



Carbon offsetting as a tool to reduce the oil and gas industry carbon footprint

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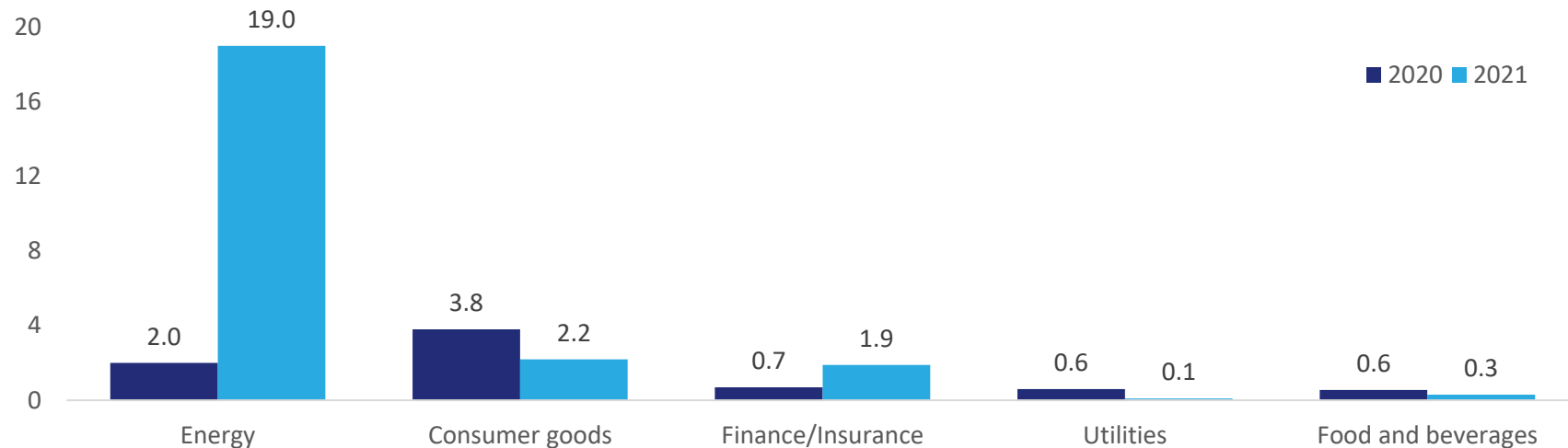
Department for Sustainable Development

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In 2021 energy sector transacted x9 as much as the second-largest sector, x9 more than in 2020

Volume of purchased carbon credits by sector

mln t CO₂-eq.



*First 9 months of 2021

Number of carbon-neutral LNG shipments is growing fast

Date	Supplier	Buyer	Volume	Market	Emissions covered	Registry and credit
18.06.2019	Shell	Tokyo Gas	1	Japan	Full lifecycle	VCS
19.06.2019	Shell	GS Energy	1	South Korea	Full lifecycle	VCS
27.06.2019	JERA	n/a	1	India	End-use only	CDM
04.03.2020	Shell	CPC	1	Taiwan	Full lifecycle	VCS
22.06.2020	Shell	CNOOC	2	China	Full lifecycle	VCS
09.09.2020	QP Trading	CNOOC	1	China	Full lifecycle	VCS
29.09.2020	TotalEnergies	CNOOC	1	China	Full lifecycle	VCS
18.11.2020	Shell	CPC	1	Taiwan	Full lifecycle	VCS
01.03.2021	Mitsui	Hokkaido Gas	1	China	Full lifecycle	n/a
01.03.2021	Gazprom	Shell	1	UK	Full lifecycle	VCS
09.04.2021	RWE	POSCO	1	South Korea	WTT	VCS
16.04.2021	Mitsubishi/DGI	Toho Gas	1	Japan	n/a	n/a
16.04.2021	n/a	Pavilion Energy	1	Singapore	WTT	VCS, CBB
05.05.2021	Cheniere Energy	Shell	1	Europe	Full lifecycle	n/a
01.06.2021	Oman LNG	Shell	1	Middle East/South Asia	Full lifecycle	n/a
11.06.2021	Shell	Astomos	1	Japan	Full lifecycle	n/a
20.06.2021	TotalEnergies	CNOOC	1	China	Full lifecycle	VCS
06.07.2021	Shell	Osaka Gas	1	Japan	Full lifecycle	n/a
10.07.2021	INPEX	Own terminal	1	Japan	Full lifecycle	n/a
12.07.2021	Shell	PetroChina	5 years	China	Full lifecycle	n/a, NBS
16.07.2021	Sempra, BP	lenova	1	Mexico	WTT	n/a, NBS
22.07.2021	n/a	AES	1	Dominican Republic	WTT	n/a, RES
06.08.2021	ENI	CPC	1	Taiwan	Full lifecycle	VCS, NBS
17.08.2021	PETRONAS	Shikoku Electric	1	Japan	n/a	VCS, RES
06.09.2021	BP	CPC	1	Taiwan	WTT	n/a
13.09.2021	INPEX	Toho Gas	1	Japan	Full lifecycle	VCS
13.09.2021	PETRONAS	Shenergy	3	China	n/a	n/a
28.09.2021	Sakhalin	Toho Gas	1	Japan	n/a	VCS
08.10.2021	DGI	JAPEX	1	Japan	n/a	n/a
10.01.2022	PETRONAS	Hiroshima Gas	1	Japan	n/a	n/a

There are 2 types of carbon offsets

Emissions reduction

Emission reduction is achieved through the implementation of projects in the field of energy efficiency, RES and avoidance of emissions in forestry (reduction of deforestation)

Emissions removal

Emission removal can be natural (absorption by ecosystems such as forests, soil, oceans), technological (CCUS, hydrogen, building materials, etc.) and hybrid (biochar, wood construction, use of waste, ash and other carbon-containing materials in construction, production of building materials with a low carbon footprint, etc.)

	2020		2021 (first 9 months)	
	Volume, mln t CO2-eq.	Price, \$/t CO2-eq.	Volume, mln t CO2-eq.	Price, \$/t CO2-eq.
Reduction	9.0	7.93	5.6	7.98
Removal	84.4	1.6	52.9	1.71

Most projects comply with the VCS standards

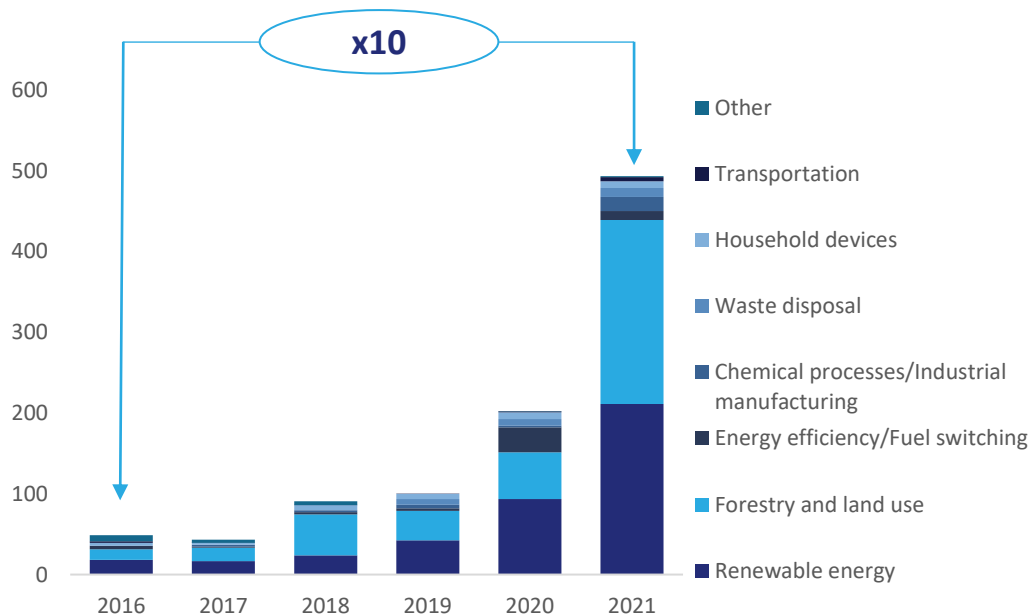
The volume and price of carbon units registered in the largest international registries

Стандарт	2019		2020		2021	
	Volume, mln t CO ₂ -eq.	Price, \$/t CO ₂ -eq.	Volume, mln t CO ₂ -eq.	Price, \$/t CO ₂ -eq.	Volume, mln t CO ₂ -eq.	Price, \$/t CO ₂ -eq.
Verified Carbon Standard (VCS)	44	1.74	66.1	3.76	125.6	4.17
Clean Development Mechanism (CDM)	4.9	2.02	7	2.19	8.2	1.13
Gold Standard (GS)	13.2	5.27	13.9	4.57	5.2	3.94
Climate Action Reserve (ACR)	4.0	2.34	2.1	4.44	4.9	2.12
American Carbon Registry (ACR)	2.5	5.36	5.4	8.44	2.0	11.37

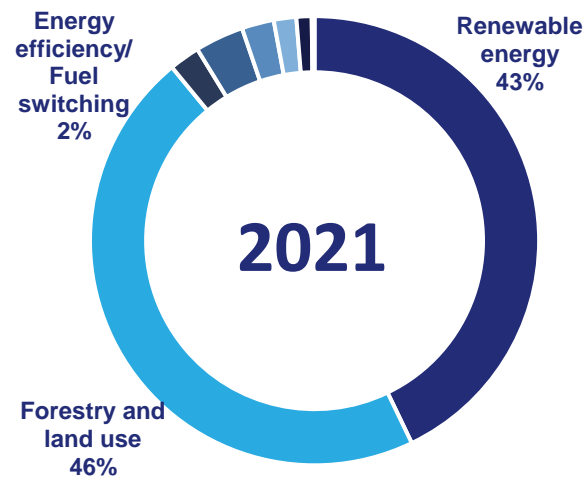
Volume of issued carbon credits has increased x10 over 6 years

Volume of transactions by types of projects

mln t CO₂-eq.



Forestry and energy projects account for over 90%



Methodologies that can be used in the O&G sector:

Based on Clean Development Mechanism (CDM) methodologies



Upstream

AM0009 Recovery and utilization of gas from oil fields that would otherwise be flared or vented



Midstream

AM0023 Leak detection and repair in gas production, processing, transmission, storage and distribution systems and in refinery facilities

AM0037 Flare (or vent) reduction and utilization of gas from oil wells as a feedstock

AM0043 Leak reduction from a natural gas distribution grid by replacing old cast iron pipes or steel pipes without cathodic protection with polyethylene pipes



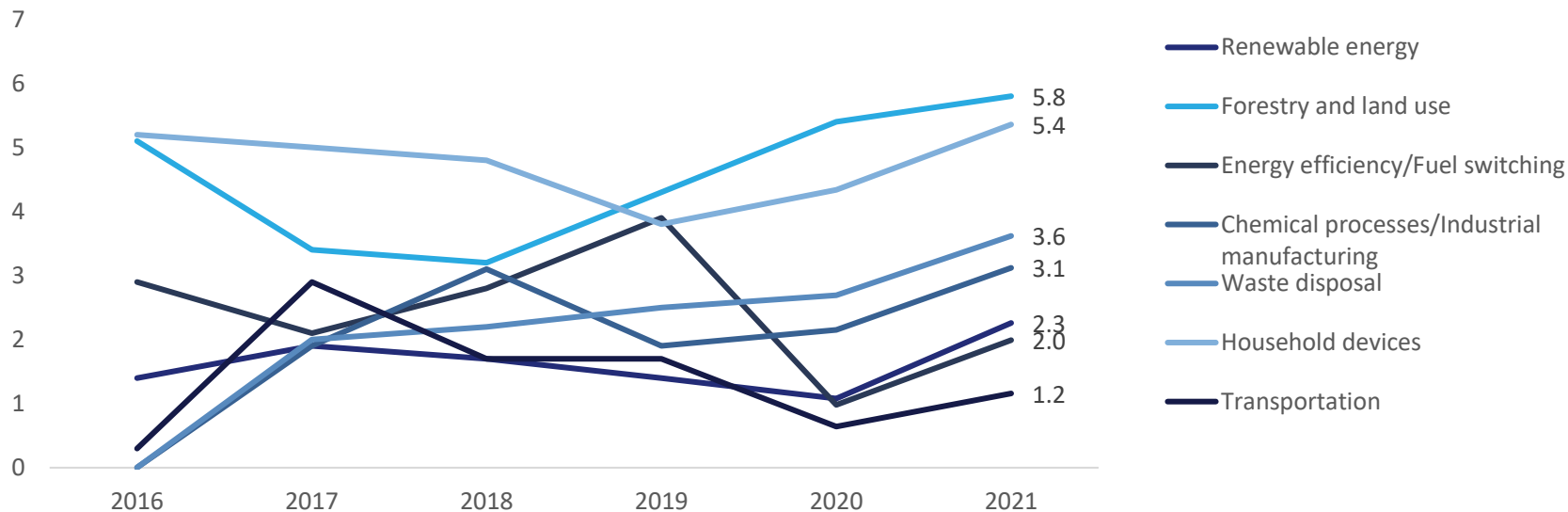
Downstream

AM0055 Recovery and utilization of waste gas in refinery or gas plant

Weighted average price increased from \$2.5 in 2020 to \$4/t in 2021

Price of carbon credits in voluntary markets

\$/t CO₂-eq.



Voluntary carbon market will grow



Decarbonisation instrument

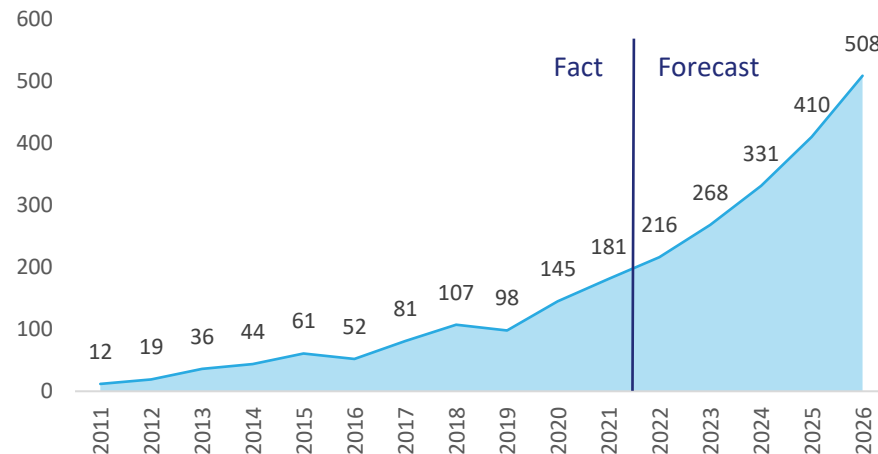
Use for own decarbonisation needs

Financial instrument

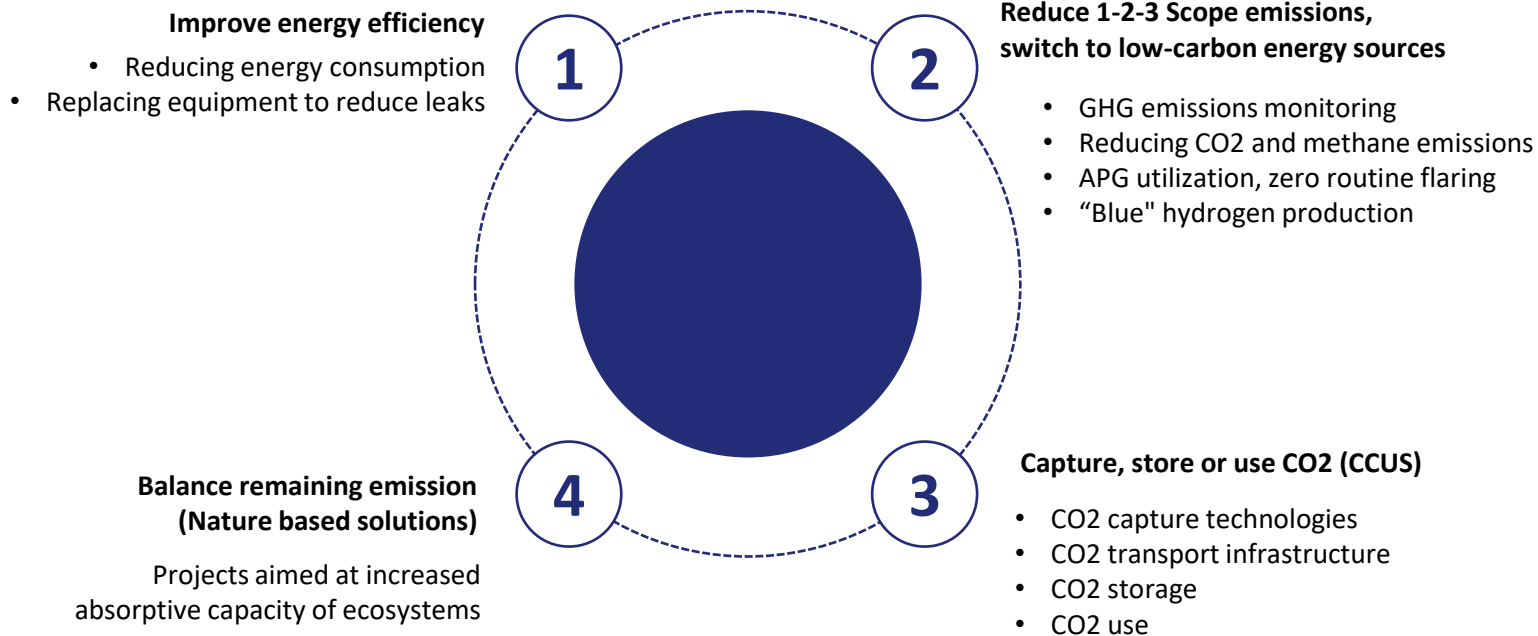
Sell or trade offsets to third-party buyers, brokers or trading platforms

In the past 10 years, **836** mln tonnes of CO₂-eq. have been reduced, removed, and avoided thanks to the VCM

Retired VCS, GS, CAR and AR credits, mln t



It is expected that demand for carbon credits will grow x5-10 in the next 10 years, x8-20 by 2040, and x10-30 by 2050





Thank you!