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The Hague, February 28th, 2019

In accordance with Law of 23 December 2016, on market abuse, Repsol International Finance, B.V. (the “**Company**”) is filing the attached Report on Payments to Governments and Information on Oil&Gas activities of Repsol, S.A., the Guarantor of the Company’s Euro 10,000,000,000 Guaranteed Euro Medium Term Note Programme.

Both documents were filed today by Repsol, S.A. with the Spanish Securities Market Commission (*Comisión Nacional del Mercado de Valores*).

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REPSOL Group

2018 Report on payments
to governments
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*



(1) PRESENTATION

Spanish¹ and European² regulations require that large undertakings and public interest entities which are active in the extractive industry prepare and publish an annual report on payments made to the Governments as a result of their Extractive Operations³.

The Report on Payments to Governments of Repsol, S.A. (the “Report”) which is presented below complies with said regulations and reflects the payments made in the scope of its hydrocarbon exploration and production activity. This Report, therefore, does not refer to the totality of taxes and payments to governments that Repsol makes in all of its activities. For more information on taxes paid, please see section 6.7 *Responsible tax policy* of the Integrated management report and section *Responsible Tax Policy* of our corporate website (<https://www.repsol.com>).

The Report has been approved by the Board of Directors of Repsol, S.A. at a meeting held on February 27, 2019.

(2) BASIS FOR THE ELABORATION OF THE INFORMATION

2.1) Basis of presentation

This Report discloses the payments made to Governments in 2018 as a result of its Extractive Operations, according to the definitions given below.

It includes payments made the Repsol Group, this is by Repsol, S.A. and its controlled⁴ companies (hereinafter ‘Repsol’). This Report does not include payments made by companies over which Repsol, S.A. has ‘joint control’ or ‘significant influence’ (as such terms are defined by the International Financial Reporting Standards (IFRS) issued by the International Accounting Standards Board (IASB) adopted by the European Union).

This Report only includes payments made directly by Repsol to Governments.

When Repsol makes payments directly to a Government as an operator in a joint operation, the Report presents the payments in full, even where Repsol is proportionally reimbursed by its non-operating project partners through a partner billing process.

On the other hand, when Repsol is not the project operator and payments are made directly by the operator of the project, this amount is not included in this Report even if Repsol pays its proportionate share to the operating partner. Any other payment made by Repsol directly to the Government is included in the Report, even when it is not the operator of the project.

¹ Tenth Additional Provision of Law 22/2015, of July 20, on Audit of Accounts.

² Chapter 10 of Directive 2013/34 / EU of the European Parliament and of the Council of 26 June 2013 on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings, amending Directive 2006/43/EC of the European Parliament and of the Council and repealing Council Directives 78/660/EEC and 83/349/EEC.

³ For further information on exploration and production activities, see section 5.1 *Upstream* of the Consolidated management report and the Information on oil and gas exploration and production activities, which can be found in the corporate website.

⁴ Controlled companies are those which Repsol, S.A. directly or indirectly, controls and fully consolidates in the Consolidated financial statements of the Repsol Group. For further information on the Group’s consolidation scope, see Appendix I of the Repsol Group’s Consolidated financial statements.

The payments are presented in this Report by project when the payments have been attributed to a specific project. However, payments made by Repsol in relation to obligations imposed at company level are presented as the entity that made such payment.

Payments are reported on a cash basis. In-kind payments are converted to an equivalent cash value based on the most appropriate and relevant valuation method for each payment, which can be at cost or market value or such other value as stated in the contract. In-kind payments are reported in both volume and equivalent cash value.

This Report is presented in millions of euros to one decimal place. Payments made in currencies other than the Euro are converted for the purposes of this Report, using the cumulative average exchange rate for the period.

Below are presented the main exchange rates used in the preparation of this Report:

Currency	US Dollar (USD)	Indonesian Rupee (IDR)	Malaysian Ringgit (MYR)	Vietnamese Dong (VND)	Bolivian Peso (BOB)	Peruvian Sol (PES)
Exch. vs. Euro	1.18	16,804.34	4.76	27,174.66	8.21	3.88

2.2) Definitions

Extractive Operations

The Report includes payments to Governments made by Repsol, S.A. and its controlled companies whose activities consist, in whole or in part, of the exploration, prospection, discovery, development and extraction of minerals, oil, natural gas deposits or other materials (Extractive Operations).

Government

Any national, regional or local authority of a country, including a department, agency or undertaking controlled by that authority.

Project

Operational activities that are governed by a single contract, license, lease, concession or similar legal agreements and form the basis for payment liabilities with a government. Nonetheless, if multiple such agreements are substantially interconnected, this shall be considered a project.

Payments

The payments included in the report are classified as follows:

- *Taxes*

Includes taxes levied on the income, profits or taxes levied on production and royalties linked to production. Excludes taxes levied on consumption such as value added taxes, personal income taxes or sales taxes. Payments are reported net of refunds.

- *Production Entitlements*

Share of production allocated to the Government of the country where the Extractive Operations derived from projects operated by the Group are carried out. This includes the government's share as a sovereign entity or through its participation as an equity or interest holder in projects within its sovereign jurisdiction.

Production entitlements arising from activities carried out by state oil companies outside of their respective home countries are excluded.

- *Signature, discovery and production bonuses*

Payments related to signature, discovery and production bonuses. These are usually paid upon the signing of an agreement or contract, or when a commercial discovery is declared, or production has commenced or reached a milestone.

- *Licence fees, rental fees, entry fees and other considerations for licenses and/or concessions*

Payments related to licence fees, rental fees, entry fees and other considerations for licenses or concessions. These are fees and other sums paid as consideration for acquiring a license in order to gain access to an area where extractive activities are being performed.

- *Other*

This heading includes dividends, royalties and payments for infrastructure improvements, grouped together for presentation purposes in this Report. All individual payments in this column are identified by their proper payment category.

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(3) INFORMATION BY COUNTRY

Million euros						
	Taxes	Production entitlement	Signature, discovery and production bonuses	License fees, rental fees and other considerations for licenses and/or concessions	Other ⁽¹⁾	TOTAL
Africa	-	-	-	0,1	-	0,1
Algeria	-	-	-	0,1	-	0,1
Asia	394,7	792,2	44,5	3,3	-	1.234,7
Indonesia	193,3	-	-	3,3	-	196,6
Malaysia	129,9	548,7	29,0	-	-	707,6
Vietnam	71,5	243,5	15,5	-	-	330,5
Europe	4,8	-	-	(5,4)	-	(0,6)
Spain	4,8	-	-	-	-	4,8
Norway	-	-	-	(5,4)	-	(5,4)
Latin America	130,9	637,3	168,7	4,5	-	941,4
Bolivia	11,7	562,1	-	1,6	-	575,4
Brazil	-	-	20,9	-	-	20,9
Colombia	2,9	-	-	-	-	2,9
Ecuador	87,3	75,2	-	0,9	-	163,4
Guayana	-	-	-	0,3	-	0,3
Mexico	4,9	-	147,8	1,7	-	154,4
Peru	24,1	-	-	-	-	24,1
North America	66,2	-	-	20,7	0,3	87,2
Canada	17,0	-	-	4,8	-	21,8
United States Of America	49,2	-	-	15,9	0,3	65,4
Oceania	-	-	-	0,2	-	0,2
Papua New Guinea	-	-	-	0,2	-	0,2
	596,6	1.429,5	213,2	23,4	0,3	2.263,0

⁽¹⁾ The amount of 0.3 million of euros included in "Other" corresponds to payments for infrastructure improvements.

(4) INFORMATION PER PROJECT

Million euros

	Taxes	Production entitlement	Signature, discovery and production bonuses	License fees, rental fees and other considerations for licenses and/or concessions	Other	TOTAL
Algeria						
Illizi	-	-	-	0,1	-	0,1
Total	-	-	-	0,1	-	0,1
Bolivia						
Margarita (Caipipendi)/Huacaya	-	551,5	-	1,2	-	552,7
Surubi Noroeste (Mamore)	-	5,6	-	0,2	-	5,8
Monteagudo	-	0,6	-	-	-	0,6
Paloma, Surubi y Surubi (Bloque Bajo)	-	3,8	-	0,2	-	4,0
Cambeiti	-	0,6	-	-	-	0,6
Repsol E&P Bolivia, S.A.	11,7	-	-	-	-	11,7
Total	11,7	562,1	-	1,6	-	575,4
Brazil						
Repsol Exploração Brasil, Ltda.	-	-	20,9	-	-	20,9
Total	-	-	20,9	-	-	20,9
Canada						
Chauvin Alberta/Chauvin	7,1	-	-	1,3	-	8,4
Duvernay	0,4	-	-	0,4	-	0,8
Greater Edson	8,0	-	-	3,1	-	11,1
Repsol Oil & Gas Canada, Inc.	1,5	-	-	-	-	1,5
Total	17,0	-	-	4,8	-	21,8
Colombia						
Repsol Exploración Colombia, S.A.	0,2	-	-	-	-	0,2
Talisman (Colombia) Oil & Gas, Ltd.	2,7	-	-	-	-	2,7
Total	2,9	-	-	-	-	2,9
Ecuador						
Bloque 16	70,0	63,7	-	0,7	-	134,4
Tivacuno	5,3	11,5	-	0,2	-	17,0
Repsol Ecuador, S.A.	12,0	-	-	-	-	12,0
Total	87,3	75,2	-	0,9	-	163,4
United States of America						
Alaska North Slope	-	-	-	2,2	-	2,2
Eagle Ford	9,8	-	-	-	-	9,8
GOM	-	-	-	1,0	-	1,0
Leon	-	-	-	0,3	-	0,3
Marcellus	7,5	-	-	12,4	0,3 ⁽¹⁾	20,2
Shenzi	32,0	-	-	-	-	32,0
Repsol Louisiana Corporation	(0,1)	-	-	-	-	(0,1)
Total	49,2	-	-	15,9	0,3	65,4
Spain						
Repsol Investigaciones Petrolíferas, S.A.	4,8	-	-	-	-	4,8
Total	4,8	-	-	-	-	4,8
Guyana						
Kanuku	-	-	-	0,3	-	0,3
Total	-	-	-	0,3	-	0,3
Indonesia						
Corridor	186,6	-	-	-	-	186,6
Jambi Merang	6,7	-	-	-	-	6,7
Seram	-	-	-	3,3	-	3,3
Total	193,3	-	-	3,3	-	196,6

⁽¹⁾ The amount of 0.3 million of euros included in "Other" corresponds to payments for infrastructure improvements.

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Million euros

	Taxes	Production entitlement	Signature, discovery and production bonuses	License fees, rental fees and other considerations for licenses and/or concessions	Other	TOTAL
Malaysia						
PM3-CAA	49,6 ⁽¹⁾	331,7 ⁽⁵⁾	16,2	-	-	397,5
PM305	5,2 ⁽²⁾	17,6 ⁽⁶⁾	-	-	-	22,8
PM314	0,4 ⁽³⁾	2,1 ⁽⁷⁾	-	-	-	2,5
SB1 Kinabalu Oil	76,3 ⁽⁴⁾	197,3 ⁽⁸⁾	12,8	-	-	286,4
Repsol Oil & Gas Malaysia, Ltd.	(1,6)	-	-	-	-	(1,6)
Total	129,9	548,7	29,0	-	-	707,6
Mexico						
Bloque 05	0,4	-	-	-	-	0,4
Bloque 10	1,0	-	24,6	0,8	-	26,4
Bloque 11	0,5	-	-	-	-	0,5
Bloque 12	0,3	-	-	-	-	0,3
Bloque 14	1,1	-	-	0,9	-	2,0
Bloque 29	1,6	-	123,2	-	-	124,8
Total	4,9	-	147,8	1,7	-	154,4
Norway						
Repsol Norge, AS	-	-	-	(5,4)	-	(5,4)
Total	-	-	-	(5,4)	-	(5,4)
Papua New Guinea						
PDL 10	-	-	-	0,2	-	0,2
Total	-	-	-	0,2	-	0,2
Peru						
Lote 56	0,2	-	-	-	-	0,2
Lote 57	23,3	-	-	-	-	23,3
Lote 88	0,3	-	-	-	-	0,3
Repsol Exploración Perú, S.A.	0,3	-	-	-	-	0,3
Total	24,1	-	-	-	-	24,1
Vietnam						
Block 15-2/01 PC	34,1	-	-	-	-	34,1
Block 46 Cai Nuoc	-	2,9 ⁽²⁾	-	-	-	2,9
PM3-CAA	37,4 ⁽¹⁾	240,6 ⁽³⁾	15,5	-	-	293,5
Total	71,5	243,5	15,5	-	-	330,5
Total	596,6	1.429,5	213,2	23,4	0,3	2.263,0

Malaysia:

- ⁽¹⁾ Includes payments in kind amounting to 1.1 million barrels of oil equivalent (48.0 million euros).
⁽²⁾ Includes payments in kind amounting to 0.1 million barrels of oil equivalent (3.9 million euros).
⁽³⁾ Includes payments in kind amounting to 0.006 million barrels of oil equivalent (0.4 million euros).
⁽⁴⁾ Includes payments in kind amounting to 1.0 million barrels of oil equivalent 58.4 million euros).
⁽⁵⁾ Includes payments in kind amounting to 8.4 million barrels of oil equivalent (331.7 million euros).
⁽⁶⁾ Includes payments in kind amounting to 0.3 million barrels of oil equivalent (17.6 million euros).
⁽⁷⁾ Includes payments in kind amounting to 0.03 million barrels of oil equivalent (2.1 million euros).
⁽⁸⁾ Includes payments in kind amounting to 3.1 million barrels of oil equivalent (197.3 million euros).

Vietnam:

- ⁽¹⁾ Includes payments in kind amounting to 1.1 million barrels of oil equivalent (37.4 million euros).
⁽²⁾ Includes payments in kind amounting to 0.04 million barrels of oil equivalent (2.9 million euros).
⁽³⁾ Includes payments in kind amounting to 5.4 million barrels of oil equivalent (240.6 million euros).

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(5) INFORMATION PER GOVERNMENT

Million euros						
	Taxes	Production entitlement	Signature, discovery and production bonuses	License fees, rental fees and other considerations for licenses and/or concessions	Other	TOTAL
Algeria						
DGE (Ministere des Finances)	-	-	-	0,1	-	0,1
Total	-	-	-	0,1	-	0,1
Bolivia						
Ministerio de Hidrocarburos y Energía	-	562,1	-	-	-	562,1
Tributos Fiscales	11,7	-	-	-	-	11,7
Yacimientos Petrolíferos Fiscales Bolivianos (YPFB)	-	-	-	1,6	-	1,6
Total	11,7	562,1	-	1,6	-	575,4
Brazil						
Agência Nacional do Petróleo, Gás Natural e	-	-	20,9	-	-	20,9
Total	-	-	20,9	-	-	20,9
Canada						
Alberta Energy Regulator	-	-	-	2,9	-	2,9
Alberta Petroleum Marketing Commission	7,2	-	-	-	-	7,2
Clearwater County	-	-	-	0,1	-	0,1
Government of Canada	(11,7)	-	-	-	-	(11,7)
Canada Revenue Agency	2,2	-	-	-	-	2,2
MD of Wainwright No 61	-	-	-	0,1	-	0,1
Ministry of Finance - Saskatchewan	0,2	-	-	-	-	0,2
Minister of Finance of Quebec	-	-	-	0,1	-	0,1
Minister of Finance, Province of Alberta	-	-	-	0,1	-	0,1
Province of Alberta	-	-	-	0,1	-	0,1
Province of BC, Energy Mines & Petr	0,5	-	-	-	-	0,5
Government of Alberta	10,3	-	-	-	-	10,3
Government of Ontario	0,6	-	-	-	-	0,6
Provincial Treasurer of Alberta	7,6	-	-	-	-	7,6
Receiver General	0,1	-	-	-	-	0,1
Sustainable Resource Development - Alberta	-	-	-	0,5	-	0,5
The Provincial Treasurer Of Alberta	-	-	-	0,6	-	0,6
Town of Edson	-	-	-	0,1	-	0,1
Yellowhead County	-	-	-	0,2	-	0,2
Total	17,0	-	-	4,8	-	21,8
Colombia						
Administración de Impuestos y Aduanas Nacionales (DIAN)	2,9	-	-	-	-	2,9
Total	2,9	-	-	-	-	2,9
Ecuador						
Servicio de Rentas Internas	87,3	-	-	-	-	87,3
Agencia de Regularizacion y Control	-	-	-	0,3	-	0,3
Ministerio de Energía y Recursos Naturales	-	75,2	-	0,1	-	75,3
Ministerio del Ambiente	-	-	-	0,3	-	0,3
Secretaría de Hidrocarburos	-	-	-	0,2	-	0,2
Total	87,3	75,2	-	0,9	-	163,4
United States of America						
Blossburg Municipal Authority	0,9	-	-	0,1	-	1,0
Bureau of Ocean Energy Management	32,2	-	-	1,4	-	33,6
City of Runge	0,1	-	-	-	-	0,1
Commissioner of the General Land	0,4	-	-	-	-	0,4
Commonwealth of Pennsylvania	6,1	-	-	11,7	-	17,8
Department of Natural Resources	-	-	-	2,3	-	2,3
Northeast Bradford School District	0,2	-	-	-	-	0,2
Northern Tier Solid Waste Authority	0,1	-	-	-	-	0,1
Pa Department of Transportation	-	-	-	-	0,3	0,3
Pennsylvania Game Commission	0,1	-	-	-	-	0,1
Texas Comptroller of Public Accounts	9,2	-	-	-	-	9,2
Susquehanna River Basin Commission	-	-	-	0,3	-	0,3
United States Geological Survey	-	-	-	0,1	-	0,1
Louisiana Department of Revenue	(0,1)	-	-	-	-	(0,1)
Total	49,2	-	-	15,9	0,3	65,4

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Million euros

	Taxes	Production entitlement	Signature, discovery and production bonuses	License fees, rental fees and other considerations for licenses and/or concessions	Other	TOTAL
Spain						
Tesoro Público	4,8	-	-	-	-	4,8
Total	4,8	-	-	-	-	4,8
Guyana						
Guyana Geology and Mines Commission	-	-	-	0,3	-	0,3
Total	-	-	-	0,3	-	0,3
Indonesia						
Directorate General Tax	193,3	-	-	-	-	193,3
Direktorat Jenderal Minyak dan Gas	-	-	-	3,3	-	3,3
Total	193,3	-	-	3,3	-	196,6
Malaysia						
Inland Revenue Board	(1,7)	-	-	-	-	(1,7)
PETRONAS	131,6	548,7	29,0	-	-	709,3
Total	129,9	548,7	29,0	-	-	707,6
Mexico						
Comisión Nacional de Hidrocarburos	-	-	-	1,7	-	1,7
Fondo Mexicano de Petróleo	-	-	147,8	-	-	147,8
Servicio de Administración Tributaria	4,9	-	-	-	-	4,9
Total	4,9	-	147,8	1,7	-	154,4
Norway						
Oljedirektoratet	-	-	-	(5,4)	-	(5,4)
Skatteetaten	-	-	-	-	-	-
Total	-	-	-	(5,4)	-	(5,4)
Papua New Guinea						
Department of Environment and Conservation	-	-	-	0,2	-	0,2
Total	-	-	-	0,2	-	0,2
Peru						
SUNAT	0,2	-	-	-	-	0,2
Organismo de Evaluación y Fiscalización Ambiental	0,2	-	-	-	-	0,2
OSINERGMIN	0,7	-	-	-	-	0,7
Perupetro S.A.	23,0	-	-	-	-	23,0
Total	24,1	-	-	-	-	24,1
Vietnam						
Vietnam Oil and Gas Group	37,4	243,5	15,5	-	-	296,4
Vietnam Tax Authority	34,1	-	-	-	-	34,1
Total	71,5	243,5	15,5	-	-	330,5
Total	596,6	1.429,5	213,2	23,4	0,3	2.263,0

Grupo REPSOL

2018 Information on oil
and gas exploration
and production
activities

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(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:

- **Information on acreage.**
- **Exploration and development activities.**
- **Net proven reserves**, which represent the 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.
- **Changes in Future net cash flows**, which reflects the changes in standardized measure of discounted future net cash flows relating to proven oil and gas reserves with respect to those presented for the previous year
- **Production of oil and gas of the year.**
- **Results of oil and gas exploration and production activities**, including revenue and expenses directly associated to this activity.
- **Accumulated investment** (capitalized cost), which shows capitalized historical costs.
- **Investments of the year** (cost incurred), which represent the amounts capitalized during the year, including the dismantling obligations.

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-PRMS system. The information here contained refers to the last three years (2018, 2017 and 2016).

(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 encompass 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											
	2018				2017				2016			
	Developed		Undeveloped		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	1,714	533	34,353	12,512	1,816	680	37,775	15,891	1,892	686	60,186	28,888
Norway	555	114	2,756	913	303	107	4,609	1,660	303	107	9,842	4,539
United Kingdom	1,137	402	472	141	1,490	555	430	105	1,567	561	699	236
Rest of Europe	22	17	31,126	11,457	22	17	32,736	14,126	22	17	49,645	24,113
Latin America	3,007	682	158,279	95,105	3,006	688	117,655	51,550	3,131	715	132,471	57,207
Brazil	838	80	4,737	1,837	838	80	2,236	316	838	80	2,448	363
Colombia	369	72	74,143	27,212	369	78	73,382	27,525	509	112	74,956	28,036
Peru	238	48	52,431	51,220	238	48	12,755	10,348	225	41	21,748	13,346
Trinidad & Tobago	151	45	3,653	1,076	151	45	3,653	1,076	152	45	6,238	2,109
Venezuela	806	192	2,185	661	806	192	2,185	661	803	192	2,187	661
Rest of Latin America	606	245	21,131	13,099	606	245	23,443	11,624	604	245	24,895	12,691
North America	3,459	2,134	25,204	12,562	6,028	2,199	17,213	8,538	5,606	2,184	35,745	20,473
Canada	2,498	1,647	10,246	5,096	2,517	1,580	10,673	5,567	2,586	1,570	27,171	16,651
United States	961	487	5,305	2,624	3,511	620	5,947	2,615	3,020	614	8,574	3,822
Rest of North America	-	-	9,653	4,842	-	-	593	356	-	-	-	-
Africa	4,245	1,095	31,980	12,100	4,347	1,234	51,793	23,899	2,566	713	87,592	56,825
Asia and Oceania	2,377	1,051	134,258	100,052	2,290	982	136,872	99,721	1,402	564	160,302	113,633
Indonesia	615	219	16,705	12,289	615	219	15,583	12,261	661	242	20,613	16,737
Malaysia	1,307	598	4,023	2,528	1,221	560	4,108	2,566	414	193	4,984	2,952
Russia	47	23	3,384	2,352	46	23	3,386	2,418	222	109	4,692	4,135
Rest of Asia and Oceania	408	210	110,146	82,884	408	180	113,794	82,476	104	20	130,012	89,808
Total	14,802	5,494	384,074	232,331	17,487	5,783	361,308	199,599	14,598	4,862	476,297	277,027

- 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											
	2018				2017				2016			
	Development		Exploration		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	2,818	1,122	33,249	11,922	2,743	1,199	36,848	15,373	2,845	1,230	59,233	28,344
Norway	999	310	2,313	717	851	324	4,062	1,444	876	343	9,269	4,304
United Kingdom	1,419	480	189	63	1,492	543	428	117	1,570	555	695	242
Rest of Europe	400	331	30,748	11,143	400	331	32,358	13,812	399	332	49,269	23,798
Latin America	16,560	4,827	144,726	90,959	15,236	4,475	105,425	47,763	16,883	4,736	118,719	53,186
Brazil	1,691	250	3,884	1,667	973	100	2,100	296	1,185	147	2,100	296
Colombia	1,684	270	72,828	27,014	1,357	219	72,394	27,383	2,196	375	73,270	27,773
Peru	1,693	292	50,975	50,975	1,413	141	11,580	10,255	2,020	202	19,952	13,185
Trinidad & Tobago	3,804	1,121	-	-	3,804	1,121	-	-	3,804	1,121	2,585	1,034
Venezuela	2,990	853	-	-	2,990	853	-	-	2,990	853	-	-
Rest of Latin America	4,698	2,041	17,039	11,303	4,698	2,041	19,351	9,828	4,688	2,038	20,812	10,899
North America	6,901	4,698	21,762	9,998	10,252	5,234	12,989	5,503	10,881	5,316	30,470	17,342
Canada	4,837	3,434	7,907	3,309	5,180	3,779	8,009	3,368	5,549	3,813	24,208	14,408
United States	2,064	1,264	4,202	1,847	5,072	1,455	4,387	1,780	5,332	1,503	6,262	2,934
Rest of North America	-	-	9,653	4,842	-	-	593	356	-	-	-	-
Africa	12,622	2,605	23,602	10,590	12,725	2,744	43,416	22,389	12,725	2,744	77,434	54,794
Asia and Oceania	7,276	2,951	129,359	98,152	10,060	4,105	129,101	96,598	11,280	4,638	150,423	109,560
Indonesia	3,124	1,011	14,196	11,496	3,124	1,011	13,074	11,469	4,279	1,589	16,996	15,391
Malaysia	2,324	1,022	3,005	2,104	2,324	1,022	3,005	2,104	2,393	1,041	3,005	2,104
Russia	346	169	3,085	2,206	346	169	3,085	2,272	1,312	642	3,602	3,602
Rest of Asia and Oceania	1,482	749	109,071	82,345	4,267	1,902	109,935	80,754	3,297	1,365	126,820	88,463
Total	46,178	16,203	352,698	221,621	51,016	17,757	327,779	187,625	54,614	18,664	436,280	263,226

(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) 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 assessment			Total completed			In progress		
	2018	2017	2016	2018	2017	2016	2018	2017	2016	2018	2017	2016	2018	2017	2016
Europe	-	-	-	3	2	-	1	-	1	4	2	1	1	-	1
Norway	-	-	-	1	1	-	1	-	-	2	1	-	1	-	-
United Kingdom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rest of Europe	-	-	-	2	1	-	-	-	1	2	1	1	-	-	1
Latin America	4	3	-	6	4	2	-	-	-	10	7	2	1	5	1
Brazil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colombia	4	-	-	3	2	2	-	-	-	7	2	2	-	3	-
Peru	-	-	-	-	1	-	-	-	-	-	1	-	-	-	1
Trinidad & Tobago	-	2	-	1	-	-	-	-	-	1	2	-	-	-	-
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rest of Latin America	-	1	-	2	1	-	-	-	-	2	2	-	1	2	-
North America	-	1	-	2	-	-	-	-	-	2	1	-	-	2	-
Canada	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
United States	-	1	-	2	-	-	-	-	-	2	1	-	-	2	-
Africa	-	-	-	3	1	1	-	-	1	3	1	2	-	1	-
Asia and Oceania	-	1	-	2	2	6	-	-	2	2	3	8	1	-	-
Indonesia	-	-	-	-	1	1	-	-	2	-	1	3	1	-	-
Malaysia	-	-	-	2	-	3	-	-	-	2	-	3	-	-	-
Russia	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-
Rest of Asia and Oceania	-	1	-	-	-	2	-	-	-	-	1	2	-	-	-
Total	4	5	-	16	9	9	1	-	4	21	14	13	3	8	2

(1) Excluding appraisal wells (2 in 2018: 1 positive and 1 in evaluation; 2 in 2017: 1 positive y 1 negative; 8 in 2016: 3 positive, 2 negative, 1 in evaluation and 2 still in progress. The Hendrix well was declared negative, although it was still in progress at December 31, 2017).

	Completed development wells											
	Positive			Negative			Under assessment			Total		
	2018	2017	2016	2018	2017	2016	2018	2017	2016	2018	2017	2016
Europe	4	4	3	-	-	-	-	-	-	4	4	3
Norway	4	3	1	-	-	-	-	-	-	4	3	1
United Kingdom	-	1	2	-	-	-	-	-	-	-	1	2
Rest of Europe	-	-	-	-	-	-	-	-	-	-	-	-
Latin America	28	69	52	1	2	2	3	3	7	32	74	61
Brazil	2	3	4	-	-	-	-	-	-	2	3	4
Colombia	22	25	3	-	-	-	3	1	1	25	26	4
Peru	-	-	3	-	-	-	-	-	1	-	-	4
Trinidad & Tobago	3	17	8	1	-	-	-	1	5	4	18	13
Venezuela	-	17	25	-	-	-	-	-	-	-	17	25
Rest of Latin America	1	7	9	-	2	2	-	1	-	1	10	11
North America	136	153	150	-	-	-	-	-	-	136	153	150
Canada	48	57	31	-	-	-	-	-	-	48	57	31
United States	88	96	119	-	-	-	-	-	-	88	96	119
Africa	7	12	8	-	1	1	-	-	1	7	13	10
Asia and Oceania	48	31	46	-	1	-	1	3	-	49	35	46
Indonesia	2	-	1	-	-	-	-	-	-	2	-	1
Malaysia	12	-	-	-	-	-	1	3	-	13	3	-
Russia	32	25	45	-	1	-	-	-	-	32	26	45
Rest of Asia and Oceania	2	6	-	-	-	-	-	-	-	2	6	-
Total	223	269	259	1	4	3	4	6	8	228	279	270

(4) 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, 2018, 2017 and 2016, and the variations therein.

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. We follow the same methodology in reporting our production amounts.

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 “Accounting estimates and judgments” of the 2018 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.

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. 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 2018, 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 GPL:

Millions of barrels

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Reserves at December 31st, 2015 ⁽¹⁾	396	13	-	80	82	96	110	16
Revisions of previous estimates	28	9	-	4	1	3	1	10
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	27	-	-	17	6	4	-	-
Purchases of minerals in place	1	-	-	-	-	1	-	-
Sales of minerals in place	(20)	-	-	-	-	(19)	-	(1)
Production ⁽¹⁾	(51)	(8)	-	(5)	(12)	(16)	(3)	(7)
Reserves at December 31st, 2016 ⁽¹⁾	380	14	-	96	77	68	107	18
Revisions of previous estimates	42	5	-	-	(6)	10	13	19
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	19	-	-	-	16	3	-	-
Purchases of minerals in place	2	-	-	-	-	-	-	2
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(52)	(6)	-	(5)	(10)	(13)	(12)	(5)
Reserves at December 31st, 2017 ⁽¹⁾	391	12	-	92	77	68	108	34
Revisions of previous estimates	46	24	-	(1)	(2)	11	8	5
Improved recovery	1	-	-	-	-	1	-	-
Extensions and discoveries	12	-	-	-	8	4	-	-
Purchases of minerals in place	6	6	-	-	-	-	-	-
Sales of minerals in place	(2)	-	-	-	(2)	-	-	-
Production ⁽¹⁾	(57)	(7)	-	(5)	(10)	(13)	(16)	(7)
Reserves at December 31st, 2018 ⁽¹⁾	397	36	-	86	72	71	100	33

Millions of barrels

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Equity-accounted investees								
Reserves at December 31st, 2015 ⁽¹⁾	192	30	42	-	-	91	-	29
Revisions of previous estimates	30	18	11	-	-	(3)	-	4
Improved recovery	19	-	-	-	-	19	-	-
Extensions and discoveries	-	-	-	-	-	-	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(38)	(8)	(5)	-	-	(21)	-	(4)
Reserves at December 31st, 2016 ⁽¹⁾	204	40	48	-	-	87	-	29
Revisions of previous estimates	63	9	15	-	-	35	-	4
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	-	-	-	-	-	-	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(41)	(9)	(5)	-	-	(23)	-	(4)
Reserves at December 31st, 2017 ⁽¹⁾	226	40	59	-	-	99	-	29
Revisions of previous estimates	52	15	(5)	-	-	40	-	2
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	1	-	-	-	-	1	-	1
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(38)	(10)	(3)	-	-	(22)	-	(3)
Reserves at December 31st, 2018 ⁽¹⁾	241	45	51	-	-	117	-	28
Total fully-consolidated and equity-accounted entities	638	81	51	86	72	188	100	61

Estimates of developed proved reserves of crude oil, condensate and GPL:

Millions of barrels

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
At December 31st, 2015	418	36	32	50	52	137	71	40
Fully-consolidated entities	283	13	-	50	52	82	71	15
Equity-accounted investees	135	23	32	-	-	55	-	25
At December 31st, 2016	407	50	33	48	46	123	68	40
Fully-consolidated entities	250	13	-	48	46	59	68	17
Equity-accounted investees	157	37	33	-	-	64	-	23
At December 31st, 2017	430	47	37	60	38	148	63	37
Fully-consolidated entities	248	11	-	60	38	61	63	16
Equity-accounted investees	182	36	37	-	-	88	-	21
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

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, 2018, 2017, 2016 and 2015 include an estimated volume of approximately 47, 47, 45 and 45 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 2018, 2017, 2016 and 2015 includes an estimated volume of 5, 5, 4 and 4 million barrels of oil equivalent, respectively, in connection with such payments.

Estimates of developed and undeveloped proved reserves of natural Gas:

Thousand Millions of Standard Cubic Feet

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Reserves at December 31st, 2015 ⁽¹⁾	5,039	14	47	1,549	1,733	794	103	799
Revisions of previous estimates	247	24	2	106	(28)	(7)	11	140
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	545	-	-	310	111	95	-	30
Purchases of minerals in place	15	-	-	-	10	4	-	-
Sales of minerals in place	(198)	-	-	-	-	(6)	-	(192)
Production ⁽¹⁾	(533)	(16)	(5)	(68)	(180)	(124)	(16)	(124)
Reserves at December 31st, 2016 ⁽¹⁾	5,116	21	44	1,897	1,646	757	98	653
Revisions of previous estimates	59	11	4	-	(87)	39	20	72
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	387	-	-	-	343	44	-	-
Purchases of minerals in place	13	-	-	-	1	4	-	8
Sales of minerals in place	(17)	-	-	-	(5)	(12)	-	(1)
Production ⁽¹⁾	(494)	(13)	(5)	(67)	(174)	(116)	(8)	(111)
Reserves at December 31st, 2017 ⁽¹⁾	5,064	20	42	1,830	1,724	717	110	620
Revisions of previous estimates	460	15	(7)	(24)	214	176	82	5
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	248	-	-	-	203	41	-	4
Purchases of minerals in place	124	93	-	-	31	-	-	-
Sales of minerals in place	(41)	-	-	-	(41)	-	-	-
Production ⁽¹⁾	(530)	(23)	(4)	(68)	(179)	(120)	(26)	(108)
Reserves at December 31st, 2018 ⁽¹⁾	5,325	105	31	1,737	1,951	812	166	521

Thousand Millions of Standard Cubic Feet

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Equity-accounted investees								
Reserves at December 31st, 2015 ⁽¹⁾	4,986	28	3,067	-	-	1,851	-	40
Revisions of previous estimates	369	(1)	86	-	-	253	-	32
Improved recovery	7	-	-	-	-	7	-	-
Extensions and discoveries	-	-	-	-	-	-	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(385)	(1)	(124)	-	-	(247)	-	(14)
Reserves at December 31st, 2016 ⁽¹⁾	4,977	26	3,029	-	-	1,864	-	58
Revisions of previous estimates	177	(1)	(33)	-	-	205	-	6
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	-	-	-	-	-	-	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	(53)	-	-	-	-	-	-	(53)
Production ⁽¹⁾	(407)	(4)	(125)	-	-	(267)	-	(11)
Reserves at December 31st, 2017 ⁽¹⁾	4,693	20	2,871	-	-	1,802	-	-
Revisions of previous estimates	(167)	3	(195)	-	-	25	-	-
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	104	-	-	-	-	104	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(400)	(8)	(106)	-	-	(287)	-	-
Reserves at December 31st, 2018 ⁽¹⁾	4,230	15	2,570	-	-	1,644	-	-
Total fully-consolidated and equity-accounted entities	9,554	120	2,601	1,737	1,951	2,456	166	521

Estimates of developed proved reserves of natural gas:

Thousand Millions of Standard Cubic Feet

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
At December 31st, 2015	5,697	15	1,308	926	1,120	1,622	33	673
Fully-consolidated entities	3,475	14	47	926	1,120	681	33	654
Equity-accounted investees	2,222	1	1,261	-	-	941	-	19
At December 31st, 2016	6,054	21	2,014	933	1,112	1,403	18	554
Fully-consolidated entities	3,249	19	44	933	1,112	596	18	528
Equity-accounted investees	2,805	2	1,971	-	-	807	-	26
At December 31st, 2017	6,212	35	1,945	1,163	1,158	1,447	11	452
Fully-consolidated entities	3,486	16	39	1,163	1,158	646	11	452
Equity-accounted investees	2,726	19	1,906	-	-	801	-	-
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	-	-

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, 2018, 2017, 2016 and 2015 include an estimated volume of approximately 1,127, 1,248, 1,273 and 1,264 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 2018, 2017, 2016 and 2015 includes an estimated volume of 73, 50, 64 and 47 billion cubic feet of gas, respectively, in connection with such payments.

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, 2015 ⁽¹⁾	1,293	16	8	356	390	237	128	158
Revisions of previous estimates	72	13	-	23	(4)	2	3	35
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	124	-	-	72	25	21	-	6
Purchases of minerals in place	4	-	-	-	2	1	-	-
Sales of minerals in place	(55)	-	-	-	-	(20)	-	(35)
Production ⁽¹⁾	(146)	(11)	(1)	(17)	(44)	(38)	(6)	(29)
Reserves at December 31st, 2016 ⁽¹⁾	1,291	17	8	434	370	203	125	135
Revisions of previous estimates	52	7	1	-	(21)	17	17	32
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	88	-	-	-	77	11	-	-
Purchases of minerals in place	5	-	-	-	-	1	-	3
Sales of minerals in place	(3)	-	-	-	(1)	(2)	-	-
Production ⁽¹⁾	(140)	(9)	(1)	(17)	(41)	(34)	(14)	(25)
Reserves at December 31st, 2017 ⁽¹⁾	1,293	15	8	417	384	196	128	145
Revisions of previous estimates	128	27	(1)	(5)	36	43	22	6
Improved recovery	1	-	-	-	-	1	-	-
Extensions and discoveries	56	-	-	-	45	11	-	1
Purchases of minerals in place	28	23	-	-	5	-	-	-
Sales of minerals in place	(9)	-	-	-	(9)	-	-	-
Production ⁽¹⁾	(151)	(11)	(1)	(17)	(41)	(35)	(21)	(26)
Reserves at December 31st, 2018 ⁽¹⁾	1,345	54	6	395	419	216	129	126

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, 2015 ⁽¹⁾	1,080	35	588	-	-	420	-	36
Revisions of previous estimates	96	18	27	-	-	42	-	9
Improved recovery	21	-	-	-	-	21	-	-
Extensions and discoveries	-	-	-	-	-	-	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(106)	(8)	(27)	-	-	(65)	-	(7)
Reserves at December 31st, 2016 ⁽¹⁾	1,090	45	588	-	-	419	-	39
Revisions of previous estimates	95	9	9	-	-	71	-	5
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	-	-	-	-	-	-	-	-
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	(9)	-	-	-	-	-	-	(9)
Production ⁽¹⁾	(114)	(10)	(27)	-	-	(71)	-	(6)
Reserves at December 31st, 2017 ⁽¹⁾	1,062	43	570	-	-	420	-	29
Revisions of previous estimates	22	15	(39)	-	-	44	-	2
Improved recovery	-	-	-	-	-	-	-	-
Extensions and discoveries	20	-	-	-	-	19	-	1
Purchases of minerals in place	-	-	-	-	-	-	-	-
Sales of minerals in place	-	-	-	-	-	-	-	-
Production ⁽¹⁾	(110)	(11)	(22)	-	-	(73)	-	(3)
Reserves at December 31st, 2018 ⁽¹⁾	994	48	509	-	-	410	-	28
Total fully-consolidated and equity-accounted entities	2,340	102	514	395	419	625	129	154

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, 2015	1,430	38	264	214	251	426	77	160
Fully-consolidated entities	901	15	8	214	251	204	77	132
Equity-accounted investees	529	23	256	-	-	222	-	28
At December 31st, 2016	1,485	53	392	214	244	373	71	139
Fully-consolidated entities	829	16	8	214	244	165	71	111
Equity-accounted investees	656	37	384	-	-	208	-	28
At December 31st, 2017	1,536	53	383	267	244	406	65	118
Fully-consolidated entities	869	13	7	267	244	176	65	97
Equity-accounted investees	667	40	376	-	-	230	-	21
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

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, 2018, 2017, 2016 and 2015 include an estimated volume of approximately 247, 269, 272 and 271 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 2018, 2017, 2016 and 2015 includes an estimated volume of 18, 14, 15 and 12 million barrels of oil equivalent, respectively, in connection with such payments.

(5) 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. 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 2016

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Future cash inflows	48,018	1,014	120	11,673	12,744	7,195	8,969	6,303
Future production costs	(11,034)	(602)	(34)	(5,048)	(1,845)	(877)	(1,086)	(1,542)
Future development and abandonment costs	(7,938)	(1,650)	(6)	(607)	(1,141)	(2,987)	(682)	(865)
Future income tax expenses	(7,722)	1,536	(27)	(2,011)	(951)	(227)	(4,441)	(1,601)
Future net cash flows after taxes	21,324	298	53	4,007	8,807	3,104	2,760	2,295
10% annual discount for estimated timing of cash flows	(11,361)	(477)	(25)	(2,677)	(5,335)	(1,178)	(1,044)	(625)
Discounted future net cash flows	9,963	(179)	28	1,330	3,472	1,926	1,716	1,670
Equity-accounted investees								
Future cash inflows	33,358	3,166	17,310	-	-	11,167	-	1,715
Future production costs	(13,832)	(2,967)	(5,826)	-	-	(4,129)	-	(910)
Future development and abandonment costs	(8,139)	(4,480)	(1,041)	-	-	(2,495)	-	(123)
Future income tax expenses	(4,376)	1,020	(4,160)	-	-	(1,123)	-	(113)
Future net cash flows after taxes	7,011	(3,261)	6,283	-	-	3,420	-	569
10% annual discount for estimated timing of cash flows	(2,784)	1,874	(3,675)	-	-	(728)	-	(255)
Discounted future net cash flows	4,227	(1,387)	2,608	-	-	2,692	-	314
Total discounted future net cash flows	14,190	(1,566)	2,636	1,330	3,472	4,618	1,716	1,984

Millions of euros
At December 31st 2017

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Future cash inflows	40,133	796	91	9,185	11,091	5,141	7,674	6,155
Future production costs	(12,634)	(510)	(33)	(4,278)	(3,126)	(2,014)	(956)	(1,717)
Future development and abandonment costs	(7,408)	(1,209)	(10)	(428)	(1,918)	(2,220)	(565)	(1,058)
Future income tax expenses	(5,627)	1,144	(19)	(1,343)	(275)	(194)	(3,694)	(1,246)
Future net cash flows after taxes	14,464	221	29	3,136	5,772	713	2,459	2,134
10% annual discount for estimated timing of cash flows	(6,494)	(451)	(16)	(2,056)	(2,895)	351	(852)	(575)
Discounted future net cash flows	7,970	(230)	13	1,080	2,877	1,064	1,607	1,559
Equity-accounted investees								
Future cash inflows	30,323	2,658	15,157	-	-	11,006	-	1,502
Future production costs	(12,713)	(2,247)	(4,616)	-	-	(4,912)	-	(938)
Future development and abandonment costs	(6,284)	(3,349)	(902)	-	-	(1,926)	-	(107)
Future income tax expenses	(3,954)	1,038	(3,780)	-	-	(1,130)	-	(82)
Future net cash flows after taxes	7,372	(1,900)	5,859	-	-	3,038	-	375
10% annual discount for estimated timing of cash flows	(2,789)	1,278	(3,257)	-	-	(617)	-	(193)
Discounted future net cash flows	4,583	(622)	2,602	-	-	2,421	-	182
Total discounted future net cash flows	12,553	(852)	2,615	1,080	2,877	3,485	1,607	1,741

Millions of euros
At December 31st 2018

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Future cash inflows	45,648	3,146	88	11,465	12,079	5,277	7,709	5,884
Future production costs	(16,013)	(1,543)	(33)	(4,964)	(4,127)	(2,370)	(1,221)	(1,755)
Future development and abandonment costs	(8,202)	(1,811)	(9)	(449)	(1,978)	(2,292)	(625)	(1,038)
Future income tax expenses	(7,135)	302	(18)	(1,910)	(568)	(185)	(3,673)	(1,083)
Future net cash flows after taxes	14,298	94	28	4,142	5,406	430	2,190	2,008
10% annual discount for estimated timing of cash flows	(5,731)	(2)	(10)	(2,639)	(2,405)	571	(670)	(576)
Discounted future net cash flows	8,567	92	18	1,503	3,001	1,001	1,520	1,432
Equity-accounted investees								
Future cash inflows	32,495	3,270	14,813	-	-	12,889	-	1,523
Future production costs	(13,839)	(2,653)	(4,370)	-	-	(5,930)	-	(886)
Future development and abandonment costs	(5,729)	(2,542)	(1,031)	-	-	(2,047)	-	(109)
Future income tax expenses	(4,334)	881	(3,807)	-	-	(1,316)	-	(92)
Future net cash flows after taxes	8,593	(1,044)	5,605	-	-	3,596	-	436
10% annual discount for estimated timing of cash flows	(3,251)	943	(3,135)	-	-	(866)	-	(193)
Discounted future net cash flows	5,342	(101)	2,470	-	-	2,730	-	243
Total discounted future net cash flows	13,909	(9)	2,488	1,503	3,001	3,731	1,520	1,675

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 2016, 2017 and 2018 as follows:

Millions of euros

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Balance at December 31st, 2015	8,695	(140)	38	874	3,016	1,466	1,613	1,828
Changes due to sale or transfer prices of future production costs	(352)	71	(6)	69	(255)	(261)	(83)	113
Changes in future development costs	(477)	(162)	(2)	161	(105)	(50)	(192)	(127)
Oil and gas sales and transfers in the period	(1,273)	(41)	(12)	(50)	(436)	(246)	(36)	(452)
Net changes due to extensions, discoveries and improvements in the recovery of reserves	642	-	-	311	198	120	-	13
Net changes due to purchases/sales of assets	(195)	5	-	-	21	23	-	(244)
Net changes due to revisions in quantity estimates	871	108	1	(90)	61	525	85	181
Previously estimated development costs incurred in the year	620	47	1	64	216	121	63	108
Effect of discounting to a different date and exchange rate effect	1,119	(18)	3	137	399	200	220	178
Other non-specific changes	-	-	-	-	-	-	-	-
Changes in income tax	313	(49)	5	(146)	357	28	46	72
Net change	1,268	(39)	(10)	456	456	460	103	(158)
Balance at December 31st, 2016	9,963	(179)	28	1,330	3,472	1,926	1,716	1,670
Changes due to sale or transfer prices of future production costs	(2,528)	50	(20)	(368)	(791)	(438)	(463)	(498)
Changes in future development costs	424	532	(2)	(2)	45	(191)	(19)	61
Oil and gas sales and transfers in the period	(1,807)	(133)	-	(116)	(528)	(289)	(215)	(526)
Net changes due to extensions, discoveries and improvements in the recovery of reserves	619	-	-	-	574	45	-	-
Net changes due to purchases/sales of assets	33	-	-	-	(5)	(6)	-	44
Net changes due to revisions in quantity estimates	237	(208)	4	(47)	(238)	37	200	489
Previously estimated development costs incurred in the year	773	65	-	106	232	36	134	200
Effect of discounting to a different date and exchange rate effect	(336)	1	-	(30)	(114)	(73)	(51)	(69)
Other non-specific changes	-	-	-	-	-	-	-	-
Changes in income tax	592	(358)	3	207	230	17	305	188
Net change	(1,993)	(51)	(15)	(250)	(595)	(862)	(109)	(111)
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

Millions of euros

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Equity-accounted investees								
Balance at December 31st, 2015	3,185	(1,610)	2,487	-	-	2,064	-	244
Changes due to sale or transfer prices of future production costs	236	184	(84)	-	-	104	-	32
Changes in future development costs	(617)	(141)	(182)	-	-	(275)	-	(19)
Oil and gas sales and transfers in the period	(992)	85	(355)	-	-	(681)	-	(41)
Net changes due to extensions, discoveries and improvements in the recovery of reserves	579	-	-	-	-	579	-	-
Net changes due to purchases/sales of assets	-	-	-	-	-	-	-	-
Net changes due to revisions in quantity estimates	510	(8)	152	-	-	335	-	31
Previously estimated development costs incurred in the year	1,031	292	231	-	-	493	-	15
Effect of discounting to a different date and exchange rate effect	481	(160)	328	-	-	281	-	32
Other non-specific changes	-	-	-	-	-	-	-	-
Changes in income tax	(186)	(29)	31	-	-	(208)	-	20
Net change	1,042	223	121	-	-	628	-	70
Balance at December 31st, 2016	4,227	(1,387)	2,608	-	-	2,692	-	314
Changes due to sale or transfer prices of future production costs	(603)	230	16	-	-	(722)	-	(127)
Changes in future development costs	861	599	51	-	-	237	-	(26)
Oil and gas sales and transfers in the period	(1,201)	(144)	(302)	-	-	(699)	-	(56)
Net changes due to extensions, discoveries and improvements in the recovery of reserves	-	-	-	-	-	-	-	-
Net changes due to purchases/sales of assets	(1)	-	-	-	-	-	-	(1)
Net changes due to revisions in quantity estimates	791	(150)	119	-	-	777	-	45
Previously estimated development costs incurred in the year	615	201	89	-	-	307	-	18
Effect of discounting to a different date and exchange rate effect	(213)	6	(101)	-	-	(112)	-	(6)
Other non-specific changes	-	-	-	-	-	-	-	-
Changes in income tax	107	23	122	-	-	(59)	-	21
Net change	356	765	(6)	-	-	(271)	-	(132)
Balance at December 31st, 2017	4,583	(622)	2,602	-	-	2,421	-	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
Total fully-consolidated and equity-accounted entities	13,909	(9)	2,488	1,503	3,001	3,731	1,520	1,675

(6) Production of oil and gas

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		
	2018	2017	2016	2018	2017	2016	2018	2017	2016	2018	2017	2016	2018	2017	2016
Europe	16	16	16	31	17	17	22	19	19	231	222	236	12	6	3
Norway	6	6	7	23	13	16	10	8	10	61	55	60	9	3	1
United Kingdom	10	9	8	8	4	1	11	10	8	161	157	166	2	2	1
Rest of Europe	-	1	1	-	-	-	1	1	1	9	10	10	1	1	1
Latin America	36	38	39	504	498	486	125	127	125	771	873	953	227	241	216
Brazil	16	17	14	7	9	5	18	18	15	29	30	28	-	-	-
Colombia	5	5	5	8	7	11	7	6	7	440	398	395	-	-	-
Peru	5	5	5	68	67	68	17	17	17	-	-	-	28	27	27
Trinidad & Tobago	1	1	4	238	217	188	43	40	37	1	1	-	66	73	55
Venezuela	3	5	5	110	130	129	23	28	28	106	247	324	32	32	32
Rest of Latin America	6	5	6	73	68	85	17	17	21	195	197	206	101	109	102
North America	17	18	20	261	256	262	64	63	67	1,439	2,657	2,924	2,795	2,219	2,610
Canada	8	8	8	82	82	82	22	22	23	1,163	1,098	1,126	1,564	1,055	1,574
United States	9	10	12	178	174	180	42	41	44	276	1,559	1,798	1,231	1,164	1,036
Africa	16	12	3	26	8	16	21	14	6	94	248	128	93	84	79
Asia and Oceania	10	9	11	108	122	137	29	31	36	625	606	621	82	78	91
Indonesia	1	-	1	82	80	94	15	15	18	6	6	55	44	42	45
Malaysia	4	3	4	25	30	28	8	8	9	75	75	90	38	33	38
Russia	3	4	4	-	11	14	3	6	7	505	472	448	-	-	8
Rest of Asia and Oceania	2	2	2	1	1	1	3	2	2	39	53	28	-	3	-
Total	95	93	89	930	901	918	261	254	253	3,160	4,606	4,862	3,209	2,628	2,999

(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
2016

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Income								
Sales to non-Group companies	2,445	366	11	210	464	538	20	836
Sales between business segments and to Group Companies	460	29	-	12	271	42	106	-
Total income	2,905	395	11	222	735	580	126	836
Production costs ⁽¹⁾	(1,525)	(223)	(22)	(152)	(317)	(375)	(70)	(366)
Exploration expenses ⁽²⁾	(541)	(133)	-	(60)	(103)	(10)	(140)	(95)
Other operating expenses	11	128	(113)	25	17	(26)	(23)	3
Depreciation and amortisation charge ⁽³⁾	(1,548)	(137)	42	(50)	(604)	(354)	(159)	(286)
Profit (Loss) before taxes and charges	(698)	30	(82)	(15)	(272)	(185)	(266)	92
Taxes and charges	(41)	(151)	(137)	4	264	28	86	(135)
Results of oil and gas production activities	(739)	(121)	(219)	(11)	(8)	(157)	(180)	(43)
Equity-accounted investees								
Income								
Sales to non-Group companies	1,686	322	480	-	-	752	-	132
Sales between business segments and to Group Companies	345	-	-	-	-	345	-	-
Total income	2,031	322	480	-	-	1,097	-	132
Production costs ⁽¹⁾	(1,296)	(358)	(255)	-	-	(600)	-	(83)
Exploration expenses ⁽²⁾	(36)	(2)	-	-	-	(34)	-	-
Other operating expenses	111	46	(25)	-	-	91	-	(1)
Depreciation and amortisation charge ⁽³⁾	(821)	(9)	(326)	-	-	(470)	-	(16)
Profit (Loss) before taxes and charges	(11)	(1)	(126)	-	-	84	-	32
Taxes and charges	(88)	-	(188)	-	-	108	-	(8)
Results of oil and gas production activities	(99)	(1)	(314)	-	-	192	-	24
Total results of oil and gas activities ⁽⁴⁾	(838)	(122)	(533)	(11)	(8)	35	(180)	(19)

Millions of euros

At December 31st
2017

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Income								
Sales to non-Group companies	2,577	347	2	283	560	528	6	851
Sales between business segments and to Group Companies	688	32	-	8	312	61	275	-
Total income	3,265	379	2	291	872	589	281	851
Production costs ⁽¹⁾	(1,394)	(181)	(15)	(159)	(326)	(320)	(100)	(293)
Exploration expenses ⁽²⁾	(547)	(136)	-	43	(145)	(135)	(54)	(120)
Other operating expenses	328	20	(2)	20	(60)	5	310	35
Depreciation and amortisation charge ⁽³⁾	(1,152)	(99)	(67)	(42)	(556)	81	(102)	(367)
Profit (Loss) before taxes and charges	500	(17)	(82)	153	(215)	220	335	106
Taxes and charges	(880)	(57)	22	(7)	(236)	(292)	(239)	(71)
Results of oil and gas production activities	(380)	(74)	(60)	146	(451)	(72)	96	35
Equity-accounted investees								
Income								
Sales to non-Group companies	2,226	431	525	-	-	1,106	-	164
Sales between business segments and to Group Companies	494	-	-	-	-	494	-	-
Total income	2,720	431	525	-	-	1,600	-	164
Production costs ⁽¹⁾	(1,363)	(325)	(164)	-	-	(786)	-	(88)
Exploration expenses ⁽²⁾	(27)	-	-	-	-	(17)	-	(10)
Other operating expenses	693	902	(265)	-	-	62	-	(6)
Depreciation and amortisation charge ⁽³⁾	(1,353)	(103)	(638)	-	-	(598)	-	(14)
Profit (Loss) before taxes and charges	670	905	(542)	-	-	261	-	46
Taxes and charges	56	-	146	-	-	(74)	-	(16)
Results of oil and gas production activities	726	905	(396)	-	-	187	-	30
Total results of oil and gas activities ⁽⁴⁾	346	831	(456)	146	(451)	115	96	65

Millions of euros

At December 31st
2018

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Income								
Sales to non-Group companies	3,643	531	4	381	590	481	666	990
Sales between business segments and to Group Companies	907	28	-	12	339	97	393	38
Total income	4,550	559	4	393	929	578	1,059	1,028
Production costs ⁽¹⁾	(1,563)	(209)	(16)	(203)	(338)	(378)	(145)	(274)
Exploration expenses ⁽²⁾	(627)	(213)	-	1	(64)	(80)	(146)	(125)
Other operating expenses	(118)	116	(290)	26	(50)	90	7	(17)
Depreciation and amortisation charge ⁽³⁾	(1,471)	(73)	(1)	(37)	(599)	(239)	(131)	(391)
Profit (Loss) before taxes and charges	771	180	(303)	180	(122)	(29)	644	221
Taxes and charges	(909)	(259)	(21)	(138)	32	(84)	(701)	262
Results of oil and gas production activities	(138)	(79)	(324)	42	(90)	(113)	(57)	483
Equity-accounted investees								
Income								
Sales to non-Group companies	2,488	619	424	-	-	1,280	-	165
Sales between business segments and to Group Companies	663	20	-	-	-	643	-	-
Total income	3,151	639	424	-	-	1,923	-	165
Production costs ⁽¹⁾	(1,384)	(328)	(115)	-	-	(860)	-	(81)
Exploration expenses ⁽²⁾	(43)	(1)	-	-	-	(37)	1	(6)
Other operating expenses	507	330	148	-	-	39	-	(10)
Depreciation and amortisation charge ⁽³⁾	(1,129)	(153)	(391)	-	-	(575)	-	(10)
Profit (Loss) before taxes and charges	1,102	487	66	-	-	490	1	58
Taxes and charges	(95)	208	(50)	-	-	(240)	-	(13)
Results of oil and gas production activities	1,007	695	16	-	-	250	1	45
Total results of oil and gas activities ⁽⁴⁾	869	616	(308)	42	(90)	137	(56)	528

(1) Production costs include local taxes, production taxes and other similar payments amounting to €712, €526 and €361 million in 2018, 2017 and 2016, respectively. It also includes transport and other costs totalling €889, €808 and €856 million in 2018, 2017 and 2016, respectively.

(2) Operating expenses include charges for the impairment of exploration assets of €312, €339 and €74 million in 2018, 2017 and 2016, respectively. This same heading also includes provisions for onerous drilling platform contracts in the amount of €109 in 2016.

(3) The depreciation and provisions heading includes charges for the impairment of producing and development assets and provisions for onerous contracts totaling €717, €335 and €267 million in 2018, 2017 and 2016, respectively.

(4) Results generated for divestments are not included

(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 2016

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Acquisition of proved properties	54	-	-	-	2	52	-	-
Acquisition of unproved properties	-	-	-	-	-	-	-	-
Exploration costs	556	90	-	13	100	57	72	224
Development costs	1,085	20	2	56	274	256	225	252
Costs incurred	1,695	110	2	69	376	365	297	476
Equity-accounted investees								
Acquisition of proved properties	-	-	-	-	-	-	-	-
Acquisition of unproved properties	-	-	-	-	-	-	-	-
Exploration costs	79	1	-	-	-	78	-	-
Development costs	1,091	145	107	-	-	822	-	17
Costs incurred	1,170	146	107	-	-	900	-	17
Total costs incurred	2,865	256	109	69	376	1,265	297	493

Millions of euros
At December 31st 2017

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Acquisition of proved properties	5	-	-	-	-	-	-	5
Acquisition of unproved properties	-	-	-	-	-	-	-	-
Exploration costs	528	104	-	1	74	186	48	115
Development costs	968	56	1	32	376	194	168	141
Costs incurred	1,501	160	1	33	450	380	216	261
Equity-accounted investees								
Acquisition of proved properties	-	-	-	-	-	-	-	-
Acquisition of unproved properties	-	-	-	-	-	-	-	-
Exploration costs	48	(1)	-	-	-	35	-	14
Development costs	534	(27)	26	-	-	522	-	13
Costs incurred	582	(28)	26	-	-	557	-	27
Total costs incurred	2,083	132	27	33	450	937	216	288

Millions of euros
At December 31st 2018

	<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								
Acquisition of proved properties	174	158	-	-	13	3	-	-
Acquisition of unproved properties	-	-	-	-	-	-	-	-
Exploration costs	531	110	-	(1)	47	279	31	65
Development costs	926	124	-	97	437	38	142	88
Costs incurred	1,631	392	-	96	497	320	173	153
Equity-accounted investees								
Acquisition of proved properties	-	-	-	-	-	-	-	-
Acquisition of unproved properties	-	-	-	-	-	-	-	-
Exploration costs	70	-	-	-	-	53	-	17
Development costs	120	(44)	3	-	-	149	-	12
Costs incurred	190	(44)	3	-	-	202	-	29
Total costs incurred	1,821	348	3	96	497	522	173	182

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 2016

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Capitalised costs of proved oil and gas properties	17,527	812	77	1,112	6,748	3,592	2,261	2,925
Capitalised costs of unproved oil and gas properties	9,223	184	-	48	4,377	2,162	320	2,132
Total capitalised costs	26,750	996	77	1,160	11,125	5,754	2,581	5,057
Auxiliary equipment and facilities	1,890	340	22	19	1,074	32	399	4
Total capitalised costs	28,640	1,336	99	1,179	12,199	5,786	2,980	5,061
Accumulated depreciation and impairment losses	(10,643)	(921)	(95)	(248)	(4,862)	(1,939)	(1,627)	(951)
Net amount	17,997	415	4	931	7,337	3,847	1,353	4,110
Equity-accounted investees								
Capitalised costs of proved oil and gas properties	9,579	912	1,400	-	-	7,034	-	233
Capitalised costs of unproved oil and gas properties	1,664	-	67	-	-	1,543	-	54
Total capitalised costs	11,243	912	1,467	-	-	8,577	-	287
Auxiliary equipment and facilities	2,934	-	1,172	-	-	1,761	-	1
Total capitalised costs	14,177	912	2,639	-	-	10,338	-	288
Accumulated depreciation and impairment losses	(6,032)	(324)	(924)	-	-	(4,682)	-	(102)
Net amount	8,145	588	1,715	-	-	5,656	-	186
Total Net amounts	26,142	1,003	1,719	931	7,337	9,503	1,353	4,296

Millions of euros
At December 31st 2017

	Total	Europe	Venezuela	Peru	United States	Rest of America	Africa	Asia and Oceania
Fully-consolidated entities								
Capitalised costs of proved oil and gas properties	14,525	776	67	521	6,374	2,679	1,520	2,588
Capitalised costs of unproved oil and gas properties	8,282	174	-	20	3,534	2,551	278	1,725
Total capitalised costs	22,807	950	67	541	9,908	5,230	1,798	4,313
Auxiliary equipment and facilities	3,784	303	36	526	1,025	754	955	185
Total capitalised costs	26,591	1,253	103	1,067	10,933	5,984	2,753	4,498
Accumulated depreciation and impairment losses	(10,547)	(919)	(99)	(265)	(4,706)	(1,836)	(1,525)	(1,197)
Net amount	16,044	334	4	802	6,227	4,148	1,228	3,301
Equity-accounted investees								
Capitalised costs of proved oil and gas properties	8,665	829	1,561	-	-	6,096	-	179
Capitalised costs of unproved oil and gas properties	2,136	1,154	-	-	-	866	-	116
Total capitalised costs	10,801	1,983	1,561	-	-	6,962	-	295
Auxiliary equipment and facilities	3,156	351	757	-	-	2,047	-	1
Total capitalised costs	13,957	2,334	2,318	-	-	9,009	-	296
Accumulated depreciation and impairment losses	(6,909)	(795)	(1,389)	-	-	(4,652)	-	(73)
Net amount	7,048	1,539	929	-	-	4,357	-	223
Total Net amounts	23,092	1,873	933	802	6,227	8,505	1,228	3,524

Millions of euros
At December 31st 2018

	<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								
Capitalised costs								
of proved oil and gas properties ⁽¹⁾	20,727	938	71	556	8,539	5,362	1,722	3,539
Capitalised costs								
of unproved oil and gas properties ⁽¹⁾	2,152	92	-	0	837	368	112	743
	22,879	1,030	71	556	9,376	5,730	1,834	4,282
Auxiliary equipment and facilities	4,576	465	33	662	1,065	830	1,108	413
Total capitalised costs	27,455	1,495	104	1,218	10,441	6,560	2,942	4,695
Accumulated depreciation and impairment losses	(11,093)	(1,001)	(100)	(315)	(4,100)	(2,199)	(1,745)	(1,633)
Net amount	16,362	494	4	903	6,341	4,361	1,197	3,062
Equity-accounted investees								
Capitalised costs								
of proved oil and gas properties ⁽¹⁾	10,736	2,036	1,559	-	-	6,959	-	182
Capitalised costs								
of unproved oil and gas properties ⁽¹⁾	802	-	(1)	-	-	708	-	95
	11,538	2,036	1,558	-	-	7,667	-	277
Auxiliary equipment and facilities	3,094	357	833	-	-	1,902	-	2
Total capitalised costs	14,632	2,393	2,391	-	-	9,569	-	279
Accumulated depreciation and impairment losses	(8,311)	(991)	(1,827)	-	-	(5,420)	-	(73)
Net amount	6,321	1,402	564	-	-	4,149	-	206
Total Net amounts	22,683	1,896	568	903	6,341	8,510	1,197	3,268

(1) In 2018, "Costs capitalized in properties with unproved reserves" only include investments in exploration assets (in previous years, this also included the purchase price of assets allocated to unproven reserves and are now included in "Costs capitalized in properties with proved reserves"). In 2018, it was decided to prospectively change this disclosure criteria in line with other companies in the sector and based on the information used for accounting purposes in the change in estimation related to the depreciation of certain assets outlined in note 3 "Accounting estimates and judgments" of the Consolidated Financial Statements of the Repsol Group.