

# Oil and natural gas extraction data

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 Climate Mitigation Services  
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## Repsol, Spain

www.repsol.com/eng/ Madrid

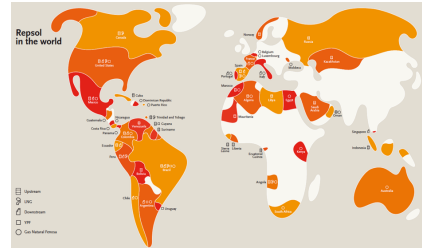
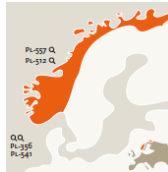
yellow column indicates original reported units **Investor-owned**



## Production / Extraction data



Year	Crude Oil & NGL			Natural Gas			Background data	
	Net production	Net production	Net production	Net production	Net production	Net production		
	Thousand bbl /d	Million bbl /yr	Million tonnes/yr	Billion cf/yr	Billion cf/yr	Billion cf/yr	Million tons/yr	Million tonnes/yr
	YPF 1987-1999	CAMPAS 1964 - Repsol	Repsol 1964-	YPF 1987-1999	CAMPAS 1964 - Repsol	Repsol 1964-		



Note: YPF expropriated Repsol assets in Argentina in 2012

- 15 1950
- 16 1951
- 17 1952
- 18 1953
- 19 1954
- 20 1955
- 21 1956
- 22 1957
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- 78 2013
- 79 2014
- 80 2015
- 81 2016
- 82 2017
- 83 2018

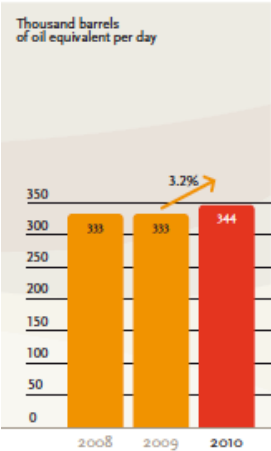
	Campas - Repsol	Repsol
	million bbl /yr	million bbl /yr
1964	0.09	0.0
1965	interpolated	0.5
1966	interpolated	0.9
1967	interpolated	1.4
1968	interpolated	1.8
1969	interpolated	2.3
1970	interpolated	2.7
1971	interpolated	3.1
1972	interpolated	3.6
1973	interpolated	4.0
1974	interpolated	4.5
1975	13.5	4.9
1976	interpolated	8.1
1977	interpolated	11.2
1978	interpolated	14.3
1979	interpolated	17.5
1980	interpolated	20.6
1981	interpolated	23.8
1982	interpolated	26.9
1983	interpolated	30.0
1984	interpolated	33.2
1985	interpolated	36.3
1986	YPF (Argentina)	39.5
1987	156	42.6
1988	161	48.3
1989	167	51.4
1990	175	56.1
1991	179	55.6
1992	110	62.1
1993	115	59.0
1994	139	67.4
1995	162	70.1
1996	173	58.0
1997	183	68.2
1998	189	74.3
1999	YPF acq. in 1999	164.5
2000		232.6
2001		235.4
2002		213.2
2003		217.0
2004		207.6
2005		193.9
2006		191.7
2007		176.2
2008	Repsol + YPF	49.0
2009	kboepd	53.0
2010	885.3	160
2011		53.0
2012	142.0	52.0
2013	139.0	51.0
2014	134.0	49
2015	207.0	76
2016	243.0	89
2017	255.0	93
2018	261.0	95

Main operational figures	2017	2016
Net undeveloped acreage (Km <sup>2</sup> )	199,599	277,027
Net developed acreage (Km <sup>2</sup> )	5,783	4,862
Reserves of crude oil, condensate and LPG (MMb)	617	584
Natural gas reserves (MMboe)	1,738	1,798
Reserve replacement ratio (%) <sup>(1)</sup>	89	103
Total production of liquids (kbb/d)	255	243
Total net gas production (Mboe/d)	440	447
Total net hydrocarbon production (Mboe/d)	695	690
Average crude oil price (\$/bbl)	49.6	39.0
Average gas price (\$/kscf)	2.9	2.4
Bonds, dry wells, and general and administration expenses <sup>(1)</sup>	457	443

Repsol Integrated Report 2017, page 29.

	YPF (Argentina)	Repsol	Repsol
2008	660	20.5	680
2009	757	25.4	783
2010	846	44.7	891
2011	816	38.1	854
2012	432	40.2	472
2013	458	39.7	497
2014	449	23.3	472
2015	445	35.0	480
2016	442	32.9	475
2017	466	50.8	517
2018	485	83.7	569
2019	519	97.3	616
2020	YPF acquired in 1999	473.7	474
2021		810.6	811
2022		757.3	757
2023		852.8	853
2024		1,102.7	1,103
2025		1,229.9	1,230
2026		1,246.6	1,247
2027		1,236.1	1,236
2028		1,140.6	1,141
2029	YPF gas prodn	421.0	1,046
2030	Bcf	409.0	958
2031	533		913
2032	491		407
2033		407	391
2034		424	424
2035	k boe per day	220	482
2036		352	771
2037		447	979
2038		440	964
2039		454	994

### Production Upstream Division



Repsol Annual Report 2010, page 7.

CMS note: the stated 344 k BOE/day is 126 million BOE/year i.e., lower than the Supplementary Information 2008-2010 Data appears to exclude YPF.

Oil production
thousand bbl /day
140.8
153.6

Gas production	
636	2,215
645	2,075

567.3	3,360
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Oil & Gas Journal OGJ100	
Crude + NGLs	Natural Gas
million bbl	Bcf
344	126
142	190
139	207

oil	344	kBOE/day	126	na	na
gas	142	kBOE/day	190	na	na
	139		207	na	na

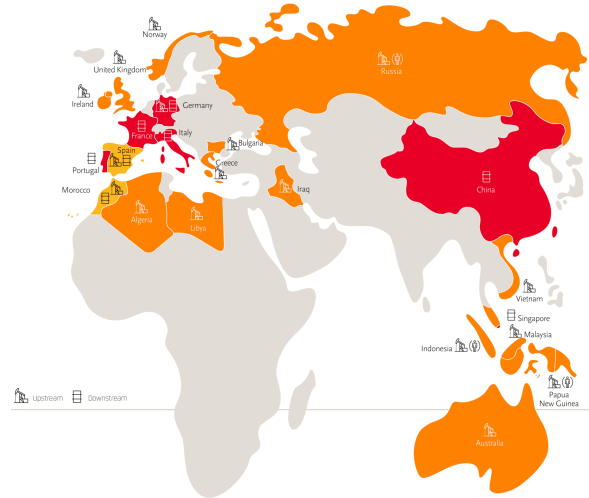
Repsol acquired Talisman in May 2015  
 YPF expropriated by Argentina in 2012.

<b>Total</b>	<b>1,910</b>	<b>3,094</b>	<b>5,785</b>	<b>7,307</b>	<b>11,434</b>	<b>24,485</b>
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	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE
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### Main operating figures

	2018	2017
Net undeveloped acreage (Km <sup>2</sup> )	232,331	199,599
Net developed acreage (Km <sup>2</sup> )	5,494	5,783
Reserves of crude oil, condensate and LPG (Mbbbl)	638	617
Natural gas reserves (Mboe)	1,702	1,738
Proven reserve replacement ratio (%) <sup>(1)</sup>	94	89
Net production of liquids (kbb/d)	261	255
Net production of gas (kboe/d)	454	440
Net production of hydrocarbons (kboe/d)	715	695
Average crude oil price (\$/bbl)	63.9	49.6
Average gas realization price (\$/bbl)	3.4	2.9
Bonds, dry boreholes, general and administrative expenses <sup>(2)</sup>	457	457



Repsol Annual report 2018. thousand boe/day

	Net production of liquids and natural gas by geographical area					
	Liquids (Mbbbl)		Natural gas (bcf)		Total (Mbep)	
	2015	2014	2015	2014	2015	2014
<b>Europe</b>	<b>9</b>	<b>2</b>	<b>7</b>	<b>1</b>	<b>10</b>	<b>2</b>
Norway	3	-	6	-	4	-
U.K.	5	-	1	-	5	-
Rest of Europe	1	2	-	1	1	2
<b>Latin America</b>	<b>35</b>	<b>27</b>	<b>419</b>	<b>412</b>	<b>110</b>	<b>101</b>
Brazil	11	6	3	3	12	6
Colombia	4	1	10	-	6	1
Peru	4	4	52	53	13	14
Trinidad & Tobago	4	4	216	244	43	49
Venezuela	5	5	69	48	17	13
Rest of Latin America	7	7	69	64	19	18
<b>North America</b>	<b>18</b>	<b>10</b>	<b>182</b>	<b>14</b>	<b>51</b>	<b>13</b>
Canada	5	-	48	-	14	-
United States	13	10	134	14	37	13
<b>Africa</b>	<b>3</b>	<b>6</b>	<b>16</b>	<b>11</b>	<b>5</b>	<b>7</b>
<b>Asia and Oceania</b>	<b>10</b>	<b>4</b>	<b>98</b>	<b>14</b>	<b>28</b>	<b>6</b>
Indonesia	1	-	63	-	12	-
Malaysia	3	-	19	-	6	-
Russia	4	4	15	14	7	6
Rest of Asia and Oceania	2	-	1	-	3	-
<b>Total</b>	<b>75</b>	<b>49</b>	<b>722</b>	<b>452</b>	<b>204</b>	<b>129</b>

Repsol Annual Report 2015, page 42.

### OPERATING HIGHLIGHTS

	2002	2003	2004
<b>Net liquids production</b>			
<i>(Thousand boe)</i>			
Spain	1,783	1,481	1,373
North Africa and Middle East	22,183	22,080	20,318
Argentina	159,795	157,672	146,096
Rest of Latin America	29,452	35,712	39,848
Rest of the world**	19	12	7
<b>Total liquids</b>	<b>213,232</b>	<b>216,957</b>	<b>207,641</b>
<b>Net natural gas production</b>			
<i>(Million cubic feet)</i>			
Spain	4,852	-	-
North Africa and the Middle East	40,288	37,022	25,963
Argentina	569,911	672,402	730,493
Rest of Latin America	236,221	391,911	472,808
Rest of the world**	1,499	1,401	587
<b>Total natural gas</b>	<b>852,771</b>	<b>1,102,736</b>	<b>1,229,850</b>

Repsol Annual Report 2004, page 28.

### Reserves

At year-end 2015, Repsol's **proven reserves**, estimated in accordance with SPE/WPC/AAPG/SPEE Petroleum Resources Management System criteria (a system more commonly known by its acronym, SPE-PRMS, with SPE standing for the Society of Petroleum Engineers) amounted 2,373 Mbep, of which 588 Mbep (25%) corresponded to crude oil, condensate and LPG, with the remainder, 1,785Mbep (75%), accounted for by natural gas.

Million barrels of oil equivalent	Proven Reserves	
	2015 <sup>(1)</sup>	2014 <sup>(2)</sup>
Europe	51	3
Latin America	1,480	1,311
North America	520	60
Africa	128	125
Asia	194	40
Oceania	-	-
<b>TOTAL</b>	<b>2,373</b>	<b>1,539</b>

<sup>(1)</sup> As of December 31, 2015, in order to facilitate the integration of the Talisman group (which estimates its reserves using the Canadian Administrator's National Instrument 51-101 Standards of Disclosure for Oil and Gas Activities, which in turn relies on the conceptual framework of the Canadian Oil and Gas Evaluation Handbook "COGE Handbook") and enable consistent reserve and resource management, the Repsol Group has decided to use the SPE-PRMS criteria for proved reserve reporting purposes.

<sup>(2)</sup> Until 2014, Repsol had been voluntarily applying the oil and gas reserves reporting and disclosure guidance and framework established by the Securities Exchange Commission (SEC) to estimate its proved reserves and the criteria established by the Society of Petroleum Engineers' SPE/WPC/AAPG/SPEE Petroleum Resource Management System (SPE-PRMS) to estimate its probable and possible reserves.

Repsol Annual Report 2015, page 44.

Repsol-YPF Annual report 2004, page 28. Data reproduced above. Gas production chiefly in Argentina and Latin America.

Repsol Integrated Report 2017, page 29. Gas production 2017: 440 kboe per day (@boe=6000cf) equals 264 kcfpf = 963.6 Bcf.

**Cell:** H9

**Comment:** Rick Heede:

Yacimientos Petrolíferos Fiscales (YPF; English: "Fiscal Petroleum Fields") (BCBA: YPFID) is an Argentine oil company. Founded in 1922 under President Hipólito Yrigoyen's administration, it was privatized in 1993 by Carlos Menem, and bought by the Spanish firm Repsol; the resulting merger in 1999 produced Repsol YPF. YPF's founder and first director was Enrique Mosconi, who advocated economic independence for Latin American states and, during Yrigoyen's second term, starting in 1928, nationalization of oil resources. The firm's new headquarters, the Repsol-YPF tower, was designed by César Pelli and were inaugurated in 2008. YPF announced on May 4, 2011, that Grupo Petersen (property of the Eskenazi family) bought another 10% of the company for USD 1,300 million. Nevertheless, most of YPF shares are still under the control of Repsol which owns the 58,23% of the company. Repsol and the Petersen group began to make business in 2007, reaching an agree that allowed the Argentine holding to acquire a 14,9% of YPF.

Repsol history (wikipedia: en.wikipedia.org/wiki/Repsol\_YPF)

"Repsol YPF, S.A.; originally an initialism for Refinería de Petróleos de Escombreras adding the word Sol – Yacimientos Petrolíferos Fiscales, Sociedad Anónima) is an integrated Spanish oil and gas company with operations in 29 countries. The bulk of its assets are located in Spain and Argentina, as a result of the 1999 takeover of Argentine energy firm YPF by the Spanish conglomerate Repsol S.A.. It is now the 15th largest petroleum refining company according to the Fortune Global 500 list,[2] employing over 40,000 people worldwide.

In May 2006 Repsol announced it was planning to float between 15% and 20% of YPF's shares on the Buenos Aires Stock Exchange.

1948: REPESA incorporation (oil refineries located in Escombreras) created for the installation of a refinery in the Valley of Escombreras (Cartagena).

1981: Creation of INH: Public organisation created to integrate the various companies operating in the oil and gas sectors in which the Spanish state had a controlling interest or was the sole owner.

1986: Creation of the Repsol group: Its sole shareholder is the INH. Repsol brings together the companies in which the Spanish government had a majority ownership in the areas of Exploration and Production (formerly Hispanoil) and Production, Refining (formerly ENPETROL), Chemical and Liquefied Natural Gas (LNG), Butane (former Butano SA), CAMPSA and Petronor. Repsol Química (Alcudia).

1989: The State (INH) began the privatisation of Repsol. IPO of 26% of Repsol capital. Shares of Repsol, SA became listed on stock exchanges in Spain and in New York.

1991: The company of Gas Natural was formed.

1997: The State completes the process of privatisation of Repsol. IPO of 10% of Repsol capital.

1998: Repsol considers the purchase of YPF.

1999: Acquisition of YPF by Repsol.

2007: Purchase of 14.9% by the Petersen Group, a company of Argentina controlled by Enrique Eskenazi.

November 2008 LUKoil was interested in acquiring approximately 30% of the shares of Repsol (20% owned by Sacyr and 10% of Caja Madrid).

2009: The company enters into agreement with Cuba to extract and drill on their territory.

2010: Repsol signed an agreement for investments estimated in US\$10 billion in Iran.

2012: Argentina and Repsol spar in nationalisation of Repsol's Argentinian business YPF."

Argentina Senate backs YPF oil nationalisation, BBC News, 26 April 2012. President Cristina Fernandez de Kirchner announced in April 2012 that Argentina would strip Repsol of its controlling stake in YPF, and approved by the Argentine Senate. Condemned by Spain, and the EU may take the case to the World Trade Organization.

"Some observers have warned that the nationalisation may have negative consequences for foreign investment in Argentina, but Ms Fernandez insists the move is necessary to reduce the state's energy bill. In 2010 Argentina started importing fuel for the first time since YPF, Argentina's biggest oil company, was privatised in the early 1990s. Ms Fernandez blames Repsol, accusing it of having drained YPF since acquiring a controlling stake in the 1990s and not investing enough to cope with growing internal demand. Repsol insists it has invested in Argentina."

**Cell:** D11

**Comment:** Rick Heede:

On this worksheet we report extractive data for each company or state-owned enterprise. Three columns under crude oil and natural gas allow for data reported in one of three formats (e.g., thousand barrels per day, or million barrels per year, or million tonnes per year).  
Note: the carbon content of the extracted resources is adjusted by a number of factors before emissions estimates are made. Most important is the subtraction of the fraction typically sequestered in petrochemicals and other non-combusted uses such as road oils, waxes, lubricants, greases, etc. See the worksheets on non-energy uses and factors for oil and natural gas in SumOil.xls and SumGas.xls

**Cell:** D12

**Comment:** Rick Heede:

Total net worldwide crude oil plus natural gas liquids produced by each company or state-owned enterprise. Where data is available, we list net production. Crude production includes natural gas liquids (NGL) unless noted.

**Cell:** H12

**Comment:** Rick Heede:

Natural gas is typically reported as dry gas; natural gas liquids are reported under crude oil. Carbon dioxide is normally removed from the gas flow at the production site (see "Vented Carbon Dioxide"). "SCM/d" = standard cubic meters per day. "cf/d" = cubic feet per day. Net production typically excludes a number of diverted gas streams. Quantities and fractions vary; ExxonMobil's exclusions are probably typical of the industry: "Net production available for sale quantities are the volumes withdrawn from ... natural gas reserves, excluding royalties and volumes due to others when produced, and excluding gas purchased from others, gas consumed in producing operations, field processing plant losses, volumes used for gas lift, gas injections and cycling operations, quantities flared, and volume shrinkage due to the removal of condensate or natural gas liquids production." ExxonMobil Corporation (2004) 2003 Financial and Operating Review, www.exxonmobil.com, p. 55.

**Cell:** D30

**Comment:** Rick Heede:

1964 discovery.

**Cell:** D41

**Comment:** Rick Heede:

1975 minimum production.

**Cell:** L52

**Comment:** Rick Heede:

No useful data in any Repsol annual report from 1986 through 1989 (reports combined oil and gas in boe, aggregates production and purchased oil, etc).

The 1990 annual report does show production in kbb/d, data that confirms OJG data for 1989 and 1990.

**Cell:** D53

**Comment:** Rick Heede:

Oil & Gas Journal OGJ100, various years, total YPF worldwide liquids production for 1987-1998 (1994 data NA, interpolated).

**Cell:** L66

**Comment:** Rick Heede:

Oil and gas production data from EI (2003) Top 100, p. 219.

**Cell:** I68

**Comment:** Rick Heede:

Repsol-YPF Annual report 2004, page 28. Data reproduced above. Gas production chiefly in Argentina and Latin America.

**Cell:** E70

**Comment:** Rick Heede:

Oil & Gas Journal OGJ100.

**Cell:** I71

**Comment:** Rick Heede:

Oil & Gas Journal OGJ100.

**Cell:** E74

**Comment:** Rick Heede:

OGJ100 6Sep10 pg 67 agrees with AR2010 but is not consistent with prior OGJ100 entry

**Cell:** F74

**Comment:** Rick Heede:

Repsol (2011?) Supplementary Information on Oil and Gas Exploration and Production Activities (unaudited information), F-161 to F-170. Repsol production appears unavailable in its financial reports or annual reports.

Repsol

**Cell:** I74

**Comment:** Rick Heede:  
OGJ100 6Sep10 pg 67  
agrees with AR 2010 but is not consistent with prior OGJ100 entry

**Cell:** H75

**Comment:** Rick Heede:  
Oil & Gas Journal Oct2011, page 46. YPF is reported in this issue, but not in the 2009 edition (and Repsol is listed as 409 and 421 Bcf in 2009 and 2010, respectively).

**Cell:** E77

**Comment:** Rick Heede:  
Repsol AnnRpt 2011, page 25. Net production of liquids, in Mb.

**Cell:** I77

**Comment:** Rick Heede:  
Repsol AnnRpt 2011, page 25. Net production of natural gas, Bcf.

**Cell:** I78

**Comment:** Rick Heede:  
Repsol-YPF continues to report in units of oil equivalent and with sparse commodity data on oil and gas production. However, 2004 production of 567 k bbl per day (Annual Report, p. 27) and 3.36 Bcf/day (equivalent to 598,500 bbl of oil equiv per day) of gas is reported.

**Cell:** H80

**Comment:** Rick Heede:  
Repsol Annual report 2015, page 36. "Net daily production of gas (Kboe/d):" 352 kboepd (220 kboepd in 2013). At 6,000 cf per boe, 2015 production of 352 kbpd = 770.9 Bcf

**Cell:** B81

**Comment:** Rick Heede:  
Repsol acquired Talisman in May 2015.

**Cell:** D81

**Comment:** Rick Heede:  
Repsol Annual report 2015, pages 36 and 42. "Net daily production of liquids (kbb/d)" of 207 kbpd (134 kbpd in 2013); and 75 Mb/yr (p.42).  
Net daily production of gas (Kboe/d): 352 kboepd (220 kboepd in 2013).

**Cell:** D82

**Comment:** Rick Heede:  
Repsol Integrated Report 2017, page 29. Total production of liquids in 2016: 255 kbpd.

**Cell:** H82

**Comment:** Rick Heede:  
Repsol Annual report 2017, page 29. "Net daily production of gas (Kboe/d):" 440 kboepd. At 6,000 cf per boe, 2017 production of 440 kbpd = 963.6 Bcf.