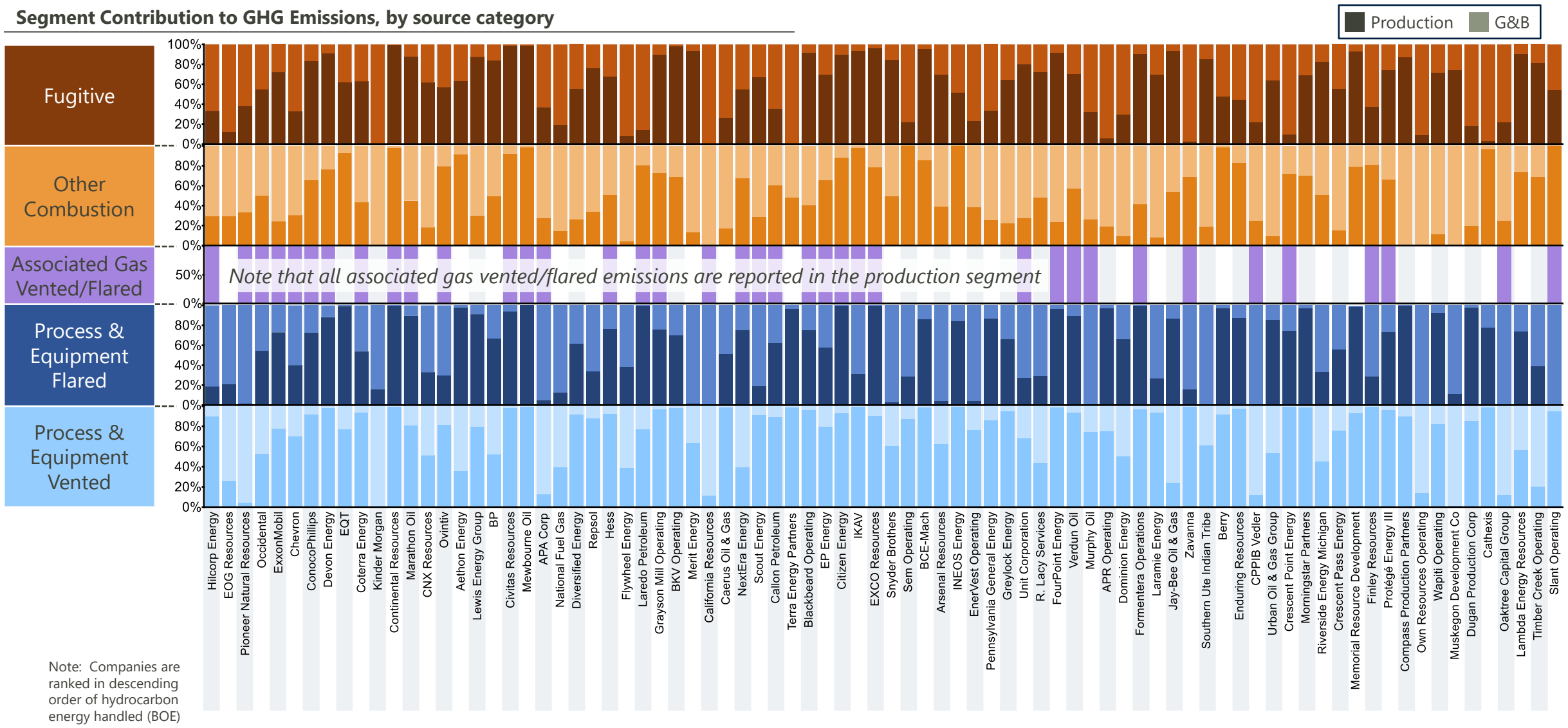


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Upstream Companies: Owners of assets in both production and G&B segments

2023 Data

Total GHG Emissions Share, by Source & Segment (100-year GWP)

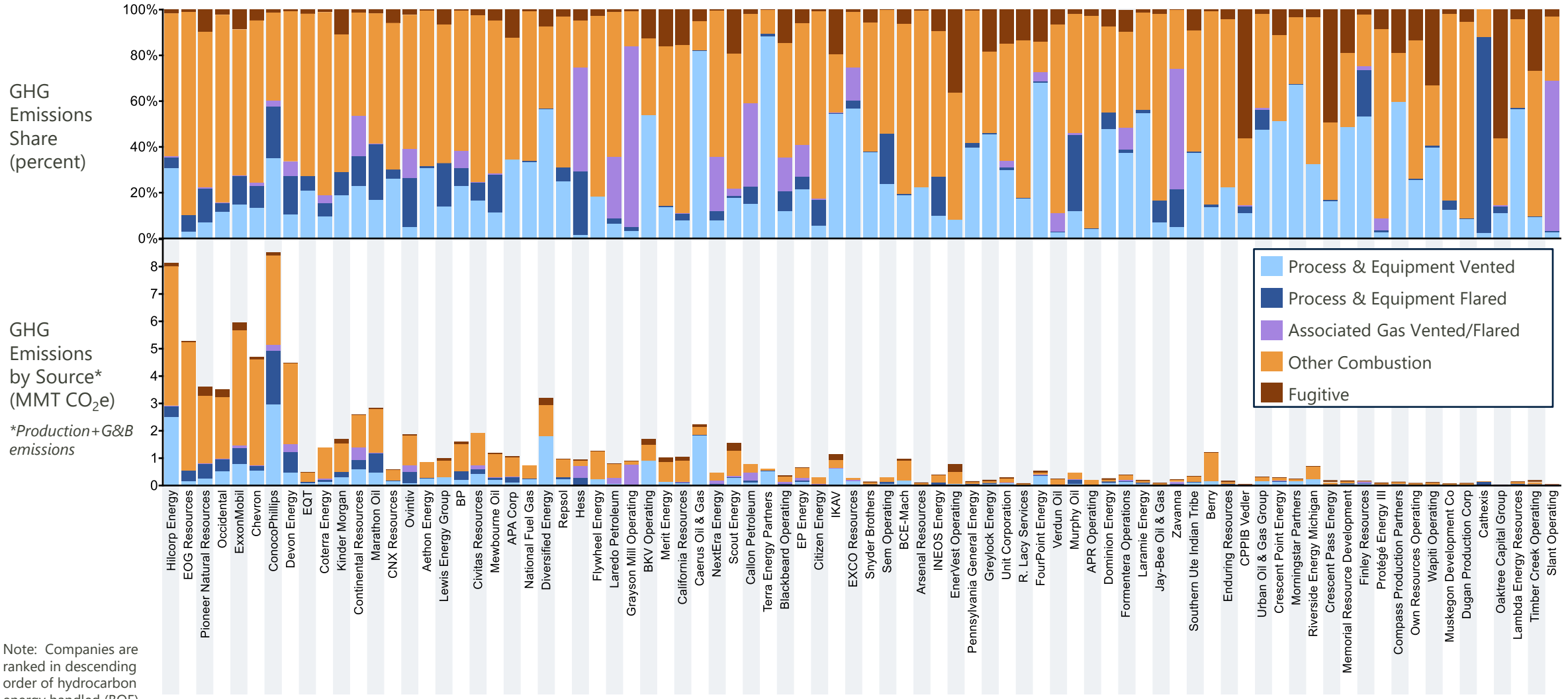


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Upstream Companies: Owners of assets in both production and G&B segments

2023 Data

GHG Emissions by Source (100-year GWP)

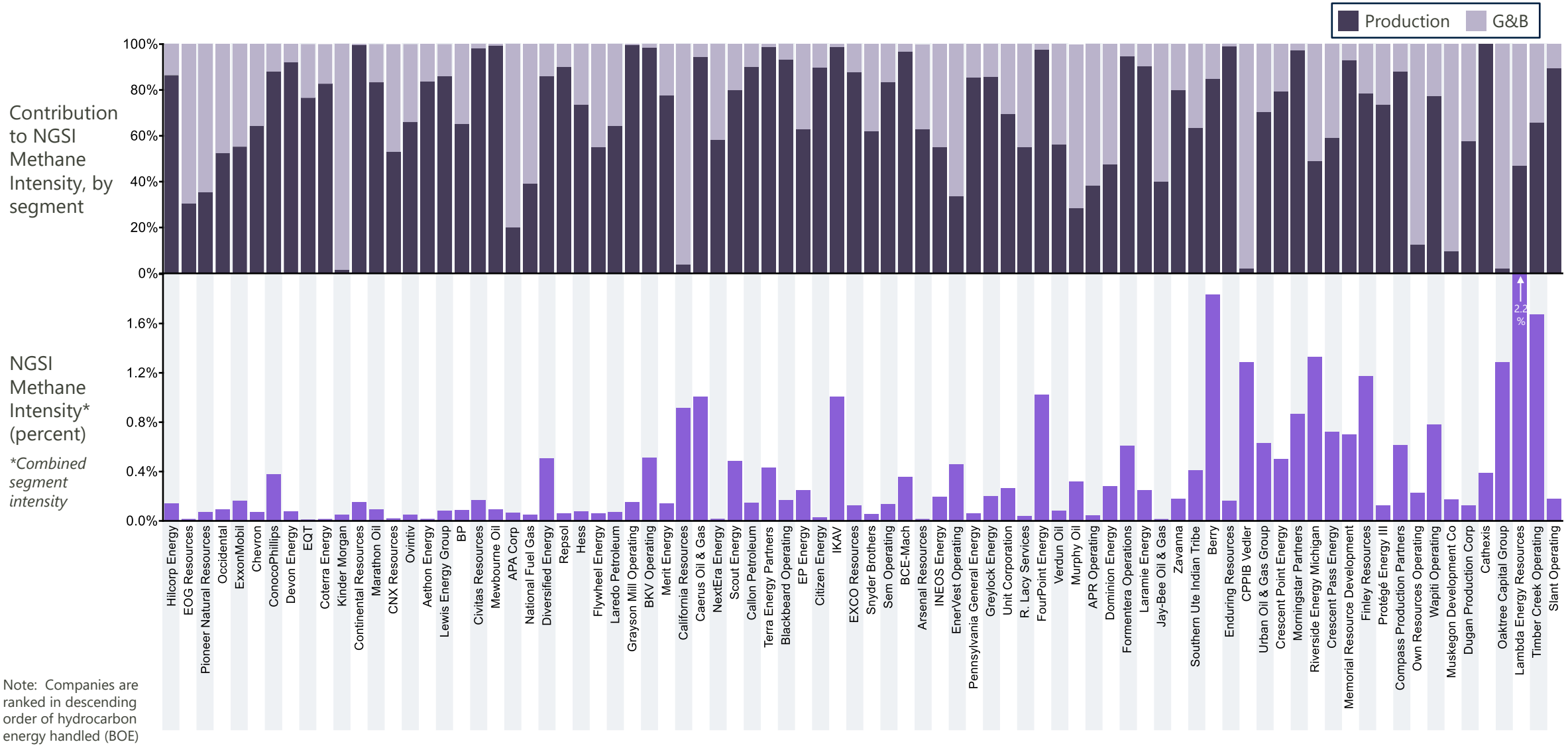


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Upstream Companies: Owners of assets in both production and G&B segments

2023 Data

Methane Intensity

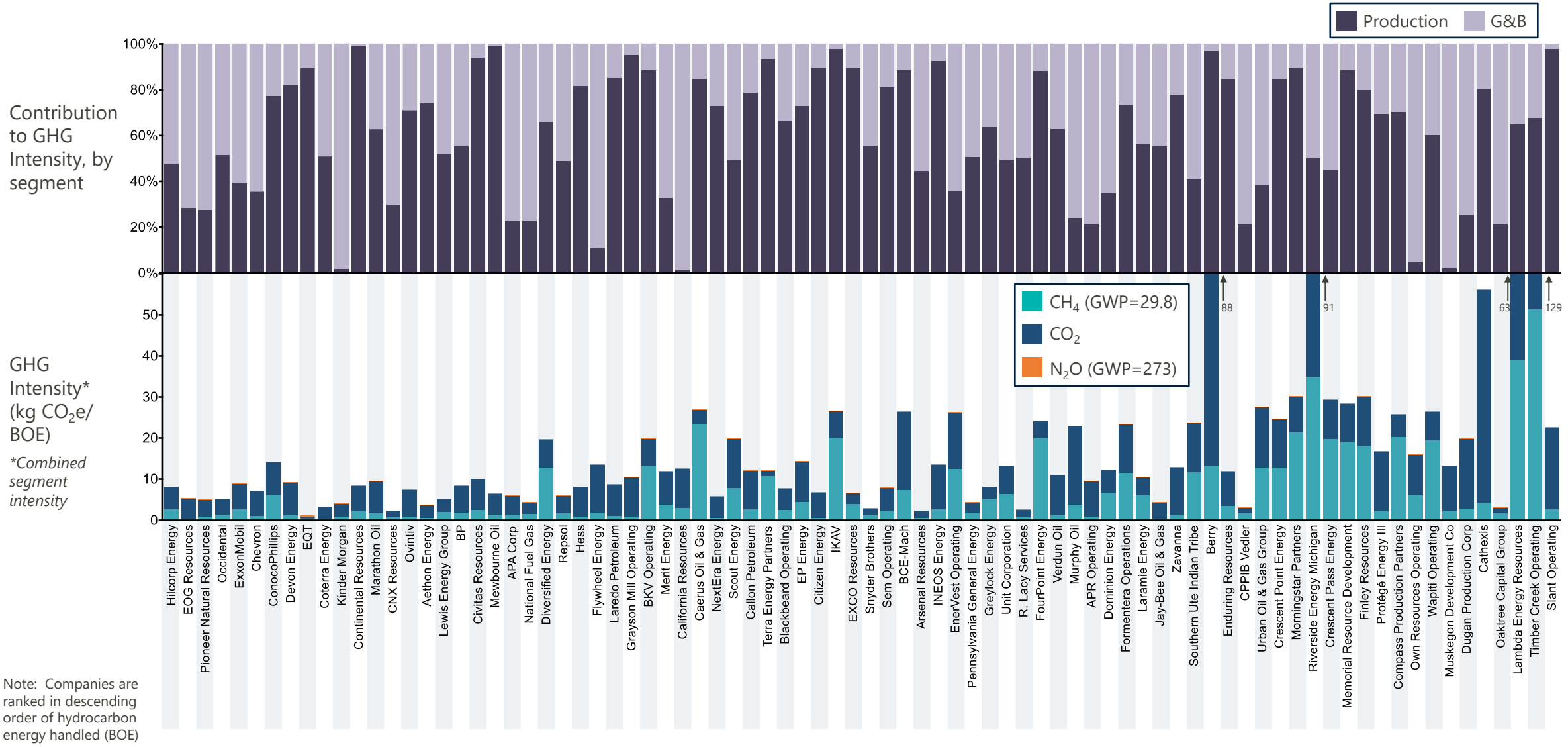


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Upstream Companies: Owners of assets in both production and G&B segments

2023 Data

GHG Emissions Intensity (100-year GWP)

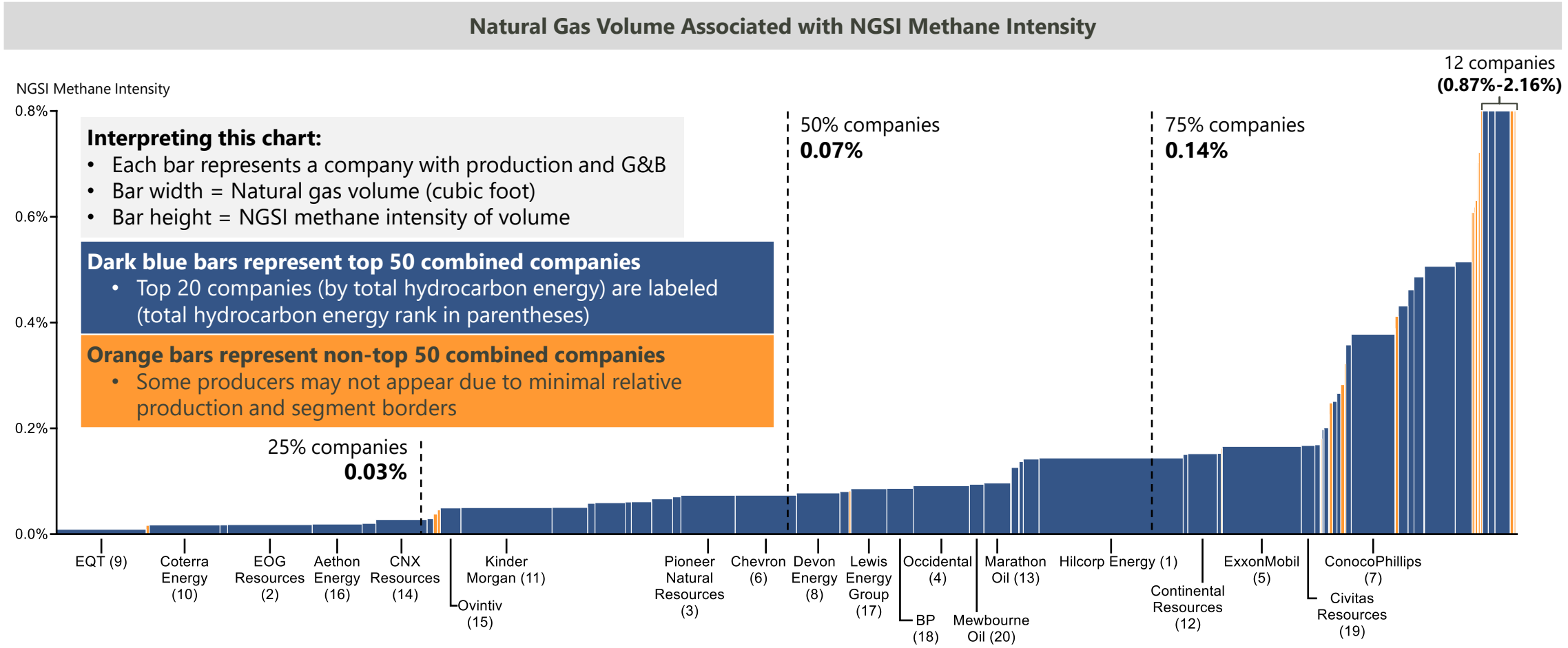


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Upstream Companies: Owners of assets in both production and G&B segments

2023 Data

Total GHGRP Natural Gas Volume, by Methane Intensity

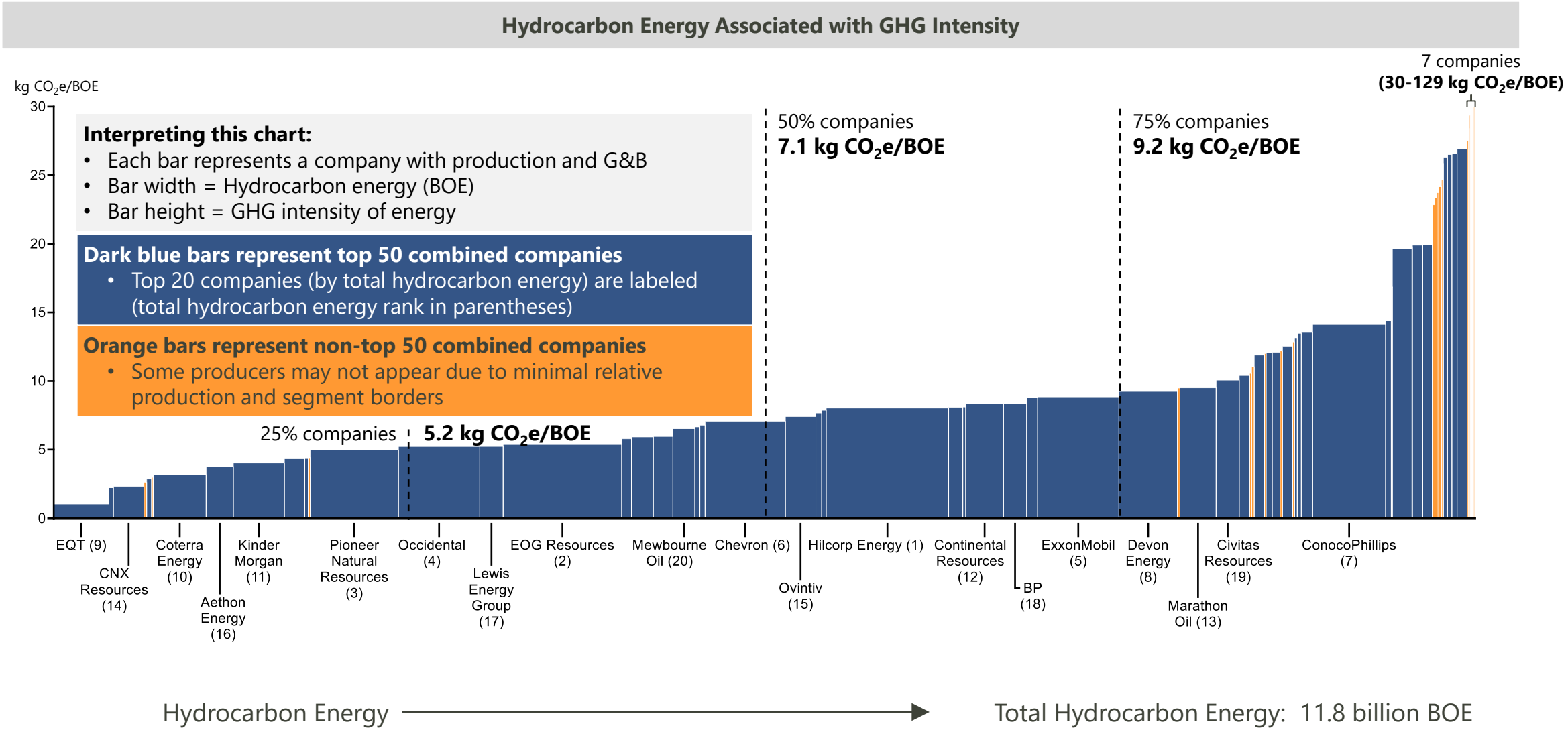


Natural Gas Volume → Total Gas Volume: 37.2 trillion cubic feet

Upstream Companies: Owners of assets in both production and G&B segments

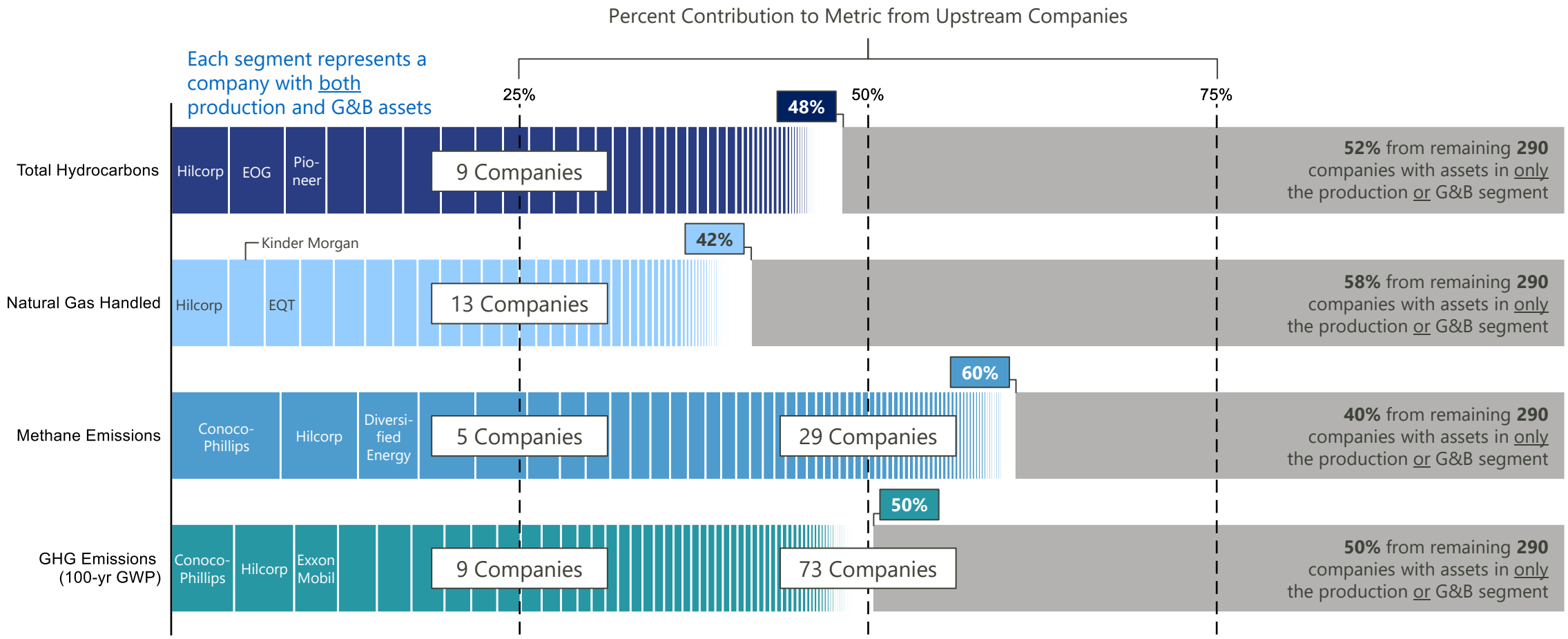
2023 Data

Total GHGRP Hydrocarbon Energy, by GHG Intensity



2023 Data

GHGRP Hydrocarbon Energy & Emissions Contributions

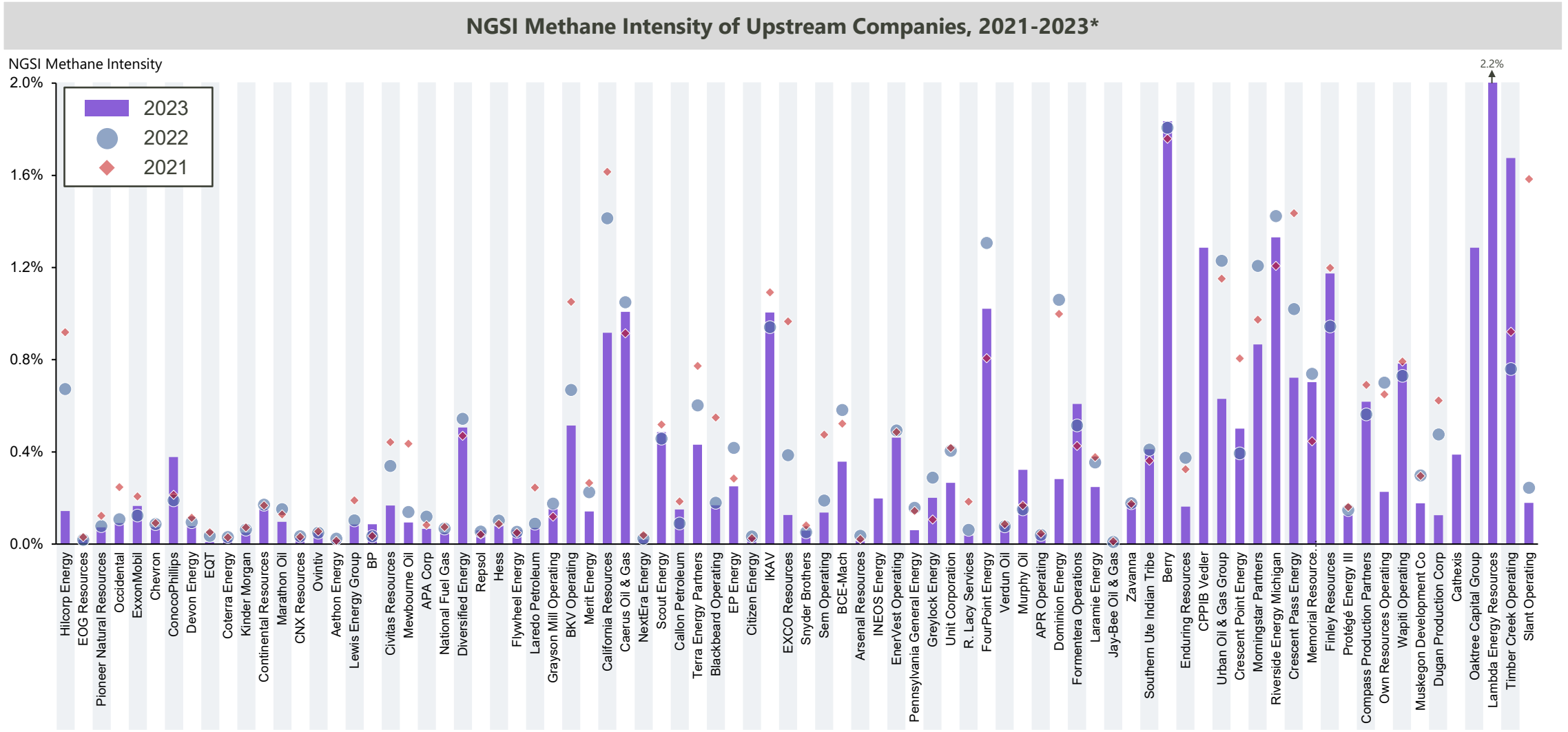


Handled hydrocarbon energy and natural gas volume reported to EPA are relatively concentrated among a small number of companies. 25% of total reported hydrocarbon energy and natural gas volume are by nine and thirteen companies, respectively. Reported methane and absolute GHG emissions are even more concentrated; five and nine companies, respectively, are responsible for 25% of cumulative methane and GHG emissions across the production and G&B segments.

Upstream Companies: Owners of assets in both production and G&B segments

2023 Data

2021-2023 Trends Analysis: Change in Methane Intensity, by Upstream Company

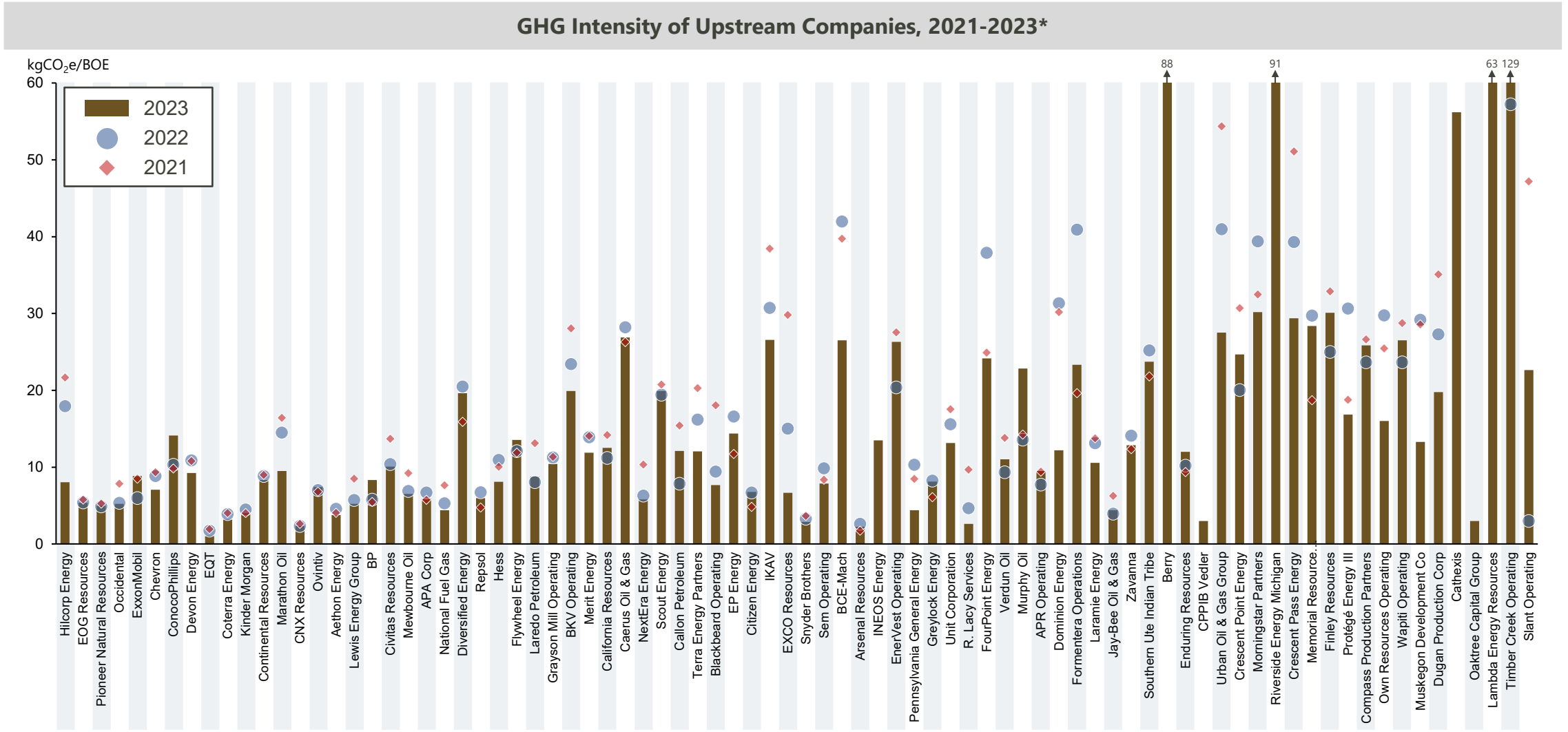


*Combined segment intensity; 4 of the 82 upstream companies in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Upstream Companies: Owners of assets in both production and G&B segments

2023 Data

2021-2023 Trends Analysis: Change in GHG Intensity, by Upstream Company



*Combined segment intensity; 4 of the 82 upstream companies in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

2023 Data

Emissions & Emissions Intensities of Upstream Companies

		Hydrocarbons (production+transported)		Emissions		Intensity		Metric Rank (among production and G&B companies) 1=highest, 82 = lowest				
Rank	Company	Total MBOE	Gas (bcf)	MT CH4	MT GHG	NGSI Intensity	GHG Intensity	Gas (bcf)	CH4 Emissions	GHG Emissions	NGSI Intensity	GHG Intensity
1	Hilcorp Energy	1,013,275	3,673	89,936	8,144,083	0.14%	8.04	1	2	2	47	55
2	EOG Resources	980,644	2,156	8,984	5,275,551	0.02%	5.38	4	25	4	78	66
3	Pioneer Natural Resources	729,206	1,384	23,312	3,622,859	0.07%	4.97	9	9	7	62	69
4	Occidental	673,048	1,435	29,817	3,519,871	0.09%	5.23	8	7	8	55	68
5	ExxonMobil	672,199	2,013	60,310	5,947,510	0.17%	8.85	5	5	3	42	49
6	Chevron	663,966	1,563	22,939	4,687,040	0.07%	7.06	7	11	5	61	59
7	ConocoPhillips	603,647	1,117	126,822	8,521,797	0.38%	14.12	12	1	1	27	30
8	Devon Energy	484,376	1,104	20,551	4,477,386	0.08%	9.24	13	12	6	60	48
9	EQT	456,857	2,281	3,671	476,509	0.01%	1.04	3	52	42	82	82
10	Coterra Energy	436,240	1,802	5,925	1,389,432	0.02%	3.19	6	36	19	80	75
11	Kinder Morgan	422,325	2,323	13,068	1,704,473	0.05%	4.04	2	19	15	70	73
12	Continental Resources	312,115	754	23,154	2,602,629	0.15%	8.34	18	10	11	45	52
13	Marathon Oil	298,962	682	17,446	2,841,924	0.10%	9.51	19	15	10	53	46
14	CNX Resources	253,074	1,305	6,451	591,542	0.03%	2.34	10	34	40	75	80
15	Ovintiv	252,289	521	7,326	1,871,249	0.05%	7.42	22	30	14	71	58
16	Aethon Energy	225,029	1,272	4,410	849,113	0.02%	3.77	11	47	32	77	74
17	Lew is Energy Group	193,221	916	13,454	1,011,622	0.09%	5.24	14	18	27	57	67
18	BP	191,855	672	12,362	1,599,957	0.09%	8.34	20	20	17	56	51
19	Civitas Resources	191,114	346	16,046	1,924,855	0.17%	10.07	29	16	13	41	45
20	Mew bourne Oil	181,622	366	8,514	1,186,767	0.09%	6.53	27	27	22	54	62
21	APA Corp	181,027	535	7,042	1,073,487	0.07%	5.93	21	31	24	64	64
22	National Fuel Gas	168,308	907	8,473	738,561	0.05%	4.39	15	28	36	69	72
23	Diversified Energy	162,612	783	70,202	3,189,972	0.51%	19.62	16	3	9	20	26
24	Repsol	162,224	770	8,857	967,334	0.06%	5.96	17	26	29	67	63
25	Hess	117,039	231	3,697	946,568	0.08%	8.09	32	51	30	59	54
26	Flyw heel Energy	94,063	519	5,799	1,274,443	0.06%	13.55	23	37	20	65	31
27	Laredo Petroleum	90,929	209	3,319	798,070	0.07%	8.78	33	54	33	63	50
28	Grayson Mill Operating	85,751	98	2,648	892,665	0.15%	10.41	50	59	31	44	44
29	BKV Operating	85,520	431	37,911	1,702,083	0.51%	19.90	24	6	16	19	24
30	Merit Energy	85,334	400	10,652	1,015,182	0.14%	11.90	25	22	26	48	41
31	California Resources	84,453	148	8,429	1,058,016	0.92%	12.53	41	29	25	11	36
32	Caerus Oil & Gas	83,339	388	65,802	2,241,597	1.01%	26.90	26	4	12	9	11
33	NextEra Energy	80,289	350	1,467	465,154	0.02%	5.79	28	66	44	76	65
34	Scout Energy	78,308	252	20,472	1,559,280	0.49%	19.91	30	13	18	22	23

2023 Data

Emissions & Emissions Intensities of Upstream Companies

		Hydrocarbons (production+transported)		Emissions		Intensity		Metric Rank (among production and G&B companies) 1=highest, 82 = lowest				
Rank	Company	Total MBOE	Gas (bcf)	MT CH4	MT GHG	NGSI Intensity	GHG Intensity	Gas (bcf)	CH4 Emissions	GHG Emissions	NGSI Intensity	GHG Intensity
35	Callon Petroleum	65,155	116	5,711	788,647	0.15%	12.10	44	39	34	46	38
36	Terra Energy Partners	50,496	245	18,095	609,380	0.43%	12.07	31	14	39	24	39
37	Blackbeard Operating	48,160	134	3,922	369,867	0.17%	7.68	43	49	47	40	57
38	EP Energy	46,402	109	6,830	667,798	0.25%	14.39	46	32	38	32	29
39	Citizen Energy	43,115	163	830	292,676	0.03%	6.79	38	70	51	74	60
40	IKAV	43,011	170	28,627	1,142,745	1.01%	26.57	37	8	23	10	12
41	EXCO Resources	41,413	189	5,557	275,924	0.13%	6.66	35	41	54	51	61
42	Snyder Brothers	40,745	187	1,760	116,765	0.06%	2.87	36	64	71	68	78
43	Sem Operating	37,092	105	2,626	292,098	0.14%	7.88	47	61	52	49	56
44	BCE-Mach	36,668	136	9,058	971,924	0.36%	26.51	42	24	28	28	13
45	Arsenal Resources	36,169	194	621	80,849	0.02%	2.24	34	74	74	79	81
46	INEOS Energy	29,463	48	2,637	397,104	0.20%	13.48	60	60	46	36	32
47	EnerVest Operating	29,452	151	12,273	774,945	0.46%	26.31	40	21	35	23	15
48	Pennsylvania General Energy	29,278	156	1,745	128,871	0.06%	4.40	39	65	68	66	71
49	Greylock Energy	24,140	116	4,225	195,931	0.20%	8.12	45	48	60	35	53
50	Unit Corporation	22,330	98	4,783	293,842	0.27%	13.16	49	45	50	31	34
51	R. Lacy Services	22,297	103	635	58,310	0.04%	2.62	48	73	78	73	79
52	FourPoint Energy	22,286	87	14,921	538,433	1.02%	24.16	52	17	41	8	18
53	Verdun Oil	21,820	50	962	240,828	0.08%	11.04	59	68	57	58	42
54	Murphy Oil	20,823	37	2,691	475,525	0.32%	22.84	64	58	43	29	21
55	APR Operating	20,617	73	569	195,725	0.05%	9.49	56	75	61	72	47
56	Dominion Energy	19,920	94	4,506	242,833	0.28%	12.19	51	46	55	30	37
57	Formentera Operations	17,446	55	6,743	407,156	0.61%	23.34	57	33	45	18	20
58	Laramie Energy	16,688	83	3,426	176,301	0.25%	10.56	54	53	63	33	43
59	Jay-Bee Oil & Gas	16,486	80	226	72,747	0.02%	4.41	55	80	75	81	70
60	Zavanna	15,534	35	651	199,648	0.18%	12.85	65	72	59	37	35
61	Southern Ute Indian Tribe	14,451	83	5,639	342,826	0.41%	23.72	53	40	48	25	19
62	Berry	13,687	14	6,014	1,210,852	1.84%	88.47	73	35	21	2	3
63	Enduring Resources	12,625	28	1,448	151,636	0.16%	12.01	67	67	66	43	40
64	CPPIB Vedler	12,417	5	680	37,160	1.29%	2.99	79	71	80	6	76
65	Urban Oil & Gas Group	12,098	53	5,197	333,008	0.63%	27.53	58	42	49	16	10
66	Crescent Point Energy	11,457	16	4,909	282,800	0.50%	24.68	71	44	53	21	17
67	Morningstar Partners	8,010	40	5,736	241,837	0.87%	30.19	62	38	56	12	6

2023 Data

Emissions & Emissions Intensities of Upstream Companies

		Hydrocarbons (production+transported)		Emissions		Intensity		Metric Rank (among production and G&B companies) 1=highest, 82 = lowest				
Rank	Company	Total MBOE	Gas (bcf)	MT CH4	MT GHG	NGSI Intensity	GHG Intensity	Gas (bcf)	CH4 Emissions	GHG Emissions	NGSI Intensity	GHG Intensity
68	Riverside Energy Michigan	7,765	43	9,112	710,011	1.33%	91.43	61	23	37	4	2
69	Crescent Pass Energy	7,469	39	4,954	219,361	0.72%	29.37	63	43	58	14	8
70	Memorial Resource Development	6,047	30	3,891	171,666	0.70%	28.39	66	50	64	15	9
71	Finley Resources	4,874	7	2,962	146,723	1.17%	30.10	77	56	67	7	7
72	Protégé Energy III	4,820	13	355	81,242	0.13%	16.86	74	77	73	50	27
73	Compass Production Partners	4,665	25	3,178	120,561	0.62%	25.84	68	55	70	17	16
74	Ow n Resources Operating	4,335	22	912	69,368	0.23%	16.00	69	69	76	34	28
75	Wapiti Operating	4,306	20	2,804	114,132	0.78%	26.51	70	57	72	13	14
76	Muskegon Development Co	3,693	12	288	49,134	0.18%	13.30	75	79	79	39	33
77	Dugan Production Corp	3,340	15	319	66,058	0.13%	19.78	72	78	77	52	25
78	Cathexis	2,885	1	418	162,170	0.39%	56.20	81	76	65	26	5
79	Oaktree Capital Group	2,433	1	133	7,280	1.29%	2.99	82	81	82	5	76
80	Lambda Energy Resources	1,948	6	2,548	123,577	2.16%	63.44	78	63	69	1	4
81	Timber Creek Operating	1,511	8	2,601	195,635	1.67%	129.44	76	62	62	3	1
82	Slant Operating	1,168	1	107	26,430	0.18%	22.64	80	82	81	38	22

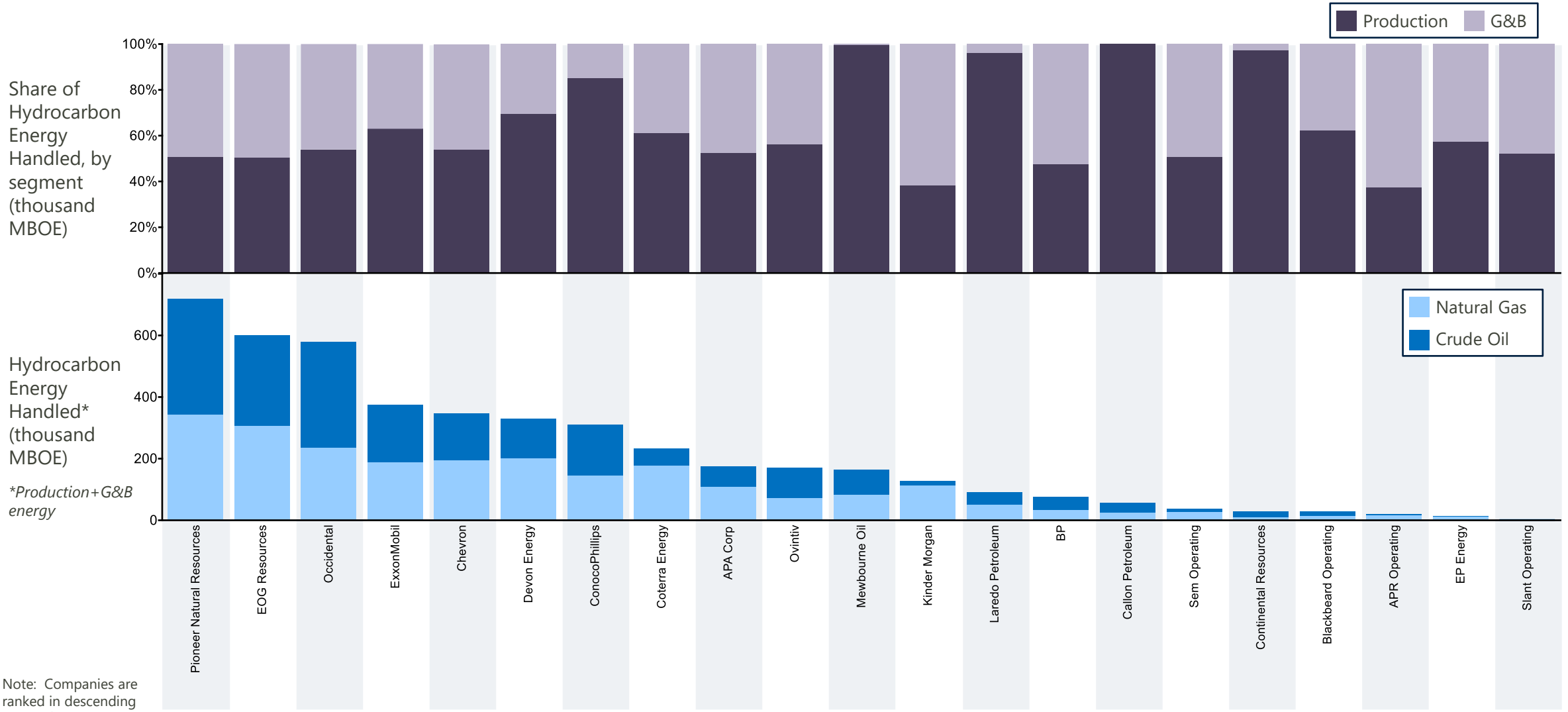
Company- & Basin-Level Summary Data

This section summarizes company-level data on produced and transported hydrocarbons, GHG emissions, emissions intensity, and sources of emissions for each of the following basins: Permian, Appalachian, and Gulf Coast. Additional data show the distribution of methane and GHG emissions intensities by volume in each basin.

Permian Basin Companies

2023 Data

Total Hydrocarbon Energy Handled

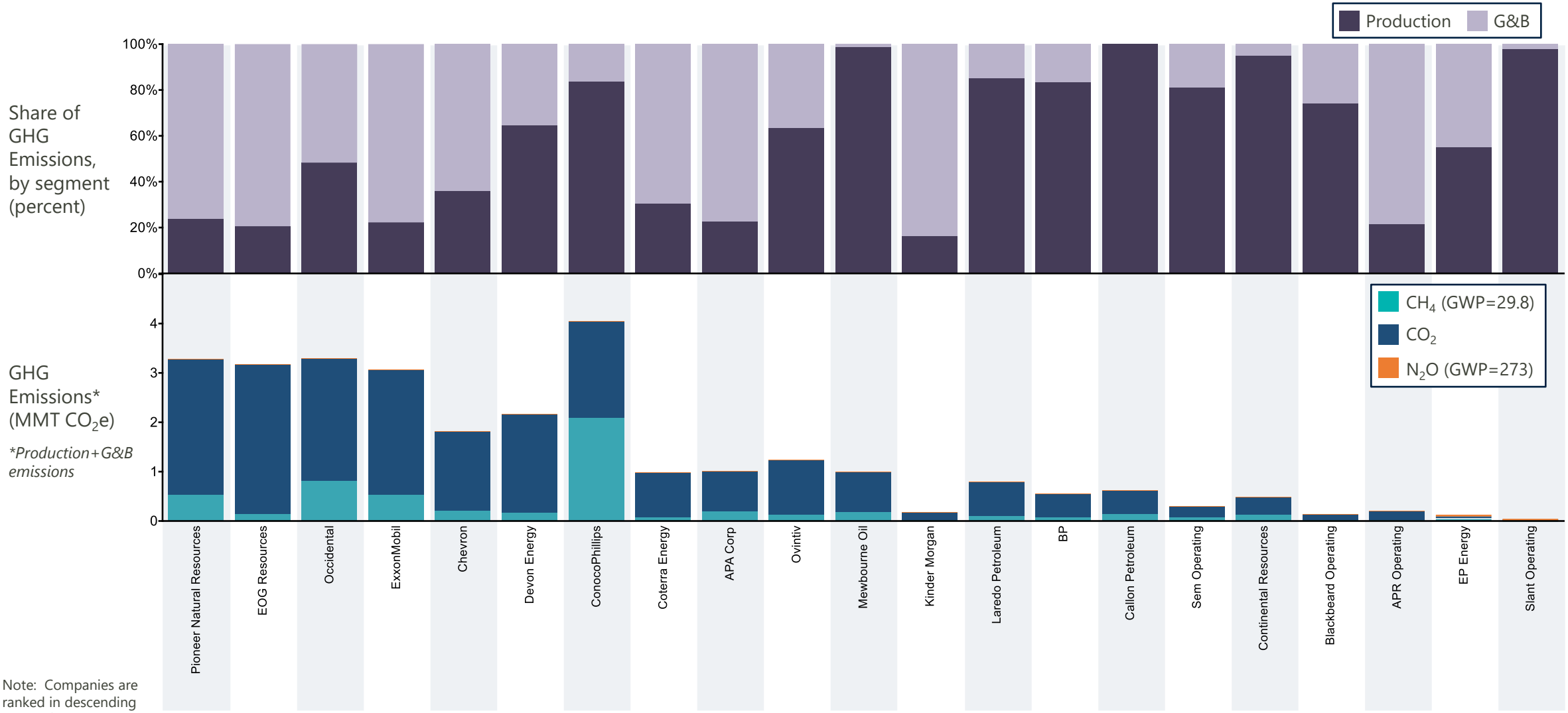


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Permian Basin Companies

2023 Data

Total GHG Emissions (100-year GWP)

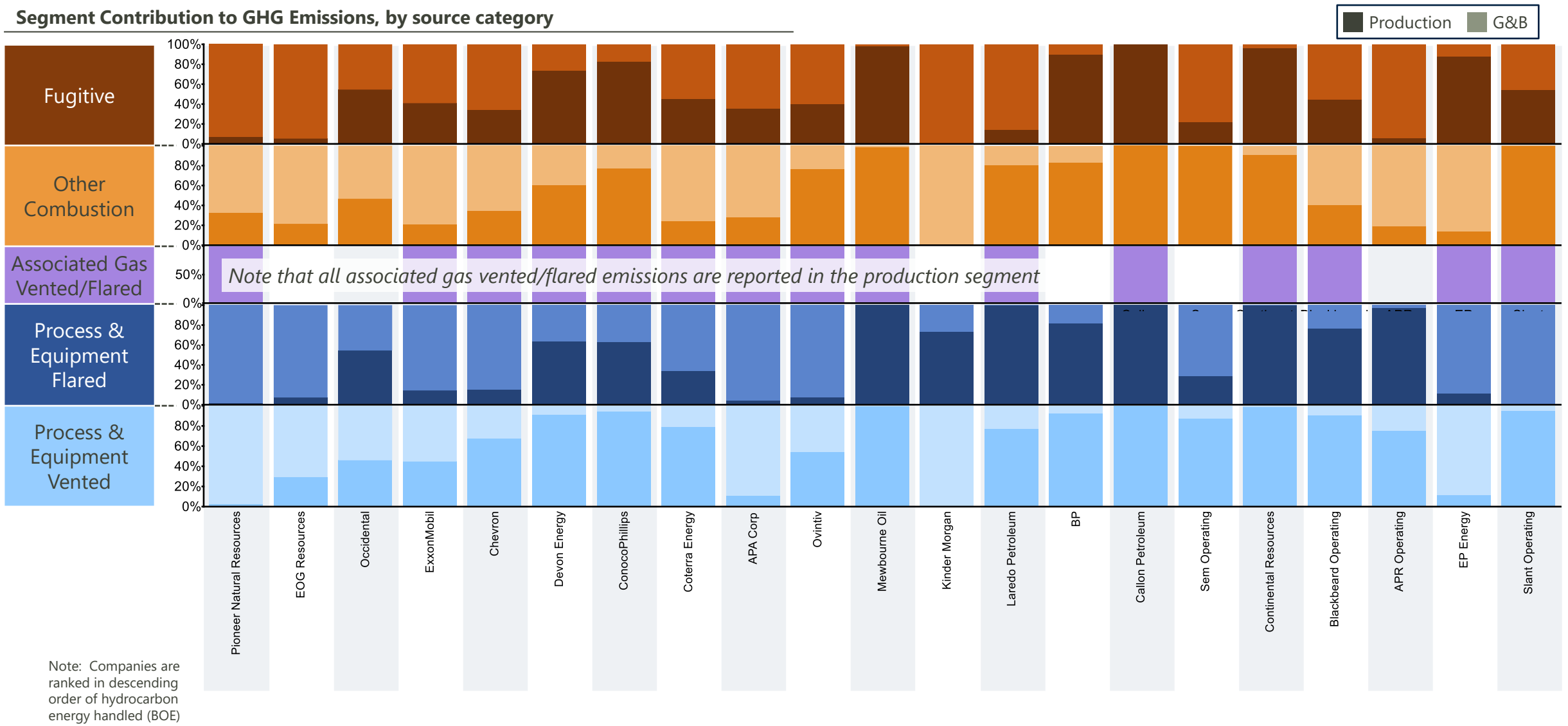


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Permian Basin Companies

2023 Data

Total GHG Emissions Share, by Source & Segment (100-year GWP)

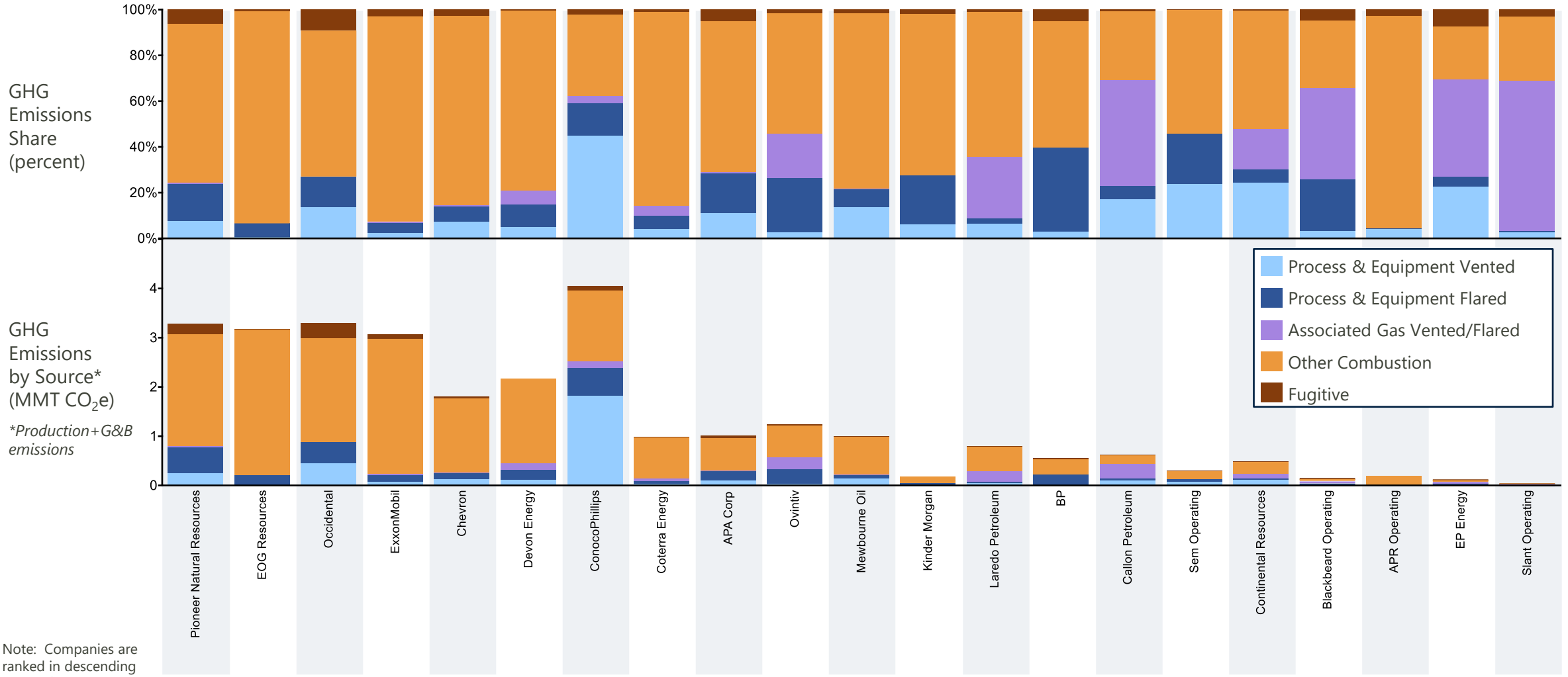


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Permian Basin Companies

2023 Data

GHG Emissions by Source (100-year GWP)

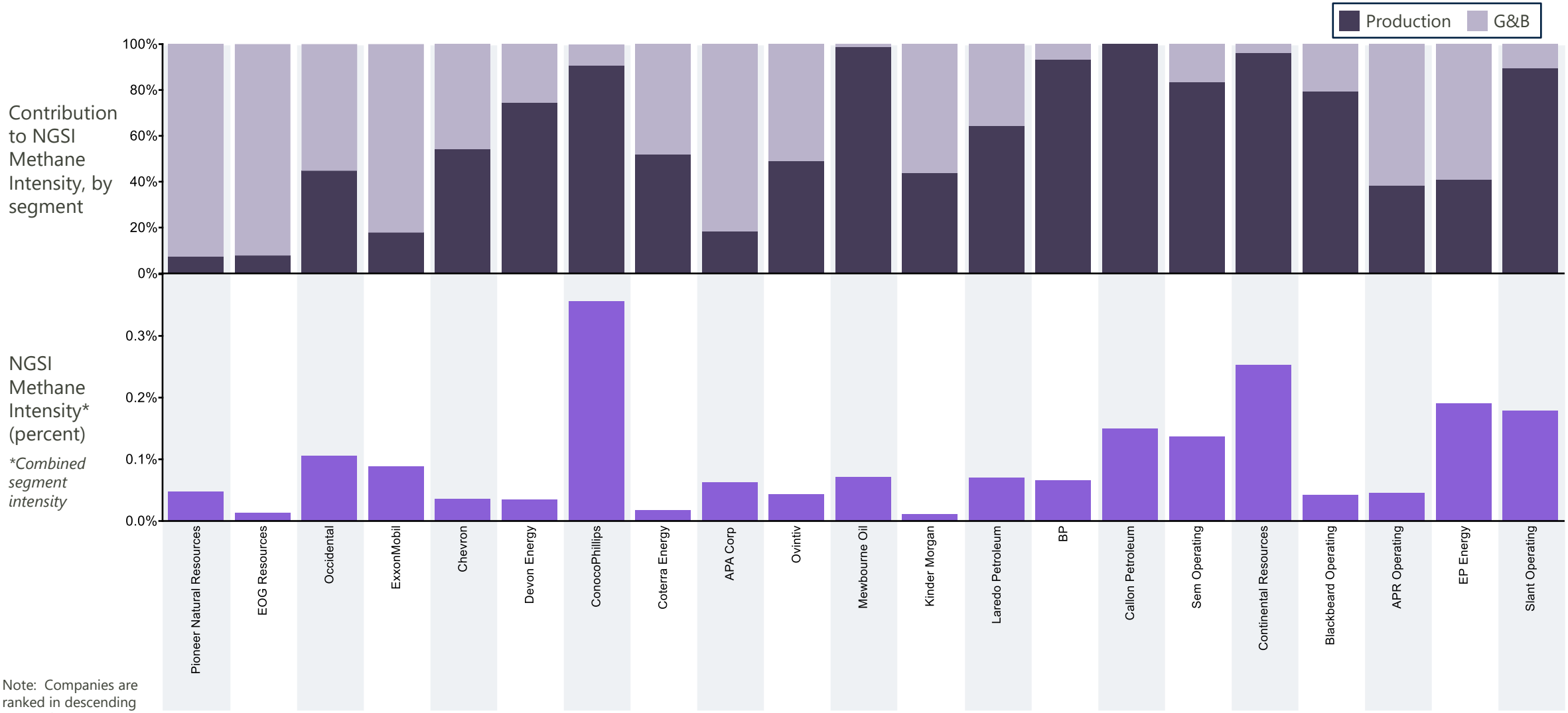


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Permian Basin Companies

Methane Intensity

2023 Data

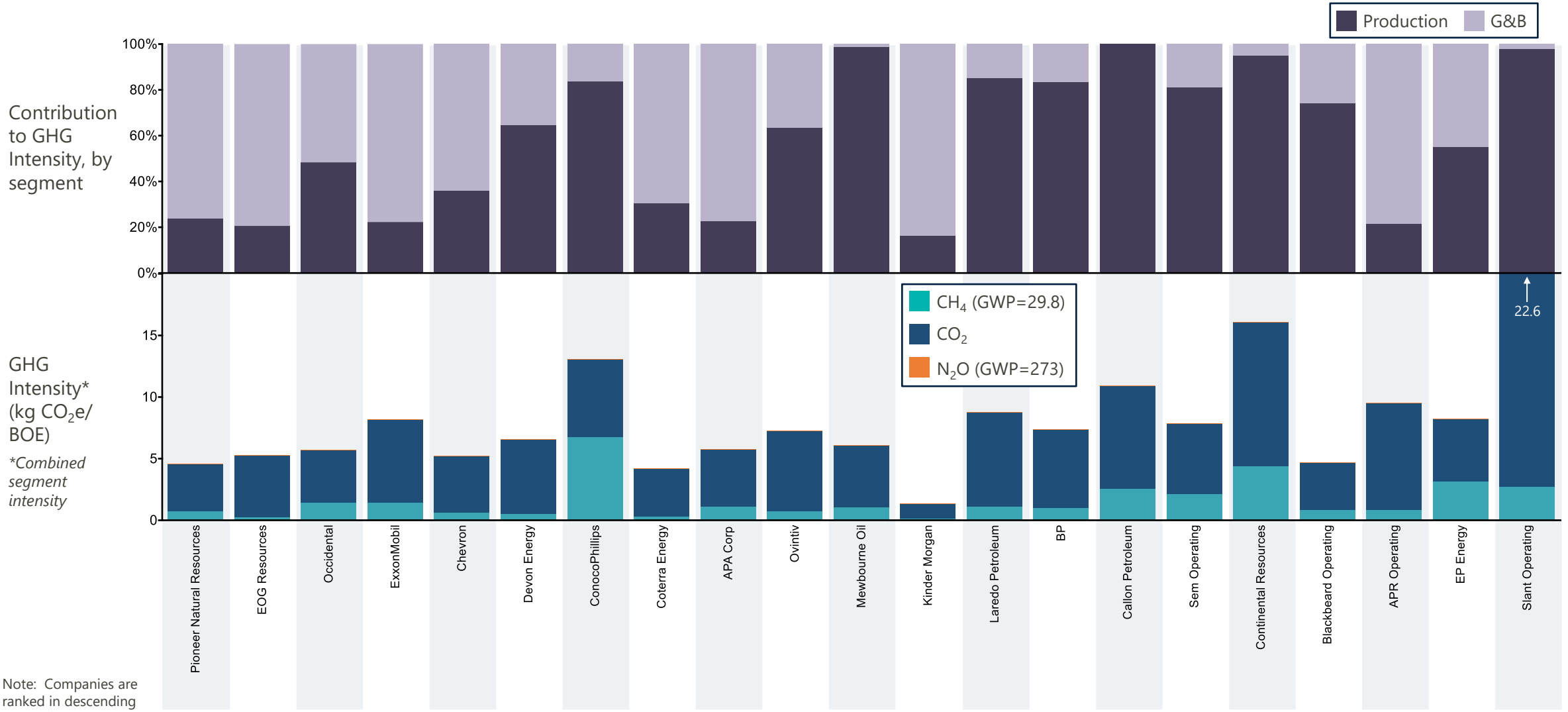


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Permian Basin Companies

2023 Data

GHG Emissions Intensity (100-year GWP)

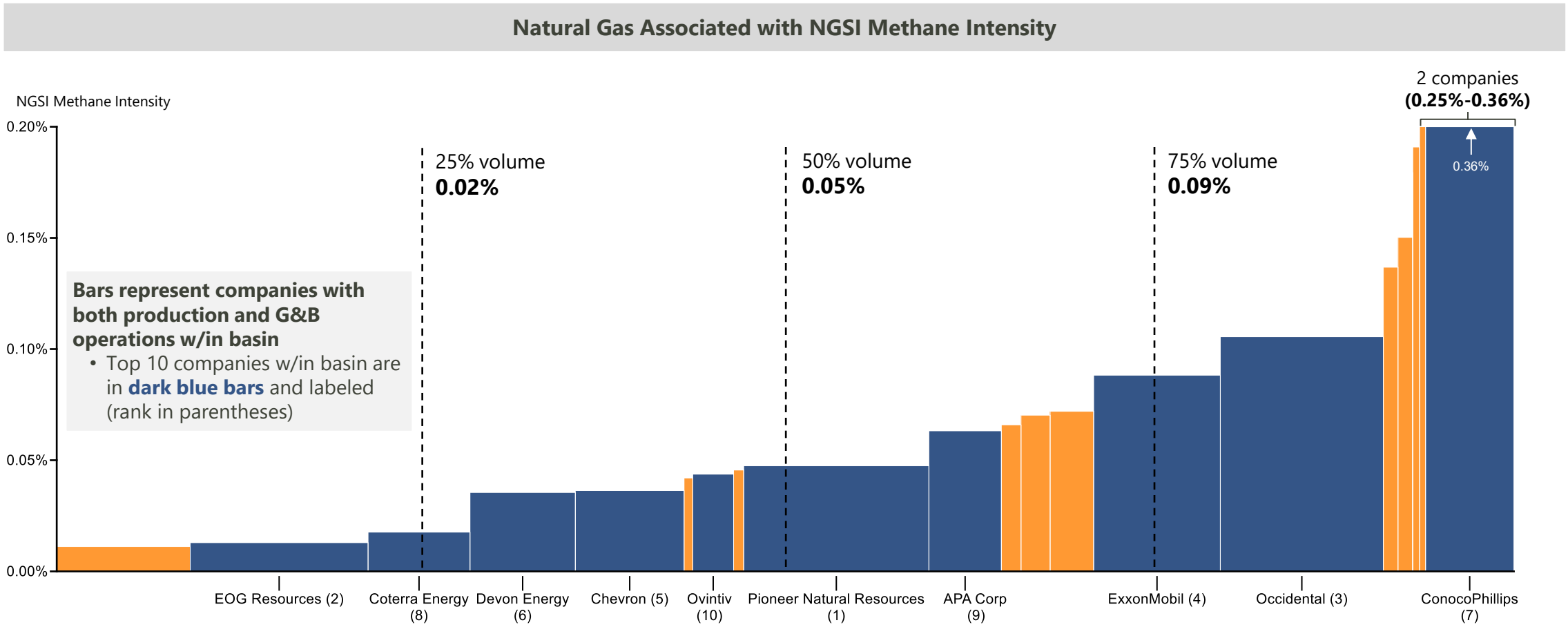


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Permian Basin Companies

2023 Data

Total GHGRP Natural Gas Volume, by Methane Intensity



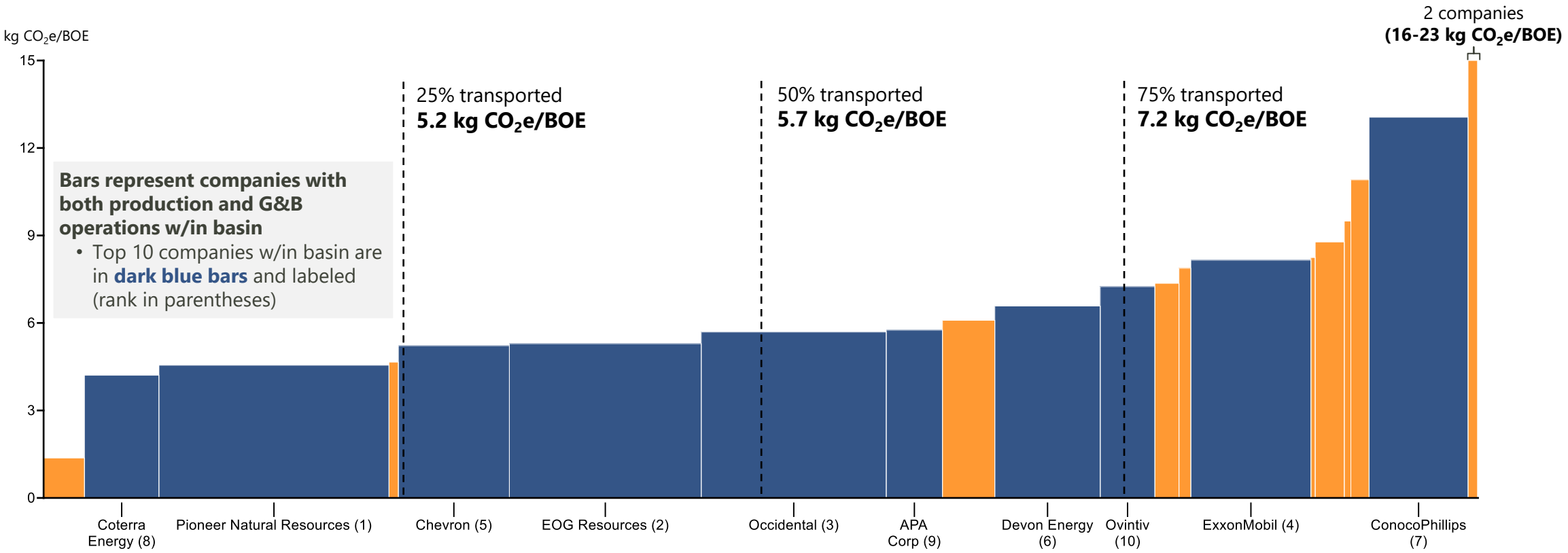
Natural Gas Volume ⟶ Total Gas Volume: 10.5 trillion cubic feet

Permian Basin Companies

2023 Data

Total GHGRP Hydrocarbon Energy, by GHG Intensity

Hydrocarbons Associated with GHG Intensity

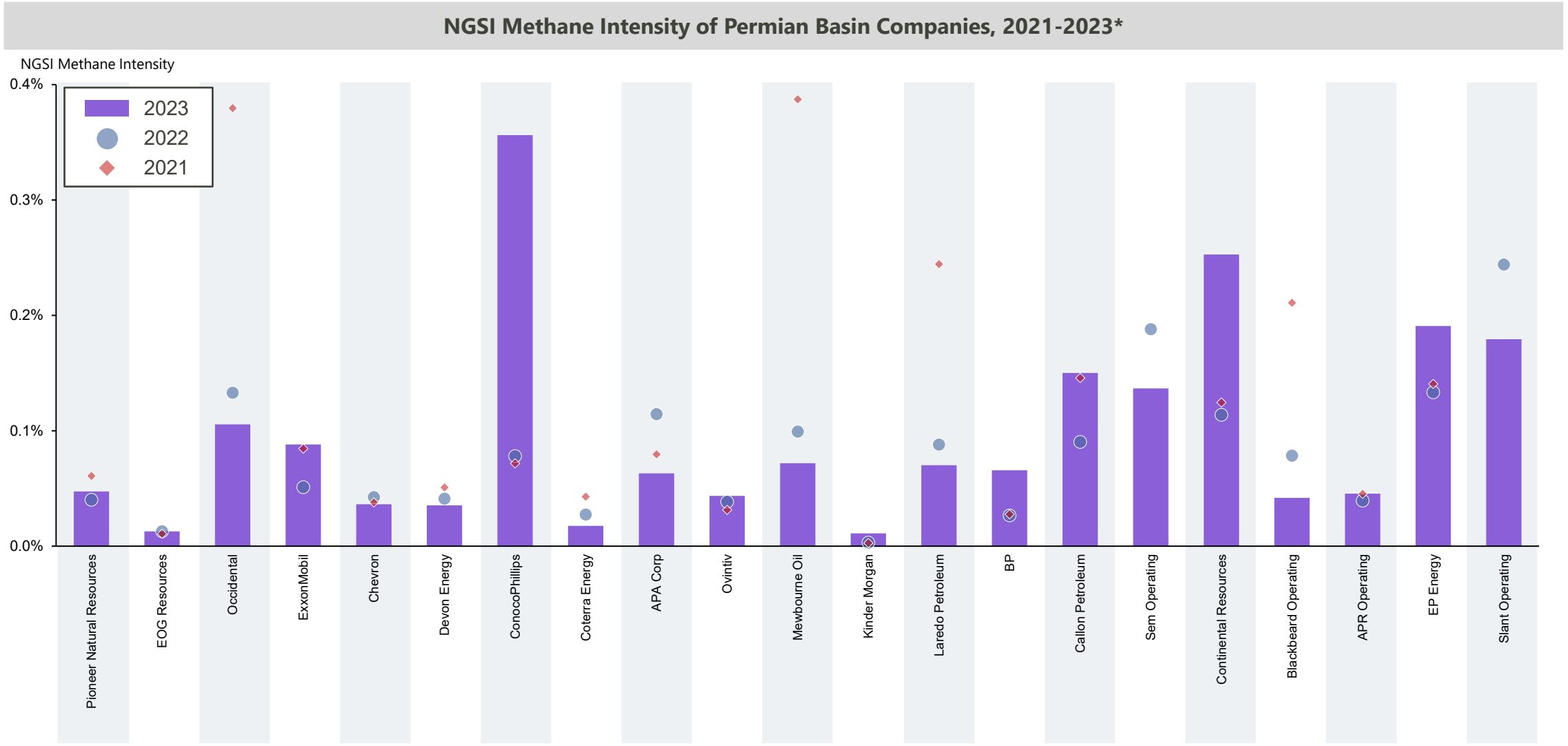


Hydrocarbon Energy →

Total Hydrocarbon Energy: 4.49 billion BOE

Permian Basin Companies

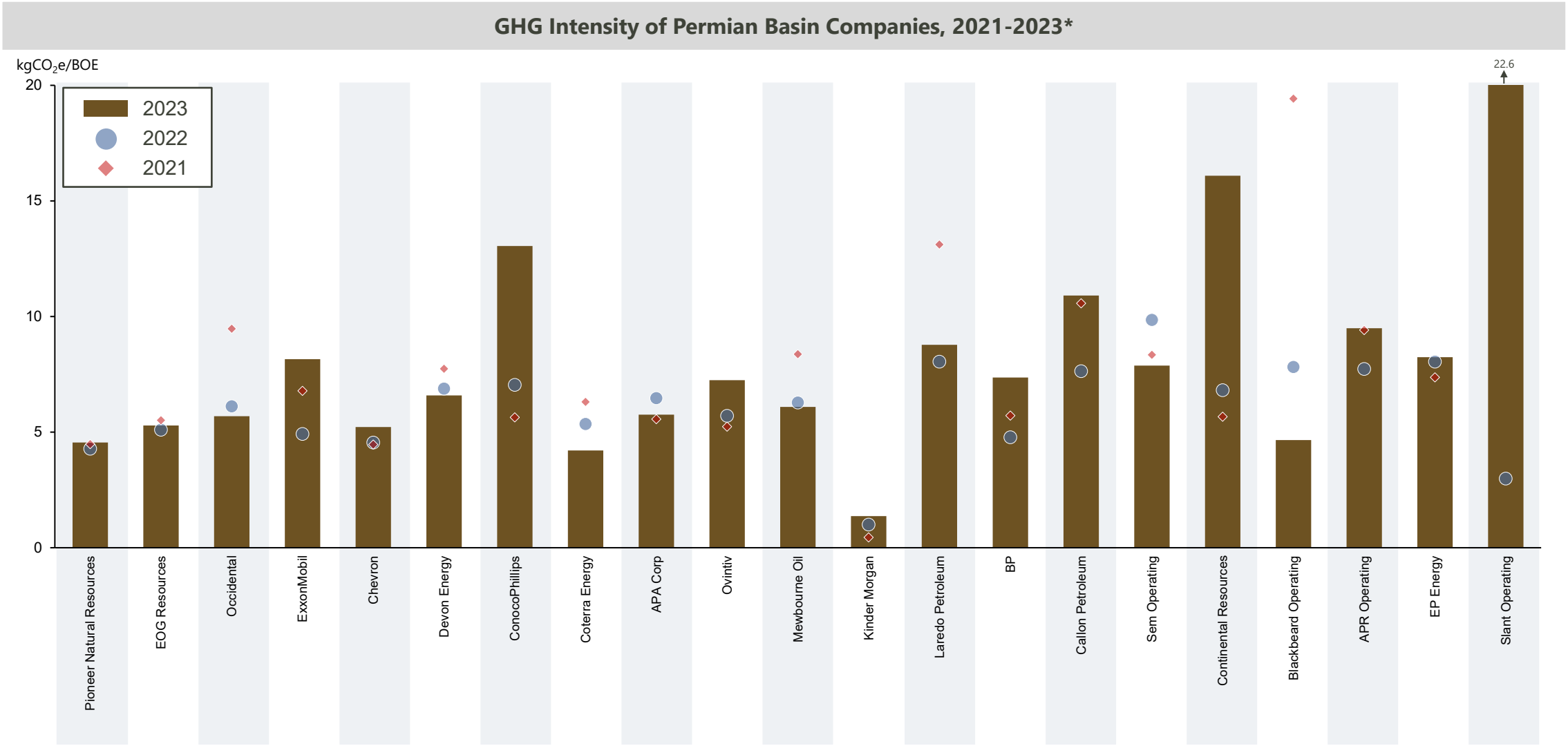
2021-2023 Trends Analysis: Change in Methane Intensity



*Note that some companies in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Permian Basin Companies

2021-2023 Trends Analysis: Change in GHG Intensity

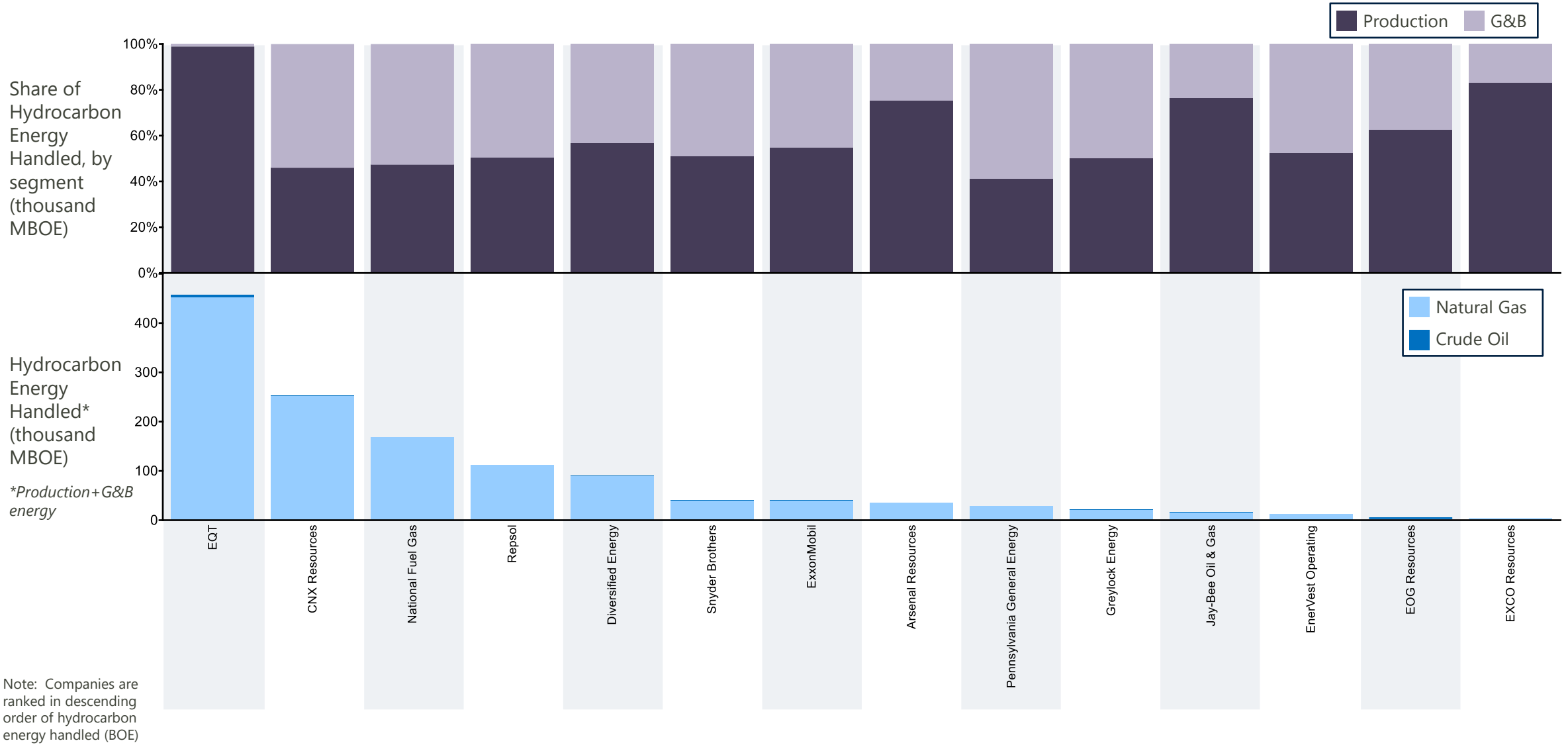


*Note that some companies in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Appalachian Basin Companies

2023 Data

Total Hydrocarbon Energy Handled

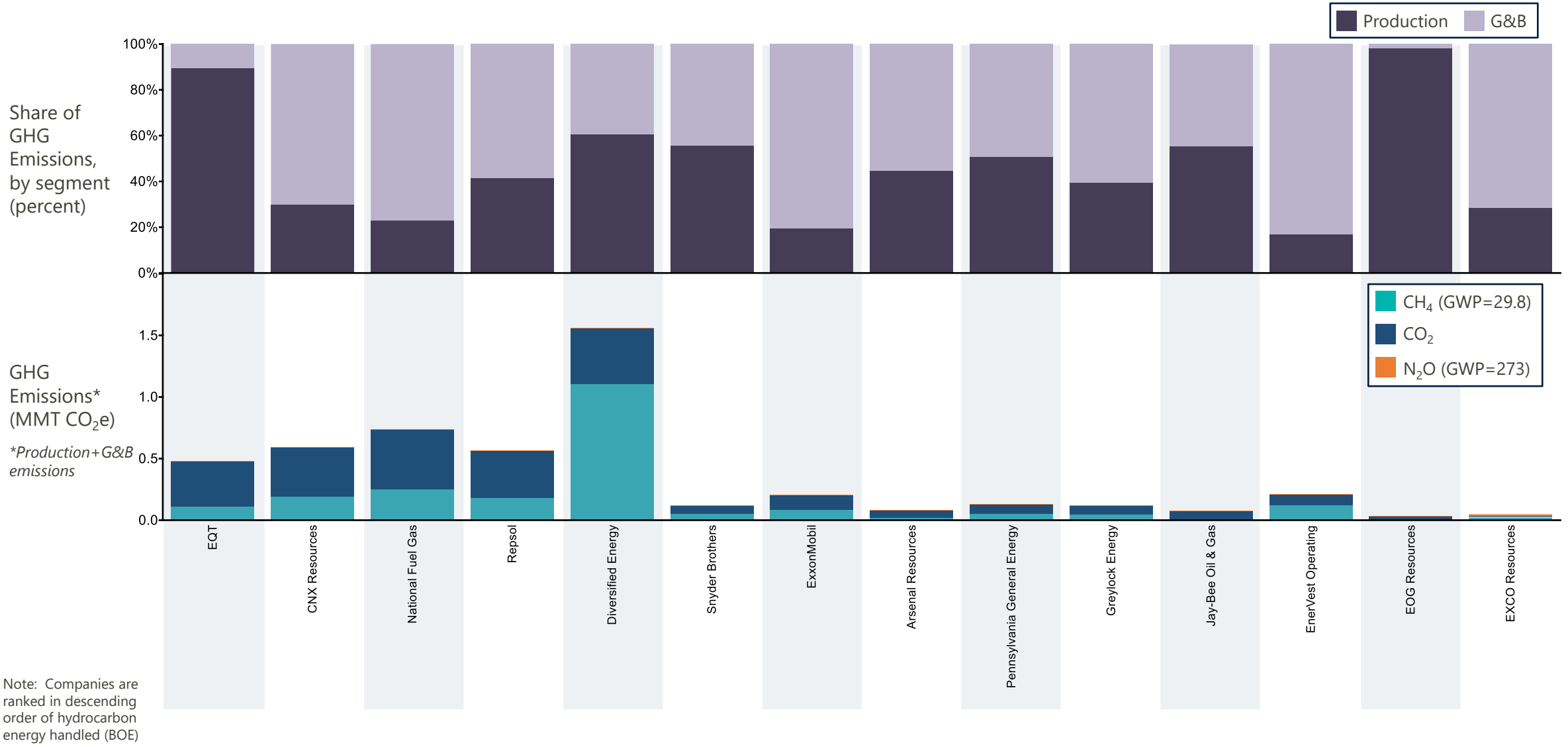


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Appalachian Basin Companies

2023 Data

Total GHG Emissions (100-year GWP)

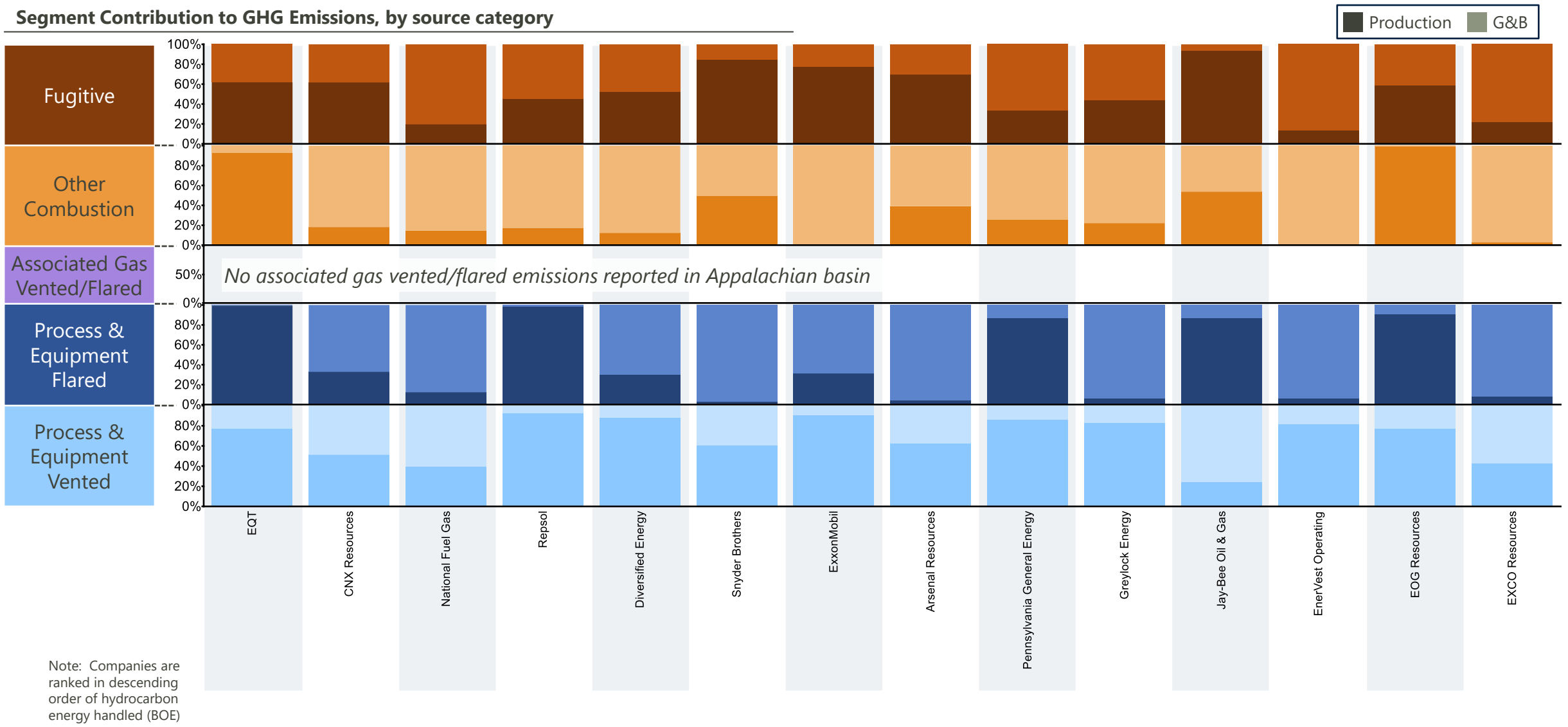


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Appalachian Basin Companies

2023 Data

Total GHG Emissions Share, by Source & Segment (100-year GWP)

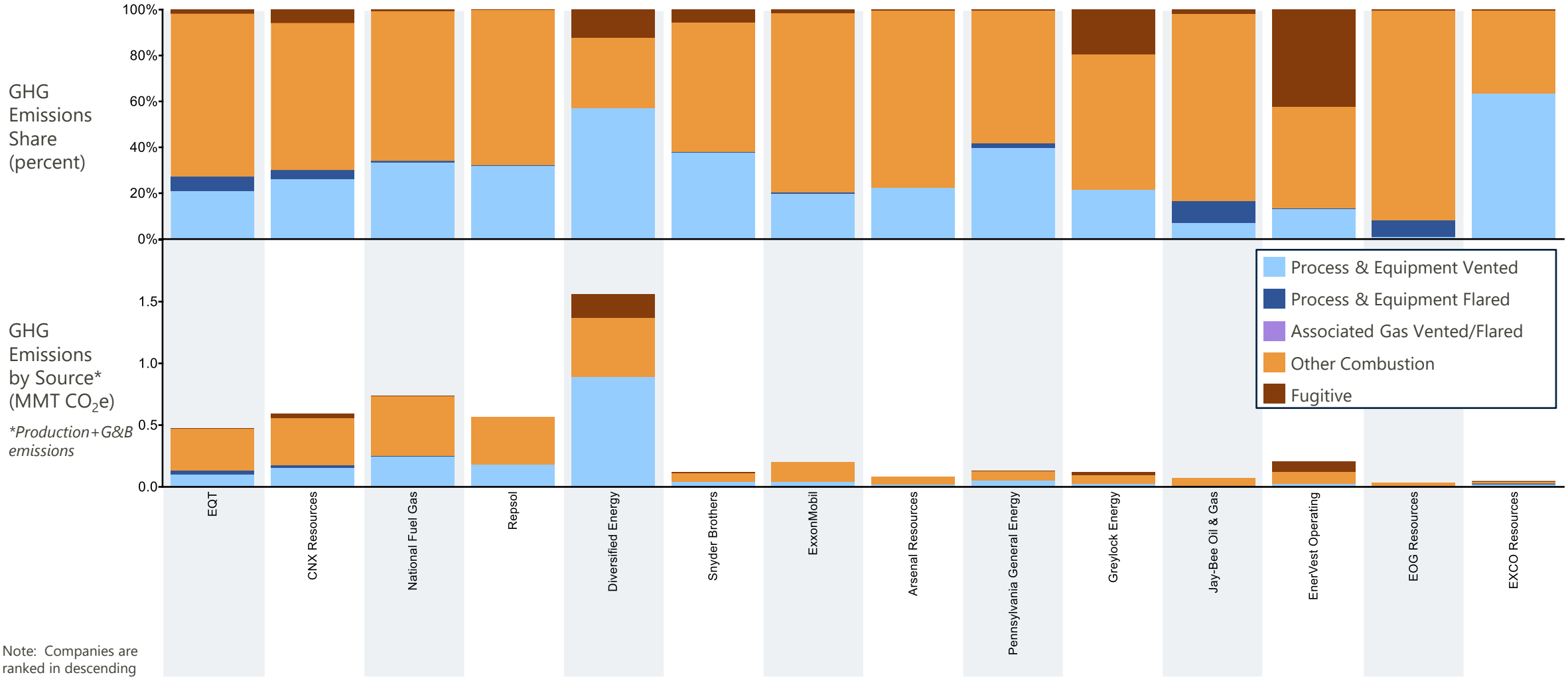


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Appalachian Basin Companies

2023 Data

GHG Emissions by Source (100-year GWP)

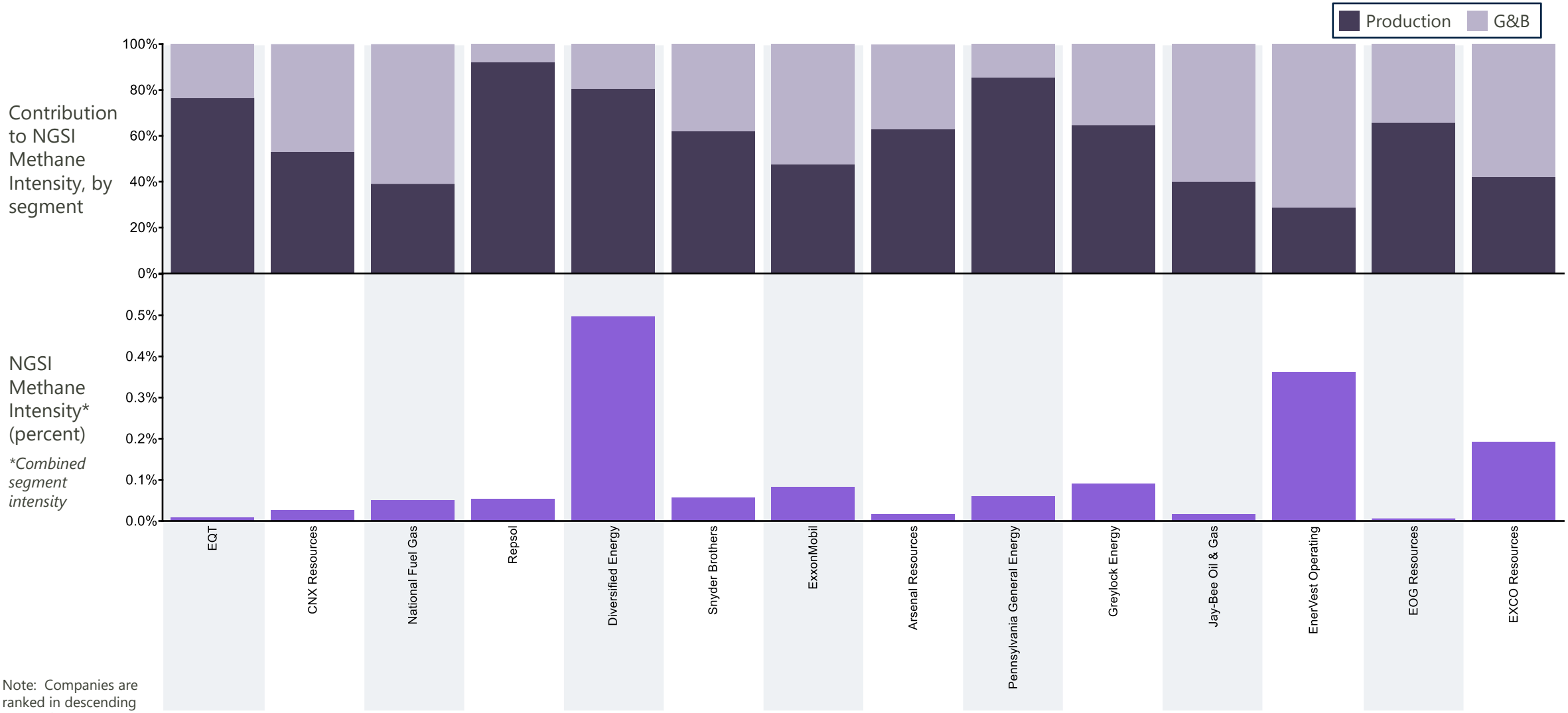


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Appalachian Basin Companies

2023 Data

Methane Intensity

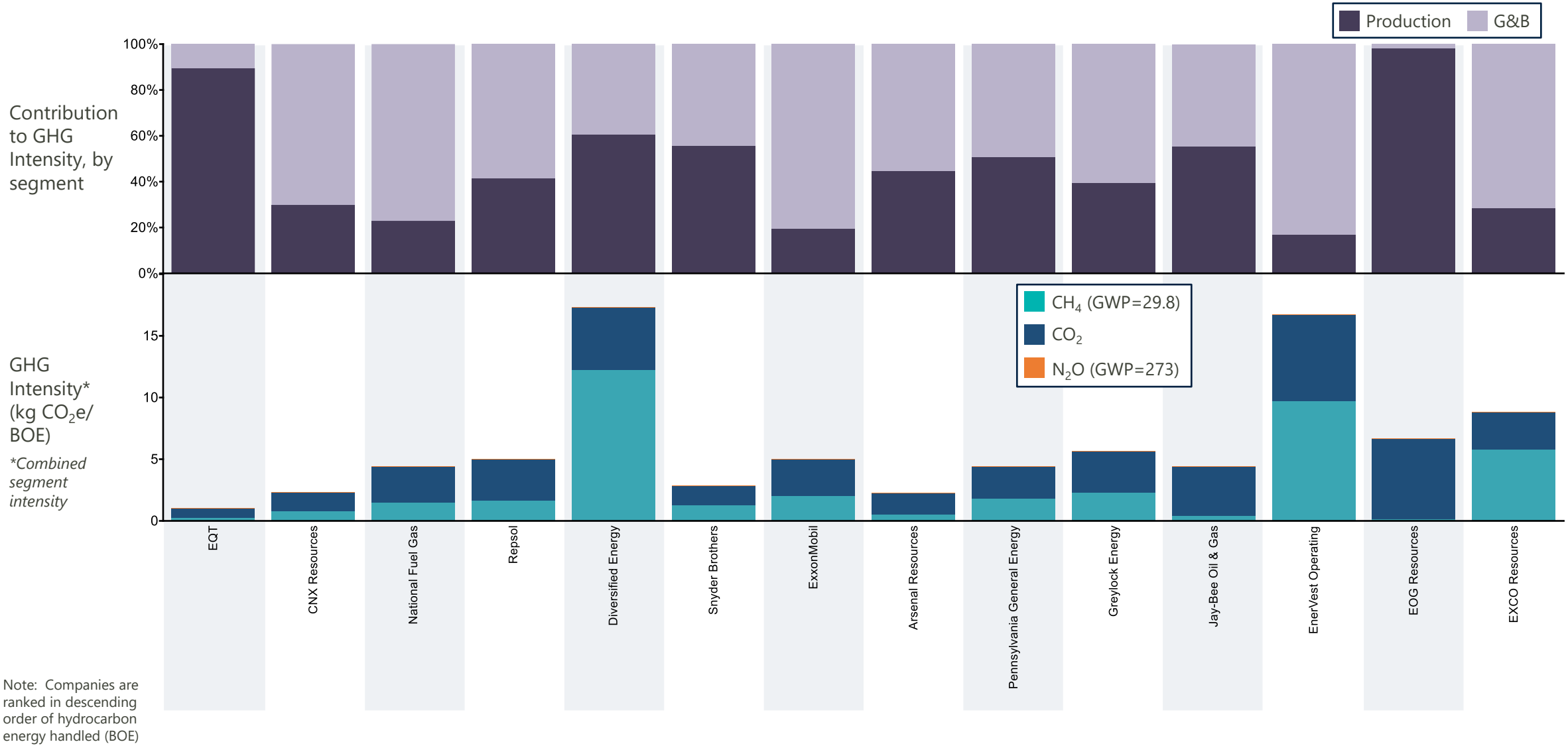


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Appalachian Basin Companies

2023 Data

GHG Emissions Intensity (100-year GWP)

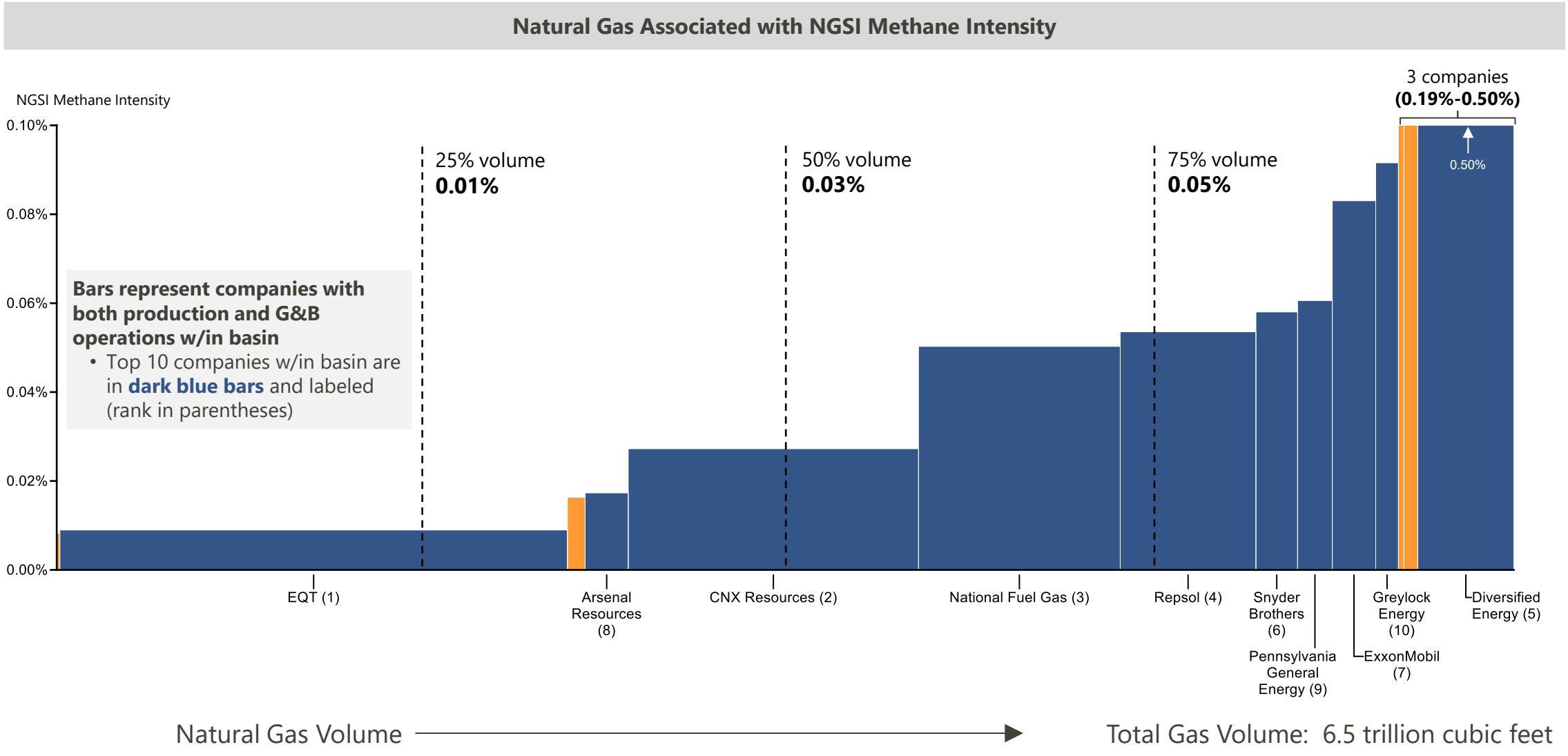


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Appalachian Basin Companies

2023 Data

Total GHGRP Natural Gas Volume, by Methane Intensity

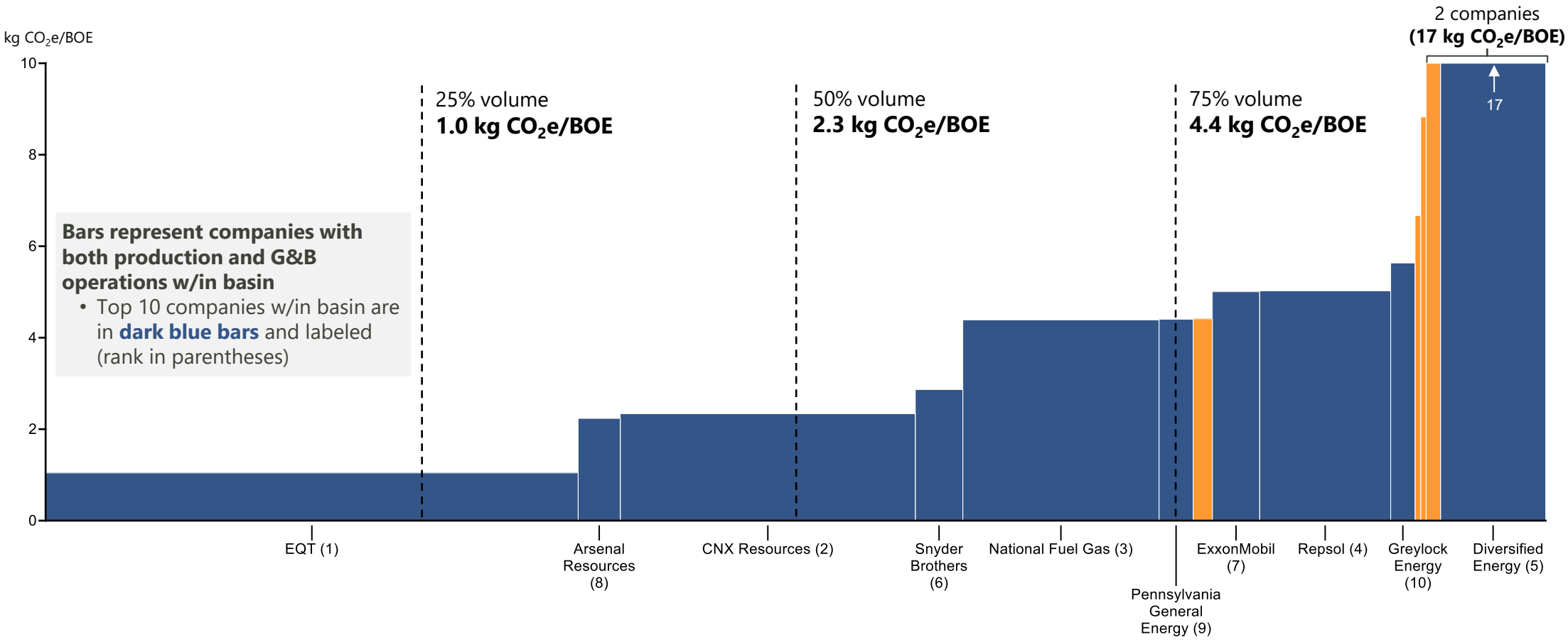


Appalachian Basin Companies

2023 Data

Total GHGRP Hydrocarbon Energy, by GHG Intensity

Hydrocarbons Associated with GHG Intensity

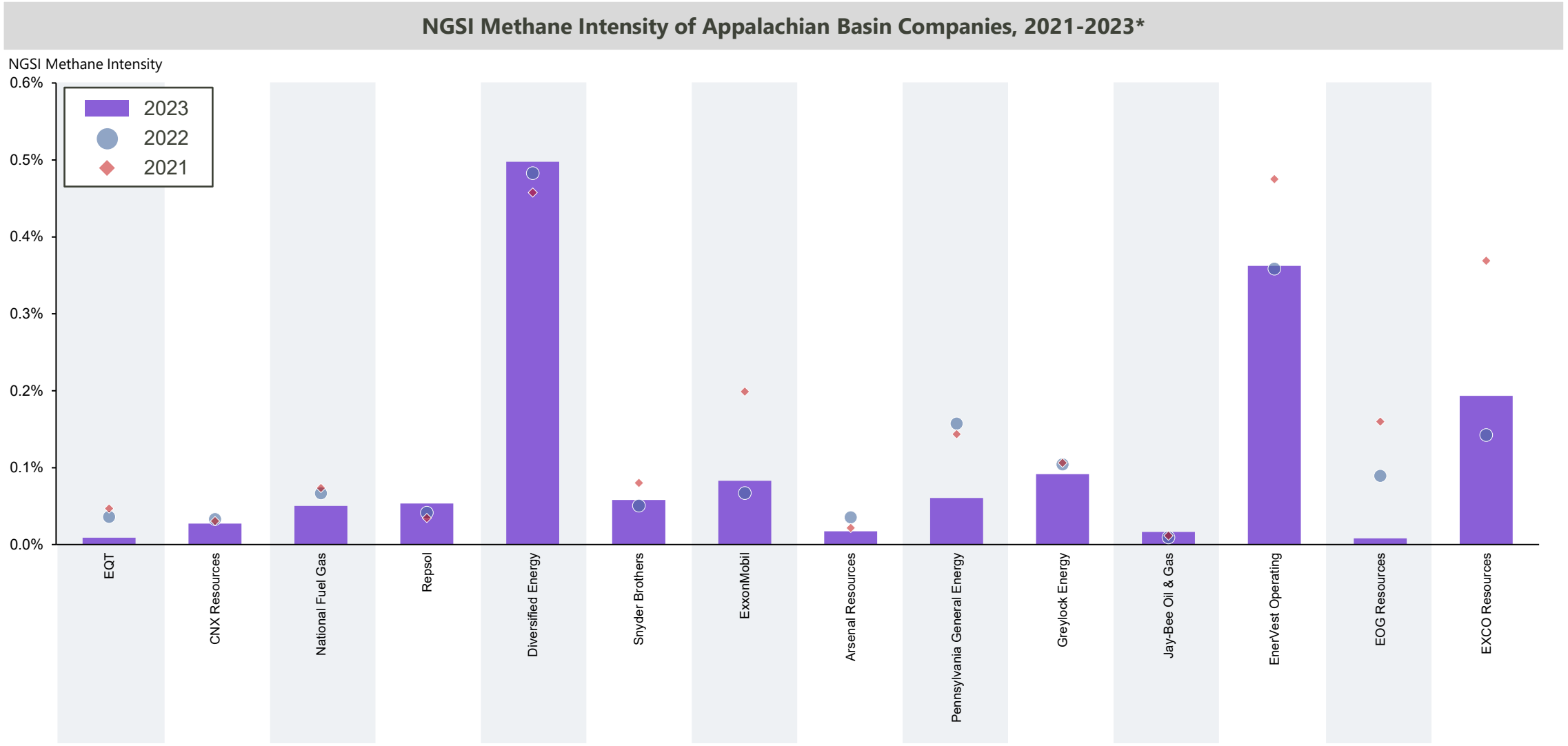


Hydrocarbon Energy ⟶

Total Hydrocarbon Energy: 1.29 billion BOE

Appalachian Basin Companies

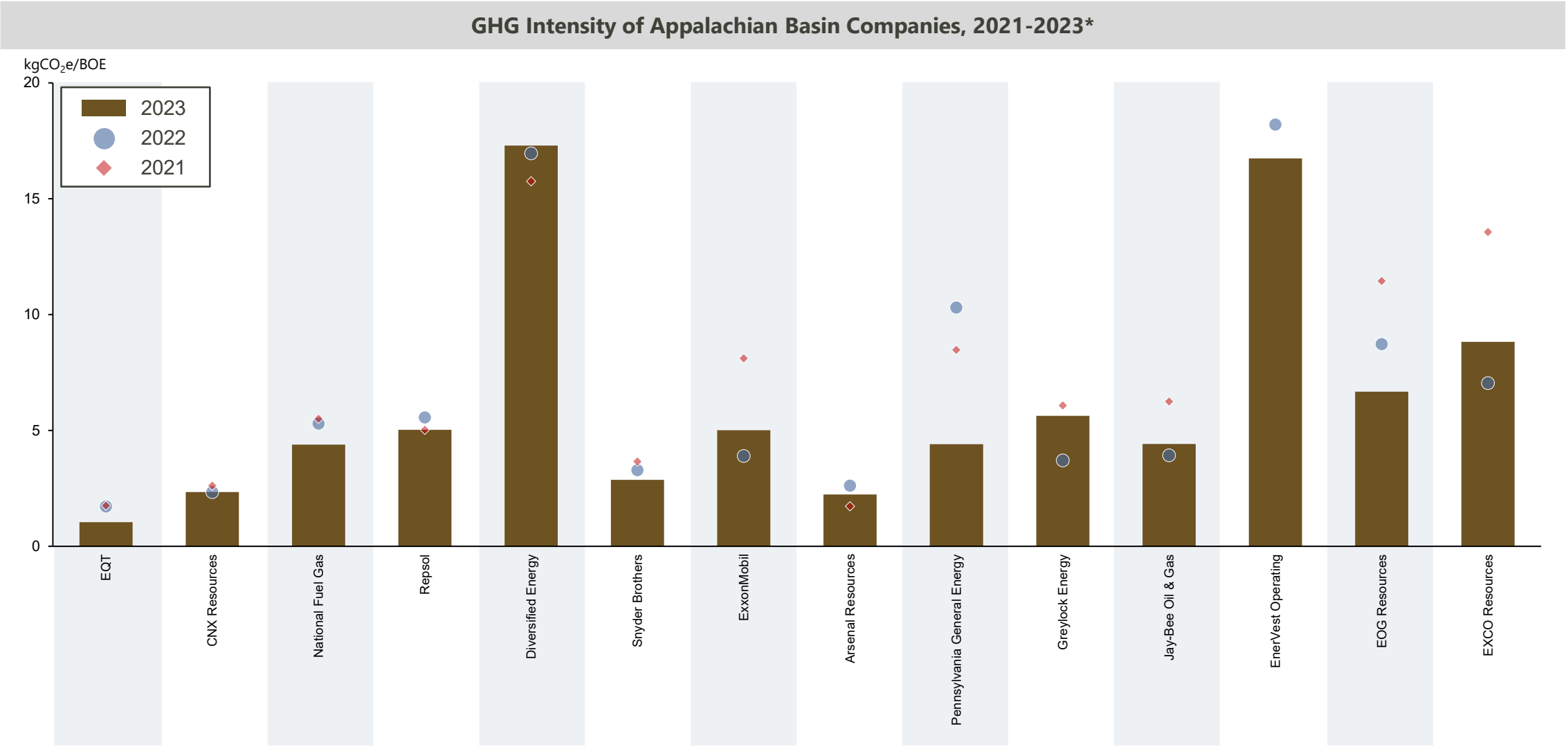
2021-2023 Trends Analysis: Change in Methane Intensity



*Note that some companies in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Appalachian Basin Companies

2021-2023 Trends Analysis: Change in GHG Intensity

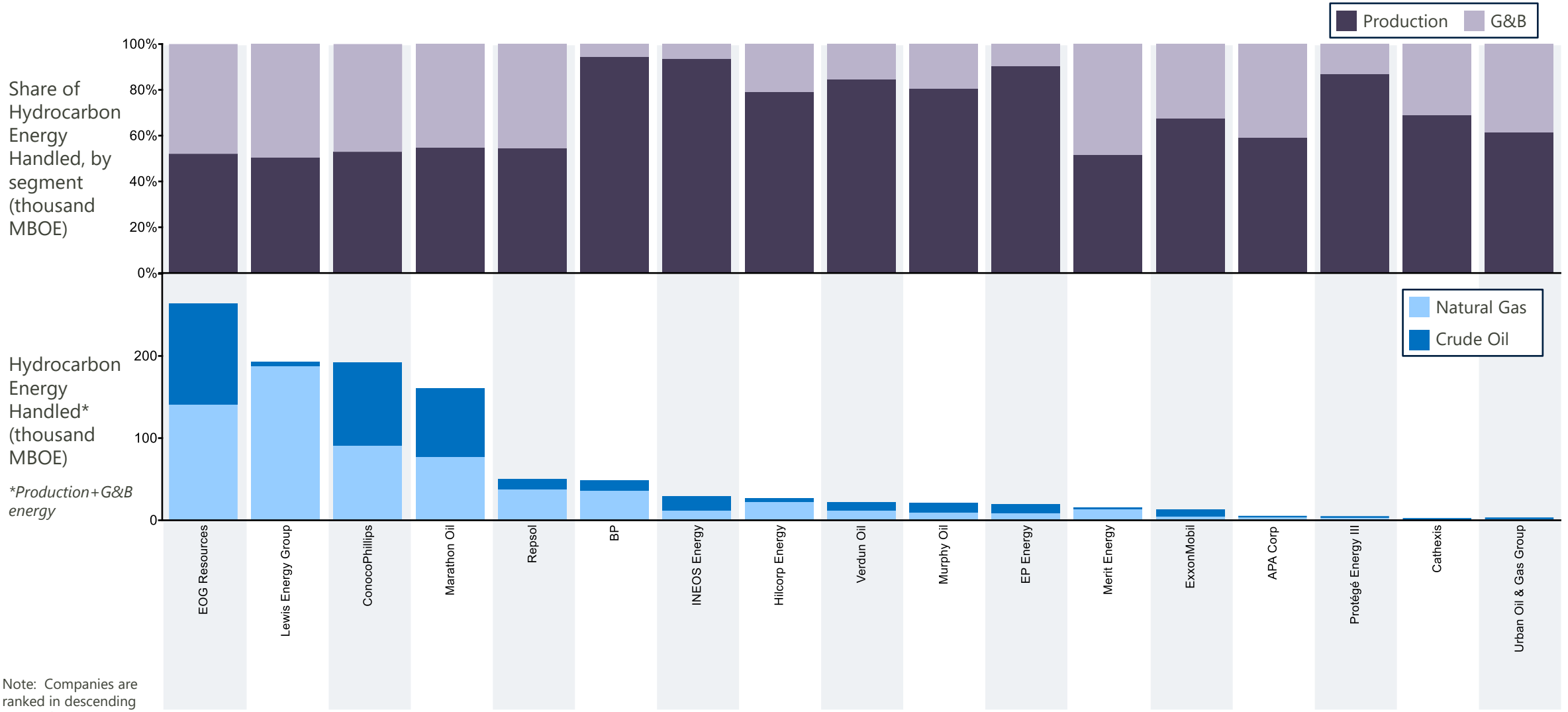


*Note that some companies in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Gulf Coast Basin Companies

2023 Data

Total Hydrocarbon Energy Handled

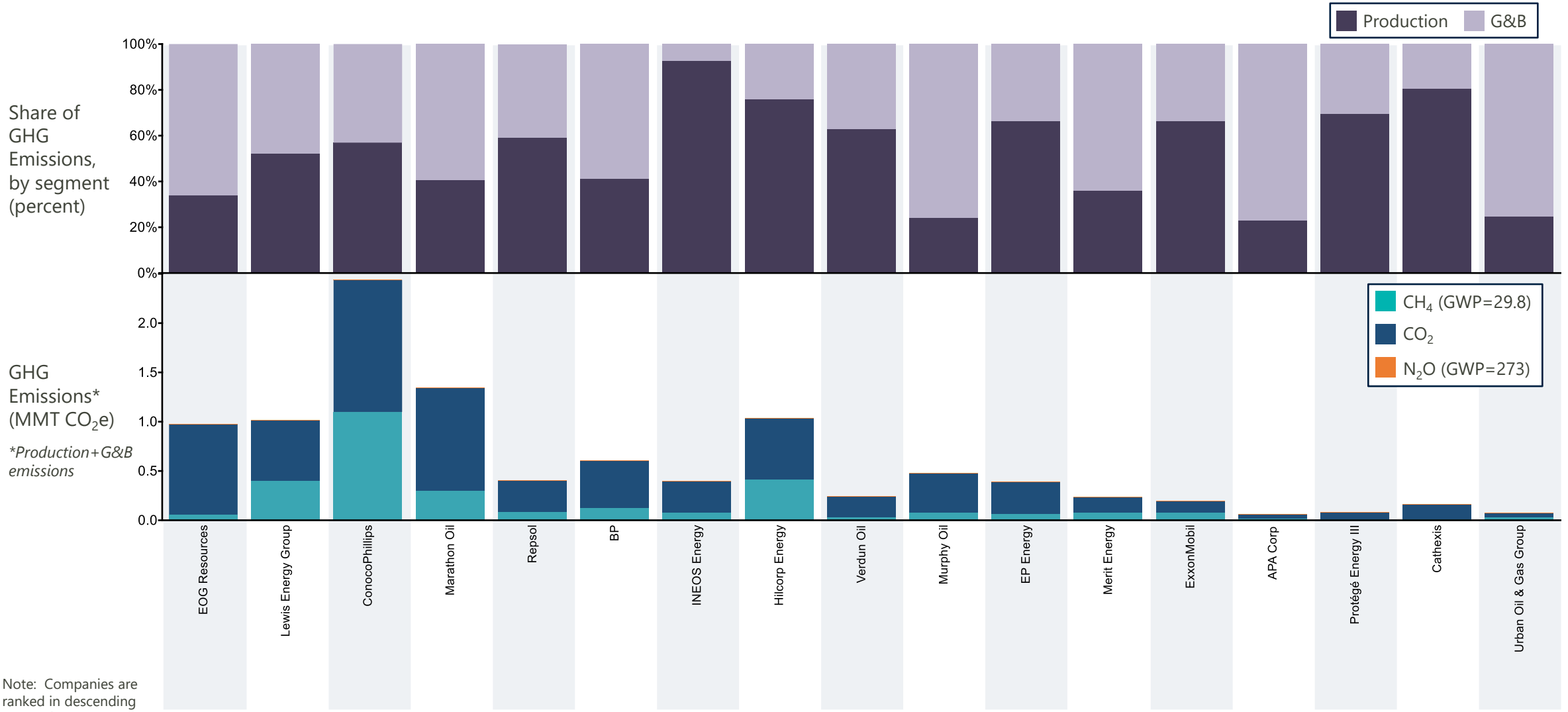


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Gulf Coast Basin Companies

2023 Data

Total GHG Emissions (100-year GWP)

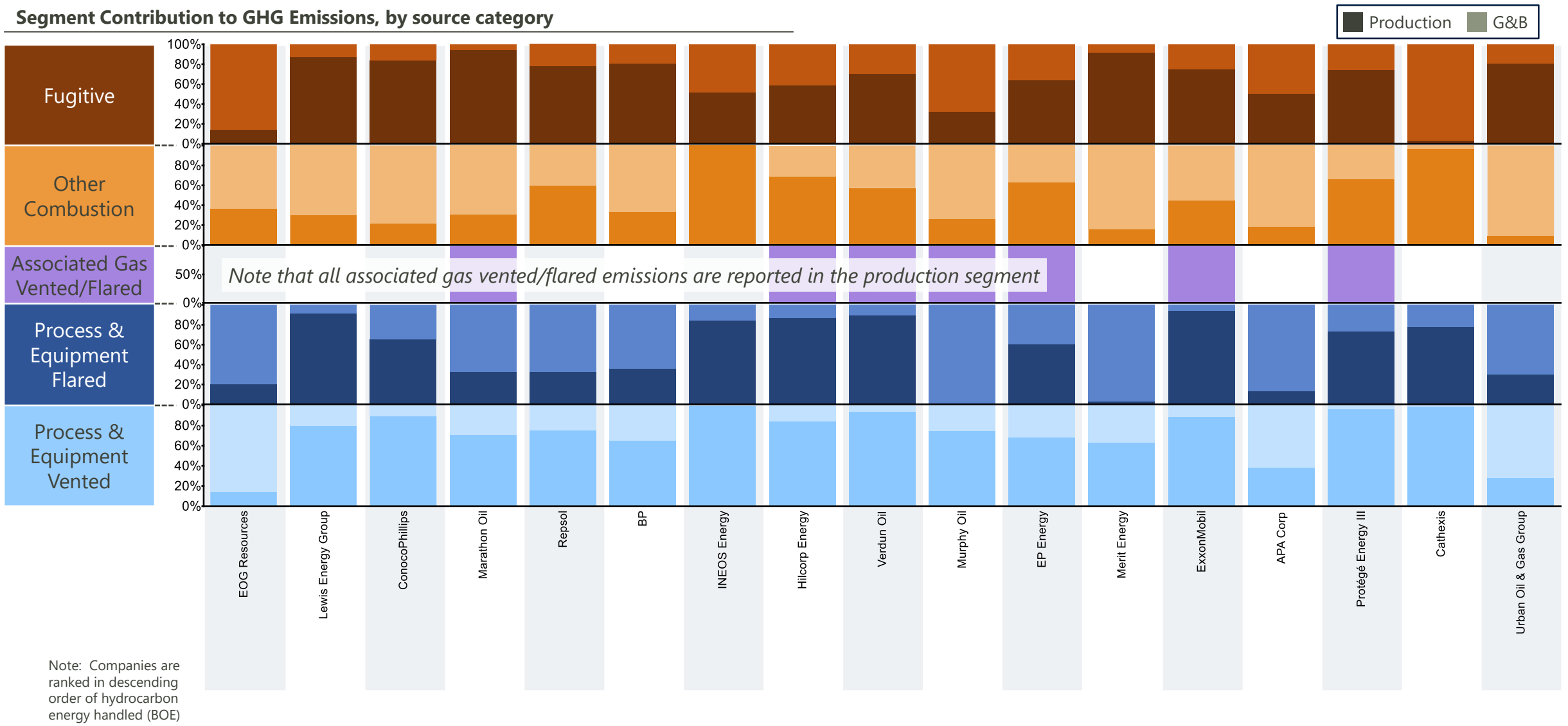


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Gulf Coast Basin Companies

2023 Data

Total GHG Emissions Share, by Source & Segment (100-year GWP)

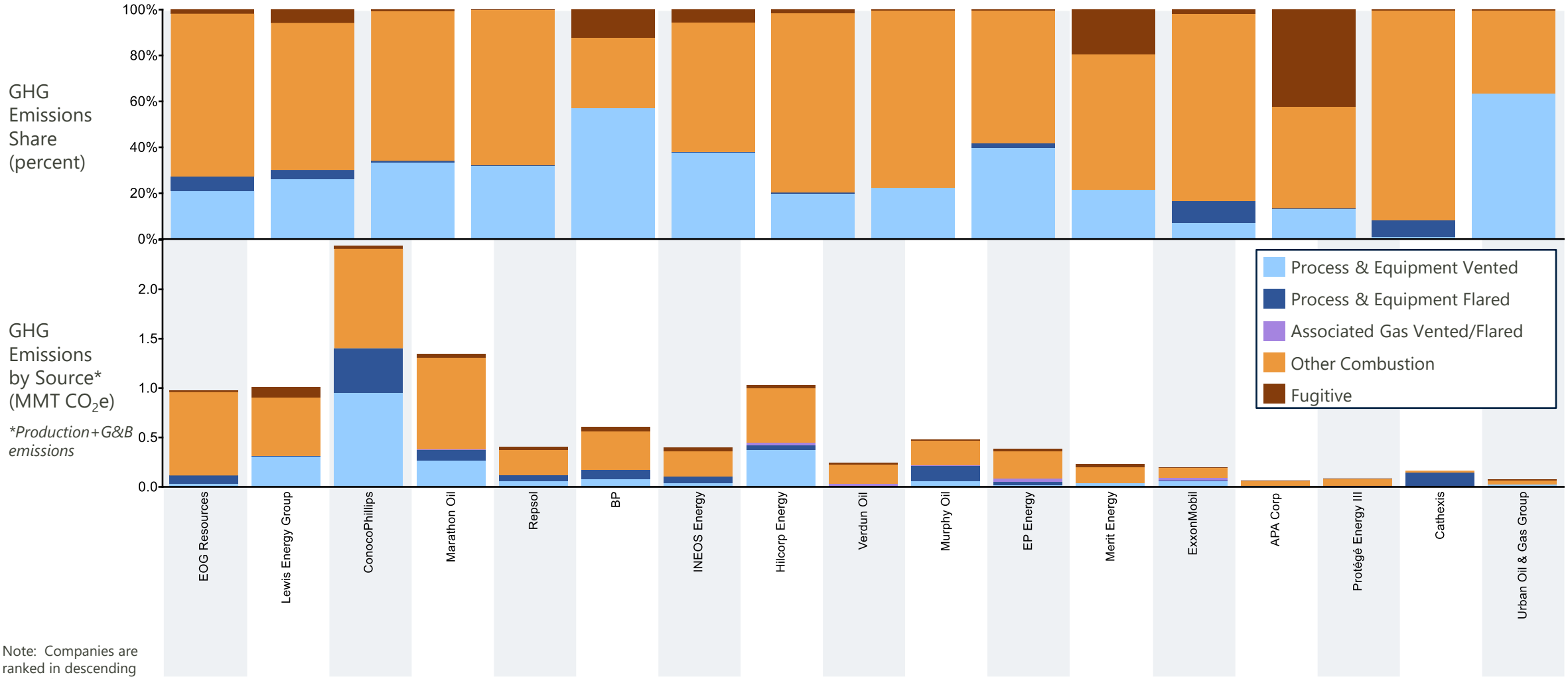


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Gulf Coast Basin Companies

2023 Data

GHG Emissions by Source (100-year GWP)

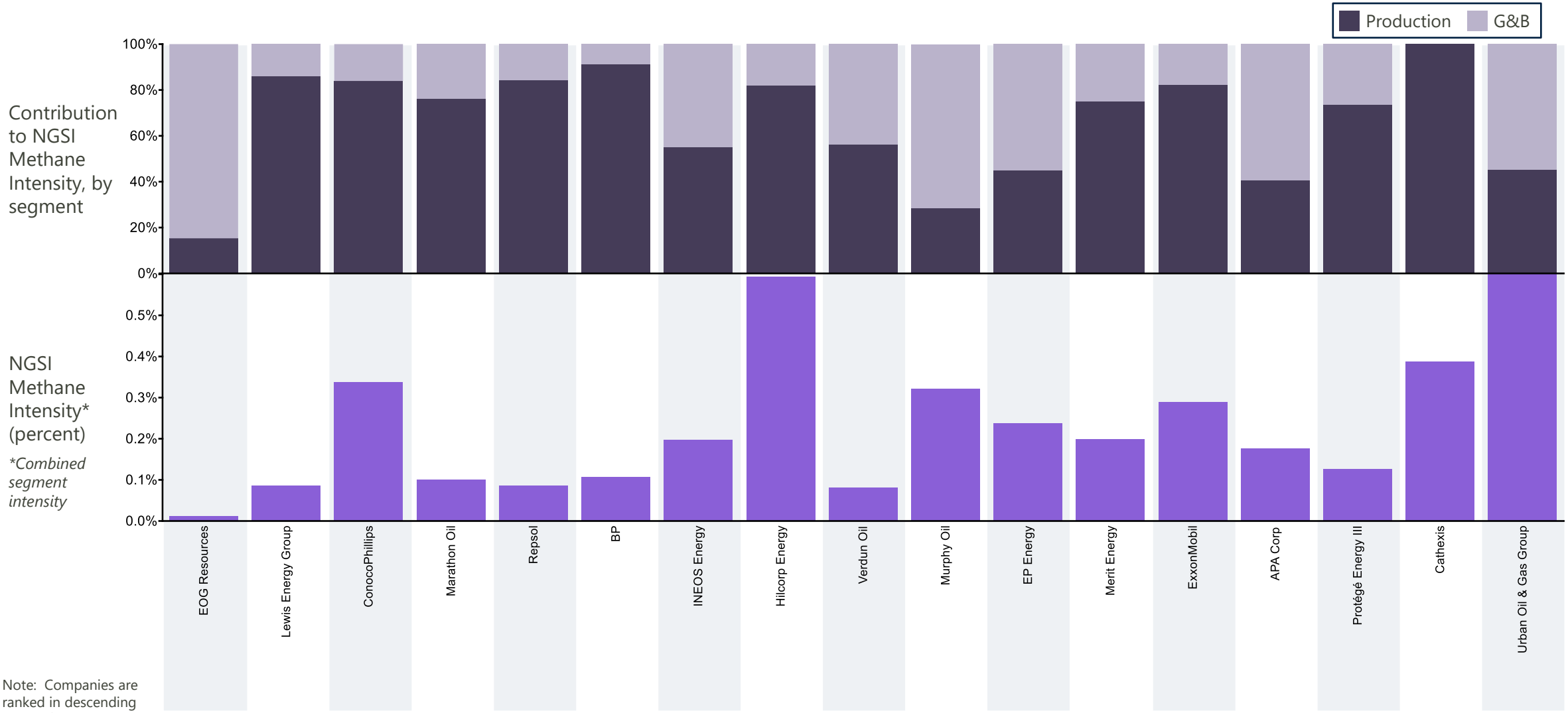


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Gulf Coast Basin Companies

2023 Data

Methane Intensity

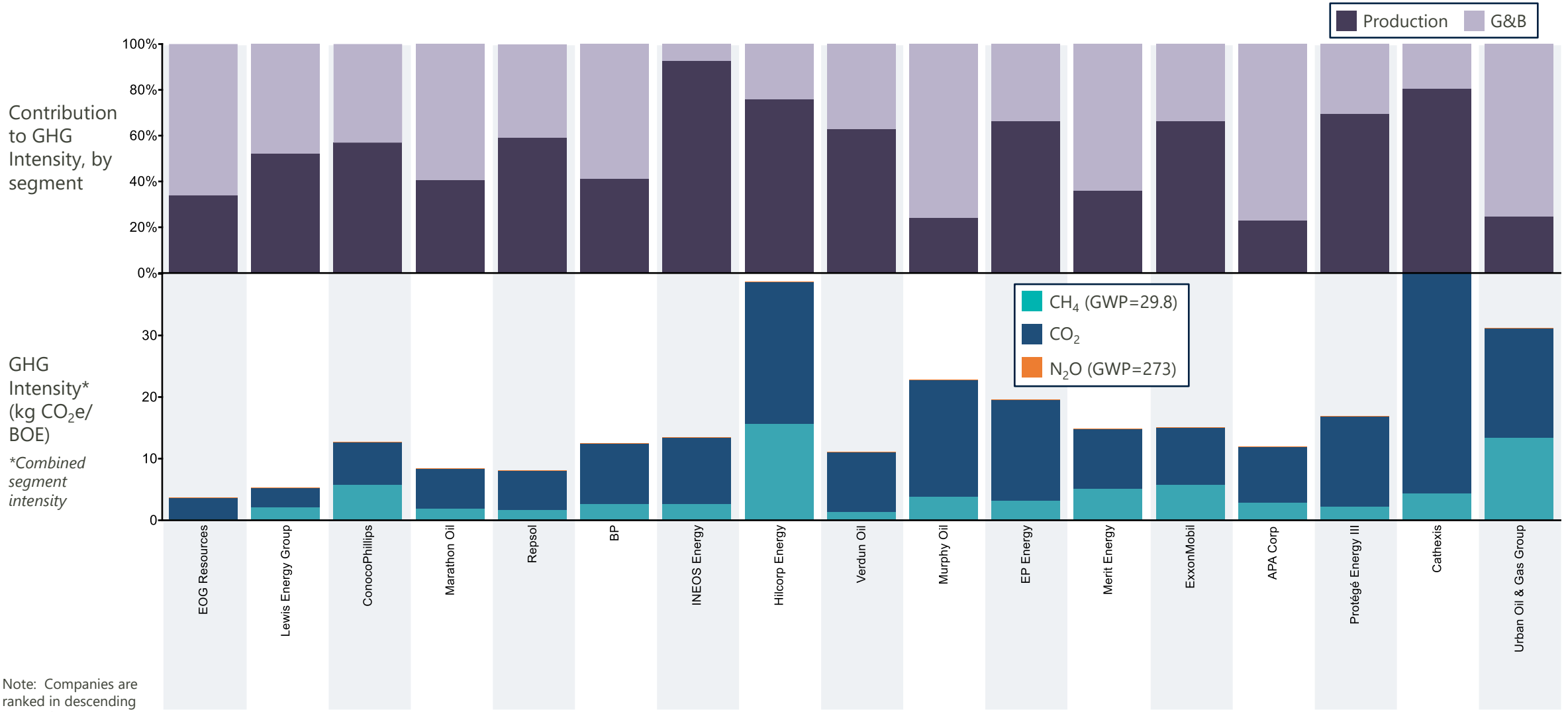


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Gulf Coast Basin Companies

2023 Data

GHG Emissions Intensity (100-year GWP)

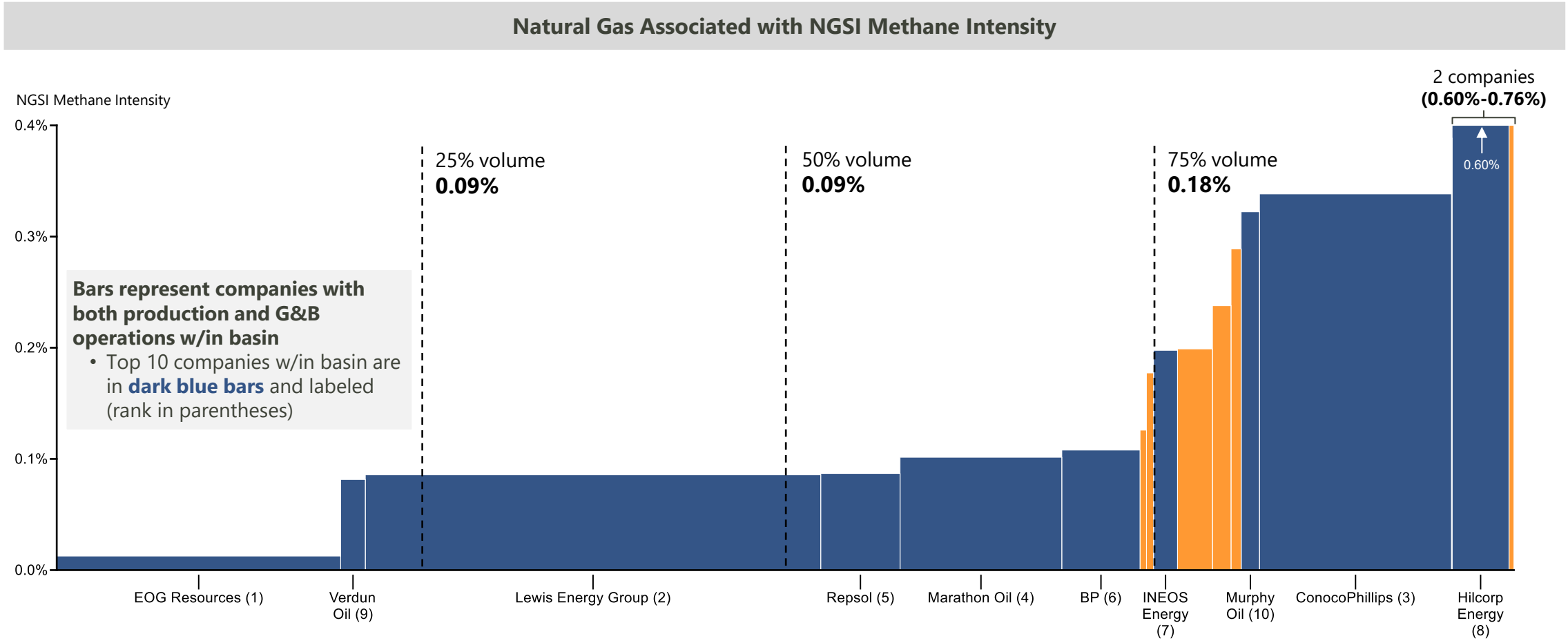


Note: Companies are ranked in descending order of hydrocarbon energy handled (BOE)

Gulf Coast Basin Companies

2023 Data

Total GHGRP Natural Gas Volume, by Methane Intensity



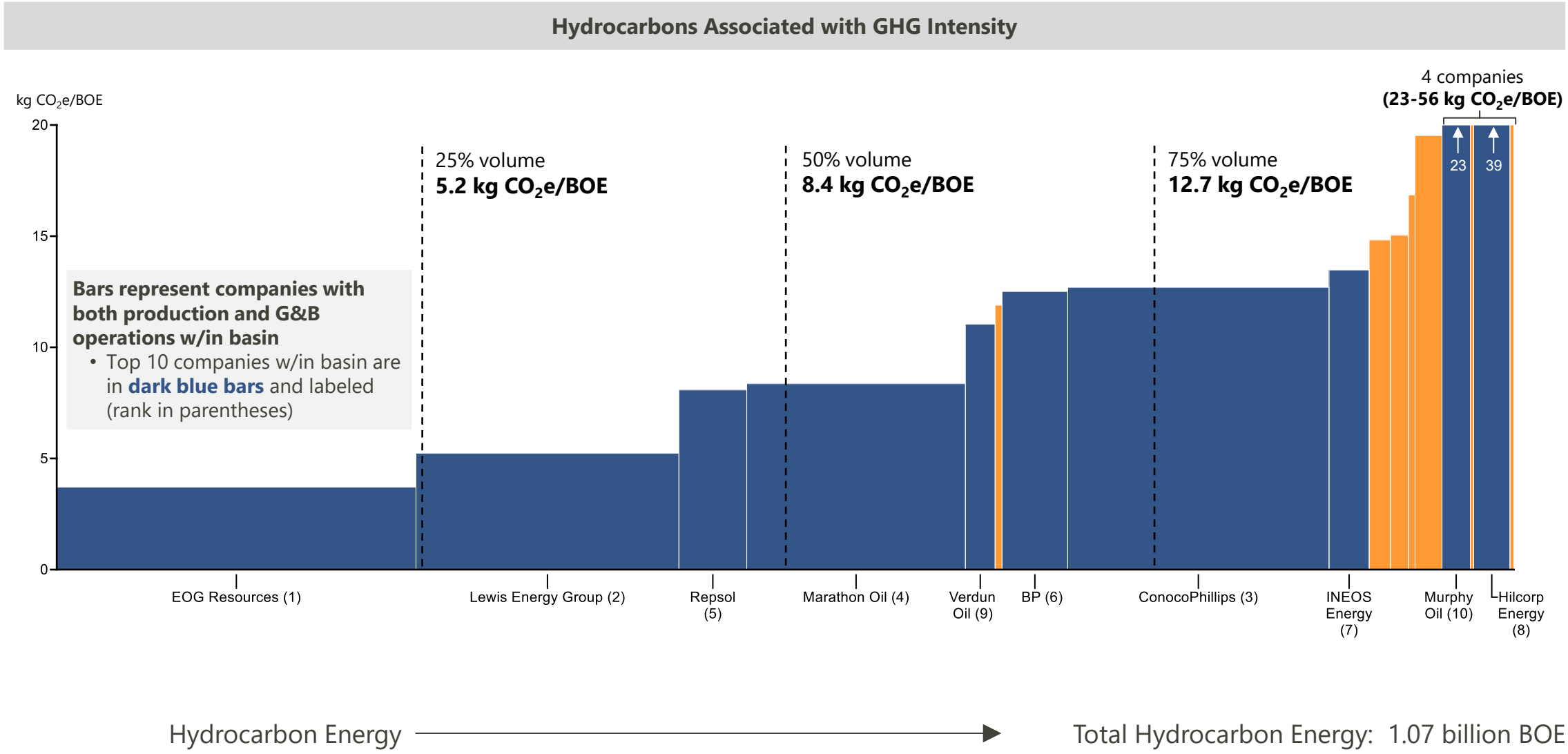
Natural Gas Volume ⟶

Total Gas Volume: 2.9 trillion cubic feet

Gulf Coast Basin Companies

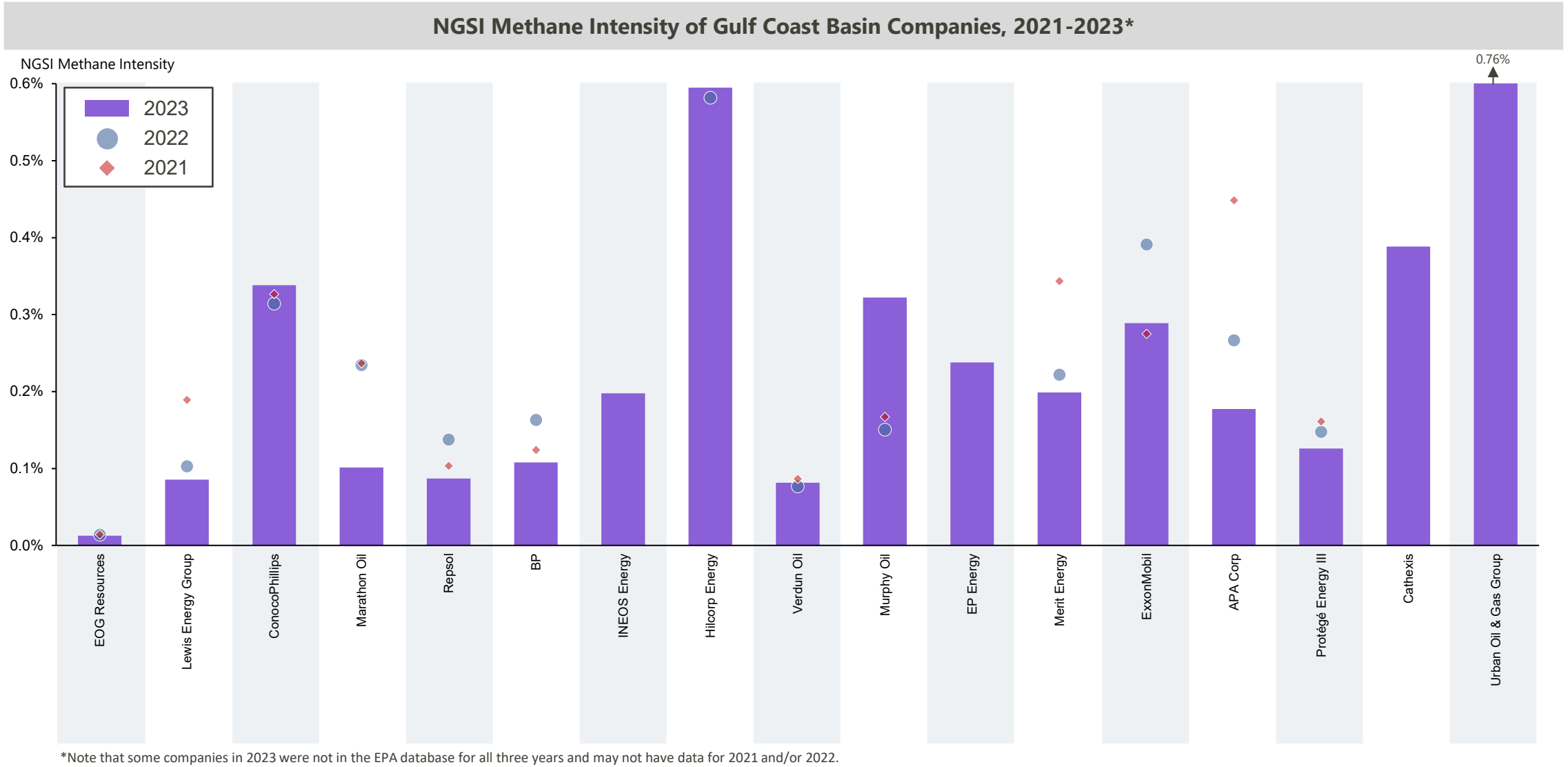
2023 Data

Total GHGRP Hydrocarbon Energy, by GHG Intensity



Gulf Coast Basin Companies

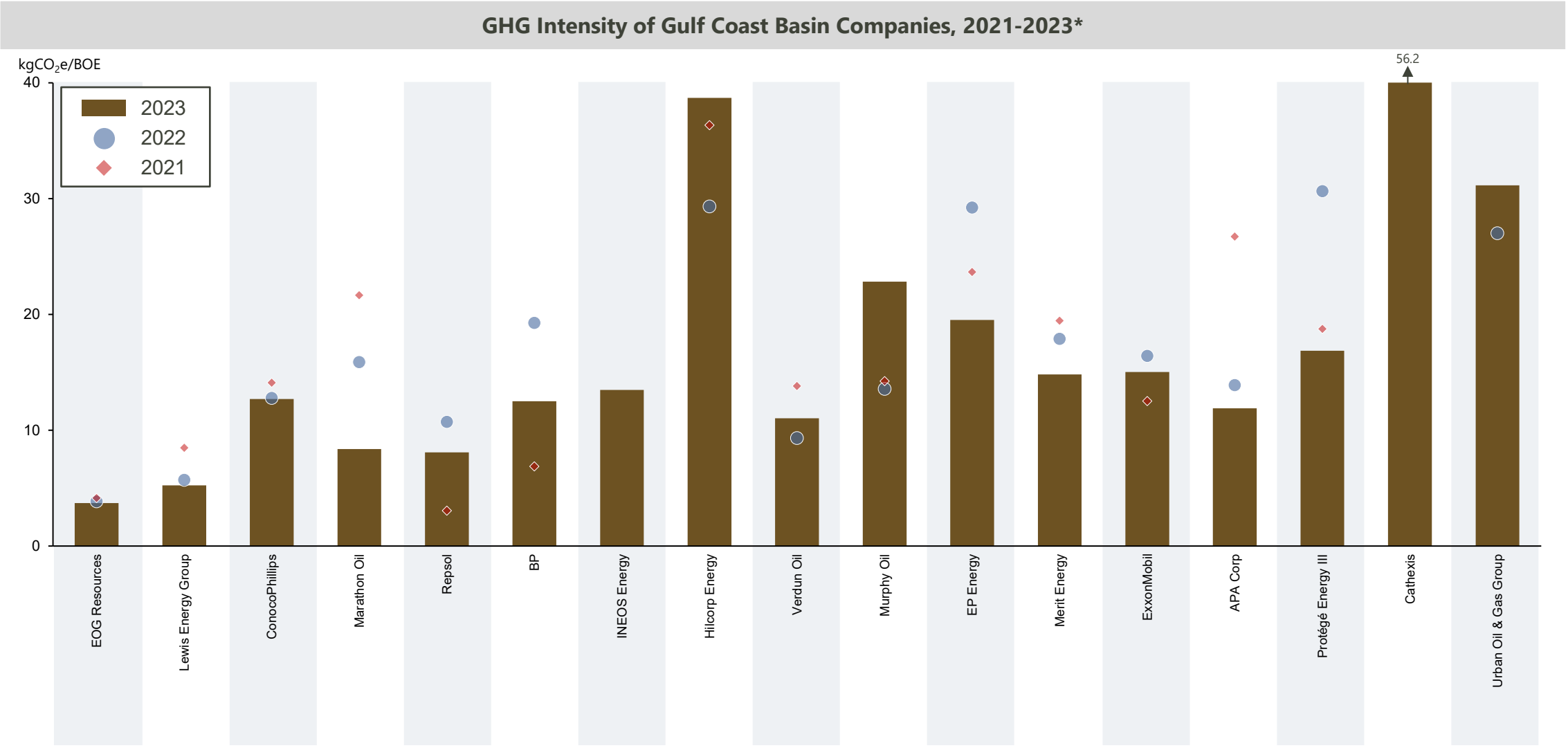
2021-2023 Trends Analysis: Change in Methane Intensity



*Note that some companies in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

Gulf Coast Basin Companies

2021-2023 Trends Analysis: Change in GHG Intensity



*Note that some companies in 2023 were not in the EPA database for all three years and may not have data for 2021 and/or 2022.

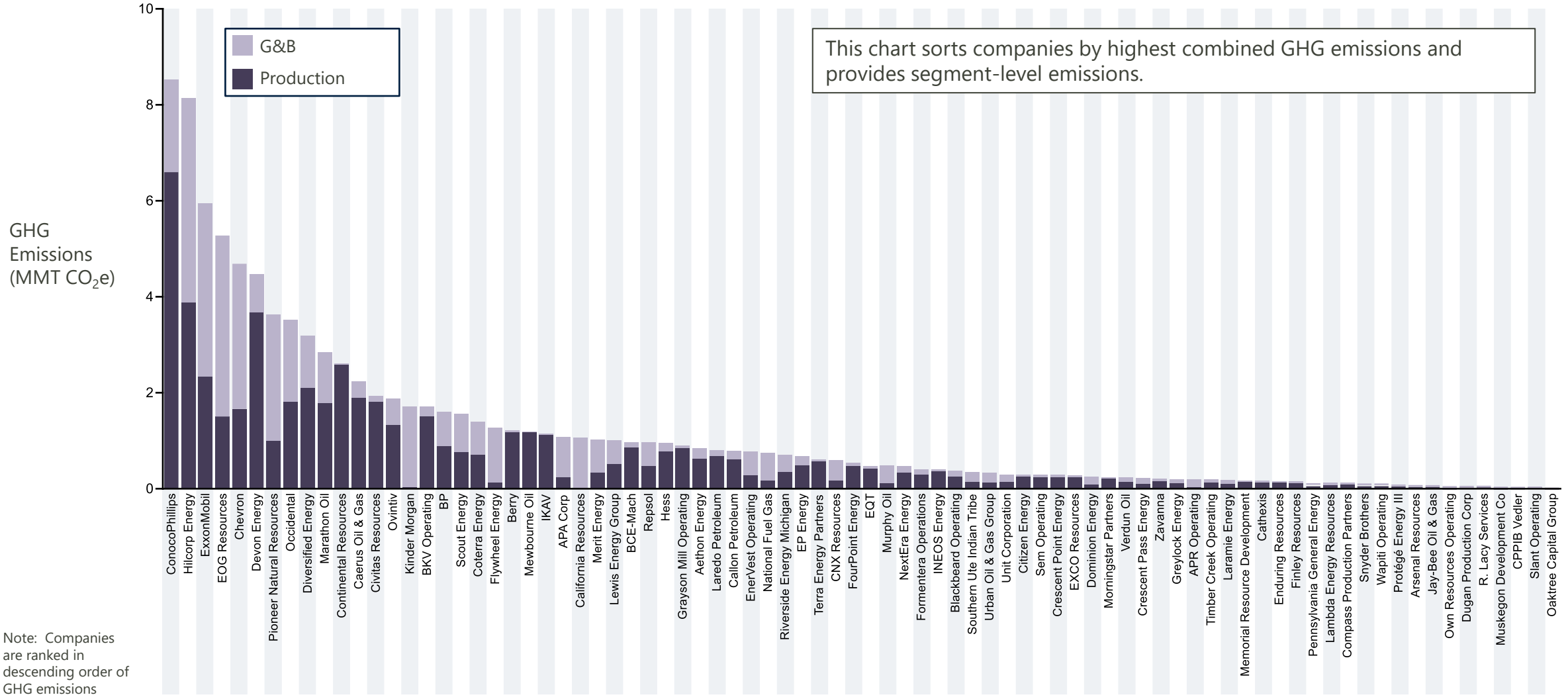
Additional Combined Production and G&B Segment Data

The following charts present emissions and emissions intensity data rankings for key metrics. They capture all 82 companies that reported both onshore production and G&B operations in 2023.

Upstream Companies: Top GHG Emitters

2023 Data

GHG Emissions (100-year GWP)

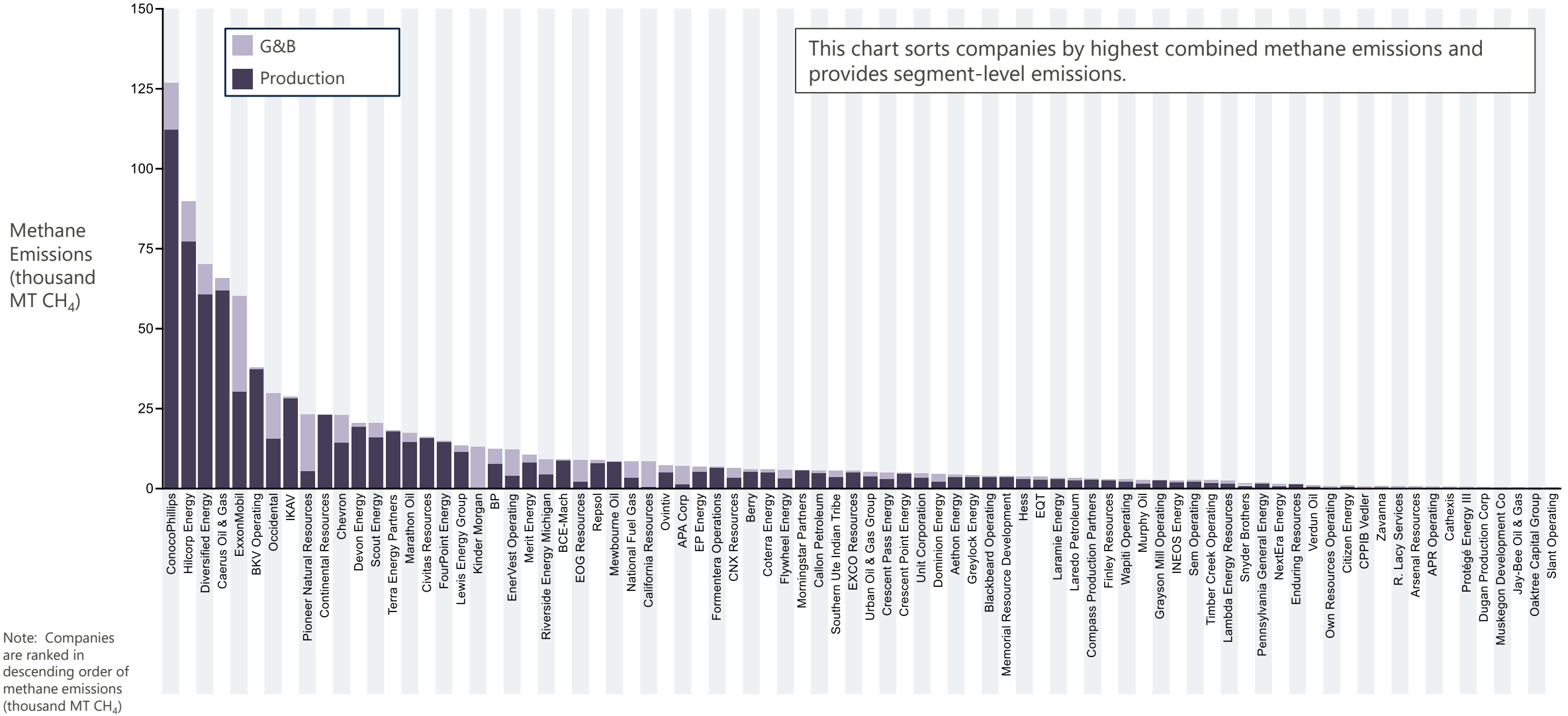


Note: Companies are ranked in descending order of GHG emissions (MMT CO_2e)

Upstream Companies: Top Methane Emitters

2023 Data

Methane Emissions

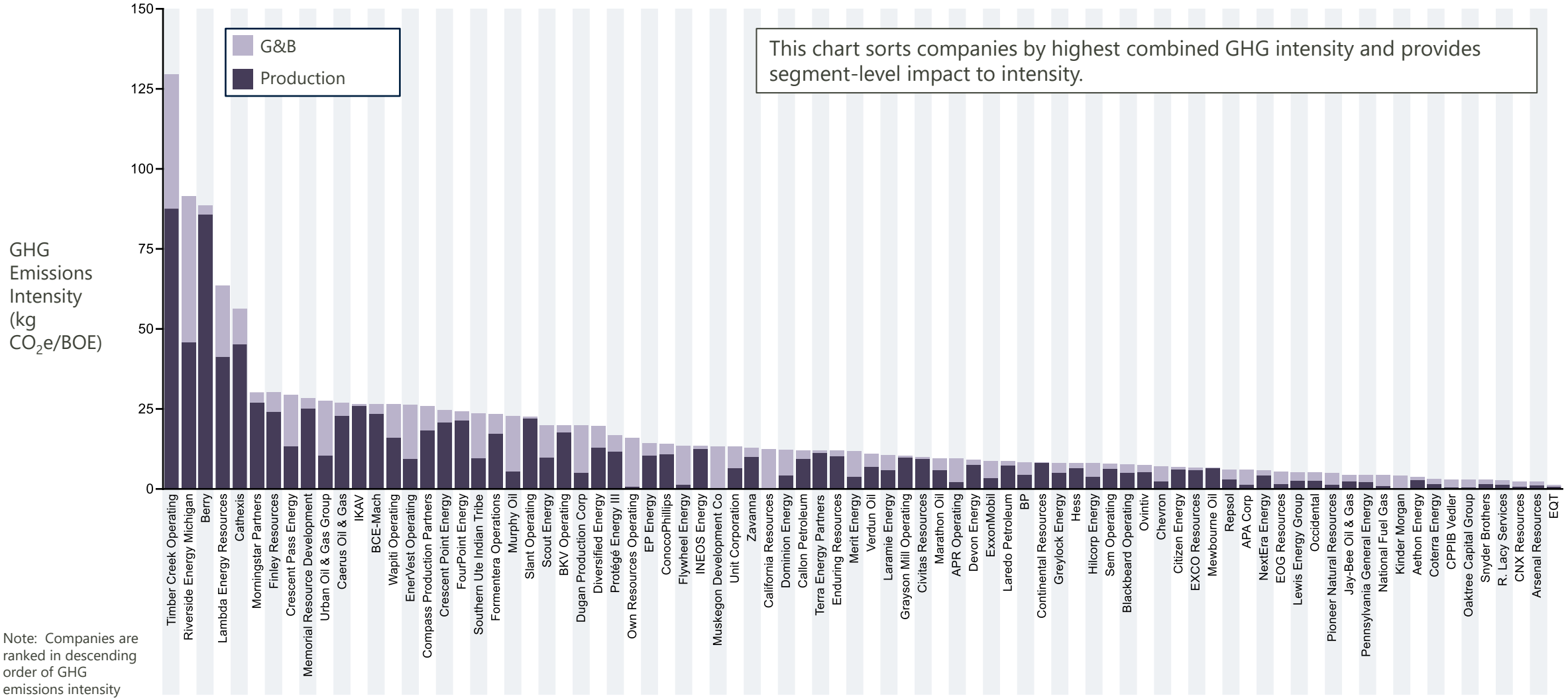


Note: Companies are ranked in descending order of methane emissions (thousand MT CH_4)

Upstream Companies: Highest GHG Emissions Intensities

2023 Data

GHG Emissions Intensity

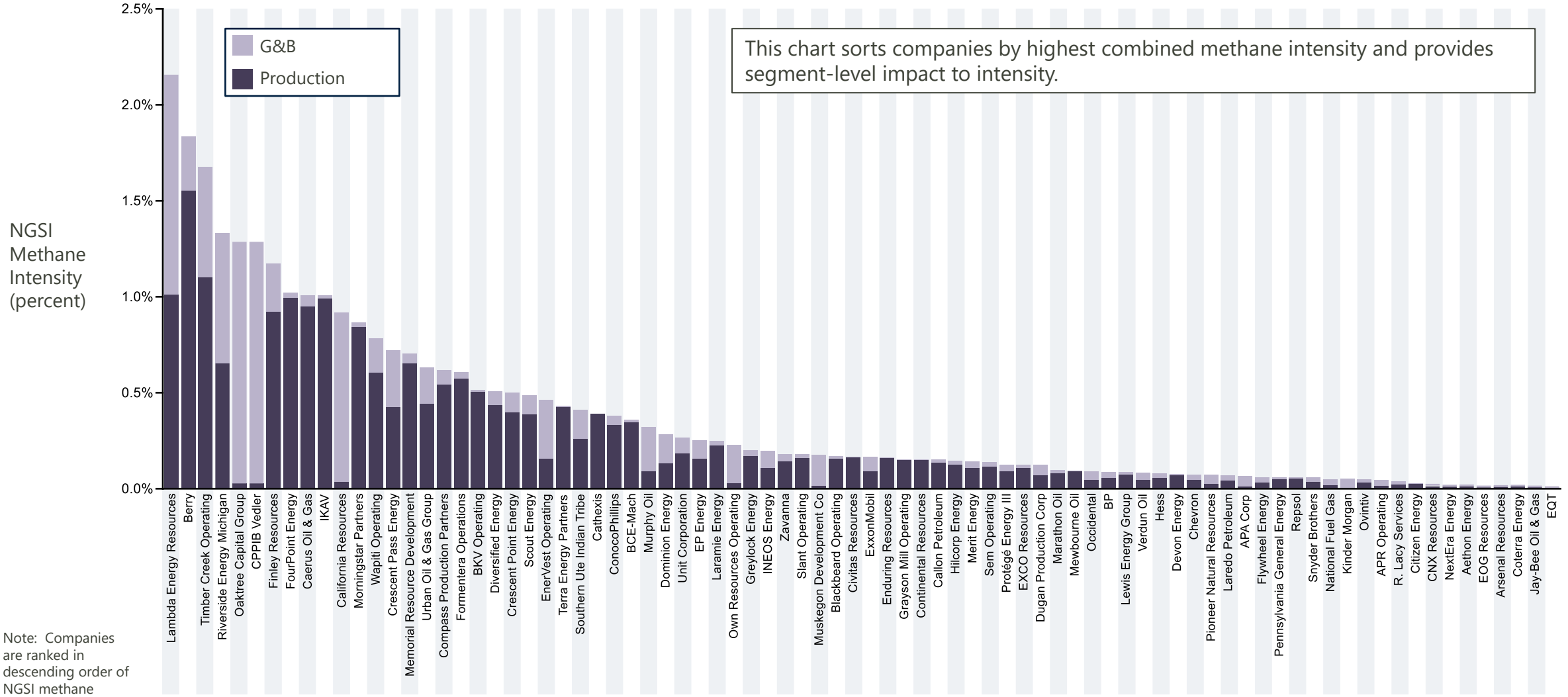


Note: Companies are ranked in descending order of GHG emissions intensity (kg CO_2e/BOE)

Upstream Companies: Highest NGSI Methane Intensities

2023 Data

Methane Intensity



Note: Companies are ranked in descending order of NGSI methane intensity (percent)