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REPSOL Group

Information
on oil and gas
exploration
and production
activities

*Translation of a report
originally issued in Spanish.
In the event of a discrepancy,
the Spanish language
version prevails*



The Repsol Commitment
Net Zero Emissions
by 2050



INDEX

(1)	About this report.....	3
(2)	Information on acreage	4
(3)	Production	5
(4)	Exploration and development.....	5
(5)	Net proven reserves	7
(6)	Standardized future cash flows	14
(7)	Results of oil and gas exploration and production activities.....	18
(8)	Investments	21

(1) About this report

This document contains information on the Repsol Group's oil and gas exploration and production activities. This unaudited information is published on an annual basis and is prepared in accordance with the criteria contained in Topic 932 of the "Financial Accounting Standards Boards" (FASB), which contains the principles that are generally applied in the oil and gas industry.

This information includes, in relation to the Repsol Group's oil and gas exploration and production activities:

- **Information on acreage.**
- **Exploration and development activities.**
- **Production of oil and gas.**
- **Net proven reserves**, which represent the estimate volume of proven developed and undeveloped reserves of oil and gas.
- **Future net cash flows**, which represents an estimate of standardized measure of discounted future net cash flows relating to proven oil and gas reserves, as well as the changes with respect to those presented for the previous year
- **Results of oil and gas exploration and production activities**, including revenue and expenses directly associated to the oil and gas exploration and production activities.
- **Investments** in oil and gas exploration and production activities, both accumulated, which shows capitalized historical costs (capitalized cost), and for the period, which represent the amounts capitalized during the year, including the dismantling obligations (cost incurred).

The financial information included in this document is consistent with that stated in the Group financial statements and management report (accessible at www.repsol.com), but there might be some differences due to the fact that the information included in the current document is presented in accordance with US GAAP (Topic 932 FASB) and the Group's official financial information is presented accordingly to International Financial Reporting Standards endorsed by the European Union (IFRS-UE).

Repsol Group estimates its proven reserves according to the standards established by the "SPE/WPC/AAPG/SPEE/SEG/SPWLA/EAGE Petroleum Resources Management System", generally referred to by its acronym "SPE-PRMS (SPE-Society of Petroleum Engineers)". The information here contained refers to the last three years (2021, 2020 and 2019).

(2) Information on acreage

The following tables disclose details of Repsol's acreage and exploration and development activities by geographical region:

- **Developed and undeveloped acreage:** developed acreage consists of surface area that contains productive wells, while undeveloped acreage encompasses surface area that does not contain productive wells or in which these do not allow for extraction of hydrocarbons.

(km ²)	Developed and undeveloped acreage											
	2021				2020				2019			
	Developed ⁽³⁾		Undeveloped ⁽⁴⁾		Developed		Undeveloped		Developed		Undeveloped	
	Gross ⁽¹⁾	Net ⁽²⁾	Gross ⁽¹⁾	Net ⁽²⁾	Gross ⁽¹⁾	Net ⁽²⁾	Gross ⁽¹⁾	Net ⁽²⁾	Gross ⁽¹⁾	Net ⁽²⁾	Gross ⁽¹⁾	Net ⁽²⁾
Europe	1,588	499	9,535	4,773	1,924	594	27,495	11,922	1,934	596	44,959	17,913
Norway	478	80	1,594	521	741	177	3,294	1,200	741	177	6,724	2,982
United Kingdom	1,087	402	425	136	1,161	400	424	135	1,170	403	439	137
Rest of Europe	22	17	7,515	4,116	22	17	23,778	10,587	22	17	37,797	14,793
Latin America	2,960	704	62,434	28,500	2,962	704	67,556	30,805	3,219	761	100,046	48,663
Brazil	838	80	7,163	3,492	838	80	7,861	3,575	838	80	5,065	1,896
Colombia	268	77	39,470	19,429	268	77	43,430	21,426	525	134	58,715	23,807
Peru	238	48	1,456	245	238	48	1,456	245	238	48	17,427	16,216
Trinidad & Tobago	152	45	2,794	838	153	45	2,793	838	153	46	3,652	1,076
Venezuela	806	192	2,185	661	806	192	2,185	661	806	192	2,185	661
Rest of Latin America	660	263	9,367	3,835	661	263	9,831	4,059	660	263	13,002	5,008
North America	3,420	2,414	19,756	8,815	3,433	2,444	19,843	9,033	3,419	2,503	21,344	9,837
Canada	2,422	1,604	5,937	1,651	2,446	1,621	6,222	1,930	2,453	1,612	6,454	2,067
United States	998	810	4,166	2,322	987	823	3,968	2,261	967	892	5,236	2,929
Rest of North America	-	-	9,653	4,842	-	-	9,653	4,842	-	-	9,653	4,842
Africa	2,777	763	17,065	4,696	4,246	1,095	26,965	8,355	4,245	1,095	26,967	8,355
Asia and Oceania	3,937	1,553	65,346	52,160	4,342	1,738	119,591	87,116	4,342	1,738	129,384	94,749
Indonesia	2,555	968	10,614	6,707	2,594	979	15,878	10,021	2,594	979	14,344	8,741
Malaysia	1,293	526	1,004	351	1,293	526	1,004	351	1,293	526	1,004	351
Russia	-	-	3,519	1,760	47	23	5,020	3,046	47	23	4,898	3,062
Rest of Asia and Oceania	89	59	50,208	43,341	408	211	97,689	73,698	408	210	109,138	82,595
Total	14,682	5,933	174,135	98,944	16,908	6,576	261,450	147,230	17,159	6,695	322,699	179,516

- (1) Gross acreage surface area is the area in which Repsol owns an interest.
- (2) Net acreage is the total of the fractional interest in the gross acreage position.
- (3) Includes 599 km² net from blocks in Ecuador, Malaysia and Vietnam sold in January 2022.
- (4) Includes 5,916 km² net from blocks in Ecuador, Greece, Russia, Malaysia and Vietnam sold in January 2022.

- **Acreage under development and exploration:** acreage under development consist of surface area occupied by blocks under development and/or production, while acreage under exploration is surface area occupied by assets in the exploration phase.

(km ²)	Acreage in development or Exploration											
	2021				2020				2019			
	Development ⁽³⁾		Exploration ⁽⁴⁾		Development		Exploration		Development		Exploration	
	Gross ⁽¹⁾	Net ⁽²⁾	Gross ⁽¹⁾	Net ⁽²⁾	Gross ⁽¹⁾	Net ⁽²⁾	Gross ⁽¹⁾	Net ⁽²⁾	Gross ⁽¹⁾	Net ⁽²⁾	Gross ⁽¹⁾	Net ⁽²⁾
Europe	2,729	1,092	8,393	4,180	4,687	1,841	24,733	10,675	2,868	1,132	44,024	17,377
Norway	847	233	1,225	368	2,810	1,009	1,225	368	1,044	321	6,420	2,838
United Kingdom	1,482	528	31	10	1,477	501	108	34	1,424	479	185	61
Rest of Europe	400	331	7,137	3,802	400	331	23,400	10,273	400	331	37,419	14,479
Latin America	15,450	4,531	49,944	24,673	15,411	4,528	55,107	26,981	16,527	4,822	86,738	44,602
Brazil	1,691	250	6,310	3,321	1,691	250	7,008	3,405	1,691	250	4,212	1,726
Colombia	1,432	211	38,305	19,295	1,393	208	42,305	21,295	1,651	264	57,590	23,676
Peru	1,693	292	-	-	1,693	292	-	-	1,693	292	15,971	15,971
Trinidad & Tobago	2,945	884	-	-	2,945	884	-	-	3,804	1,121	-	-
Venezuela	2,990	853	-	-	2,990	853	-	-	2,990	853	-	-
Resto of Latin America	4,698	2,041	5,329	2,056	4,698	2,041	5,794	2,281	4,698	2,041	8,965	3,229
North America	6,471	4,550	16,705	6,679	6,738	4,835	16,538	6,643	6,859	5,064	17,904	7,278
Canada	4,439	3,039	3,920	217	4,704	3,296	3,964	255	4,816	3,419	4,091	261
United States	2,032	1,511	3,131	1,621	2,034	1,539	2,921	1,545	2,043	1,645	4,160	2,176
Rest of North America	-	-	9,653	4,842	-	-	9,653	4,842	-	-	9,653	4,842
Africa	11,153	2,326	8,689	3,132	12,622	2,605	18,589	6,845	12,622	2,605	18,589	6,845
Asia & Oceania	4,857	1,983	64,425	51,730	5,739	2,362	118,194	86,492	5,982	2,454	127,744	94,032
Indonesia	2,018	727	11,151	6,949	2,018	727	16,454	10,273	2,095	754	14,843	8,965
Malaysia	2,297	877	-	-	2,297	877	-	-	2,297	877	-	-
Russia	-	-	3,519	1,760	357	174	4,711	2,895	353	172	4,592	2,912
Rest of Asia and Oceania	542	379	49,756	43,021	1,067	584	97,029	73,325	1,237	651	108,309	82,155
Total	40,660	14,483	148,157	90,393	45,196	16,171	233,161	137,635	44,859	16,077	294,999	170,134

- (1) Gross acreage surface area is the area in which Repsol owns an interest.
- (2) Net acreage is the total of the fractional interest in the gross acreage position.
- (3) Includes 1,420 km² net from blocks in Ecuador, Malaysia and Vietnam sold in January 2022.
- (4) Includes 5,095 km² net from blocks in Russia and Greece sold in January 2022.

(3) Production

The next table shows the productions in volume and the number of Repsol's productive wells by geographic area:

	Net Production of liquids and natural gas by area									Productive wells by area					
	Liquids (Mbbbl)			Natural gas (bcf)			Total (Mbep)			Oil			Gas		
	2021	2020	2019	2021	2020	2019	2021	2020	2019	2021	2020	2019	2021	2020	2019
Europe	10	14	16	30	29	35	16	19	22	187	230	241	15	11	11
Norway	4	5	6	26	24	28	9	9	11	27	66	66	13	8	8
United Kingdom	6	9	10	4	5	7	7	10	11	160	157	168	2	2	2
Rest of Europe	0	0	0	0	0	0	0	0	0	0	7	7	0	1	1
Latin America	29	30	35	382	440	483	97	108	121	717	741	792	207	207	241
Brazil	14	14	15	9	8	9	16	16	17	29	29	27	0	0	0
Colombia	3	3	7	0	1	8	3	3	8	458	446	479	0	0	0
Peru	4	5	5	56	68	72	14	17	18	0	0	0	28	28	29
Trinidad & Tobago	1	1	1	140	189	221	26	34	40	1	1	1	45	45	78
Venezuela	2	2	3	103	93	97	21	18	20	135	81	97	31	31	31
Resto of Latin America	4	5	5	74	80	75	17	19	18	94	184	188	103	103	103
North America	16	20	18	224	294	274	56	72	66	1,852	1,943	1,434	1,975	2,228	2,918
Canada	5	6	8	51	59	74	14	16	21	986	1,083	1,158	1,289	1,549	1,611
United States	11	14	10	174	234	200	42	56	45	866	860	276	686	679	1,307
Rest of North America	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Africa	15	7	15	26	34	42	20	13	22	377	387	385	22	93	92
Asia & Oceania	5	9	9	87	90	98	20	25	27	84	669	668	62	61	70
Indonesia	0	0	0	73	71	78	13	13	14	2	4	7	30	28	35
Malaysia	2	4	4	14	18	18	5	7	7	79	81	79	31	32	35
Russia	1	3	3	0	0	0	1	3	3	0	542	542	0	0	0
Rest of Asia and Oceania	1	1	2	1	2	1	1	2	2	3	42	40	1	1	0
Total	75	79	93	750	887	931	209	237	259	3,217	3,970	3,520	2,281	2,600	3,332

(4) Exploration and development activities

The following tables show Repsol's completed exploratory and developed wells by geographical region:

	Exploration wells completed and in progress ⁽¹⁾														
	Positive			Negative			Under assesment			Total completed			In progress		
	2021	2020	2019	2021	2020	2019	2021	2020	2019	2021	2020	2019	2021	2020	2019
Europe	-	-	1	1	-	3	-	-	-	1	-	4	-	-	-
Norway	-	-	1	1	-	2	-	-	-	1	-	3	-	-	-
United Kingdom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rest of Europe	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-
Latin America	1	1	-	-	-	4	-	-	3	1	1	7	1	1	2
Brazil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colombia	-	1	-	-	-	3	-	-	-	-	1	3	-	-	1
Peru	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trinidad & Tobago	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Resto of Latin America	1	-	-	-	-	1	-	-	1	1	-	2	1	1	1
North America	1	5	1	1	1	-	-	-	-	2	6	1	-	-	2
Canada	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
United States	1	3	1	-	-	-	-	-	-	1	3	1	-	-	2
Rest of North America	-	2	-	1	1	-	-	-	-	1	3	-	-	-	-
Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asia & Oceania	-	-	3	-	-	1	-	-	-	-	-	4	-	-	-
Indonesia	-	-	1	-	-	1	-	-	-	-	-	2	-	-	-
Malaysia	-	-	2	-	-	-	-	-	-	-	-	2	-	-	-
Russia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rest of Asia and Oceania	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2	6	5	2	1	8	-	-	3	4	7	16	1	1	4

(1) Excluding appraisal wells (2 completed in 2021, 2 completed positives and 1 in progress; 2 completed in 2020: 1 completed positive and 1 completed in evaluation, and 1 in progress; 8 completed in 2019: 4 completed positives, 2 completed negative and 2 completed in evaluation).

	Completed development wells ⁽¹⁾											
	Positive			Negative			Under assesment			Total		
	2021	2020	2019	2021	2020	2019	2021	2020	2019	2021	2020	2019
Europe	8	4	7	-	-	-	1	-	-	9	4	7
Norway	6	4	6	-	-	-	1	-	-	7	4	6
United Kingdom	2	-	1	-	-	-	-	-	-	2	-	1
Rest of Europe	-	-	-	-	-	-	-	-	-	-	-	-
Latin America	12	15	30	-	1	-	3	1	2	15	17	32
Brazil	-	3	-	-	-	-	1	1	-	1	4	-
Colombia	9	9	24	-	-	-	1	-	-	10	9	24
Peru	-	-	-	-	-	-	-	-	-	-	-	-
Trinidad & Tobago	3	-	5	-	-	-	-	-	-	3	-	5
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-
Resto of Latin America	-	3	1	-	1	-	1	-	2	1	4	3
North America	19	18	103	-	-	1	-	-	-	19	18	104
Canada	-	1	8	-	-	1	-	-	-	-	1	9
United States	19	17	95	-	-	-	-	-	-	19	17	95
Africa	-	6	14	-	-	-	-	-	-	-	6	14
Asia & Oceania	3	12	50	-	1	-	1	-	6	4	13	56
Indonesia	3	-	-	-	-	-	1	-	-	4	-	-
Malaysia	-	5	8	-	-	-	-	-	-	-	5	8
Russia	-	5	40	-	1	-	-	-	6	-	6	46
Rest of Asia and Oceania	-	2	2	-	-	-	-	-	-	-	2	2
Total	42	55	204	-	2	1	5	1	8	47	58	213

(1) Excluding pilot wells for development concept (1 in 2021, positive).

(5) Net proven oil and gas reserves

The tables below reflect the net developed and undeveloped proved reserves of crude oil, condensates, LPG and natural gas, including the volume of reserves equivalent to the financial income obtained under certain production-sharing contracts and service contracts in force as of December 31, 2021, 2020 and 2019, and the variations therein.

Repsol applies the criteria established by the Society of Petroleum Engineers' Petroleum Resource Management System (SPE/WPC/AAPG/SPEE/SEG/SPWLA/EAGE) to estimate its proven and unproven reserves of oil and gas. See Note 3.7 "*Policies, judgements and estimates relating to hydrocarbon exploration and production activities*" of the 2021 Consolidated Financial Statements.

In accordance with these rules, proved oil and gas reserves are those quantities of oil and gas, which, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be commercially recoverable – from a given date forward, from known reservoirs, and under existing economic conditions, operating methods, and government regulations – prior to the time at which contracts providing the right to operate expire, regardless of whether deterministic or probabilistic methods are used for the estimation. The project to extract the hydrocarbons must have commenced or the operator must be reasonable certain that it will commence the project within a reasonable time.

In determining net reserves, we exclude from our reported reserves royalties due to others, whether payable in cash or in kind, where the royalty owner has a direct interest in the underlying production and is able to make lifting and sales arrangements independently. By contrast, to the extent that royalty payments required to be made to a third party, whether payable in cash or in kind, are a financial obligation, or are substantially equivalent to a production or severance tax, the related reserves are not excluded from our reported reserves despite the fact that such payments are referred to as "royalties" under local rules. Repsol follows the same methodology in reporting our production amounts.

All of Repsol's oil and gas reserves have been estimated by the company's petroleum engineers.

To control the quality of reserves booked, Repsol has established a process that is integrated into Repsol's internal control system. The process to manage reserves booking is centrally controlled by the Reserve Control Direction which is independent from the upstream activities and it is overseen by the Audit and Control Committee of the Repsol's Board. Furthermore, the volumes booked are submitted to third party engineers for a reserves audit on a periodic basis (at least 95% of the reserves are externally audited on a three years cycle).

For those areas submitted to third party audit, Repsol's proved reserves figures have to be within 7% of the third party reserves audit figures for Repsol to declare that the reserves information meets the third party reserves audit standards. In the event that the difference is greater than 7% tolerance, Repsol reestimates its proved reserves to achieve this tolerance level or discloses the third party reserves audit figures. In 2021, Repsol commissioned an external audit for various areas of South America, North America, Europe, Africa and Asia.

Estimates of developed and undeveloped proved reserves of crude oil, condensate and natural gas liquids:

<i>Millions of barrels</i>								
	<u>Total</u>	<u>Europe</u>	<u>Venezuela</u>	<u>Peru</u>	<u>United States</u>	<u>Rest of America</u>	<u>Africa</u>	<u>Asia and Oceania</u>
Fully-consolidated entities								
Reserves at December 31st, 2018 ⁽¹⁾	397	36	-	86	72	71	100	33
Revisions of previous estimates	(1)	5	-	3	(13)	9	5	(11)
Improved recovery	8	-	-	-	-	8	-	-
Extensions and discoveries	15	-	-	-	13	1	-	-
Purchases of minerals in place	53	1	-	-	52	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(56)	(6)	-	(5)	(10)	(15)	(15)	(6)
Reserves at December 31st, 2019 ⁽¹⁾	415	35	-	84	114	74	90	17
Revisions of previous estimates	15	(1)	-	(3)	-	(9)	23	4
Improved recovery	4	-	-	-	2	2	-	-
Extensions and discoveries	(6)	-	-	-	(6)	-	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(47)	(5)	-	(5)	(14)	(11)	(7)	(6)
Reserves at December 31st, 2020 ⁽¹⁾	381	30	-	77	96	57	107	15
Revisions of previous estimates	36	2	-	-	16	1	17	1
Improved recovery	1	-	-	-	-	1	-	-
Extensions and discoveries	51	-	-	-	50	1	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	(6)	-	-	-	-	-	(4)	(2)
Production ⁽¹⁾	(48)	(4)	-	(4)	(11)	(10)	(15)	(3)
Reserves at December 31st, 2021 ^{(1) (2)}	414	27	-	72	151	49	105	10
<i>Millions of barrels</i>								
	<u>Total</u>	<u>Europe</u>	<u>Venezuela</u>	<u>Peru</u>	<u>United States</u>	<u>Rest of America</u>	<u>Africa</u>	<u>Asia and Oceania</u>
Equity-accounted investees								
Reserves at December 31st, 2018 ⁽¹⁾	241	45	51	-	-	117	-	28
Revisions of previous estimates	(2)	-	(11)	-	-	8	-	1
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	3	-	-	-	-	2	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(37)	(10)	(3)	-	-	(21)	-	(3)
Reserves at December 31st, 2019 ⁽¹⁾	205	35	37	-	-	107	-	26
Revisions of previous estimates	23	11	(8)	-	-	23	-	(3)
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	1	-	-	-	-	-	-	1
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(32)	(9)	(2)	-	-	(18)	-	(3)
Reserves at December 31st, 2020 ⁽¹⁾	196	37	28	-	-	112	-	20
Revisions of previous estimates	4	(1)	-	-	-	6	-	-
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	-	-	-	-	-	-	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	(19)	-	-	-	-	-	-	(19)
Production ⁽¹⁾	(27)	(6)	(2)	-	-	(17)	-	(1)
Reserves at December 31st, 2021 ⁽¹⁾	155	30	25	-	-	101	-	-
Total fully-consolidated and equity-accounted entities	570	56	25	72	151	150	105	10

Estimates of developed proved reserves of crude oil, condensate and natural gas liquids:

Millions of barrels

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
At December 31st, 2018	438	55	33	55	37	164	59	36
Fully-consolidated entities	242	14	-	55	37	63	59	15
Equity-accounted investees	195	41	33	-	-	102	-	20
At December 31st, 2019	436	42	30	56	60	151	66	31
Fully-consolidated entities	264	10	-	56	60	59	66	13
Equity-accounted investees	171	32	30	-	-	92	-	18
At December 31st, 2020	392	39	27	50	30	141	77	27
Fully-consolidated entities	217	6	-	50	30	41	77	12
Equity-accounted investees	175	33	27	-	-	100	-	15
At December 31st, 2021	353	24	24	52	47	131	67	8
Fully-consolidated entities	212	4	-	52	47	34	67	8
Equity-accounted investees	141	20	24	-	-	97	-	-

Note: The aggregated changes in reserves and total reserves at December 31 may differ from the individual values shown because the calculations use more precise figures than those shown in the table.

- (1) Total net proved developed and undeveloped reserves at December 31, 2021, 2020, 2019 and 2018 include an estimated volume of approximately 29, 46, 47 and 47 million barrels of oil equivalent, respectively, corresponding to royalty payments which, as described above, constitute a financial obligation or are substantially equivalent to a production or equivalent tax. Net production 2021, 2020, 2019 and 2018 includes an estimated volume of 3, 4, 5 and 5 million barrels of oil equivalent, respectively, in connection with such payments.
- (2) Total net proved reserves at December 31, 2021 include a volume of 10 million barrels of oil equivalent corresponding to assets classified as held for sale under IFRS-UE.

Estimates of developed and undeveloped proved reserves of natural Gas:

Thousand Millions of Standard Cubic Feet

	<u>Total</u>	<u>Europe</u>	<u>Venezuela</u>	<u>Peru</u>	<u>United States</u>	<u>Rest of America</u>	<u>Africa</u>	<u>Asia and Oceania</u>
Fully-consolidated entities								
Reserves at December 31st, 2018 ⁽¹⁾	5,325	105	31	1,737	1,951	812	166	521
Revisions of previous estimates	(177)	8	(7)	(56)	(140)	(10)	81	(52)
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	421	-	-	-	409	12	-	-
Purchases of minerals in place	237	5	-	-	232	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(558)	(28)	(4)	(72)	(200)	(114)	(42)	(98)
Reserves at December 31st, 2019 ⁽¹⁾	5,248	90	20	1,609	2,251	701	206	371
Revisions of previous estimates	(175)	5	3	(74)	67	(183)	21	(13)
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	(115)	-	-	-	(115)	-	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(556)	(25)	(3)	(68)	(234)	(102)	(34)	(90)
Reserves at December 31st, 2020 ⁽¹⁾	4,403	71	21	1,467	1,969	415	193	267
Revisions of previous estimates	104	13	1	-	(74)	29	(6)	140
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	1,221	-	-	-	1,217	4	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	(57)	-	-	-	-	-	(55)	(2)
Production ⁽¹⁾	(465)	(26)	(4)	(56)	(174)	(92)	(26)	(87)
Reserves at December 31st, 2021 ⁽¹⁾⁽²⁾	5,206	58	18	1,411	2,938	356	106	318

Thousand Millions of Standard Cubic Feet

	<u>Total</u>	<u>Europe</u>	<u>Venezuela</u>	<u>Peru</u>	<u>United States</u>	<u>Rest of America</u>	<u>Africa</u>	<u>Asia and Oceania</u>
Equity-accounted investees								
Reserves at December 31st, 2018 ⁽¹⁾	4,230	15	2,570	-	-	1,644	-	-
Revisions of previous estimates	(633)	3	(635)	-	-	(1)	-	-
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	59	-	-	-	-	59	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(373)	(7)	(93)	-	-	(273)	-	-
Reserves at December 31st, 2019 ⁽¹⁾	3,282	11	1,843	-	-	1,428	-	-
Revisions of previous estimates	(192)	5	(198)	-	-	1	-	-
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	-	-	-	-	-	-	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(331)	(5)	(91)	-	-	(236)	-	-
Reserves at December 31st, 2020 ⁽¹⁾	2,759	12	1,554	-	-	1,194	-	-
Revisions of previous estimates	(133)	5	34	-	-	(173)	-	-
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	10	-	-	-	-	10	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(285)	(4)	(99)	-	-	(182)	-	-
Reserves at December 31st, 2021 ⁽¹⁾	2,351	13	1,489	-	-	849	-	-
Total fully-consolidated and equity-accounted entities	7,557	71	1,507	1,411	2,938	1,205	106	318

Estimates of developed proved reserves of natural gas:

Thousand Millions of Standard Cubic Feet

	<u>Total</u>	<u>Europe</u>	<u>Venezuela</u>	<u>Peru</u>	<u>United States</u>	<u>Rest of America</u>	<u>Africa</u>	<u>Asia and Oceania</u>
At December 31st, 2018	6,442	109	1,814	1,093	1,190	1,701	150	385
Fully-consolidated entities	3,658	95	29	1,093	1,190	715	150	385
Equity-accounted investees	2,784	14	1,784	-	-	986	-	-
At December 31st, 2019	6,054	92	1,617	1,012	1,411	1,456	152	315
Fully-consolidated entities	3,615	80	20	1,012	1,411	625	152	315
Equity-accounted investees	2,439	11	1,597	-	-	831	-	-
At December 31st, 2020	5,112	75	1,415	914	1,226	1,081	143	257
Fully-consolidated entities	3,022	64	21	914	1,226	397	143	257
Equity-accounted investees	2,090	11	1,394	-	-	684	-	-
At December 31st, 2021	4,684	67	1,348	1,000	1,082	844	60	282
Fully-consolidated entities	2,837	54	18	1,000	1,082	340	60	282
Equity-accounted investees	1,847	13	1,330	-	-	504	-	-

Notes: The aggregated changes in reserves and total reserves at December 31 may differ from the individual values shown because the calculations use more precise figures than those shown in the table.

- (1) Total net proved developed and undeveloped reserves at December 31, 2021, 2020, 2019 and 2018 include an estimated volume of approximately 717, 781, 907 and 1,127 billion cubic feet of gas, respectively, corresponding to royalty payments which, as described above, constitute a financial obligation or are substantially equivalent to a production or equivalent tax. Net production in 2021, 2020, 2019 and 2018 includes an estimated volume of 53, 64, 70 and 73 billion cubic feet of gas, respectively, in connection with such payments.
- (2) Total net proved reserves at December 31, 2021 include a volume of 44 billion cubic feet of gas corresponding to assets classified as held for sale under IFRS-UE.

Estimates of developed and undeveloped proved reserves of crude oil, condensate, natural gas liquids and natural gas:

Millions of Barrels of Oil Equivalent

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Reserves at December 31st, 2018 ⁽¹⁾	1,345	54	6	395	419	216	129	126
Revisions of previous estimates	(33)	6	(1)	(7)	(38)	7	20	(20)
Improved recovery	8	-	-	-	-	8	-	-
Extensions and discoveries	90	-	-	-	86	3	-	-
Purchases of minerals in place	95	2	-	-	93	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(155)	(11)	(1)	(18)	(45)	(35)	(22)	(23)
Reserves at December 31st, 2019 ⁽¹⁾	1,350	51	4	371	515	199	127	83
Revisions of previous estimates	(16)	-	1	(16)	12	(42)	27	2
Improved recovery	4	-	-	-	2	2	-	-
Extensions and discoveries	(27)	-	-	-	(27)	-	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(146)	(9)	-	(17)	(56)	(29)	(13)	(22)
Reserves at December 31st, 2020 ⁽¹⁾	1,165	42	4	338	447	131	141	62
Revisions of previous estimates	55	4	-	-	3	6	16	26
Improved recovery	1	-	-	-	-	1	-	-
Extensions and discoveries	268	-	-	-	267	1	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	(16)	-	-	-	-	-	(14)	(2)
Production ⁽¹⁾	(131)	(9)	(1)	(14)	(42)	(27)	(20)	(19)
Reserves at December 31st, 2021 ^{(1) (2)}	1,341	37	3	324	674	112	124	67

Millions of Barrels of Oil Equivalent

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Equity-accounted investees								
Reserves at December 31st, 2018 ⁽¹⁾	994	48	509	-	-	410	-	28
Revisions of previous estimates	(114)	-	(124)	-	-	8	-	1
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	13	-	-	-	-	13	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(104)	(11)	(19)	-	-	(70)	-	(3)
Reserves at December 31st, 2019 ⁽¹⁾	789	37	366	-	-	361	-	26
Revisions of previous estimates	(12)	12	(43)	-	-	23	-	(3)
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	1	-	-	-	-	-	-	1
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(91)	(10)	(18)	-	-	(60)	-	(3)
Reserves at December 31st, 2019 ⁽¹⁾	687	39	304	-	-	324	-	20
Revisions of previous estimates	(19)	-	6	-	-	(25)	-	-
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	2	-	-	-	-	2	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	(19)	-	-	-	-	-	-	(19)
Production ⁽¹⁾	(78)	(7)	(20)	-	-	(50)	-	(1)
Reserves at December 31st, 2020 ⁽¹⁾	574	32	290	-	-	252	-	-
Total fully-consolidated and equity-accounted entities	1,916	69	293	324	674	364	124	67

Estimates of developed proved reserves of crude oil, condensate, natural gas liquids and natural gas:

Millions of Barrels of Oil Equivalent

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
At December 31st, 2018	1,585	75	356	249	249	467	85	104
Fully-consolidated entities	894	31	5	249	249	190	85	84
Equity-accounted investees	691	43	350	-	-	277	-	20
At December 31st, 2019	1,514	58	318	236	312	410	93	87
Fully-consolidated entities	908	24	4	236	312	170	93	69
Equity-accounted investees	606	34	315	-	-	240	-	18
At December 31st, 2020	1,303	52	279	213	249	334	103	73
Fully-consolidated entities	756	17	4	213	249	112	103	58
Equity-accounted investees	547	35	275	-	-	222	-	15
At December 31st, 2021	1,188	37	264	231	240	281	78	58
Fully-consolidated entities	717	14	3	231	240	94	78	58
Equity-accounted investees	471	23	261	-	-	187	-	-

Notes: The aggregated changes in reserves and total reserves at December 31 may differ from the individual values shown because the calculations use more precise figures than those shown in the table.

- (1) Total net proved developed and undeveloped reserves at December 31, 2021, 2020, 2019 and 2018 include an estimated volume of approximately 157, 186, 208 and 247 million barrels of oil equivalent, respectively, corresponding to royalty payments which, as described above, constitute a financial obligation or are substantially equivalent to a production or equivalent tax. Net production in 2021, 2020, 2019 and 2018 includes an estimated volume of 13, 15, 17 and 18 million barrels of oil equivalent, respectively, in connection with such payments.
- (2) Total net proved reserves at December 31, 2021 include a volume of 18 million barrels of oil equivalent corresponding to assets classified as held for sale under IFRS-UE.

(6) Standardized future cash flows

Standardized measure of discounted future net cash flows and changes therein relating to proved oil and gas reserves

Projected net cash flows were estimated in accordance with the criteria established by the “SPE/WPC/AAPG/SPEE/SEG/SPWLA/EAGE Petroleum Resources Management System, commonly referred to by its acronym, SPE-PRMS (SPE standing for the Society of Petroleum Engineers)”. Oil and gas prices and other financial assumptions regarding the outlook for costs reflect the Company's best estimates for the purposes of valuing its assets (See Note 3 of the 2021 Consolidated Financial Statements). These assumptions are applied to estimated future production in respect of its proved oil and gas reserves as of the most recent reporting date, less estimated future development and production costs (based on current costs) in respect of these same proved reserves, all of which assuming that prevailing economic conditions are sustained.

Future production costs were estimated on based on the cost structure at the end of the year and are projected on the basis of the above-mentioned assumptions. Future development costs were calculated on the basis of technical studies conducted by Repsol and by the operators holding joint title with Repsol. The taxes projected for each of the future years were determined under the contractual and tax regime prevailing at the end of the year. The rate used to discount the future net revenues was 10%.

The present value of the future net cash flows estimated on the basis of the aforementioned assumptions is not intended to be interpreted, and should not be interpreted, as the fair value of the Group's oil and gas reserves. An estimation of the fair value of these reserves should also include the future exploitation of reserves not yet classified as proved reserves and costs and a discount rate which represents the time value of money at the calculation date and the uncertainties inherent to estimating the reserves.

The following table shows the present value of the future net revenues relating to proved oil and gas reserves, calculated on the basis of the aforementioned assumptions.

Millions of euros
At December 31st 2019

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Future cash inflows	36,832	2,613	58	7,280	12,318	4,663	6,579	3,321
Future production costs	(15,657)	(1,417)	(25)	(3,574)	(6,013)	(2,682)	(1,006)	(940)
Future development and abandonment costs	(6,785)	(1,204)	(9)	(712)	(2,366)	(1,426)	(785)	(283)
Future income tax expenses	(4,729)	264	(11)	(891)	(303)	(168)	(2,891)	(729)
Future net cash flows after taxes	9,661	256	13	2,103	3,636	387	1,897	1,369
10% annual discount for estimated timing of cash flows	(3,121)	(10)	(4)	(1,276)	(1,331)	303	(569)	(234)
Discounted future net cash flows	6,540	246	9	827	2,305	690	1,328	1,135
Equity-accounted investees								
Future cash inflows	23,897	2,220	10,257	-	-	9,884	-	1,536
Future production costs	(10,070)	(1,324)	(3,114)	-	-	(4,598)	-	(1,034)
Future development and abandonment costs	(3,973)	(1,960)	(410)	-	-	(1,498)	-	(105)
Future income tax expenses	(2,791)	544	(2,583)	-	-	(669)	-	(83)
Future net cash flows after taxes	7,063	(520)	4,150	-	-	3,119	-	314
10% annual discount for estimated timing of cash flows	(2,464)	620	(2,148)	-	-	(810)	-	(126)
Discounted future net cash flows	4,599	100	2,002	-	-	2,309	-	188
Total discounted future net cash flows	11,139	346	2,011	827	2,305	2,999	1,328	1,323

Translation of a report originally issued in Spanish.
In the event of a discrepancy, the Spanish language version prevails.

Millions of euros
At December 31st 2020

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Future cash inflows	28,124	1,828	52	5,867	8,997	2,752	6,593	2,035
Future production costs	(11,988)	(1,121)	(30)	(2,787)	(4,999)	(1,397)	(994)	(660)
Future development and abandonment costs	(5,370)	(1,128)	(1)	(549)	(1,800)	(981)	(623)	(288)
Future income tax expenses	(3,857)	491	(8)	(748)	(6)	(110)	(3,083)	(393)
Future net cash flows after taxes	6,909	70	13	1,783	2,192	264	1,893	694
10% annual discount for estimated timing of cash flows	(2,339)	(55)	(5)	(1,075)	(775)	348	(679)	(98)
Discounted future net cash flows	4,570	15	8	708	1,417	612	1,214	596
Equity-accounted investees								
Future cash inflows	18,796	2,007	7,440	-	-	8,345	-	1,004
Future production costs	(8,120)	(1,474)	(2,284)	-	-	(3,507)	-	(855)
Future development and abandonment costs	(3,807)	(2,225)	(204)	-	-	(1,303)	-	(75)
Future income tax expenses	(1,792)	751	(1,844)	-	-	(682)	-	(17)
Future net cash flows after taxes	5,077	(941)	3,108	-	-	2,853	-	57
10% annual discount for estimated timing of cash flows	(1,887)	659	(1,634)	-	-	(895)	-	(17)
Discounted future net cash flows	3,190	(282)	1,474	-	-	1,958	-	40
Total discounted future net cash flows	7,760	(267)	1,482	708	1,417	2,570	1,214	636

Millions of euros
At December 31st 2021

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Future cash inflows	39,106	2,251	28	7,454	16,590	2,992	7,495	2,296
Future production costs	(14,714)	(1,074)	(26)	(3,062)	(7,086)	(1,792)	(932)	(742)
Future development and abandonment costs	(6,986)	(921)	(2)	(675)	(3,479)	(1,130)	(562)	(217)
Future income tax expenses	(5,629)	(35)	(3)	(1,175)	(114)	(147)	(3,732)	(423)
Future net cash flows after taxes	11,777	221	(3)	2,542	5,911	(77)	2,269	914
10% annual discount for estimated timing of cash flows	(4,314)	(66)	-	(1,264)	(2,649)	603	(769)	(169)
Discounted future net cash flows	7,463	155	(3)	1,278	3,262	526	1,500	745
Equity-accounted investees								
Future cash inflows	19,147	2,027	7,722	-	-	9,398	-	-
Future production costs	(8,574)	(1,629)	(2,319)	-	-	(4,626)	-	-
Future development and abandonment costs	(4,192)	(2,478)	(223)	-	-	(1,491)	-	-
Future income tax expenses	(1,975)	854	(1,919)	-	-	(910)	-	-
Future net cash flows after taxes	4,406	(1,226)	3,261	-	-	2,371	-	-
10% annual discount for estimated timing of cash flows	(1,474)	808	(1,608)	-	-	(674)	-	-
Discounted future net cash flows	2,932	(418)	1,653	-	-	1,697	-	-
Total discounted future net cash flows	10,395	(263)	1,650	1,278	3,262	2,223	1,500	745

Changes in Standardized measure of discounted future net cash flows relating to proved oil and gas reserves

The detail of the changes in the standardized measure of discounted future net cash flows for 2018, 2019 and 2020 as follows:

Changes in the standardized measure of discounted future net cash flows

Millions of euros

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Balance at December 31st, 2017	7,970	(230)	13	1,080	2,877	1,064	1,607	1,559
Changes due to sale or transfer prices of future production costs	(468)	69	6	655	(591)	(374)	(122)	(111)
Changes in future development costs	304	496	(1)	(18)	(60)	(5)	(12)	(96)
Oil and gas sales and transfers in the period	(2,266)	(124)	1	(119)	(494)	(308)	(639)	(583)
Net changes due to extensions, discoveries and improvements in the recovery of reserves	325	-	-	-	256	63	-	6
Net changes due to purchases/sales of assets	66	70	-	-	(4)	-	-	-
Net changes due to revisions in quantity estimates	707	52	(3)	(62)	386	293	199	(158)
Previously estimated development costs incurred in the year	933	82	1	32	257	115	73	373
Effect of discounting to a different date and exchange rate effect	1,104	(33)	1	162	405	137	211	221
Other non-specific changes	-	-	-	-	-	-	-	-
Changes in income tax	(108)	(290)	-	(227)	(31)	16	203	221
Net change	597	322	5	423	124	(63)	(87)	(127)
Balance at December 31st, 2018	8,567	92	18	1,503	3,001	1,001	1,520	1,432
Changes due to sale or transfer prices of future production costs	(3,861)	(284)	(4)	(1,015)	(1,384)	(493)	(520)	(161)
Changes in future development costs	87	198	(2)	(124)	(139)	123	(33)	64
Oil and gas sales and transfers in the period	(2,818)	(201)	(6)	(184)	(610)	(323)	(816)	(678)
Net changes due to extensions, discoveries and improvements in the recovery of reserves	369	-	-	-	319	50	-	-
Net changes due to purchases/sales of assets	432	14	-	-	418	-	-	-
Net changes due to revisions in quantity estimates	290	142	(4)	25	(228)	105	269	(19)
Previously estimated development costs incurred in the year	1,045	315	1	32	398	96	83	120
Effect of discounting to a different date and exchange rate effect	954	22	1	175	352	104	159	141
Other non-specific changes	-	-	-	-	-	-	-	-
Changes in income tax	1,475	(52)	5	415	178	27	666	236
Net change	(2,027)	154	(9)	(676)	(696)	(311)	(192)	(297)
Balance at December 31st, 2019	6,540	246	9	827	2,305	690	1,328	1,135
Changes due to sale or transfer prices of future production costs	(2,603)	(162)	(4)	(61)	(861)	(770)	(513)	(232)
Changes in future development costs	129	(128)	4	1	221	2	101	(72)
Oil and gas sales and transfers in the period	(2,801)	(369)	(6)	(107)	(666)	(216)	(812)	(625)
Net changes due to extensions, discoveries and improvements in the recovery of reserves	378	-	-	-	355	23	-	-
Net changes due to purchases/sales of assets	-	-	-	-	-	-	-	-
Net changes due to revisions in quantity estimates	1,300	5	2	(64)	(350)	733	974	-
Previously estimated development costs incurred in the year	693	150	1	37	211	117	77	100
Effect of discounting to a different date and exchange rate effect	61	3	-	11	41	1	(10)	15
Other non-specific changes	-	-	-	-	-	-	-	-
Changes in income tax	873	270	2	64	161	32	69	275
Net change	(1,970)	(231)	(1)	(119)	(888)	(78)	(114)	(539)
Balance at December 31st, 2020	4,570	15	8	708	1,417	612	1,214	596
Changes due to sale or transfer prices of future production costs	2,214	346	(13)	694	1,024	(76)	225	14
Changes in future development costs	(284)	135	(1)	(33)	(334)	(118)	3	64
Oil and gas sales and transfers in the period	(1,532)	(33)	(3)	(92)	(292)	(151)	(555)	(406)
Net changes due to extensions, discoveries and improvements in the recovery of reserves	1,181	-	-	-	1,164	17	-	-
Net changes due to purchases/sales of assets	64	(4)	-	-	-	-	58	10
Net changes due to revisions in quantity estimates	945	70	-	64	(149)	105	554	301
Previously estimated development costs incurred in the year	455	192	-	23	105	55	32	48
Effect of discounting to a different date and exchange rate effect	892	15	1	149	318	99	216	94
Other non-specific changes	-	-	-	-	-	-	-	-
Changes in income tax	(1,042)	(581)	5	(235)	9	(17)	(247)	24
Net change	2,893	140	(11)	570	1,845	(86)	286	149
Balance at December 31st, 2021	7,463	155	(3)	1,278	3,262	526	1,500	745

Millions of euros

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Equity-accounted investees								
Balance at December 31st, 2017	4,584	(622)	2,602	-	-	2,422	-	182
Changes due to sale or transfer prices of future production costs	369	75	220	-	-	45	-	29
Changes in future development costs	662	805	(56)	-	-	(95)	-	8
Oil and gas sales and transfers in the period	(1,382)	(136)	(332)	-	-	(877)	-	(37)
Net changes due to extensions, discoveries and improvements in the recovery of reserves	117	-	-	-	-	112	-	5
Net changes due to purchases/sales of assets	-	-	-	-	-	-	-	-
Net changes due to revisions in quantity estimates	(122)	(108)	(579)	-	-	542	-	23
Previously estimated development costs incurred in the year	499	125	62	-	-	300	-	12
Effect of discounting to a different date and exchange rate effect	621	(79)	360	-	-	313	-	27
Other non-specific changes	-	-	-	-	-	-	-	-
Changes in income tax	(5)	(161)	193	-	-	(31)	-	(6)
Net change	759	521	(132)	-	-	309	-	61
Balance at December 31st, 2018	5,342	(101)	2,470	-	-	2,730	-	243
Changes due to sale or transfer prices of future production costs	(965)	265	(381)	-	-	(781)	-	(68)
Changes in future development costs	799	181	405	-	-	222	-	(9)
Oil and gas sales and transfers in the period	(1,609)	(236)	(242)	-	-	(1,077)	-	(54)
Net changes due to extensions, discoveries and improvements in the recovery of reserves	57	-	-	-	-	53	-	4
Net changes due to purchases/sales of assets	-	-	-	-	-	-	-	-
Net changes due to revisions in quantity estimates	(1,199)	96	(1,332)	-	-	6	-	31
Previously estimated development costs incurred in the year	528	134	27	-	-	353	-	14
Effect of discounting to a different date and exchange rate effect	564	(31)	291	-	-	279	-	25
Other non-specific changes	-	-	-	-	-	-	-	-
Changes in income tax	1,082	(208)	764	-	-	524	-	2
Net change	(743)	201	(468)	-	-	(421)	-	(55)
Balance at December 31st, 2019	4,599	100	2,002	-	-	2,309	-	188
Changes due to sale or transfer prices of future production costs	(943)	(151)	(274)	-	-	(310)	-	(208)
Changes in future development costs	(66)	(33)	74	-	-	(100)	-	(7)
Oil and gas sales and transfers in the period	(1,317)	(271)	(211)	-	-	(785)	-	(50)
Net changes due to extensions, discoveries and improvements in the recovery of reserves	5	-	-	-	-	-	-	5
Net changes due to purchases/sales of assets	-	-	-	-	-	-	-	-
Net changes due to revisions in quantity estimates	(278)	(277)	(565)	-	-	516	-	48
Previously estimated development costs incurred in the year	385	96	2	-	-	272	-	15
Effect of discounting to a different date and exchange rate effect	64	10	41	-	-	4	-	9
Other non-specific changes	-	-	-	-	-	-	-	-
Changes in income tax	741	244	405	-	-	52	-	40
Net change	(1,409)	(382)	(528)	-	-	(351)	-	(148)
Balance at December 31st, 2020	3,190	(282)	1,474	-	-	1,958	-	40
Changes due to sale or transfer prices of future production costs	(76)	26	(10)	-	-	(92)	-	-
Changes in future development costs	(399)	(99)	(7)	-	-	(293)	-	-
Oil and gas sales and transfers in the period	(839)	(111)	(166)	-	-	(540)	-	(22)
Net changes due to extensions, discoveries and improvements in the recovery of reserves	(2)	-	-	-	-	(2)	-	-
Net changes due to purchases/sales of assets	(33)	(13)	-	-	-	-	-	(20)
Net changes due to revisions in quantity estimates	296	(5)	31	-	-	270	-	-
Previously estimated development costs incurred in the year	342	124	5	-	-	213	-	-
Effect of discounting to a different date and exchange rate effect	522	(66)	268	-	-	318	-	2
Other non-specific changes	-	-	-	-	-	-	-	-
Changes in income tax	(69)	8	58	-	-	(135)	-	-
Net change	(258)	(136)	179	-	-	(261)	-	(40)
Balance at December 31st, 2021	2,932	(418)	1,653	-	-	1,697	-	-
Total fully-consolidated and equity-accounted entities	10,395	(263)	1,650	1,278	3,262	2,223	1,500	745

(7) Results of oil and gas exploration and production activities

The following table shows the revenues and expenses associated directly with the Group's oil and gas exploration and production activities. It does not include any allocation of the finance costs or general expenses, except for the accretion expense, and, therefore, is not necessarily indicative of the contribution to consolidated net profit of the oil and gas activities.

Millions of euros

At December 31st 2019	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Income								
Sales to non-Group companies	3,289	407	6	267	572	496	636	905
Sales between business segments and to Group Companies	825	11	-	11	321	154	327	1
Total income	4,114	418	6	278	893	650	963	906
Production costs	(986)	(113)	(5)	(72)	(256)	(292)	(82)	(166)
Production taxes	(159)	-	(1)	(60)	(6)	-	(62)	(30)
Exploration expenses ⁽¹⁾	(916)	(134)	-	(1)	3	(145)	(111)	(528)
Other operating expenses	(402)	(51)	(117)	(14)	(131)	(68)	33	(54)
Depreciation and amortisation charge ⁽²⁾	(5,912)	(178)	(1)	(49)	(2,383)	(2,768)	(190)	(343)
Profit (Loss) before taxes and charges	(4,261)	(58)	(118)	82	(1,880)	(2,623)	551	(215)
Taxes and charges ⁽³⁾	(92)	(87)	7	(25)	50	497	(418)	(116)
Results of oil and gas production activities	(4,353)	(145)	(111)	57	(1,830)	(2,126)	133	(331)
Equity-accounted investees								
Income								
Sales to non-Group companies	2,208	570	383	-	-	1,099	-	156
Sales between business segments and to Group Companies	561	20	-	-	-	541	-	-
Total income	2,769	590	383	-	-	1,640	-	156
Production costs	(592)	(227)	(32)	-	-	(317)	-	(16)
Production taxes	(409)	-	(55)	-	-	(291)	-	(63)
Exploration expenses ⁽¹⁾	(121)	(1)	-	-	-	(65)	-	(55)
Other operating expenses	(90)	19	(86)	-	-	(10)	-	(13)
Depreciation and amortisation charge ⁽²⁾	(1,218)	(242)	(39)	-	-	(926)	-	(11)
Profit (Loss) before taxes and charges	339	139	171	-	-	31	-	(2)
Taxes and charges ⁽³⁾	(63)	(38)	(90)	-	-	75	-	(10)
Results of oil and gas production activities	276	101	81	-	-	106	-	(12)
Total results of oil and gas activities ⁽⁴⁾	(4,077)	(44)	(30)	57	(1,830)	(2,020)	133	(343)

Millions of euros

At December 31st
2020

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Income								
Sales to non-Group companies	409	6	-	6	198	55	144	-
Sales between business segments and to Group Companies	2,174	221	7	223	545	323	205	650
Total income	2,583	227	7	229	743	378	349	650
Production costs	(876)	(109)	(3)	(62)	(278)	(226)	(72)	(126)
Production taxes	(73)	-	(1)	(41)	(4)	-	(22)	(5)
Exploration expenses ⁽¹⁾	(253)	(105)	-	(1)	(9)	(50)	(24)	(64)
Other operating expenses	(468)	(108)	-	(31)	(203)	-	(40)	(86)
Depreciation and amortisation charge ⁽²⁾	(3,017)	(796)	3	(47)	(553)	(735)	(213)	(676)
Profit (Loss) before taxes and charges	(2,104)	(891)	6	47	(304)	(633)	(22)	(307)
Taxes and charges ⁽³⁾	226	53	3	(15)	60	77	(47)	95
Results of oil and gas production activities	(1,878)	(838)	9	32	(244)	(556)	(69)	(212)
Equity-accounted investees								
Income								
Sales to non-Group companies	359	28	-	-	-	331	-	-
Sales between business segments and to Group Companies	1,249	302	324	-	-	527	-	96
Total income	1,608	330	324	-	-	858	-	96
Production costs	(453)	(201)	(21)	-	-	(217)	-	(14)
Production taxes	(223)	-	(53)	-	-	(131)	-	(39)
Exploration expenses ⁽¹⁾	(110)	-	-	-	-	(46)	-	(64)
Other operating expenses	(61)	(14)	(77)	-	-	35	-	(5)
Depreciation and amortisation charge ⁽²⁾	(1,634)	(494)	(128)	-	-	(932)	-	(80)
Profit (Loss) before taxes and charges	(873)	(379)	45	-	-	(433)	-	(106)
Taxes and charges ⁽³⁾	149	125	3	-	-	14	-	7
Results of oil and gas production activities	(724)	(254)	48	-	-	(419)	-	(99)
Total results of oil and gas activities ⁽⁴⁾	(2,602)	(1,092)	57	32	(244)	(975)	(69)	(311)

Millions of euros

At December 31st
2021

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Income								
Sales to non-Group companies	770	6	-	5	364	42	353	-
Sales between business segments and to Group Companies	3,679	593	2	548	695	528	601	712
Total income	4,449	599	2	553	1,059	570	954	712
Production costs	(811)	(139)	(1)	(60)	(225)	(200)	(61)	(125)
Production taxes	(181)	-	-	(107)	(7)	-	(51)	(16)
Exploration expenses ⁽¹⁾	(367)	(59)	-	(1)	(248)	(54)	(1)	(4)
Other operating expenses	(677)	(320)	(19)	(73)	(165)	(42)	6	(64)
Depreciation and amortisation charge ⁽²⁾	(896)	(176)	-	(37)	(150)	(253)	(71)	(209)
Profit (Loss) before taxes and charges	1,517	(95)	(18)	275	264	21	776	294
Taxes and charges ⁽⁵⁾	(941)	(199)	(3)	(90)	(66)	(103)	(336)	(144)
Results of oil and gas production activities	576	(294)	(21)	185	198	(82)	440	150
Equity-accounted investees								
Income								
Sales to non-Group companies	553	101	-	-	-	452	-	-
Sales between business segments and to Group Companies	1,798	352	411	-	-	983	-	52
Total income	2,351	453	411	-	-	1,435	-	52
Production costs	(487)	(253)	(32)	-	-	(198)	-	(4)
Production taxes	(361)	-	(64)	-	-	(266)	-	(31)
Exploration expenses ⁽¹⁾	12	-	-	-	-	(15)	-	27
Other operating expenses	(232)	(28)	(143)	-	-	(60)	-	(1)
Depreciation and amortisation charge ⁽²⁾	(856)	(281)	(42)	-	-	(532)	-	(1)
Profit (Loss) before taxes and charges	427	(109)	130	-	-	364	-	42
Taxes and charges ⁽³⁾	(98)	54	22	-	-	(155)	-	(19)
Results of oil and gas production activities	329	(55)	152	-	-	209	-	23
Total results of oil and gas activities ⁽⁴⁾	905	(349)	131	185	198	127	440	173

(1) Exploration expenses include charges for the impairment of exploration assets of €188, €192 and €713 million in 2021, 2020 and 2019, respectively (see Note 21 to the Financial Statements).

(2) Depreciation and amortization charge and provisions" includes the net impairment of production assets and development and provisions for onerous charges, as well as impairment of goodwill amounting to €337, €2,919 and €4,981 million in 2021, 2020 and 2019, respectively (see Note 21 to the Financial Statements).

(3) The income tax expense includes the impairment of tax assets recognized in 2020 and 2019 amounting to €75 and €470 million (see Note 20 to the Financial Statements).

(4) Results generated for divestments are not included. In addition, it does not include the results recorded because of the procedure initiated by Addax Petroleum UK Limited y Sinopec International Petroleum Exploration and Production Corporation (see Note 15 to the Financial Statements).

(8) Investments

Investments of the year (cost incurred)

The costs incurred represent amounts capitalised during the year relating to acquisitions of properties and for exploration and development activities, including dismantling costs.

Millions of euros

At December 31st 2019

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Acquisition of proved properties	512	37	-	-	475	-	-	-
Acquisition of unproved properties	-	-	-	-	-	-	-	-
Exploration costs	479	96	-	-	220	111	14	38
Development costs	1,138	315	-	7	589	34	63	130
Costs incurred	2,129	448	-	7	1,284	145	77	168
Equity-accounted investees								
Acquisition of proved properties	-	-	-	-	-	-	-	-
Acquisition of unproved properties	-	-	-	-	-	-	-	-
Exploration costs	55	-	-	-	-	42	-	13
Development costs	546	130	-	-	-	401	-	15
Costs incurred	601	130	-	-	-	443	-	28
Total costs incurred	2,730	578	-	7	1,284	588	77	196

Millions of euros

At December 31st 2020

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Acquisition of proved properties	193	-	-	-	193	-	-	-
Acquisition of unproved properties	-	-	-	-	-	-	-	-
Exploration costs	261	27	-	-	105	94	3	32
Development costs	482	221	(4)	40	128	21	8	68
Costs incurred	936	248	(4)	40	426	115	11	100
Equity-accounted investees								
Acquisition of proved properties	-	-	-	-	-	-	-	-
Acquisition of unproved properties	-	-	-	-	-	-	-	-
Exploration costs	35	-	-	-	-	23	-	12
Development costs	397	67	2	-	-	324	-	4
Costs incurred	432	67	2	-	-	347	-	16
Total costs incurred	1,368	315	(2)	40	426	462	11	116

Millions of euros
At December 31st 2021

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Acquisition of proved properties	-	-	-	-	-	-	-	-
Acquisition of unproved properties	-	-	-	-	-	-	-	-
Exploration costs	222	24	-	-	112	59	1	26
Development costs	844	323	(1)	67	314	75	38	28
Costs incurred	1,066	347	(1)	67	426	134	39	54
Equity-accounted investees								
Acquisition of proved properties	3	3	-	-	-	-	-	-
Acquisition of unproved properties	-	-	-	-	-	-	-	-
Exploration costs	26	-	-	-	-	23	-	3
Development costs	316	116	(31)	-	-	230	-	1
Costs incurred	345	119	(31)	-	-	253	-	4
Total costs incurred	1,411	466	(32)	67	426	387	39	58

Accumulated investments (capitalised costs)

Capitalised costs represent the historical costs capitalised related to oil and gas exploration and production activities, including auxiliary equipment and facilities, and the related accumulated depreciation and accumulated impairment losses.

Millions of euros
At December 31st 2019

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Capitalised costs of proved oil and gas properties ⁽²⁾	20,548	1,036	72	505	8,454	5,424	1,762	3,295
Capitalised costs of unproved oil and gas properties	1,837	89	-	0	1,198	370	20	160
Total capitalised costs	22,385	1,125	72	505	9,652	5,794	1,782	3,455
Auxiliary equipment and facilities	5,299	733	32	748	1,236	927	1,187	436
Total capitalised costs	27,684	1,858	104	1,253	10,888	6,721	2,969	3,891
Accumulated depreciation and impairment losses ⁽²⁾	(15,146)	(1,208)	(102)	(368)	(5,394)	(4,187)	(1,963)	(1,924)
Net amount	12,538	650	2	885	5,494	2,534	1,006	1,967
Equity-accounted investees								
Capitalised costs of proved oil and gas properties	11,326	2,116	1,587	-	-	7,399	-	224
Capitalised costs of unproved oil and gas properties	706	-	-	-	-	640	-	66
Total capitalised costs	12,032	2,116	1,587	-	-	8,039	-	290
Auxiliary equipment and facilities	4,022	462	870	-	-	2,688	-	2
Total capitalised costs	16,054	2,578	2,457	-	-	10,727	-	292
Accumulated depreciation and impairment losses	(9,584)	(1,214)	(1,895)	-	-	(6,381)	-	(94)
Net amount	6,470	1,364	562	-	-	4,346	-	198
Total Net amounts ⁽¹⁾	19,008	2,014	564	885	5,494	6,880	1,006	2,165

Millions of euros
At December 31st 2020

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Capitalised costs of proved oil and gas properties	19,142	1,008	66	460	7,924	4,991	1,628	3,065
Capitalised costs of unproved oil and gas properties	1,734	32	-	0	1,195	377	1	129
Total capitalised costs	20,876	1,040	66	460	9,119	5,368	1,629	3,194
Auxiliary equipment and facilities	5,174	863	26	702	1,246	856	1,074	407
Total capitalised costs	26,050	1,903	92	1,162	10,365	6,224	2,703	3,601
Accumulated depreciation and impairment losses	(15,951)	(1,213)	(90)	(380)	(5,448)	(4,480)	(1,972)	(2,368)
Net amount	10,099	690	2	782	4,917	1,744	731	1,233
Equity-accounted investees								
Capitalised costs of proved oil and gas properties	9,938	1,963	1,454	-	-	6,346	-	175
Capitalised costs of unproved oil and gas properties	582	-	-	-	-	586	-	(4)
Total capitalised costs	10,520	1,963	1,454	-	-	6,932	-	171
Auxiliary equipment and facilities	3,980	456	790	-	-	2,732	-	2
Total capitalised costs	14,500	2,419	2,244	-	-	9,664	-	173
Accumulated depreciation and impairment losses	(9,703)	(1,514)	(1,846)	-	-	(6,207)	-	(136)
Net amount	4,797	905	398	-	-	3,457	-	37
Total Net amounts ⁽¹⁾	14,896	1,595	400	782	4,917	5,201	731	1,270

Millions of euros
At December 31st 2021

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Capitalised costs of proved oil and gas properties	20,694	920	71	559	8,836	5,492	1,702	3,114
Capitalised costs of unproved oil and gas properties	1,744	20	-	(1)	1,166	397	(1)	163
	22,438	940	71	558	10,002	5,889	1,701	3,277
Auxiliary equipment and facilities	5,951	1,190	28	768	1,467	899	1,183	416
Total capitalised costs	28,389	2,130	99	1,326	11,469	6,788	2,884	3,693
Accumulated depreciation and impairment losses	(17,587)	(1,209)	(97)	(446)	(6,043)	(5,044)	(2,178)	(2,570)
Net amount	10,802	921	2	880	5,426	1,744	706	1,123
Equity-accounted investees								
Capitalised costs of proved oil and gas properties	10,890	2,189	1,508	-	-	7,193	-	-
Capitalised costs of unproved oil and gas properties	685	-	-	-	-	661	-	24
	11,575	2,189	1,508	-	-	7,854	-	24
Auxiliary equipment and facilities	4,193	541	840	-	-	2,810	-	2
Total capitalised costs	15,768	2,730	2,348	-	-	10,664	-	26
Accumulated depreciation and impairment losses	(11,117)	(1,889)	(2,030)	-	-	(7,198)	-	-
Net amount	4,651	841	318	-	-	3,466	-	26
Total Net amounts ^{(2) (3)}	15,453	1,762	320	880	5,426	5,210	706	1,149

- (1) In 2019, the European Union adopted IFRS 16 (for further details on its application in Repsol, see Note 2 on Bases of Presentation in the Consolidated Financial Statements). Consequently, total cumulative investments at December 31, 2019 increased by €835 million, mainly affecting "Ancillary equipment and facilities" of investees and consolidated companies, amounting to €685 million and €134 million, respectively.
- (2) In 2019 "Investments in areas with reserves" included the reclassification for the final recognition of the interest prior to the acquisition of the 63% interest in the Eagle Ford asset.
- (3) In 2021, includes assets classified as held for sale amounting €257 million.

The information in this document is published pursuant to the provision of article 226 of the Spanish Securities Market Law.