



La comptabilité carbone des compagnies pétrolières

Webinaire AJE
Octobre 2023



La comptabilité carbone des compagnies pétrolières :

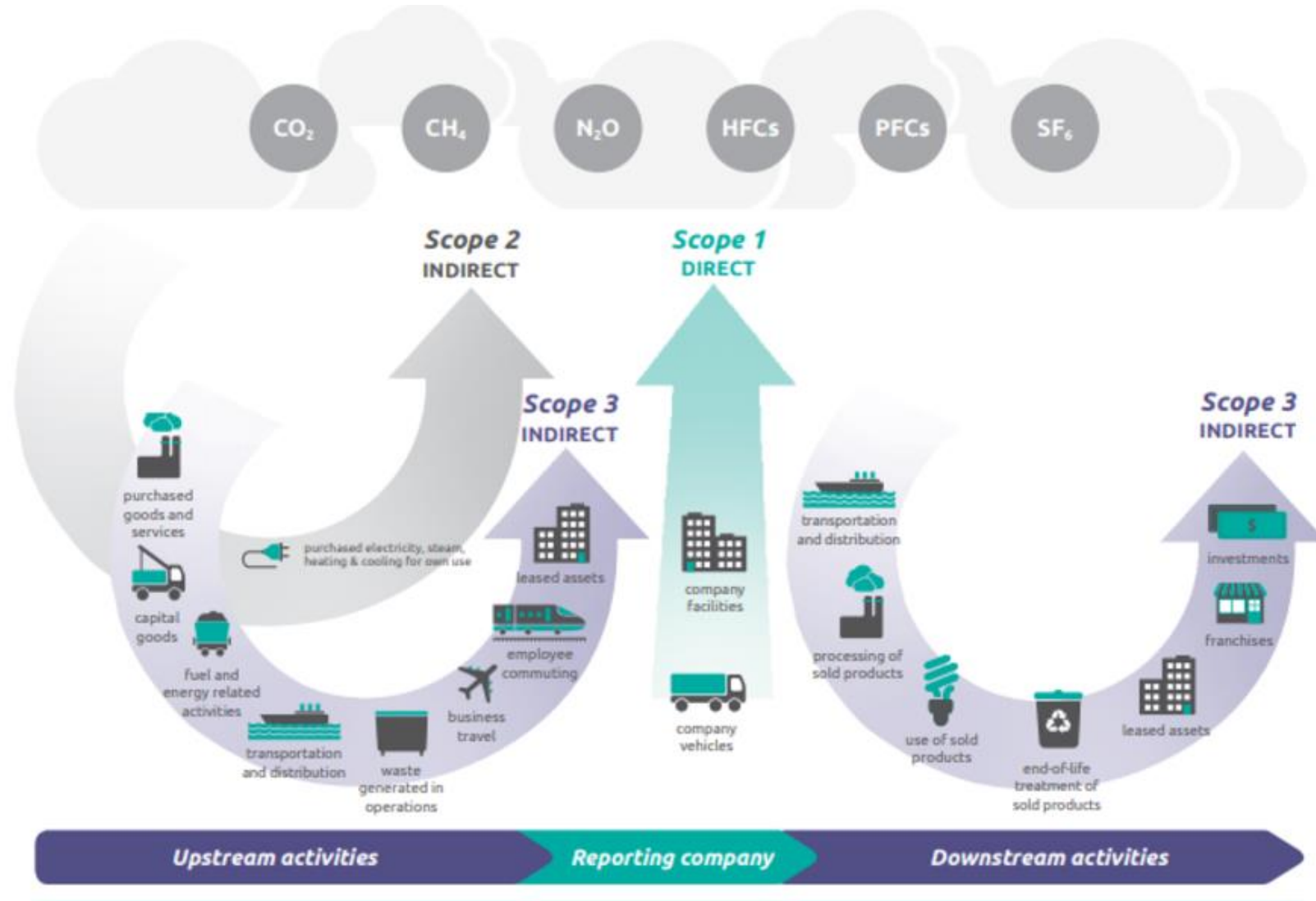
Les standards

Les super majors pétrolières suivent les recommandations suivantes pour leur rapportage des émissions de GES:

- **Le GHG Protocol (co-fondé en 1997 par le World Business Council for Sustainable Development et le World Resource Institute)**
- **L'APIECA (International Petroleum Industry Environmental Conservation Association fondé en 1973)**
- ISO 14 064 - Quantification et la déclaration des émissions et des suppressions des gaz à effet de serre (établie en 2006 et révisée en 2018)









La comptabilité carbone des compagnies pétrolières : Les standards



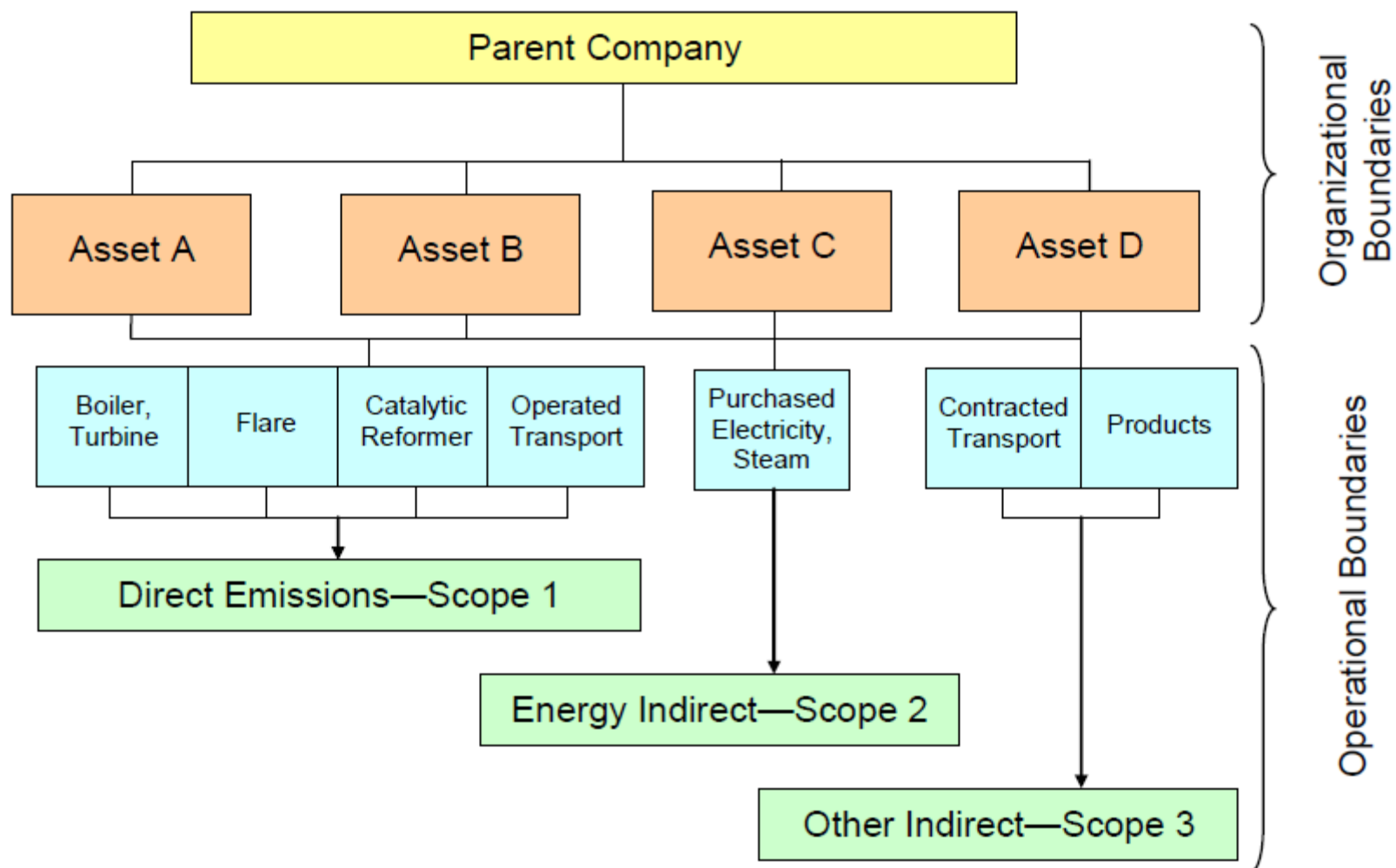


La comptabilité carbone des compagnies pétrolières : Les compagnies étudiées en quelques chiffres (2022)

	Production (Mbep/j) O&G	CA (Mds \$)	Bénéfice (Mds \$)	Emissions (Mt CO2 éq/an) Scope 1, 2 et 3
	6,1	415	56	820
	2,9	236	36	725
	3,1	281	20 (36)	429
	2,9	381	43	968
	2,3	241	28	339
	1,6	133	14	419



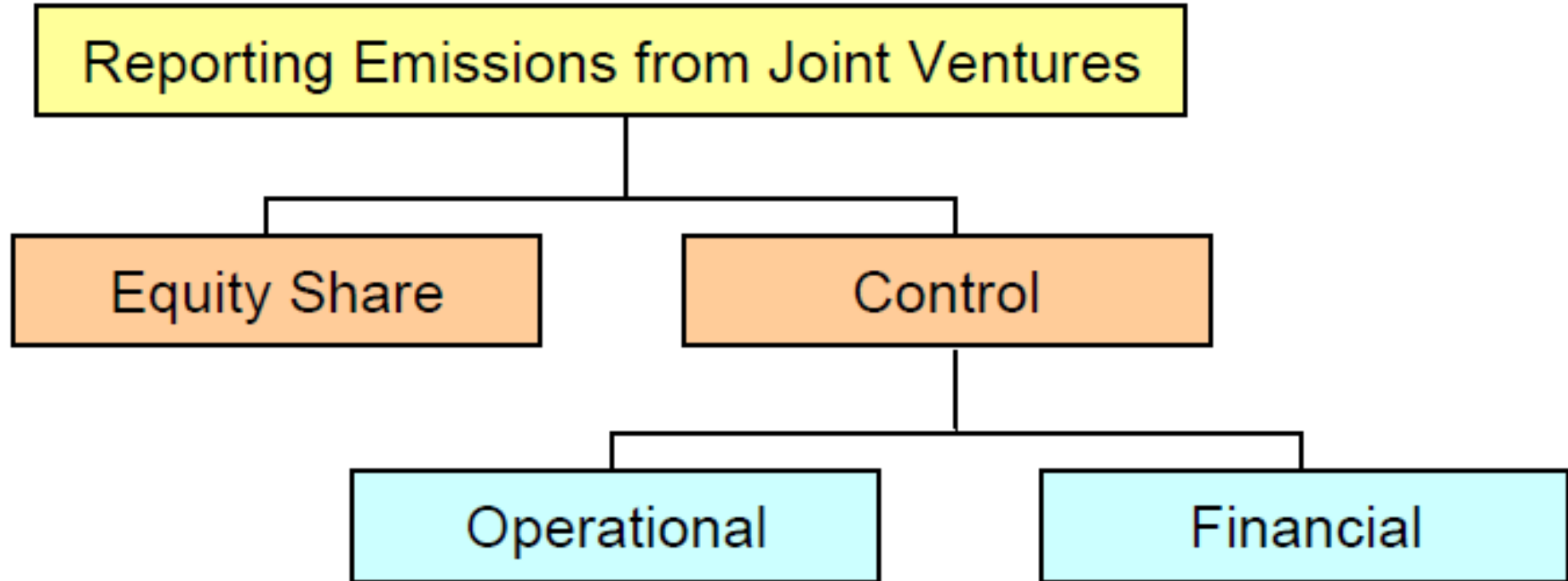
La comptabilité carbone des compagnies pétrolières : Le scope 1 : ce que dit l'IPIECA





La comptabilité carbone des compagnies pétrolières :

Le scope 1 : ce que dit l'IPIECA





La comptabilité carbone des compagnies pétrolières : Le scope 1 : exemple



			2015	2022	2025	2030
Nos émissions (Scope 1+2)	Scope 1+2 (opéré)	Mt CO ₂ e vs 46 Mt en 2015	46	40 -13%	40 38 -17%	25-30 ⁽¹⁾ > -40% ⁽¹⁾
	Scope 1+2 pétrole & gaz (opéré)	Mt CO ₂ e vs 46 Mt en 2015	46	33 -29%		
	Émissions de méthane - (opéré)	kt CH ₄ vs 64 kt en 2020	94	42 -34%	- 50 %	- 80 %
	Brûlage de routine	Mm ³ /j	2,3	0,5	< 0,1	0



La comptabilité carbone des compagnies pétrolières : Le scope 1 : exemple



Climat	Unité	PÉRIMÈTRE OPÉRÉ							PÉRIMÈTRE PATRIMONIAL				
		2015	2019	2020	2021	2022	2025	2030	2015	2019	2020	2021	2022
Émissions de GES - Scope 1+2													
Scope 1 – Émissions directes	Mt CO ₂ e	42	41	38 ⁽¹⁾ (36)	34 ⁽¹⁾ (33)	37			50	55	52	49	51
Activités oil & gas Amont	Mt CO ₂ e	19	18	16	14	14			22	26	24	23	22
Integrated Gas, Renewables & Power, hors activités gaz de l'Amont	Mt CO ₂ e	-	3	3	5	9			-	4	5	6	9
Raffinage-Chimie	Mt CO ₂ e	22	20	17	15 ⁽¹⁾ (14)	15			27	25	22	19	20
Marketing & Services	Mt CO ₂ e	<1	<1	<1	<1	<1			1	<1	<1	<1	<1
Décomposition par zone géographique													
Europe : UE 27 + Norvège + Royaume-Uni + Suisse	Mt CO ₂ e	22	24	22 ⁽¹⁾ (21)	20 ⁽¹⁾ (19)	23			22	23	20	18	21
Eurasie (yc. Russie)/Océanie	Mt CO ₂ e	5	1	1	1	<1			13	18	17	17	15
Afrique	Mt CO ₂ e	12	11	10	9	9			9	8	7	7	7
Amériques	Mt CO ₂ e	4	4	4	5	5			5	6	7	7	8
Décomposition par type de GES													
CO ₂	Mt CO ₂ e	39	39	34	32	36			-	-	-	47	50
CH ₄	Mt CO ₂ e	2	2	2	1	1			-	-	-	1	1
N ₂ O	Mt CO ₂ e	<1	<1	<1	<1	<1			-	-	-	<1	<1
Scope 2 – Émissions indirectes liées à la consommation d'énergie	Mt CO ₂ e	4	4	3 ⁽¹⁾ (3)	2 ⁽¹⁾ (2)	2			-	-	-	5	5
dont Europe + UE 27 + Norvège + Royaume-Uni + Suisse	Mt CO ₂ e	2	2	2 ⁽¹⁾ (2)	1 ⁽¹⁾ (1)	1			-	-	-	2	2
Scope 1+2	Mt CO ₂ e	46	44	41⁽¹⁾ (38)	37⁽¹⁾ (35,7)	40	38	25-30⁽²⁾	-	-	-	54	56
vs 2015			-3%	-9% ⁽¹⁾	-20% ⁽¹⁾	-13%	-17%	> -40% ⁽²⁾					
dont installations oil & gas	Mt CO ₂ e	46	42	39 ⁽¹⁾ (36)	33 ⁽¹⁾ (32)	33			-	-	-	49	48
dont CCGT	Mt CO ₂ e	-	2	3 ⁽¹⁾ (3)	4	7			-	-	-	5	8
Émissions de GES - Méthane													
Émissions de Méthane ⁽³⁾	kt CH ₄	94	68	64	49	42			-	-	-	51	47
vs 2020					-23%	-34%							
Décomposition par secteur													
Activités oil & gas Amont	kt CH ₄	92	66	62	48	41			-	-	-	48	43
Integrated Gas, Renewables & Power, excluant les activités gaz de l'Amont	kt CH ₄	0	<1	<1	<1	1			-	-	-	2	3
Raffinage-Chimie	kt CH ₄	1	1	1	1	1			-	-	-	1	1
Marketing & Services	kt CH ₄	0	0	0	0	0			-	-	-	0	0
Décomposition par zone géographique													
Europe : UE 27 + Norvège + Royaume-Uni + Suisse	kt CH ₄	9	15	12	7	7			-	-	-	5	5
Eurasie (yc. Russie) / Océanie	kt CH ₄	33	3	3	1	1			-	-	-	16	15
Afrique	kt CH ₄	49	39	31	23	23			-	-	-	18	17
Amériques	kt CH ₄	3	10	18	18	12			-	-	-	12	10
Brûlage													
Gaz brûlé à la torche ⁽⁴⁾ (activités oil & gas opérées Amont)	Mm ³ /j	7,2	5,7	4,2	3,6	3,3							
dont brûlage de routine	Mm ³ /j	2,3 ⁽⁵⁾	0,9	0,6	0,7	0,5			<0,1				0

(1) Hors effet Covid-19 pour les données d'émissions 2020 et 2021. (2) Y compris puits de carbone. (3) Hors méthane biogénique. (4) Cet indicateur inclut le brûlage de sécurité, de routine et de non-routine. (5) Volumes estimés selon les données historiques.



La comptabilité carbone des compagnies pétrolières : Le scope 1 : exemple



Metric	Unit	2018	2019	2020	2021	2022	Metric	Unit	2018	2019	2020	2021	2022
GHG – Operational control ^{op}							GHG – Equity share ^{ex}						
Scope 1 (direct) greenhouse gas emissions ¹	MtCO ₂ e	48.8	49.2	41.7	33.2	30.4	Scope 1 (direct) greenhouse gas emissions ¹	MtCO ₂ e	46.5	46.0	41.3	36.5	33.9
Exploration, production and LNG	MtCO ₂ e	–	–	–	15.5	13.8	Exploration, production and LNG	MtCO ₂ e	–	–	–	17.7	14.6
Refining and chemicals	MtCO ₂ e	–	–	–	16.9	15.9	Refining and chemicals	MtCO ₂ e	–	–	–	17.5	16.3
Other	MtCO ₂ e	–	–	–	–	0.7	Other	MtCO ₂ e	–	–	–	–	3.0

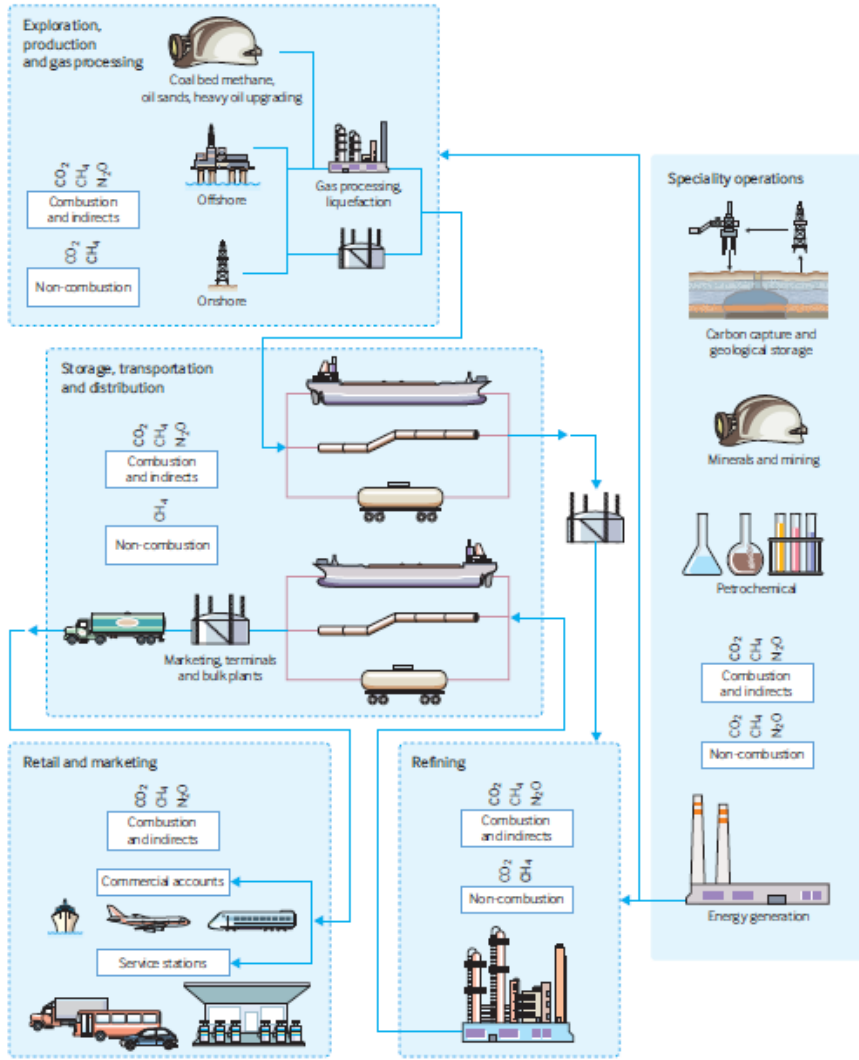
x bp equity share data comprises 100% of emissions from subsidiaries and the percentage of emissions equivalent to our share of joint arrangements and associates, other than bp's share of Rosneft. On 27 February 2022, following the military action in Ukraine, the bp board announced that bp intends to exit its 19.75% shareholding in Rosneft Oil Company (Rosneft).



PERIOD	2019	2020	2021
GHG EMISSIONS			
Total emissions (Scope 1+2), mln t CO ₂ -equiv.	81.2	80.9 ⁵	72.7
Direct emissions (Scope 1), mln t CO ₂ -equiv.	59.4	60.8	54.2
Indirect emissions (Scope 2), mln t CO ₂ -equiv.	21.8	20.1	18.5



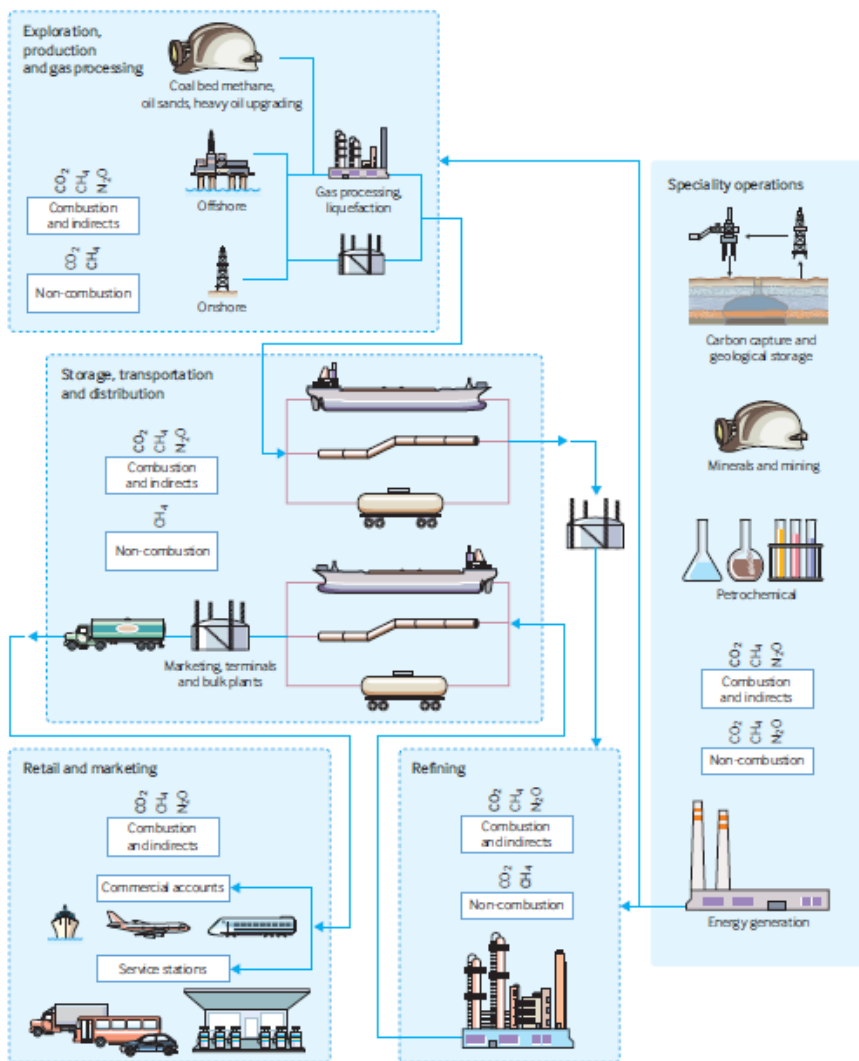
La comptabilité carbone des compagnies pétrolières : 50 nuances de scope 3 ...



1. Purchased goods and services	All cradle-to-gate emissions from the extraction, production, and transport of goods and services not included in categories 2–8.
2. Capital goods	All cradle-to-gate emissions from the extraction, production and transport of capital goods purchased during the accounting year.
3. Fuel and energy	Extraction, production, and transport of purchased fuels and energy, not already accounted for in scope 1 and 2, including extraction, production, and transport emissions of purchased fuels and energy, transmission and distribution losses and generation of purchased energy sold to end users.
4. Upstream transportation and distribution	In this case the term 'upstream' refers to emissions from the transportation and distribution of products (excluding fuel and energy products) purchased or acquired by the reporting company in the accounting year in vehicles and facilities not owned or operated by the accounting company, as well as other transportation and distribution services purchased by the accounting company in the accounting year (including both inbound and outbound logistics).
5. Waste generated in operations	Emissions of waste management suppliers that occur during disposal and treatment of waste generated in the company's operations.
6. Business travel	Emissions of transportation carriers that occur during the transportation of employees for business-related activities.
7. Employee commuting	Transportation of employees between their homes and their worksites.
8. Upstream leased assets	In this case the term 'upstream' refers to operations of assets leased by the company (company is the lessee) not included in scope 1 and scope 2.
9. Downstream transportation and distribution	In this case the term 'downstream' refers to transportation and distribution of products sold by the company between the company's operations and end consumer (if not paid for by the accounting company) including retail and storage.
10. Processing of sold products	Processing by third parties of intermediate products sold by the accounting company.
11. Use of sold products	Direct use-phase emissions of the end use of goods and services sold by the company.
12. End-of-life treatment of sold products	Emission of waste management from the waste treatment and disposal of products sold by the company at the end of their life.
13. Downstream leased assets	In this case the term 'downstream' refers to emissions from the operations of assets owned by the company and leased to other entities, not included in scope 1 and scope 2.
14. Franchises	Emissions from the operations of franchises not included in scope 1 and 2.
15. Investments	Operations of investments in the accounting year not included in scope 1 and 2.



La comptabilité carbone des compagnies pétrolières : 50 nuances de scope 3 ...Le traitement des produits hors combustion



1. Purchased goods and services	All cradle-to-gate emissions from the extraction, production, and transport of goods and services not included in categories 2–8.
2. Capital goods	All cradle-to-gate emissions from the extraction, production and transport of capital goods purchased during the accounting year.
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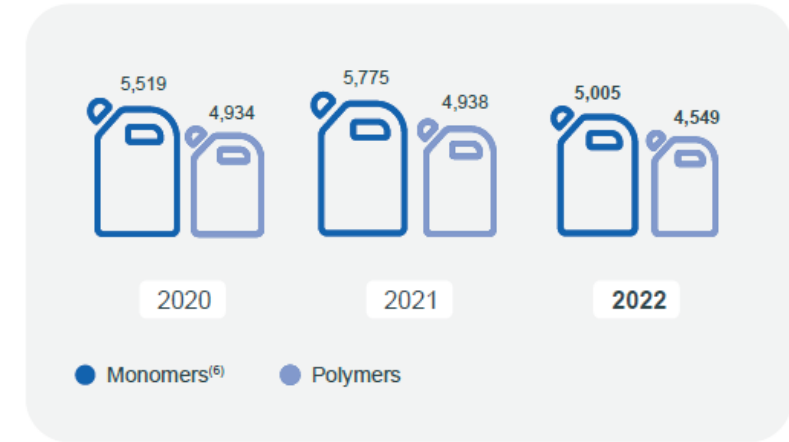
La comptabilité carbone des compagnies pétrolières : 50 nuances de scope 3 ...Le traitement des produits hors combustion



Estimates of indirect GHG emissions - Scope 3	Unit	2022
Categories of Scope 3		
Cat 1 - Purchased goods and services ⁽¹⁾	Mt CO ₂ e	30
Cat 2 - Capital goods ⁽²⁾	Mt CO ₂ e	<1
Cat 3 - Fuel-and-energy-related activities (not included in Scope 1 or 2) ⁽³⁾	Mt CO ₂ e	3
Cat 4 - Upstream transportation ⁽⁴⁾	Mt CO ₂ e	9
Cat 5 - Waste generated in operations ⁽⁵⁾	Mt CO ₂ e	<1
Cat 6 - Business travel ⁽⁶⁾	Mt CO ₂ e	<1
Cat 7 - Employee commuting ⁽⁷⁾	Mt CO ₂ e	<1
Cat 8 - Upstream leased assets ⁽⁸⁾	Mt CO ₂ e	0
Cat 9 - Downstream transportation ⁽⁹⁾	Mt CO ₂ e	1
Cat 10 - Processing of sold products ⁽¹⁰⁾	Mt CO ₂ e	6
Cat 11 - Use of sold products ⁽¹¹⁾	Mt CO ₂ e	389*(381)
Cat 12 - End of life treatment of sold products⁽¹²⁾	Mt CO₂e	11
Cat 13 - Downstream leased assets ⁽¹³⁾	Mt CO ₂ e	n/a
Cat 14 - Franchises ⁽¹⁴⁾	Mt CO ₂ e	<1
Cat 15 - Investments ⁽¹⁵⁾	Mt CO ₂ e	n/a

(12) Emissions related to the end of life of the main non-energy products sold (lubricants, polymers, bitumen).

Petrochemical products production volume
(kt)



10 Mt environ = 37 Mt CO₂... ?



La comptabilité carbone des compagnies pétrolières : 50 nuances de scope 3 ...Le traitement des produits hors combustion



Scope 3 Categories		Operational control (tonnes)	Equity (tonnes)
1	Purchased goods and services	Purchased goods & services (excl. 3 rd party energy products sold by Shell)	Not estimated
		3 rd party energy products sold by Shell	144,000,000 [b]
2	Capital goods	Capital goods	Not estimated
3	Fuel and energy-related activities (not included in Scope 1 or Scope 2)	Purchased 3 rd party power sold by Shell	Not estimated
		Well-to-tank emissions from purchased electricity, steam and heat consumed by own assets	2,000,000 [e]
4	Upstream transportation and distribution	Upstream transportation and distribution	Not estimated [g]
5	Waste generated in operations	Waste generated in operations	Not estimated
6	Business travel	Business travel (air, hotel, rented cars)	Not estimated
7	Employee commuting	Employee commuting	<200,000 [k]
8	Upstream leased assets	Upstream leased assets	3,400,000 [m]
9	Downstream transportation and distribution	Downstream transportation and distribution	6,000,000 [n]
10	Processing of sold products	Processing of sold products	3,000,000 [o]
11	Use of sold products	Own production	332,000,000 [p]
		3 rd party products	578,000,000 [q]
		CO ₂ transfers	350,000 [r]
12	End-of-life treatment of sold products	End-of-life treatment of sold products	17,000,000 [s]
13	Downstream leased assets	Downstream leased assets	0 [t]
14	Franchises	Franchises	1,700,000 [v]
15	Investments	Investments	1,100,000 [x]

Chemicals sales volumes (thousand tonnes)

12,281 2021: 14,216

12,281 Mt environ = 45 Mt CO₂... ?



La comptabilité carbone des compagnies pétrolières : 50 nuances de scope 3 ...Le traitement des produits hors combustion



- Shell's climate target is to become a net-zero emissions energy business by 2050.
- Our targets include reducing our absolute Scope 1 and 2 emissions by 50% by 2030 compared to 2016 levels, on a net basis, and reducing the carbon intensity of the energy products we sell by 6-8% by 2023, 9-12% by 2024, 9-13% by 2025, 20% by 2030, 45% by 2035 and 100% by 2050.

NCI reference year: 2016
(equity boundary)

		2022	2021	2020	2016
NCI [E]	gCO ₂ e/MJ	76	77	75	79
Estimated total energy delivered by Shell [A]	trillion (10 ¹²) MJ	16.29	17.89	18.40	20.93
Estimated total GHG emissions included in NCI (net) [B]	million tonnes CO ₂ e	1,240	1,375	1,384	1,645
Carbon credits	million tonnes CO ₂ e	4.1	5.1	3.9	0.0
Estimated total GHG emissions (gross) [C][D]	million tonnes CO ₂ e	1,244	1,381	1,388	1,645

[A] The NCI calculation uses Shell's energy product sales volumes data, as disclosed in the Annual Report and Sustainability Report. This excludes certain contracts held for trading purposes and reported **net** rather than gross. Business-specific methodologies to **net** volumes have been applied in oil products and pipeline gas and power. Paper trades that do not result in physical product delivery are excluded. Retail sales volumes from markets where Shell operates under trademark licensing agreements are also excluded from the scope of Shell's **net carbon intensity metric**.

[B] These numbers include well-to-wheel emissions associated with energy products sold by Shell, on an equity boundary basis; they also include the well-to-tank emissions associated with the manufacturing of energy products by others that are sold by Shell. Emissions associated with the manufacturing and use of non-energy products are excluded.

[C] All figures disclosed are rounded.

[D] While the NCI is an intensity measure and not an inventory of absolute emissions, a notional estimate of the amount of GHG emissions covered by the scope of the NCI calculation can be derived from the final NCI value for any year. Similarly, a fossil-equivalent estimate of the total amount of energy sold included in the calculation can also be determined.

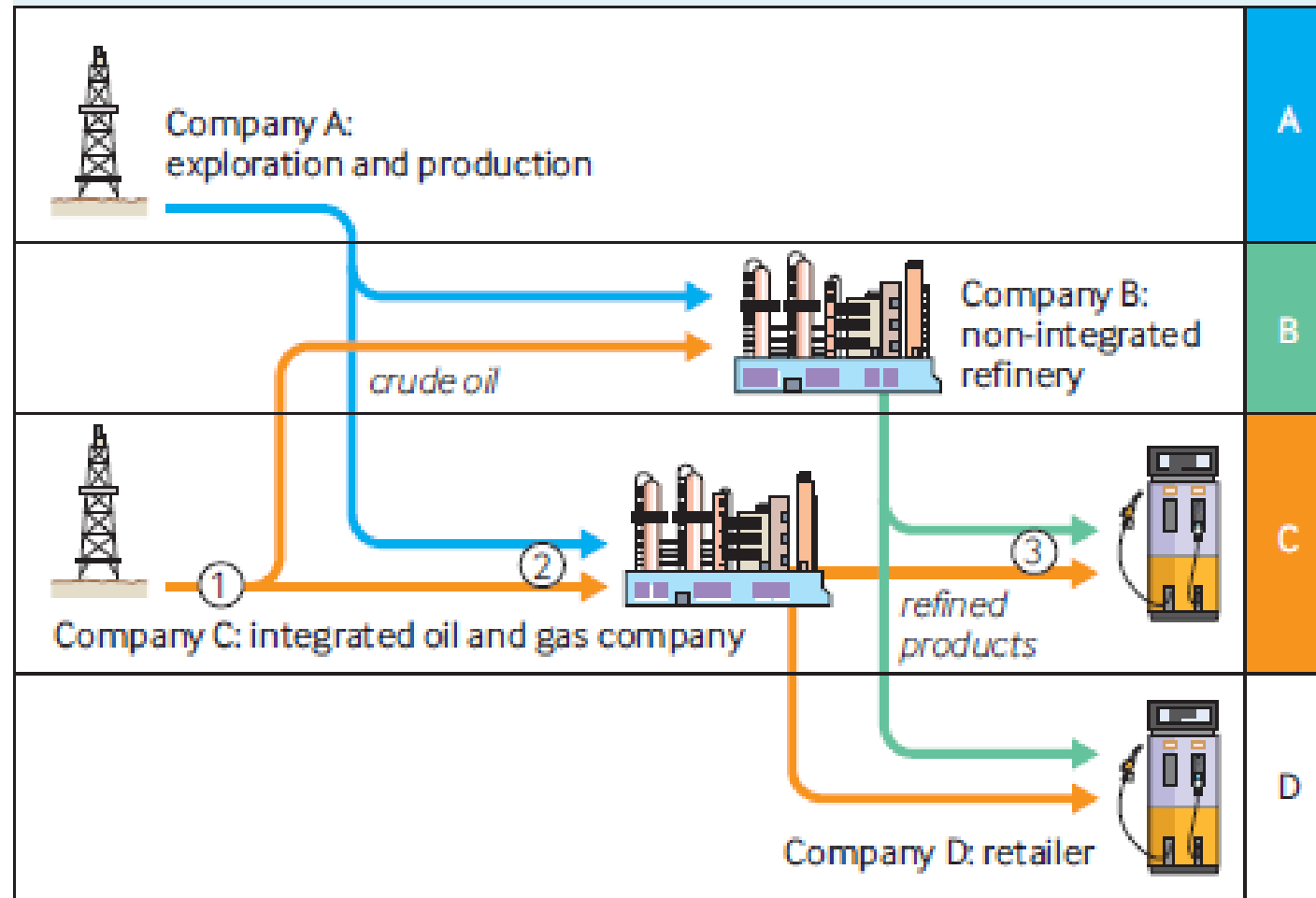
[E] Acquisitions and divestments are included in the actual performance tracking with the target and baseline year unchanged. Note that acquisitions and divestments could have a material impact on meeting the targets.

Chemicals sales volumes (thousand tonnes)

12,281 2021: 14,216



La comptabilité carbone des compagnies pétrolières : 50 nuances de scope 3 ...Les trois niveaux de catégorie 11





La comptabilité carbone des compagnies pétrolières : 50 nuances de scope 3 ...Les trois niveaux de catégorie 11

ExxonMobil

Estimated Scope 3 emissions from the use of ExxonMobil's crude and natural gas production for the year ending Dec. 31, 2022, as provided under Ipieca's Category 11 were 540 million metric tons.

ExxonMobil 2022 Scope 3 estimates

(Million metric tons CO₂-equivalent)

Ipieca Category 11 Scope 3 potential estimates		Upstream production	Refining throughput	Petroleum product sales
Natural gas production	170	540	640	720
Crude production	370			



La comptabilité carbone des compagnies pétrolières : 50 nuances de scope 3 ...Les trois niveaux de catégorie 11



Net zero

Metric	Unit	2018	2019	2020	2021	2022
Net zero aims						
Aim 1 – Scope 1 (direct) and Scope 2 (indirect) greenhouse gas emissions ^a	MtCO ₂ e	54.2	54.4	45.5	35.6	31.9
Aim 2 – Emissions from the carbon in our upstream oil and gas production (our Scope 3 aim) ^b	MtCO ₂	–	360.9	327.6	303.6	306.7
Aim 3 – Average carbon intensity of our sold energy products ^{cd}	gCO ₂ e/MJ	–	79	77	78	77
Refined energy products carbon intensity ^{de}	gCO ₂ e/MJ	–	95	92	92	92
Gas products carbon intensity ^{df}	gCO ₂ e/MJ	–	68	67	67	67

^b Estimated CO₂ emissions from the assumed combustion of upstream production of crude oil, natural gas and natural gas liquids (NGLs) based on bp's net share of production, excluding bp's share of production in Rosneft. On 27 February 2022, following the military action in Ukraine, the bp board announced that bp intends to exit its 19.75% shareholding in Rosneft Oil Company (Rosneft). It is assumed that all produced volumes undergo full stoichiometric combustion to CO₂. These emissions are broadly equivalent to the GHG Protocol, Scope 3, category 11, with the specific scope of upstream production volumes.



La comptabilité carbone des compagnies pétrolières : 50 nuances de scope 3 ...Total vs Greenpeace



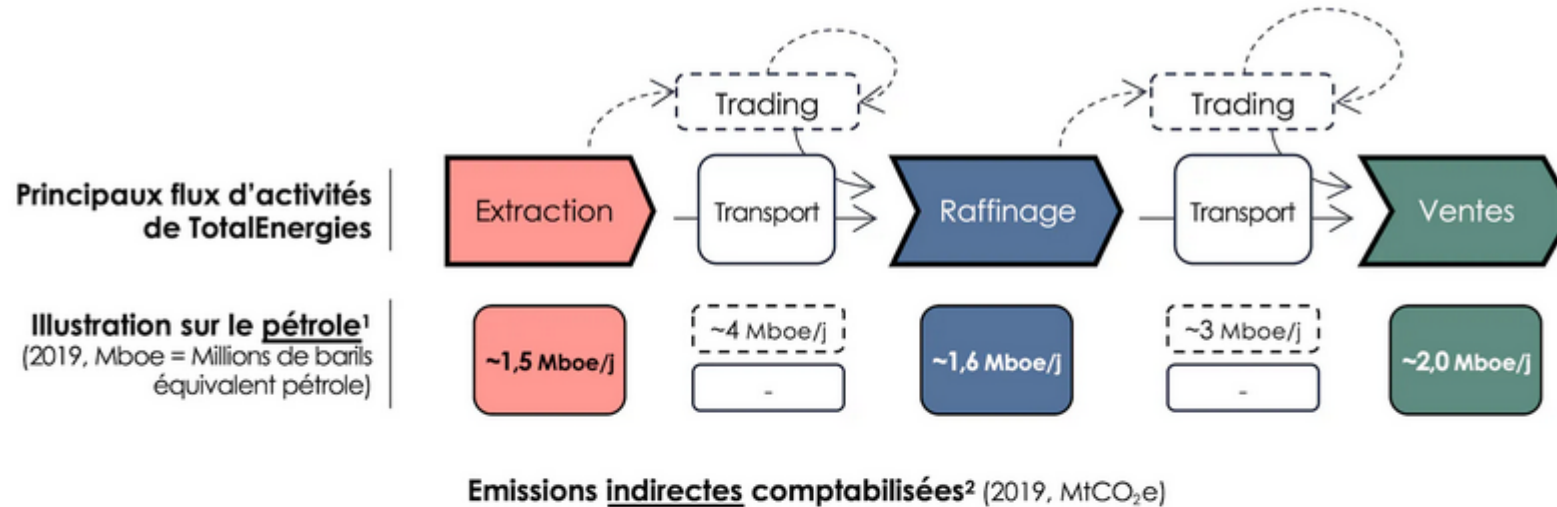
			2015	2022	2025	2030
Nos émissions (Scope 1+2)	Scope 1+2 (opéré)	Mt CO ₂ e vs 46 Mt en 2015	46	40 -13%	38 ≤40 -17%	25-30 ⁽¹⁾ > -40% ⁽¹⁾
	Scope 1+2 pétrole & gaz (opéré)	Mt CO ₂ e vs 46 Mt en 2015	46	33 -29%		
	Émissions de méthane - (opéré)	kt CH ₄ vs 64 kt en 2020	94	42 -34%	- 50 %	- 80 %
	Brûlage de routine	Mm ³ /j	2,3	0,5	< 0,1	0
Empreinte carbone des produits vendus ⁽²⁾	Intensité carbone cycle de vie	100 en 2015		- 12 %	- 15 % ≥ -10 %	- 25 % ≥ -20 %
	Scope 3 Pétrole Monde ⁽²⁾	Mt CO ₂ e vs 350 Mt en 2015		254 ⁽³⁾ -27%	- 30 %	- 40 % -30%
	Scope 3 Monde ⁽²⁾	Mt CO ₂ e	410	389 ⁽³⁾	< 400	< 400

Scope	Émissions (tCO ₂ e)
1	160 536 394
3	1 477 111 607
Total	1 637 648 000

(1) Y compris puits de carbone. (2) Produits énergétiques utilisés par nos clients (catégorie 11 du Scope 3 du GHG Protocol). (3) Hors effet Covid-19 au 1^{er} semestre 2022. Nouveaux objectifs.



La comptabilité carbone des compagnies pétrolières : 50 nuances de scope 3 ... Total vs Greenpeace



Je ne compte pas le trading, et je compte seulement les émissions de combustion du volume d'énergie le plus important pour éviter les doubles-comptes sur la combustion

Total

Combustion seulement → 410 MtCO₂e

~410 MtCO₂e

Je compte le trading « physique » à 100% mais pas le trading « financier », les émissions de combustion et amont du volume d'énergie le plus important, et les autres émissions indirectes comme le transport



~610 MtCO₂e

~330 MtCO₂e

~540 MtCO₂e

~10 MtCO₂e

~30 MtCO₂e

~1 500 MtCO₂e



La comptabilité carbone des compagnies pétrolières : 50 nuances de scope 3 ... Total vs Greenpeace



Scope 3 GHG emissions [A] [B]

	Unit	2022	2021	2020	2019	2018	Ipieca	SASB	GRI
Purchased goods and services (Category 1)									
Third-party products [C]	Million tonnes CO ₂ e	144	147	147	178	190	CCE4	-	305-3
Fuel and energy-related activities (not included in Scope 1 or Scope 2) (Category 3)									
Third-party power [D]	Million tonnes CO ₂ e	115	136	103	102	96	CCE4	-	305-3
Downstream transport and distribution (Category 9)									
Sold own energy products [E]	Million tonnes CO ₂ e	5	6	-	-	-	-	-	305-3
Use of sold products (Category 11)									
Use of sold products [F]	Million tonnes CO ₂ e	910	1,010	1,054	1,271	1,351	CCE4	-	305-3
Own production [G]	Million tonnes CO ₂ e	332	380	452	564	594	CCE4	-	305-3
Third-party products [H]	Million tonnes CO ₂ e	578	630	602	708	757	CCE4	-	305-3

[A] The values in this table reflect estimated Scope 3 emissions included in our net carbon intensity. This excludes certain contracts held for trading purposes and reported net rather than gross. Business-specific methodologies for net volumes have been applied to oil products, pipeline gas and power. Paper trades that do not result in physical product delivery are excluded. Retail sales volumes from markets where Shell operates under trademark licensing agreements are also excluded from the scope of Shell's carbon intensity metric.

[B] Estimated emissions from other Scope 3 categories are published on www.shell.com/ghg. 2022 data will be available around June 2023.

[C] This category includes estimated well-to-tank emissions from purchased third-party refined oil products, natural gas, liquefied natural gas, crude oil and biofuels.

[D] This category includes estimated well-to-wire emissions from the generation of purchased power included in our net carbon intensity.

[E] Estimated emissions from the transport and distribution of sold own oil products, crude oil, liquefied natural gas, gas-to-liquids, natural gas and biofuels.

[F] This category includes estimated emissions from the sales volumes of oil products, natural gas, liquefied natural gas, gas-to-liquids and biofuels.

[G] This category includes estimated emissions from our refinery production, natural gas, liquefied natural gas, gas-to-liquids and biofuel products.

[H] Estimated as the difference between own production and total sold products.



La comptabilité carbone des compagnies pétrolières : 50 nuances de scope 3 ... Total vs Greenpeace

Aims	Measure/coverage	2019	2022 update	2025 targets	2030 aims	Aims for 2050 or sooner
① Net zero operations*	Scope 1+2	Baseline 54.4 MtCO ₂ e	41% cumulative reduction in emissions against 2019 baseline	20% ^a	50% ^a 30-35% ^b	Net zero*
② Net zero production*	Scope 3	Baseline 361 MtCO ₂	15% cumulative reduction in emissions against 2019 baseline	10-15% ^a 20% ^b	20-30% ^a 35-40% ^b	Net zero*
③ Net zero sales*	Average lifecycle carbon intensity ⁱ	Baseline 79 ^c gCO ₂ e/MJ	2% ^c cumulative reduction in carbon intensity against 2019 baseline	5% ^d	15-20% ^d	Net zero* 50% ^b
④ Reducing methane	Methane intensity*	0.14% ^e	0.05% ^e	0.20% ^f	50% ^f reduction	
⑤ More \$ into transition	Transition growth investment*	\$634m ^g	\$4.9bn ^h	\$6-8bn ⁱ \$3-4bn ⁱ	\$7-9bn ⁱ ~\$5bn ⁱ	

Aim 3 update

Following the changes to aim 3 we announced in February 2022, we have updated our aim 3 metric from the average carbon intensity of our marketed energy products to the average carbon intensity of our sold energy products* (including physically traded energy products*). In addition, a number of methodological changes have been made. These include methodology improvements for power, updated carbon intensity factors and physical and chemical properties of various energy products in line with the latest editions of industry publications.

As a result of these changes, the energy included under aim 3 for 2019 – our baseline year – has increased from 12.6EJ to 20.9EJ and the emissions have increased from 993MtCO₂e to 1,638MtCO₂e. Overall, the 2019 carbon intensity remained at 79gCO₂e/MJ.

All figures, up to and including our baseline year of 2019, have been recalculated on this revised basis.

^c The previously reported aim 3 figures have been recalculated in accordance with the expanded sales boundary (now the average carbon intensity of sold energy products*), methodology improvements for power, and updated carbon intensity factors and physical/chemical properties, and so differ from those presented in the 2019-2021 bp Annual Report and Form 20-F, sustainability report and ESG datasheet. For more detail on how this metric is calculated see the basis of reporting.

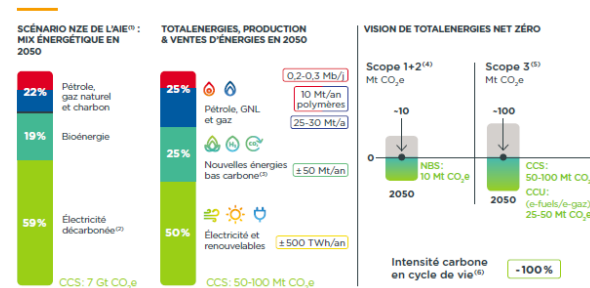
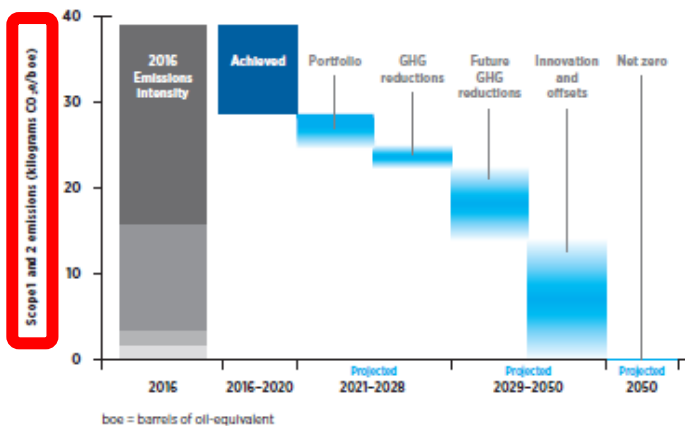
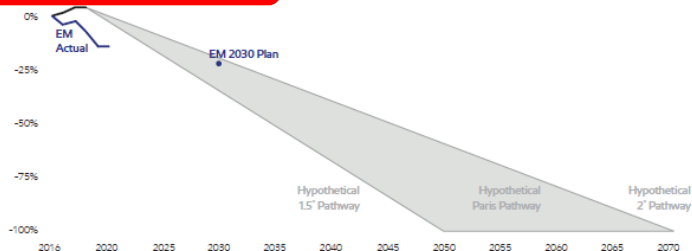


La comptabilité carbone des compagnies pétrolières : Les objectifs net zero des compagnies pétrolières : la divergence



ExxonMobil emission reduction plans within pathway of Paris Agreement^{(1), (2)}

GHG Scope 1 and 2 operated absolute emissions change vs. 2016 level



(1) Scénario NZE 2021 de l'AIE. (2) Hydraulique, solaire, éolien et nucléaire. (3) Biofuels, biogaz, hydrogène et e-fuels/e-gaz. (4) Des installations opérées. (5) Des produits énergétiques utilisés par nos clients (GHG Protocol - catégorie 1). (6) Intensité carbone moyenne de nos produits énergétiques utilisés par nos déposataires dans le monde.



- Shell's climate target is to become a net-zero emissions energy business by 2050.
- Our targets include reducing our absolute Scope 1 and 2 emissions by 50% by 2030 compared to 2016 levels, on a net basis, and reducing the carbon intensity of the energy products we sell by 6-8% by 2023, 9-12% by 2024, 9-13% by 2025, 20% by 2030, 45% by 2035 and 100% by 2050.



Aims	2025 target	2030 aim	2050, or sooner, aim
① Net zero operations* Scope 1 and 2	20%*	50% ^a 30-35% ^b	Net zero*
② Net zero production* Scope 3	10-15% ^{ac} 20% ^b	20-30% ^{ac} 35-40% ^b	Net zero*
③ Net zero sales* Average lifecycle carbon intensity ^d	5% ^d	15-20% ^d >15% ^b	Net zero* 50% ^b
④ Reducing methane	0.20%*	50% reduction*	
⑤ More \$ into transition	\$6-8bn ^f \$3-4bn ^f	\$7-9 bn ^f ~\$5bn ^f	



PROGRESS 2022 vs. Eni for 2021 commitments	SHORT-TERM COMMITMENTS	MEDIUM-TERM COMMITMENTS	LONG-TERM COMMITMENTS
NET CARBON FOOTPRINT (SCOPE 1+2) - BASELINE 2018			
Upstream: -33% Eni: -19%	Upstream: -50% in 2024 Upstream: -65% in 2025	Upstream: Net Zero by 2030 Eni: Net Zero by 2035	
NET GHG LIFECYCLE EMISSIONS (SCOPE 1+2+3) - BASELINE 2018			
-17%		-35% in 2030 -55% in 2035	-80% in 2040 Net Zero by 2050
NET CARBON INTENSITY (SCOPE 1+2+3) - BASELINE 2018			
-3%		-15% in 2030	-50% in 2040 Net Zero by 2050





La comptabilité carbone des compagnies pétrolières : Les objectifs net zero des compagnies pétrolières : à chacun son indice



Indicateur de l'intensité carbone cycle de vie des produits vendus
Cet indicateur mesure les émissions moyennes de GES des produits énergétiques utilisés par les clients de la Compagnie, sur l'ensemble de leur cycle de vie (c'est-à-dire Scope 1+2+3), depuis leur production jusqu'à leur utilisation finale, par unité d'énergie. Il est calculé comme le quotient entre :

Au numérateur :

- les émissions liées à la production et à la transformation des produits énergétiques utilisés par les clients de la Compagnie ;
- les émissions liées à l'utilisation des produits énergétiques par les clients, calculées par application de facteurs d'émissions stoechiométriques par produit pour obtenir une quantité d'émissions. Les produits à usage non combustible (bitumes, lubrifiants, plastiques, etc.) ne sont pas pris en compte ;
- en soustraction, les volumes de CO₂ séquestrés grâce au CCS et aux puits de carbone naturels.

Au dénominateur :

- la quantité d'énergie vendue. L'électricité est ramenée à un pied d'égalité sur une base fossile en prenant en compte des taux de charge et d'efficacité moyens.
- L'indicateur d'intensité carbone correspond donc en moyenne aux émissions associées à chaque unité d'énergie utilisée par les clients. Pour suivre son évolution, il est exprimé en base 100 par rapport à 2015.



$$\text{Average Carbon Intensity} = \frac{\sum_i (\text{Carbon Intensity})_i \times \text{Energy}_i}{\sum_i \text{Energy}_i}$$

Where:
(Carbon Intensity)_i is the carbon intensity of energy product *i*.
Energy_i is the energy of sold product *i*.

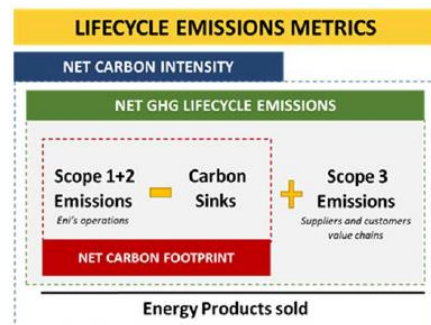


The lifecycle intensity for Shell's total energy product sales is the weighted average of the WtT intensity of each principal energy pathway (*pathway*). It is calculated by

$$CI_{Port,t}^{WtW} = \frac{\sum_{pathway} (CI_{port,t}^{WtW,pathway} * E_{port,t}^{end_use,pathway})}{\sum_{pathway} E_{port,t}^{end_use,pathway}} \quad (\text{Eq. 120})$$

where $CI_{port,t}^{WtW,pathway}$ is the lifecycle intensity by pathway and $E_{port,t}^{end_use,pathway}$ is energy delivered (sold) by pathway. The total volume of energy delivered to customers is

$$E_{Port,t}^{end_use} = \sum_{pathway} E_{port,t}^{end_use,pathway} \quad (\text{Eq. 121})$$





La comptabilité carbone des compagnies pétrolières : Les objectifs net zero des compagnies pétrolières : à chacun son indice





La comptabilité carbone des compagnies pétrolières : Quelques éléments de conclusions

- Les compagnies pétrolières sont de grandes machines à carbone complexes à analyser
- De trop nombreux indices sont utilisés pour décrire leurs stratégies sur le thème « diviser pour mieux régner »
- Il y a globalement un manque d'harmonisation dans les pratiques de reportages des compagnies qui rend les comparaisons difficiles
- L'IIPECA est l'organisme professionnel qui fixe les règles : vous avez dit juge et partie ?



Merci

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