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1. History and strategy of TOTAL

1.1. History and development

TOTAL S.A., a French *société anonyme* (limited company) incorporated in France on March 28, 1924, together with its subsidiaries and affiliates, is the fifth largest publicly-traded integrated international oil and gas company in the world[1].

With operations in more than 130 countries, TOTAL has activities in every sector of the oil industry: including in the upstream (oil and gas exploration, development and production, liquefied natural gas) and downstream (refining, petrochemicals, specialty chemicals, the trading and shipping of crude oil and petroleum products, marketing). In addition, TOTAL has equity stakes in coal mines and operates in the power generation and renewable energy sectors.

TOTAL began its Upstream operations in the Middle East in 1924. Since that time, the Company has grown and expanded its operations worldwide. In early 1999, the Company acquired control of PetroFina S.A. (hereafter referred to as "PetroFina" or "Fina") and in early 2000, the Company acquired control of Elf Aquitaine S.A. (hereafter referred to as "Elf Aquitaine" or "Elf").

The Company's Corporate name is TOTAL S.A.

The Company's registered office is 2, place Jean Millier, La Défense 6, 92400 Courbevoie, France.

The telephone number is +33 1 47 44 45 46 and the website address is total.com.

TOTAL S.A. is registered in France at the Nanterre Trade Register under the registration number 542 051 180.

1.2. Strategy

TOTAL's activities lie at the heart of the two biggest challenges facing the world now and in future: energy supply and environmental protection. The Group's responsibility as an energy producer is to provide optimum, sustainable management of these twin imperatives.

TOTAL's strategy, the implementation of which is based on a model for sustainable growth combining the acceptability of operations with a sustained, profitable investment program, aims at:

– expanding hydrocarbon exploration and production activities and strengthening its worldwide position as one of the global leaders in the natural gas and LNG markets;

– progressively expanding energy solutions and developing new energies to complement oil and gas;

– adapting its refining and petrochemical base to market changes, focusing on a small number of large, competitive platforms and maximizing the advantages of integration;

– developing its petroleum product marketing business, in particular in Africa, Asia and the Middle East, while maintaining the competitiveness of its operations in mature areas; and

– pursuing research and development to develop "clean" sources of energy, contributing to the moderation of the demand for energy, and participating in the effort against climate change.

(1) Based on market capitalization (in dollars) as of December 31, 2012.

2. Upstream segment

TOTAL's Upstream segment includes the activities of Exploration & Production and Gas & Power. The Group has exploration and production activities in more than fifty countries and produces oil or gas in approximately thirty countries. Gas & Power conducts activities downstream from production related to natural gas, liquefied natural gas (LNG) and liquefied petroleum gas (LPG), as well as power generation and trading, and other activities.

Effective July 1, 2012, the Upstream segment no longer includes the activities of New Energies, which are now reported with Marketing & Services. As a result, certain information has been restated according to the new organization.

- **2.3** Mboe/d of hydrocarbons produced in 2012
- **11.4** Bboe of proved reserves as of December 31, 2012[1]
- Capital expenditure for 2012: €**19.6** billion
- **18,045** employees

Upstream segment financial data

(M€)	2012	2011	2010
Non-Group sales	22,143	22,211	18,526
Adjusted operating income	22,108	22,609	17,694
Adjusted net operating income	11,186	10,602	8,629

For the full year 2012, adjusted net operating income from the Upstream segment was €11,186 million compared with €10,602 million in 2011, an increase of 6%. Expressed in dollars, adjusted net operating income from the Upstream segment was $14.4 billion, a decrease of 3% compared with 2011, explained mainly by the decrease in hydrocarbon production, since the increase in technical costs (as discussed below) was largely offset by the decrease in the effective tax rate for the Upstream segment.

Technical costs[2] for consolidated subsidiaries, in accordance with ASC 932[3], were 22.8 $/boe[4] in 2012, compared with 18.9 $/boe in 2011.

The Return on Average Capital Employed (ROACE[5]) for the Upstream segment was 18% in 2012 compared with 21% in 2011.

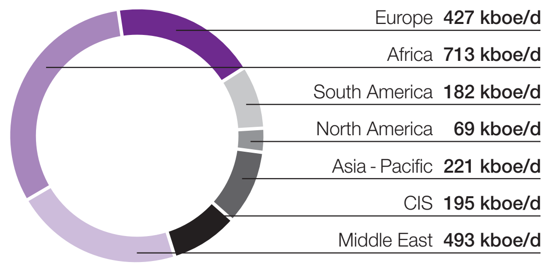
Price realizations[a]	2012	2011	2010
Average liquids price ($/b)	107.7	105.0	76.3
Average gas price ($/Mbtu)	6.74	6.53	5.15

(a) Consolidated subsidiaries, excluding fixed margins. Effective first quarter 2012, over/under-lifting valued at market prices.

TOTAL's average liquids price and average gas price increased by 3% in 2012 compared with 2011.

Production

Hydrocarbon production	2012	2011	2010
Combined production (kboe/d)	2,300	2,346	2,378
Liquids (kb/d)	1,220	1,226	1,340
Gas (Mcf/d)	5,880	6,098	5,648

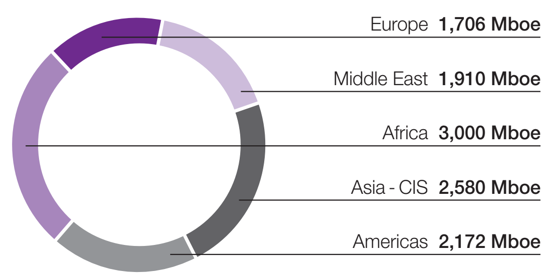


Hydrocarbon production was 2,300 kboe/d in 2012, a decrease of 2% compared with 2011, essentially as a result of:

- +4.5% for start-ups and ramp-ups from new projects;
- -4% for normal decline;
- +1.5% for changes in the portfolio, comprised essentially of an increased share of Novatek production and the impact of the sale of CEPSA and assets in the UK, France, Nigeria, and Cameroon;
- -2% for incidents at Elgin in the UK North Sea and Ibewa in Nigeria;
- -1.5% for disruptions related to security conditions in Yemen and the production shut-down in Syria, net of the positive effect of the return of production in Libya; and
- -0.5% for price effect[6].

Reserves

As of December 31,	2012	2011	2010
Hydrocarbon reserves (Mboe)	11,368	11,423	10,695
Liquids (Mb)	5,686	5,784	5,987
Gas (Bcf)	30,877	30,717	25,788



Proved reserves based on SEC rules (based on Brent at 111.13 $/b) were 11,368 Mboe at December 31, 2012. Based on the 2012 average rate of production, the reserve life is 13 years. The 2012 proved reserve replacement rate[7], based on SEC rules, was 93%. The 2012 organic proved reserve replacement rate[8] was 100% in a constant price environment. At year-end 2012, TOTAL had a solid and diversified portfolio of proved and probable reserves[9] representing more than 20 years of reserve life based on the 2012 average production rate, and resources[10] representing more than 45 years of production.

(1) Based on a Brent crude price of $111.13/b.
(2) (Production costs + exploration expenses + depreciation, depletion and amortization and valuation allowances)/production of the year.
(3) FASB Accounting Standards Codification 932, Extractive industries – Oil and Gas.
(4) Excluding IAS 36 (impairment of assets).
(5) Calculated based on adjusted net operating income and average capital employed, using replacement cost.
(6) Impact of changing hydrocarbon prices on entitlement volumes.
(7) Change in reserves excluding production i.e. (revisions + discoveries, extensions + acquisitions – divestments) / production for the period.
(8) The reserve replacement rate would be 100% in an environment with a constant 110.96 $/b oil price, excluding acquisitions and divestments.
(9) Limited to proved and probable reserves covered by E&P contracts on fields that have been drilled and for which technical studies have demonstrated economic development in a 100 $/b Brent environment, including projects developed by mining.
(10) Proved and probable reserves plus contingent resources (potential average recoverable reserves from known accumulations - Society of Petroleum Engineers - 03/07).

2.1. Exploration & Production

2.1.1. Exploration and development

TOTAL's Upstream segment aims at continuing to combine long-term growth and profitability at the level of the best in the industry.

TOTAL evaluates exploration opportunities based on a variety of geological, technical, political and economic factors (including taxes and license terms), and on projected oil and gas prices. Discoveries and extensions of existing fields accounted for approximately 77% of the 2,016 Mboe added to the Upstream segment's proved reserves during the three-year period ended December 31, 2012 (before deducting production and sales of reserves in place and adding any acquisitions of reserves in place during this period). The remaining 23% comes from revisions of previous estimates. The level of revisions during this three-year period was significantly impacted by the effects of the increase of the reference oil price (from $59.91/b in 2009 to $111.13/b in 2012 for Brent crude) and the decrease of the U.S. onshore gas price (from $4.21/MBtu in 2011 to $2.85/MBtu in 2012 for Henry Hub), which together induced a substantial negative revision.

In 2012, the exploration investments of consolidated subsidiaries amounted to €2,634 million (including exploration bonuses included in the unproved property acquisition costs). Exploration investments were made primarily in Angola, the United Kingdom, the United States, Norway, Iraq, Nigeria, Brazil, Malaysia, the Republic of Congo and French Guiana. In 2011, the exploration investments of consolidated subsidiaries amounted to €1,629 million (including exploration bonuses included in the unproved property acquisition costs). The main exploration investments were made in Norway, the United Kingdom, Angola, Brazil, Azerbaijan, Indonesia, Brunei, Kenya, French Guiana and Nigeria. In 2010, the exploration investments of consolidated subsidiaries amounted to €1,472 million (including exploration bonuses included in the unproved property acquisition costs) notably in Angola, Norway, Brazil, the United Kingdom, the United States, Indonesia, Nigeria and Brunei.

The Group's consolidated Exploration & Production subsidiaries' development investments amounted to €14 billion in 2012, primarily in Angola, Norway, Canada, Australia, Nigeria, the United Kingdom, Gabon, Kazakhstan, Indonesia, the Republic of the Congo, the United States and Russia. The Group's consolidated Exploration & Production subsidiaries' development investments amounted to €10 billion in 2011, primarily in Angola, Nigeria, Norway, Kazakhstan, the United Kingdom, Australia, Canada, Gabon, Indonesia, the Republic of the Congo, the United States and Thailand. The Group's consolidated Exploration & Production subsidiaries' development investments amounted to €8 billion in 2010, mostly in Angola, Nigeria, Kazakhstan, Norway, Indonesia, the Republic of the Congo, the United Kingdom, the United States, Canada, Thailand, Gabon and Australia.

2.1.2. Reserves

The definitions used for proved, proved developed and proved undeveloped oil and gas reserves are in accordance with the United States Securities & Exchange Commission (SEC) Rule 4-10 of Regulation S-X as amended by the SEC Modernization of Oil and Gas Reporting release issued on December 31, 2008. Proved reserves are estimated using geological and engineering data to determine with reasonable certainty whether the crude oil or natural gas in known reservoirs is recoverable under existing regulatory, economic and operating conditions.

TOTAL's oil and gas reserves are consolidated annually, taking into account, among other factors, levels of production, field reassessments, additional reserves from discoveries and acquisitions, disposal of reserves and other economic factors. Unless otherwise indicated, any reference to TOTAL's proved reserves, proved developed reserves, proved undeveloped reserves and production reflects the Group's entire share of such reserves or such production. TOTAL's worldwide proved reserves include the proved reserves of its consolidated subsidiaries as well as its proportionate share of the proved reserves of equity affiliates. For further information concerning changes in TOTAL's proved reserves for the years ended December 31, 2012, 2011 and 2010, see "Supplemental Oil and Gas Information (Unaudited)" in Chapter 10.

The reserves estimation process involves making subjective judgments. Consequently, estimates of reserves are not exact measurements and are subject to revision under well-established control procedures.

The reserves booking process requires, among other things:

– internal peer reviews of technical evaluations to ensure that the SEC definitions and guidance are followed; and

– that management makes significant funding commitments towards the development of the reserves prior to booking.

For further information regarding the preparation of reserves estimates, see "Supplemental Oil and Gas Information (Unaudited)" in Chapter 10.

2.1.3. Proved reserves

In accordance with the amended Rule 4-10 of Regulation S-X, proved reserves for the years ended on or after December 31, 2009, are calculated using a 12-month average price determined as the unweighted arithmetic average of the first-day-of-the-month price for each month of the relevant year unless prices are defined by contractual arrangements, excluding escalations based upon future conditions. The reference prices for 2012, 2011 and 2010 were, respectively, $111.13/b, $110.96/b, and $79.02/b for Brent crude.

As of December 31, 2012, TOTAL's combined proved reserves of oil and gas were 11,368 Mboe (51% of which were proved developed reserves). Liquids (crude oil, condensates, natural gas liquids and bitumen) represented approximately 50% of these reserves and natural gas the remaining 50%. These reserves were located in Europe (mainly in Norway and the United Kingdom), in Africa (mainly in Angola, Gabon, Libya, Nigeria and the Republic of the Congo), in the Americas (mainly in Canada, Argentina and Venezuela), in the Middle East (mainly in Qatar, the United Arab Emirates and Yemen), and in Asia (mainly in Australia, Kazakhstan and Russia).

As of December 31, 2011, TOTAL's combined proved reserves of oil and gas were 11,423 Mboe (53% of which were proved developed reserves). Liquids (crude oil, natural gas liquids and bitumen) represented approximately 51% of these reserves and natural gas the remaining 49%. These reserves were located in Europe (mainly in Italy, Norway and the United Kingdom), in Africa (mainly in Angola, Gabon, Libya, Nigeria and the Republic of the Congo), in the Americas (mainly in Canada, the United States, Argentina and Venezuela), in the Middle East (mainly in Qatar, the United Arab Emirates and Yemen), and in Asia (mainly in Australia, Indonesia, Kazakhstan and Russia).

As of December 31, 2010, TOTAL's combined proved reserves of oil and gas were 10,695 Mboe (53% of which were proved developed reserves). Liquids (crude oil, natural gas liquids and bitumen) represented approximately 56% of these reserves and natural gas the remaining 44%. These reserves were located in Europe (mainly in Norway and the United Kingdom), in Africa (mainly in Angola, Gabon, Libya, Nigeria and the Republic of the Congo), in the Americas (mainly in Canada, the United States, Argentina and Venezuela), in the Middle East (mainly in Qatar, the United Arab Emirates and Yemen), and in Asia (mainly in Indonesia and Kazakhstan).

2.1.4. Sensitivity to oil and gas prices

Changes in the price used as a reference for the proved reserves estimation result in non-proportionate inverse changes in proved reserves associated with production sharing and risked service contracts (which together represent approximately 25% of TOTAL's reserves as of December 31, 2012). Under such contracts, TOTAL is entitled to a portion of the production, the sale of which is meant to cover expenses incurred by the Group. As oil prices increase, fewer barrels are necessary to cover the same amount of expenses. Moreover, the number of barrels retrievable under these contracts may vary according to criteria such as cumulative production, the rate of return on investment or the income-cumulative expenses ratio. This decrease is partly offset by an extension of the duration over which fields can be produced economically. However, the increase in reserves due to extended field life resulting from higher prices is generally less than the decrease in reserves under production sharing or risked service contracts due to such higher prices. As a result, higher prices lead to a decrease in TOTAL's reserves.

Furthermore, changes in the price used as a reference for the proved reserves estimation impact the volume of royalties in Canada and thus TOTAL's share of proved reserves.

Lastly, for any type of contract, a decrease of the reference price of petroleum products may involve a significant reduction of proved reserves.

2.1.5. Production

For the full year 2012, average daily oil and gas production was 2,300 kboe/d compared to 2,346 kboe/d in 2011. Liquids accounted for approximately 53% and natural gas for approximately 47% of TOTAL's combined liquids and natural gas production in 2012.

The table on the next page sets forth by geographic area TOTAL's average daily production of liquids and natural gas for each of the last three years.

Consistent with industry practice, TOTAL often holds a percentage interest in its fields rather than a 100% interest, with the balance being held by joint venture partners (which may include other international oil companies, state-owned oil companies or government entities). TOTAL frequently acts as operator (the party responsible for technical production) on acreage in which it holds an interest. See the table "Presentation of production activities by geographic area" on the following pages for a description of TOTAL's producing assets.

As in 2011 and 2010, substantially all of the liquids production from TOTAL's Upstream segment in 2012 was marketed by the Trading & Shipping division of TOTAL's Refining & Chemicals segment (see table "Trading division's supply and sales of crude oil" on paragraph 3.2.1. of the present Chapter).

The majority of TOTAL's natural gas production is sold under long term contracts. However, its North American production, and part of its production from the United Kingdom, Norway and Argentina, is sold on the spot market. The long-term contracts under which TOTAL sells its natural gas usually provide for a price related to, among other factors, average crude oil and other petroleum product prices, as well as, in some cases, a cost-of-living index. Though the price of natural gas tends to fluctuate in line with crude oil prices, a slight delay may occur before changes in crude oil prices are reflected in long-term natural gas prices. Due to the interaction between the contract price of natural gas and crude oil prices, contract prices are not usually affected by short-term market fluctuations in the spot price of natural gas.

Some of TOTAL's long-term contracts, notably in Argentina, Indonesia, Nigeria, Norway, Qatar and Russia, specify the delivery of quantities of natural gas that may or may not be fixed and determinable. Such delivery commitments vary substantially, both in duration and in scope, from contract to contract throughout the world. For example, in some cases, contracts require delivery of natural gas on an as-needed basis, and, in other cases, contracts call for the delivery of varied amounts of natural gas over different periods of time. Nevertheless, TOTAL estimates the fixed and determinable quantity of gas to be delivered over the period 2013-2015 to be 4,070 Bcf. The Group expects to satisfy most of these obligations through the production of its proved reserves of natural gas, with, if needed, additional sourcing from spot market purchases (see Chapter 10, "Supplemental Oil and Gas Information (Unaudited)" of this Registration Document).

2.1.6. Production by region

	2012			2011			2010		
	Liquids kb/d	Natural gas Mcf/d	Total kboe/d	Liquids kb/d	Natural gas Mcf/d	Total kboe/d	Liquids kb/d	Natural gas Mcf/d	Total kboe/d
Africa	**574**	**705**	**713**	**517**	**715**	**659**	**616**	**712**	**756**
Algeria	6	90	23	16	94	33	25	87	41
Angola	172	44	179	128	39	135	157	34	163
Cameroon	-	-	-	2	1	3	9	2	9
Gabon	54	19	57	55	17	58	63	20	67
Libya	62	-	62	20	-	20	55	-	55
Nigeria	173	521	279	179	534	287	192	542	301
The Congo, Republic of	107	31	113	117	30	123	115	27	120
North America	**25**	**246**	**69**	**27**	**227**	**67**	**30**	**199**	**65**
Canada[a]	12	-	12	11	-	11	10	-	10
United States	13	246	57	16	227	56	20	199	55
South America	**59**	**682**	**182**	**71**	**648**	**188**	**76**	**569**	**179**
Argentina	12	394	83	14	397	86	14	381	83
Bolivia	3	124	27	3	118	25	3	94	20
Colombia	1	23	6	5	27	11	11	34	18
Trinidad & Tobago	4	70	16	4	47	12	3	2	3
Venezuela	39	71	50	45	59	54	45	58	55
Asia-Pacific	**27**	**1,089**	**221**	**27**	**1,160**	**231**	**28**	**1,237**	**248**
Australia	-	29	5	-	25	4	-	6	1
Brunei	2	54	12	2	56	13	2	59	14
China	-	7	1	-	-	-	-	-	-
Indonesia	16	605	132	18	757	158	19	855	178
Myanmar	-	127	16	-	119	15	-	114	14
Thailand	9	267	55	7	203	41	7	203	41
CIS	**27**	**909**	**195**	**22**	**525**	**119**	**13**	**56**	**23**
Azerbaijan	4	64	16	4	57	14	3	54	13
Russia	23	845	179	18	468	105	10	2	10
Europe	**197**	**1,259**	**427**	**245**	**1,453**	**512**	**269**	**1,690**	**580**
France	2	58	13	5	69	18	5	85	21
The Netherlands	1	184	33	1	214	38	1	234	42
Norway	159	622	275	172	619	287	183	683	310
United Kingdom	35	395	106	67	551	169	80	688	207
Middle East	**311**	**990**	**493**	**317**	**1,370**	**570**	**308**	**1,185**	**527**
United Arab Emirates	233	70	246	226	72	240	207	76	222
Iran	-	-	-	-	-	-	2	-	2
Iraq	6	-	6	-	-	-	-	-	-
Oman	24	61	37	24	62	36	23	55	34
Qatar	38	560	139	44	616	155	49	639	164
Syria	-	-	-	11	218	53	14	130	39
Yemen	10	299	65	12	402	86	13	285	66
Total production	**1,220**	**5,880**	**2,300**	**1,226**	**6,098**	**2,346**	**1,340**	**5,648**	**2,378**
Including production share of equity affiliates	**308**	**1,635**	**611**	**316**	**1,383**	**571**	**300**	**781**	**444**
Algeria	-	-	-	10	3	10	19	4	20
Colombia	-	-	-	4	-	4	7	-	7
Venezuela	38	7	40	44	7	45	45	6	46
United Arab Emirates	225	61	237	219	62	231	199	66	212
Oman	23	60	34	22	62	34	22	55	32
Qatar	7	364	74	8	382	78	8	367	75
Russia	15	844	171	9	465	95	-	-	-
Yemen	-	299	55	-	402	74	-	283	52

(a) The Group's production in Canada consists of bitumen only. All of the Group's bitumen production is in Canada.

2.1.7. Presentation of production activities by region

The table below sets forth, by country, TOTAL's producing assets, the year in which TOTAL's activities commenced, the Group's interest in each asset and whether TOTAL is operator of the asset.

TOTAL's producing assets as of December 31, 2012[a]

	Year of entry into the country	Operated (Group share in %)	Non-operated (Group share in %)
Africa			
Algeria	1952		
			Tin Fouye Tabankort (35.00%)
Angola	1953		
		Girassol, Jasmim, Rosa, Dalia, Pazflor (Block 17) (40.00%)	
			Cabinda Block 0 (10.00%)
			Kuito, BBLT, Tombua-Landana (Block 14) (20.00%)
			Oombo (Block 3/91) (50.00%)
Gabon	1928		
		Anguille (100.00%)	
		Anguille Nord Est (100.00%)	
		Anguille Sud-Est (100.00%)	
		Atora (40.00%)	
		Avocette (57.50%)	
		Ayol Marine (100.00%)	
		Baliste (50.00%)	
		Barbier (100.00%)	
		Baudroie Marine (50.00%)	
		Baudroie Nord Marine (50.00%)	
		Coucal (57.50%)	
		Girelle (100.00%)	
		Gonelle (100.00%)	
		Grand Anguille Marine (100.00%)	
		Grondin (100.00%)	
		Hylia Marine (75.00%)	
		Lopez Nord (100.00%)	
		Mandaros (100.00%)	
		M'Boumba (100.00%)	
		Mérou Sardine Sud (50.00%)	
		Pageau (100.00%)	
		Port Gentil Océan (100.00%)	
		Port Gentil Sud Marine (100.00%)	
		Tchengue (100.00%)	
		Torpille (100.00%)	
		Torpille Nord Est (100.00%)	
			Rabi Kounga (47.50%)
Libya	1959		
			zones 15, 16 & 32 (75.00%)[b]
			zones 70 & 87 (75.00%)[b]
			zones 129 & 130 (30.00%)[b]
			zones 130 & 131 (24.00%)[b]
Nigeria	1962		
		OML 58 (40.00%)	
		OML 99 Amenam-Kpono (30.40%)	
		OML 100 (40.00%)	
		OML 102 (40.00%)	OML 102-Ekanga (40.00%)
		OML 130 (24.00%)	
		OML 138 (20,00%)	
			Shell Petroleum Development Company (SPDC 10.00%)
			OML 118 - Bonga (12.50%)

	Year of entry into the country	Operated (Group share in %)	Non-operated (Group share in %)
The Congo, Republic of	1928		
		Kombi-Likalala-Libondo (65.00%)	
		Moho Bilondo (53.50%)	
		Nkossa (53.50%)	
		Nsoko (53.50%)	
		Sendji (55.25%)	
		Tchendo (65.00%)	
		Tchibeli-Litanzi-Loussima (65.00%)	
		Tchibouela (65.00%)	
		Yanga (55.25%)	
			Loango (50.00%)
			Zatchi (35.00%)
North America			
Canada	1999		
			Surmont (50.00%)
United States	1957		
			Several assets in the Barnett Shale area (25.00%)[c]
			Several assets in the Utica Shale area (25.00%)[c]
			Chinook (33.33%)
			Tahiti (17.00%)
South America			
Argentina	1978		
		Aguada Pichana (27.27%)	
		Aries (37.50%)	
		Cañadon Alfa Complex (37.50%)	
		Carina (37.50%)	
		Hidra (37.50%)	
		San Roque (24.71%)	
			Sierra Chata (2.51%)
Bolivia	1995		
			San Alberto (15.00%)
			San Antonio (15.00%)
			Itaú (41.00%)
Trinidad & Tobago	1996		
			Angostura (30.00%)
Venezuela	1980		
			PetroCedeño (30.323%)
			Yucal Placer (69.50%)
Asia-Pacific			
Australia	2005		
			Several assets in UJV GLNG (27.50%)[d]
Brunei	1986		
		Maharaja Lela Jamalulalam (37.50%)	
China	2006		
			South Sulige (49.00%)

	Year of entry into the country	Operated (Group share in %)	Non-operated (Group share in %)
Indonesia	1968		
		Bekapai (50.00%)	
		Handil (50.00%)	
		Peciko (50.00%)	
		Sisi-Nubi (47.90%)	
		South Mahakam (50.00%)	
		Tambora (50.00%)	
		Tunu (50.00%)	
			Badak (1.05%)
			Nilam-gas and condensates (9.29%)
			Nilam-oil (10.58%)
Myanmar	1992		
		Yadana (31.24%)	
Thailand	1990		
			Bongkot (33.33%)
Commonwealth of Independant States			
Azerbaijan	1996		
			Shah Deniz (10.00%)
Russia	1991		
		Kharyaga (40.00%)	
			Several fields through the participation in Novatek (15.34%)
Europe			
France	1939		
		Lacq (100.00%)	
		Meillon (100.00%)	
		Pécorade (100.00%)	
		Lagrave (100.00%)	
		Lanot (100.00%)	
Norway	1965		
		Atla (40.00%)	
		Skirne (40.00%)	
			Åsgard (7.68%)
			Ekofisk (39.90%)
			Eldfisk (39.90%)
			Embla (39.90%)
			Gimle (4.90%)
			Glitne (21.80%)
			Gungne (10.00%)
			Heimdal (16.76%)
			Huldra (24.33%)
			Islay (5.51%)[e]
			Kristin (6.00%)
			Kvitebjørn (5.00%)
			Mikkel (7.65%)
			Morvin (6.00%)
			Oseberg (14.70%)
			Oseberg East (14.70%)
			Oseberg South (14.70%)

	Year of entry into the country	Operated (Group share in %)	Non-operated (Group share in %)
Norway	1965		
			Sleipner East (10.00%)
			Sleipner West (9.41%)
			Snøhvit (18.40%)
			Tor (48.20%)
			Troll I (3.69%)
			Troll II (3.69%)
			Tune (10.00%)
			Tyrihans (23.18%)
			Vale (24.24%)
			Vilje (24.24%)
			Visund (7.70%)
			Visund South (7.70%)
			Yttergryta (24.50%)
The Netherlands	1964		
		F6a gaz (55.66%)	
		F6a huile (65.68%)	
		F15a Jurassic (38.20%)	
		F15a/F15d Triassic (32.47%)	
		F15d (32.47%)	
		J3a (30.00%)	
		K1a (40.10%)	
		K1b/K2a (54.33%)	
		K2c (54.33%)	
		K3b (56.16%)	
		K3d (56.16%)	
		K4a (50.00%)	
		K4b/K5a (36.31%)	
		K5b (45.27%)	
		K6/L7 (56.16%)	
		L1a (60.00%)	
		L1d (60.00%)	
		L1e (55.66%)	
		L1f (55.66%)	
		L4a (55.66%)	
		L4d (55.66%)	
			E16a (16.92%)
			E17a/E17b (14.10%)
			J3b/J6 (25.00%)
			Q16a (6.49%)
United Kingdom	1962		
		Alwyn North, Dunbar, Ellon, Grant,	
		Nuggets (100.00%)	
		Elgin-Franklin (EFOG 46.17%)[f]	
		Forvie Nord (100.00%)	
		Glenelg (49.47%)	
		Islay (94.49%)[e]	
		Jura (100.00%)	
		West Franklin (EFOG 46.17%)[f]	
			Bruce (43.25%)
			Markham unitized fields (7.35%)
			Keith (25.00%)

	Year of entry into the country	Operated (Group share in %)	Non-operated (Group share in %)
Middle East			
U.A.E.	**1939**		
		Abu Dhabi-Abu Al Bu Khoosh (75.00%)	
			Abu Dhabi offshore (13.33%)(g)
			Abu Dhabi onshore (9.50%)(h)
			GASCO (15.00%)
			ADGAS (5.00%)
Irak	**1920**		
			Halfaya (18,75%)(i)
Oman	**1937**		
			Various fields onshore (Block 6) (4.00%)(j)
			Mukhaizna field (Block 53) (2.00%)(k)
Qatar	**1936**		
		Al Khalij (100.00%)	
			North Field-Bloc NF Dolphin (24.50%)
			North Field-Bloc NFB (20.00%)
			North Field-Qatargas 2 Train 5 (16.70%)
Syria	**1988**		
		Deir Ez Zor (Al Mazraa, Atalla North, Jafra, Marad, Qahar, Tabiyeh) (100.00%)(l)	
Yemen	**1987**		
		Kharir/Atuf (Block 10) (28.57%)	
			Various fields onshore (Block 5) (15.00%)

(a) The Group's interest in the local entity is approximately 100% in all cases except for Total Gabon (58.28%) and certain entities in Abu Dhabi and Oman (see notes (b) through (l) below).
(b) TOTAL's stake in the foreign consortium.
(c) TOTAL's interest in the joint venture with Chesapeake.
(d) TOTAL's interest in the uncorporated Joint Venture.
(e) The field of Islay extends partially in Norway. Total E&P UK holds a 94.49% interest and Total E&P Norge holds a 5.51% interest.
(f) TOTAL has a 46.17% indirect interest in Elgin Franklin through its interest in EFOG.
(g) Through ADMA (equity affiliate), TOTAL has a 13.33% interest and participates in the operating company, Abu Dhabi Marine Operating Company.
(h) Through ADPC (equity affiliate), TOTAL has a 9.50% interest and participates in the operating company, Abu Dhabi Company for Onshore Oil Operation.
(i) TOTAL has an interest of 18.75% in the consortium.
(j) TOTAL has a direct interest of 4.00% in Petroleum Development Oman LLC, operator of Block 6, in which TOTAL has an indirect interest of 4.00% via Pohol (equity affiliate). TOTAL also has a 5.54% interest in the Oman LNG facility (trains 1 and 2), and an indirect participation of 2.04% through OLNG in Qalhat LNG (train 3).
(k) TOTAL has a direct interest of 2.00% in Block 53.
(l) Operated by DEZPC, which is 50% owned by TOTAL and 50% owned by GPC. Following the extension of European Union sanctions against Syria on December 1, 2011, TOTAL has ceased its activities that contribute to oil and gas production in Syria. For further information on U.S and European restrictions relevant to TOTAL's activities in Syria, see Chapter 4 "Risk factors".

2.1.7.1 Africa

In 2012, TOTAL's production in Africa was 713 kboe/d, representing 31% of the Group's overall production, compared to 659 kboe/d in 2011 and 756 kboe/d in 2010.

In **Algeria**, TOTAL's production was 23 kboe/d in 2012, compared to 33 kboe/d in 2011 and 41 kboe/d in 2010. These declines in production were mainly due to the sale in July 2011 of TOTAL's 48.83% share in CEPSA. All of the Group's production in Algeria now comes from the Tin Fouyé Tabenkort (TFT) field (35%). TOTAL also has stakes of 37.75% and 47% in the Timimoun and Ahnet gas development projects, respectively.

– On the TFT field, plateau production was maintained at 170 kboe/d.

– Pursuant to the ALNAFT national agency approval, at end 2010, of the development plan, the Timimoun Group, the operator of the development and the exploitation of the field, has been created. The answers for the main tendering for the construction of the facility are being processed. A 3D seismic survey has started at year end 2012. Commercial gas production is scheduled to start up by the end of 2016, with anticipated plateau production of 1.6 Bm^3/y (160 Mcf/d).

– Under the Ahnet project, the technical section of a development plan was submitted to the authorities in July 2011. Discussions are underway with the project partners and the authorities. The anticipated plateau production is 4 Bm^3/y (400 Mcf/d) as from the end of 2017.

In **Angola**, the Group's production was 179 kboe/d in 2012, compared with 135 kboe/d in 2011 and 163 kboe/d in 2010. Production comes mainly from Blocks 0, 14 and 17. Highlights of 2010 to 2012 included the launch of the CLOV project in August 2010, the start-up of production on Pazflor in August 2011, several discoveries on Blocks 15/06 and 17/06 and, finally, the acquisition of interests in Blocks 25, 39 and 40 in the Kwanza basin.

– Deep-offshore Block 17 (40%, operator) is TOTAL's principal asset in Angola. It is composed of four major zones: Girassol, Dalia, Pazflor, which are all in production, and CLOV, which is currently being developed.

  Production on Pazflor, which comprises the Perpetua, Zinia, Hortensia and Acacia fields and which started in August 2011, was 196 kb/d in 2012.

  The development of CLOV started in 2010 and will result in the installation of a fourth floating production, storage and offloading units (FPSOs) with a production capacity of 160 kb/d. Start-up of production is expected in 2014.

– On Block 14 (20%), production on the Tombua-Landana field started in 2009 and adds to production from the Benguela-Belize-Lobito-Tomboco and Kuito fields.

– The development of the Lianzi (10%) field was approved in 2012. Located in the offshore unitization zone between Angola and the Republic of Congo, this field will be developed by a connection with the existing Benguela-Belize-Lobito-Tomboco platform (Block 14). Production start-up is expected in 2015.

– On Block 0, the development of Mafumeira Sul (10%) was approved by the partners and the authorities. This project is the second phase of the development of the Mafumeira field. The first oil is expected in 2015.

– On the ultra-deep offshore Block 32 (30%, operator), exploration work continues and the basic engineering studies are underway for the Kaombo project. These studies are expected to permit the development of the discoveries made in the southeast portion of the block through two FPSOs with an estimated capacity of 100 kb/d each. The calls for tender have been issued and the final decision on investment should be made in 2013.

– On Block 15/06 (15%), the development of a first production hub including the discoveries located in the northwest portion of the block began in early 2012.

TOTAL has operations on exploration Blocks 33 (55%, operator), 17/06 (30%, operator), 25 (35%, operator), 39 (15%) and 40 (50%, operator). The Group plans to drill for pre-salt targets in Blocks 25, 39 and 40.

TOTAL is also developing in LNG through the Angola LNG project (13.6%), which includes a gas liquefaction plant near Soyo. The plant will be supplied in particular by the gas associated with production from Blocks 0, 14, 15, 17 and 18. Construction work is now complete and start-up is expected mid-2013.

In **Cameroon**, TOTAL finalized in April 2011 the sale of its entire 75.8% stake in its Upstream subsidiary Total E&P Cameroun. Since that time, the Group no longer owns any exploration or production assets in the country. Production was 3 kboe/d in 2011 and 9 kboe/d in 2010.

In **Côte d'Ivoire**, TOTAL is active in four deep offshore exploration licenses.

TOTAL is the operator of the CI-100 (60%) license and, since February 2012, the CI-514 (54%) license and also holds, since February 2012, a stake in the CI-515 (45%) and CI-516 (45%) licenses. A comprehensive 3D seismic survey was conducted on the CI-100 license, and the first exploration drilling started at the beginning of January 2013. The 2,000 km^2 license is located approximately 100 km southeast of Abidjan in water depths ranging from 1,500 m to 3,100 m.

A 3D seismic survey campaign, covering the whole of the three licenses CI-514, CI-515 and CI-516, was completed in December 2012. The data are currently being interpreted.

In **Egypt**, TOTAL signed a concession agreement in 2010 and became operator of Block 4 (East El Burullus Offshore). In January 2013, TOTAL sold a 40% interest in Block 4, but continues to operate this license with a 50% stake. The license, located in the Nile river basin where a number of gas discoveries have been made, covers a 4-year initial exploration period and includes a commitment to carrying out 3D seismic work and drilling exploration wells. Following the 3,374 km^2 3D seismic survey shot in 2011, drilling is under preparation and should start in 2013.

In **Gabon**, the Group's production was 57 kboe/d in 2012 compared to 58 kboe/d in 2011 and 67 kboe/d in 2010. The Group's exploration and production activities in Gabon are mainly carried out by Total Gabon[1], one of the Group's oldest subsidiaries in sub-Saharan Africa.

– Under the Anguille field redevelopment project, the AGM North platform, from which twenty-one additional development wells are to be drilled, was installed in January 2012. The drilling campaign started early in the second quarter of 2012 and production from this platform, which should represent 20 kboe/d, is expected to start in 2013.

(1) Total Gabon is a Gabonese company whose shares are listed on Euronext Paris. TOTAL holds 58.28%, the Republic of Gabon holds 25% and the public float is 16.72%.

- On the deep-offshore Diaba license, Total Gabon, the operator, sold off in June 2012 part of its interest, which now stands at 42.5%. A 6,000 km² 3D seismic survey was shot, processed and interpreted in 2010. Initial exploration drilling is planned for the first half of 2013.
- Total Gabon farmed into the onshore Mutamba-Iroru (50%), DE7 (30%), and Nziembou (20%) exploration licenses in 2010. Following negative exploration drilling on license DE7, Total Gabon relinquished the license in 2011. After reprocessing the existing seismic data, the Nguongui-updip well was drilled on the Mutamba-Iroru license in 2012 and revealed the presence of hydrocarbons. The commercial viability of this discovery will be investigated further. A 2D seismic survey was made on the Nziembou license in 2012, and an exploration well is due to be drilled in 2014.

In **Kenya**, TOTAL acquired in September 2011 a 40% stake in five offshore licenses in the Lamu basin (L5, L7, L11a, L11b and L12), representing a total surface area of more than 30,600 km² in water depths ranging from 100 m to 3,000 m. Following a 3,500 km² 3D seismic survey in the initial exploration period, 25% of the surface area of the five blocks has been relinquished and the decision was made to drill two exploration wells in 2013 on Blocks L7 and L11b. In June 2012, the Group also acquired the L22 offshore license (100%, operator), located in the same basin and covering a surface area of more than 10,000 km² in water depths ranging from 2,000 m to 3,500 m.

In **Libya**, the Group's production was 62 kb/d in 2012, compared to 20 kb/d in 2011 and 55 kb/d in 2010. TOTAL is present in the following contract zones: 15, 16 & 32 (75%[1]), 70 & 87 (75%[1]), 129 & 130 (30%[1]), 130 & 131 (24%[1]), and Block NC 191 (100%[1], operator).

In 2012, production recovered the level preceding the events of 2011 in the country that had caused the interruption of production in late February 2011.

- In offshore zones 15, 16 and 32, production resumed in September 2011 and quickly reached its former level. The drilling of two wells is expected to start in the second quarter of 2013.
- In onshore zones 70 and 87, production resumed in January 2012. It gradually ramped back up to plateau level. In addition, the Group is continuing the development of the Dahra and Garian fields, where production is expected to start at the beginning of 2014.
- In onshore zones 129, 130 and 131, production resumed in October 2011. A return to plateau level production occurred in 2012. The seismic campaign started before the events and will be pursued in 2013.
- In the onshore Murzuk basin, following a successful appraisal well drilled on the discovery made on a portion of Block NC 191, a development plan was submitted to the authorities in 2009. After the interruption related to the events of 2011 in the country, discussions with the authorities have restarted.

In **Madagascar**, TOTAL acquired in 2008 a 60% stake in the Bemolanga 3102 license (operator) to appraise the license's oil sand accumulations. The exploitation of oil sand accumulations is no longer a consideration, TOTAL is focusing on exploration for conventional hydrocarbons. The conventional exploration of the block is expected to continue in 2013 with a 2D seismic survey following the approval of an additional two-year extension by the local authorities of the exploration phase.

In **Mauritania**, TOTAL has exploration operations on the Ta7 and Ta8 licenses (60%, operator) located in the Taoudenni basin. In January 2012, TOTAL acquired interests in two exploration licenses (90%, operator): Block C9 in ultra-deep offshore, and Block Ta29 onshore in the Taoudenni basin.

- Following a 2D seismic survey shot in 2011 on license Ta7, a well has been prepared and drilling operations started in February 2013.
- On the Ta8 license, drilling of the exploration well ended in 2010. Results from the well were disappointing.
- A 900 km² 2D seismic shot was taken on Block Ta29 in 2012.
- On Block C9, a 3D seismic campaign started at the end of January 2013.

In **Morocco**, an authorization of recognition was allocated in December 2011 to TOTAL and the ONHYM (National Bureau of Petroleum and Mines) for an offshore zone of 100,000 km². In the 2012, the Group led geological studies and realized a seabed survey. In December 2012, the authorization of recognition was extended of one year and 3 D seismic survey shot of 5,000 km² started at the end of 2012.

In **Mozambique**, TOTAL acquired a 40% stake in the contract to share the production of the offshore Blocks 3 and 6 in September 2012. Located in the prolific Rovuma basin, these two blocks cover a total surface area of 15,250 km² in water depths ranging from 0 m to 2,500 m. An exploration well was drilled in 2012. The results are currently being analyzed.

In **Nigeria**, the Group's production was 279 kboe/d in 2012, compared to 287 kboe/d in 2011 and 301 kboe/d in 2010. This level of production makes of Nigeria the first contributing country for the productions of the Group in 2012. TOTAL has been present in Nigeria since 1962. It operates seven production licenses (OML) out of the thirty-eight in which it has a stake, and two exploration licenses (OPL) out of the five in which it has a stake. TOTAL is also the operator of the exploration Block 1 in the Joint Development Zone (JDZ administered jointly by Nigeria and São Tomé and Principe). The Group is also active in LNG through Nigeria LNG and the Brass LNG project. Regarding recent variations in the mining fields:

- In November 2012, TOTAL announced the signing of an agreement to sell its 20% stake in Block OML 138, which includes the Usan field. The agreement is subject to approval by the relevant authorities.
- In 2011, TOTAL (operator) increased its stake from 45.9% to 48.6% in Block 1 of the JDZ.
- The divestment of the 10% Group's stakes held through the joint venture operated by Shell Petroleum Development Company (SPDC) in Blocks OML 26 and 42 was finalized in 2011, and in Blocks OML 30, 34 and 40 in 2012. Blocks OML 4, 38 and 41 were sold in 2010.
- TOTAL owns 15% of the Nigeria LNG gas liquefaction plant, located on Bonny Island, with an overall LNG capacity of 22Mt/y.

With respect to the Brass LNG gas liquefaction plant project (17%), preliminary work continued in 2012 prior to launching the construction of two trains, each with a capacity of 5 Mt/y. Calls for tenders for the construction of the plant and loading facilities are underway.

TOTAL continues its efforts to strengthen its ability to supply gas to the LNG projects in which it owns a stake and to meet the growing domestic demand for gas:

(1) TOTAL's stake in the foreign consortium.

- As part of its joint venture with the Nigerian National Petroleum Company (NNPC), TOTAL pursued the project to increase the gas production capacity of the OML 58 license (40%, operator) from 370 Mcf/d to 550 Mcf/d. The second phase of this project will be the development of additional reserves.

  A drilling incident on OML 58 in late March 2012 resulted in the facilities being stopped. The incident was resolved and production gradually ramped up as of June 2012. The facilities were stopped again and secured in October 2012 due to exceptionally high rainfall. Production resumed in November 2012.
- On the OML 112/117 licenses (40%), TOTAL continued development studies in 2012 for the Ima gas field.
- On the OML 99 license (40%, operator), engineering work is underway to develop the Ikike field, where production is expected to start in 2016 (estimated capacity: 55 kboe/d).
- On the OML 102 license (40%, operator), TOTAL continues to develop the Ofon phase 2 project, which was launched in 2011, with an expected capacity of 60 kboe/d and production start-up scheduled end of 2014. In 2011, the Group also discovered Etisong North, located 15 km of the currently-producing Ofon field. The exploration campaign continued in 2012 with the drilling of the Eben well, which is also south of Ofon. The positive results produced by this well further enhance the appeal of the future Etisong-Eben development hub as a satellite of the Ofon field.
- On the deep water acreage, TOTAL drilled three exploration wells in 2012: Obo and Enitimi on JDZ Block 1, and Owowo West on OPL 223. Results are under study.
- On the OML 130 license (24%, operator), the Akpo field reached plateau production of 225 kboe/d in 2010. The Group is actively working on the Egina field (capacity of 200 kboe/d), for which a development plan has been approved by the relevant authorities. Calls for tender are underway and the contracts should be signed in the second quarter of 2013.
- On the OML 138 license (20%, operator), TOTAL started production on the Usan offshore field in February 2012 (180 kb/d, capacity of the FPSO), which reached a level of 120 kboe/d at the end of 2012. As described above, on November 2012, TOTAL signed an agreement on the sale of its 20% stake in Block OML 138. This agreement is subject to approval by the relevant authorities, expected in 2013.
- The production that is not operated by the Group in Nigeria comes mainly from the SPDC association, in which TOTAL holds a 10% stake. Gas production by the SPDC association in 2011 remained strong due to the contribution made by the Gbaran-Ubie project, which started up in 2010. However, the sharp increase of oil bunkering in 2012 had an impact on onshore production, as well as on the integrity of the facilities and the environment. TOTAL also holds a 12.5% interests in Shell Nigeria Exploration and Production Company (SNEPCO) association, wich operates notably on the OML 118 license. On this license, the Bonga field contributed approximately 15 kboe/d to the Group's production in 2012.
- On the operated deep water acreage, the Bonga Northwest development project was progressed in 2012 on the OML licence (12.5%).

In **Uganda**, TOTAL finalized in February 2012 its farm-in for an interest of 33.33% covering the EA-1, EA-1A and EA-2 licenses as well as the new Kanywataba license and the Kingfisher production license. All of these licenses are located in the Lake Albert region, where oil resources have already been discovered.

TOTAL is the operator of EA-1 and EA-1A and a partner on the other licenses. TOTAL and its partners are embarking on an exploration and appraisal program from 2012 onwards.

- The Kanywataba exploration well was drilled in June 2012 and produced negative results. The license expired in August 2012 and was returned to the authorities.
- The EA-1A license expired in February 2013, following a campaign of several exploration drillings.
- On the appraisal license EA-1, a campaign of appraisal wells, production tests and a 3D seismic survey are planned for 2012-2014. Five development plans will be submitted to the authorities before the end of 2013 (Ngiri, Jobi-Rii, Mpyo, Gunya and Jobi East).
- On the appraisal license EA-2, the campaign of appraisal wells and production tests started in 2012 will continue in 2013. Several development plans will be submitted to the authorities before the end of 2013 (Waraga, Kasamene, Wahrindi, Kigogole, Ngege, Ngara and Nsoga).
- The development plan of the EA-3 production license of the Kingfisher field was finalized by the operator in November 2012 and submitted to the authorities for approval.

In the **Republic of Congo**, the Group's production was 113 kboe/d in 2012, compared to 123 kboe/d in 2011 and 120 kboe/d in 2010.

- The development of the Lianzi field (26.75%) was approved in 2012. Located in the offshore unitization zone between Angola and the Republic of Congo, this field will be developed by a tieback to the existing Benguela-Belize-Lobito-Tomboco platform (Block 14 in Angola). Production start-up is expected in 2015.
- The Moho Bilondo offshore field (53.5%, operator), reached plateau production of 90 kboe/d in mid-2010. The field has now started its decline.

  The existence of additional resources in the southern portion of the license was confirmed in 2010, creating the prospects for additional development of the existing facilities ("Phase 1b"). The basic engineering studies were finished in 2012.

  A series of agreements on the contractual and fiscal conditions applicable to the Moho Bilondo license were signed with the authorities in July 2012 and approved by a law passed in October 2012, triggering the development of the northern portion of the license, the potential of which was bolstered by appraisal and exploration wells drilled in 2008 and 2009 (Moho North project). The basic engineering studies were finished in 2012.

  The Phase 1b and Moho North projects have been launched in March 2013, with production start-up planned in 2015 and 2016 respectively. The estimated production capacities are about 140 kboe/d in 2017 ("Phase 1b" 40 kboe/d, "Moho Nord" 100 kboe/d).
- Production on Libondo (65%, operator), which is part of the Kombi-Likalala-Libondo operating license, started up in March 2011. Plateau production reached 12 kboe/d in 2011. A substantial portion of the equipment was sourced locally in Pointe-Noire through the redevelopment of a construction site that had been idle for several years.

In the **Democratic Republic of the Congo**, following the Presidential decree approving TOTAL's entry in 2011 as operator with a 60% interest in Block III of the Graben Albertine, the exploration permit was issued in January 2012 by the Minister of Hydrocarbons for a period of three years and subsequently extended by an additional year due to the postponement of the works resulting from the general security situation in the eastern part of the country. This block is located in the Lake Albert region. TOTAL acquired an additional 6.66% of this block in March 2012. The prospecting program is limited to the northern portion of the license, which is outside the Virunga park. A helicopter acquisition of gravimetric and magnetic data was completed in August 2012.

In the **Republic of South Sudan,** TOTAL holds an interest in Block B and is working with state authorities to resume exploration activities on this zone. Since the independence of the Republic of South Sudan on July 9, 2011, TOTAL is no longer present in Sudan.

2.1.7.2. North America

In 2012, TOTAL's production in North America was 69 kboe/d, representing 3% of the Group's overall production, compared to 67 kboe/d in 2011 and 65 kboe/d in 2010.

In **Canada**, TOTAL signed in March 2011 a partnership with Suncor related to the Fort Hills and Joslyn mining projects and the Voyageur upgrader. This partnership allows TOTAL to reorganize around two major hubs the different oil sands assets that it has acquired over the last few years: on the one hand, a Steam Assisted Gravity Drainage (SAGD) hub focused on Surmont's (50%) ongoing development and, on the other hand, a mining and upgrading hub, which includes the TOTAL-operated Joslyn (38.25%) and Suncor-operated Fort Hills (39.2%) mining projects and the Suncor-operated Voyageur upgrader (49%) project. The Group also has a 50% stake in the Northern Lights mining project (operator) and 100% of a number of oil sands leases acquired through several auction sales. The Group's production was 12 kboe/d in 2012, compared to 11 kboe/d in 2011 and 10 kboe/d in 2010.

– On the Surmont lease, gross commercial production in SAGD mode of the first development phase in 2012 was around 25 kboe/d of bitumen from forty well pairs. The operator plans to drill additional wells in 2013 and to continue to convert the activation method on the existing wells from gas lift to electric submersible pump (ESP) in order to improve production. In addition, a project to debottleneck the steam has been initiated which will allow to increase the production of Phase 1.

  In early 2010, the partners of the project decided to launch the construction of the second development phase. The goal of production start-up from Surmont Phase 2 has been set for 2015 and overall production capacity from the field is expected to increase to 130 kboe/d. In April 2011, the authorities issued a license permitting production (phases 1 and 2) of up to 136 kboe/d.

– The Joslyn license is expected to be exploited using mining techniques. After the public hearings in 2010 and the 2011 provincial and federal Canadian authorities approval for a project of 100 kboe/d, the engineering studies including a review of the design to optimize the production of the Joslyn North Mine project are underway. On-site preliminary works were launched (surface waters drainage and civil engineering).

– TOTAL closed in September 2010 the acquisition of UTS and its main asset: a 20% stake in the Fort Hills lease. In 2011, as part of their partnership, TOTAL acquired from Suncor an additional 19.2% stake in the lease, thereby increasing its stake to 39.2%. The pre-project studies and site preparation work are underway. The Fort Hills mining project has already been approved by the authorities for a first development phase with a capacity of 180 kboe/d. After the completion of the pre-project studies in June 2012, the basic engineering studies are now in progress, with a final decision on investment expected for 2013. Some contracts for detailed engineering works have already been awarded.

– TOTAL also acquired in December 2010 a 49% interest in the Voyageur upgrader project, which is operated by Suncor, located in the Canadian province of Alberta and intended to upgrade bitumen from the Fort Hills and Joslyn mines. In 2012, the estimate of this project's cost and the evolution of North American oil markets modified its strategic and economic perspectives. As a consequence, the partners, TOTAL and Suncor, launched a joint strategic review of the development plan for the Voyageur upgrader. This detailed review included, notably, the optimization of the development plan, production evacuation logistics studies and implications of possible evolutions of the project. Pending the finalization of this review, development spending on the project was minimized during this period and until a joint decision on the future development of this project by both partners, TOTAL and Suncor.

  On March 27, 2013, TOTAL entered into an agreement for the sale to Suncor Energy Inc. of its 49% interest in the Voyageur upgrader project. The mining developments of Fort Hills and Joslyn are not affected by this transaction and continue according to the production evacuation logistics studies jointly conducted with Suncor (see Chapter 7, point 6.).

– The Group also holds a 50% stake in the Northern Lights project, which is expected to be developed through mining techniques.

In the **United States**, the Group's production was 57 kboe/d in 2012, compared to 56 kboe/d in 2011 and 55 kboe/d in 2010.

– In the Gulf of Mexico:

  - The deep-offshore Tahiti oil field (17%) reached peak production of 135 kboe/d in 2009. Phase 2, which was launched in September 2010, comprises drilling four injection wells and two producing wells. The injection of water, which attempts to limit the decline of the wells, started in February 2012. The second producing well is currently being drilled.
  - The Chinook 4 well in the deep offshore Chinook project (33.33%) started production in the third quarter of 2012. More drilling operations are planned, including one well underway (Chinook 5).
  - The TOTAL (40%) - Cobalt (60%, operator) alliance's exploratory drilling campaign was launched in 2009 and the drilling of the first three wells produced disappointing results. This campaign was interrupted due to the U.S. government's moratorium on deep offshore drilling operations in 2010 and resumed in 2012 with the drilling of the Ligurian 2 and North Platte wells. A significant discovery of oil was made in the latter in December 2012. Appraisal works are planned.
  - In 2010, the Group disposed of its equity stakes in the Matterhorn and Virgo operated fields.

– Following the signature of an agreement in late 2009, a joint venture was set up with Chesapeake to produce shale gas in the Barnett Shale Basin in Texas. Under this joint venture, TOTAL owns 25% of Chesapeake's portfolio in the area. In 2011, approximately 300 additional wells were drilled, enabling gas production to reach 1.4 Bcf/d at the end of 2011. Following the drop in gas prices in the United States, drilling activity was sharply reduced in 2012, with around 100 wells being drilled. The hook-up of certain wells drilled in 2011 helped to maintain production in 2012.

  At the end of 2011, TOTAL signed an agreement with Chesapeake and EnerVest to enter into a joint venture. Pursuant to the agreement, TOTAL acquired a 25% share in Chesapeake's and EnerVest's liquid-rich area of the Utica shale play in Ohio. More than 100 wells were drilled in 2012 and forty-seven were connected and started producing.

  Engineers from TOTAL are assigned to the teams led by Chesapeake.

- The Group holds a 50% stake in American Shale Oil LLC (AMSO) to develop in situ shale oil technology. The pilot to develop this technology is underway in Colorado.
- In March 2012, TOTAL entered a 50/50 joint venture with Red Leaf Resources for the ex-situ development of oil shale and agreed to fund a production pilot before any larger-scale development.
- In October 2012, TOTAL finalized an agreement to buy about 30,000 additional acres in Colorado and Utah, with a view to developing in situ shale oil techniques (AMSO technique) or ex-situ techniques (Red Leaf technique).

In **Mexico**, TOTAL is conducting various studies with state-owned PEMEX under a general technical cooperation agreement renewed in July 2011 for a period of five years.

2.1.7.3. South America

In 2012, TOTAL's production in South America was 182 kboe/d, representing 8% of the Group's overall production, compared to 188 kboe/d in 2011 and 179 kboe/d in 2010.

In **Argentina**, where TOTAL has been present since 1978, the Group operated 30%[1] of the country's gas production in 2012. The Group's production was 83 kboe/d in 2012, compared to 86 kboe/d in 2011 and 83 kboe/d in 2010.

- In Tierra del Fuego, the Group notably operates the Carina and Aries offshore fields (37.5%). Further to the re-appraisal of the reserves of the Carina field, two additional wells are expected to be drilled from the existing platform. These wells should allow production levels from the facilities operated by the Group in Tierra del Fuego to be maintained at about 615 Mcf/d until the Vega Pleyade field (37.5%, operator) starts up in 2015.
- In the Neuquén basin, TOTAL started a drilling campaign in 2011 on its mining licenses in order to assess their shale gas and oil potential. In 2012, this campaign, which started on the Aguada Pichana license (27.3%, operator), was extended to all the blocks operated by the Group: San Roque (24.7%, operator), Rincón la Ceniza and La Escalonada (85%, operator), Aguada de Castro (42.5%, operator), and Pampa de las Yeguas II (42.5%, operator), as well as to the blocks operated by third parties: Cerro Las Minas (40%), Cerro Partido (45%), Rincón de Aranda (45%) and Veta Escondida (45%). The first results of the production tests on the wells drilled during this campaign are positive and analyses are underway. The conventional production continues on the Group's assets in this basin.

In **Bolivia**, the Group's production, primarily gas, amounted to 27 kboe/d in 2012, compared to 25 kboe/d in 2011 and 20 kboe/d in 2010. TOTAL has stakes in six licenses: three producing licenses, San Alberto and San Antonio (15%) and Block XX Tarija Oeste (41%), and three licenses in the exploration or appraisal phase, Aquio and Ipati (80%, operator) and Rio Hondo (50%).

- Production started up in February 2011 on the gas and condensates Itaú field located on Block XX Tarija Oeste; it is routed to the existing facilities of the neighboring San Alberto field. In early 2011, TOTAL decreased its stake to 41% in Block XX Tarija Oeste after divesting 34% and is no longer the operator. The development of phase 2, which was approved by the local authorities in 2011, continued in 2012 and is expected to increase the field's production by 1.5 Mm³/d to 4.5 Mm³/d over the course of 2013.
- In 2004, TOTAL discovered the Incahuasi gas field on the Ipati Block. In 2011, an appraisal well confirmed the extension of the discovery northwards onto the adjacent Aquio Block. TOTAL consequently filed a declaration of commerciality for the Aquio and Ipati Blocks, which was approved by the local authorities in 2011. Additional appraisal work is underway, notably with the drilling of a second well on the Ipati Block, which started in January 2012 with encouraging results. In December 2012, TOTAL submitted to the Bolivian authorities a Phase 1 development plan, including two wells tied to a central processing plant of 6.5 Mm³/d for which calls for tenders have been launched. A third appraisal well should be drilled in 2013 which will be tied back to the Phase 1 project in case of success.

In **Brazil**, TOTAL has equity stakes in three exploration blocks: Blocks BC-2 (41.2%) and BM-C-14 (50%) in the Campos basin, and Block BM-S-54 (20%) in the Santos basin.

- The Xerelete field is mainly located on Block BC-2, with an extension on Block BM-C-14. In 2012 TOTAL became the operator of the field. Following seismic reprocessing, a pre-salt prospect was found under the Xerelete discovery made in 2001 at a water depth of 2,400 m. Further to approval by the authorities, TOTAL expects to resume drilling activity on the block at the end of 2013.
- On Block BM-S-54, a first well was drilled in the pre-salt at the end of 2010 on the Gato do Mato structure, and a significant oil column was found. Between October 2011 and July 2012, an exploration/delineation campaign was conducted on the block, enabling a second structure (Epitonium) identified on Block BM-S-54 to be drilled, the productivity of the well drilled in 2010 to be tested and an appraisal well to be drilled in the northern part of the Gato do Mato structure. The encouraging results achieved on Gato do Mato are currently being analyzed in order to define the next steps in the appraisal of the field.

In **Colombia**, where TOTAL has had operations since 1973, the Group's production was 6 kboe/d in 2012, compared to 11 kboe/d in 2011 and 18 kboe/d in 2010. The drop in production in 2011 was due in particular to TOTAL's disposal of its interest in CEPSA, which was finalized in July 2011. The drop in production in 2012 was due to the sale in October 2012 of the Group's 100% owned subsidiary, TEPMA BV, which held an interest in the Cusiana field. This operation also involved the disposal of stakes in the OAM and ODC pipelines.

In 2011, TOTAL sold 10% of its stake in the Ocensa oil pipeline, thereby reducing its holding to 5.2%.

Following the discovery of Huron-1 in 2009 on the Niscota (50%) exploration license and a 3D seismic survey of this discovery in 2010, the first appraisal well, Huron-2, also found hydrocarbons and should be tested during the second quarter of 2013. The drilling of a second appraisal well, Huron-3, is in progress. The conceptual development studies have started for a declaration of commerciality in late 2013.

In **French Guiana**, TOTAL owns a 25% stake in the Guyane Maritime license. The license, located about 150 km off the coast, covers an area of approximately 24,100 km² in water depths ranging

(1) Source: Argentinean Ministry of Federal Planning, Public Investment and Services – Energy Secretary.

from 200 m to 3,000 m. At the end of 2011, the authorities extended the research permit until May 31, 2016.

After a 2,500 km² 3D seismic survey of the eastern portion of the block in 2009 and 2010, drilling started in 2011 of the GM-ES-1 well, about 170 km northeast of Cayenne on the Zaedyus prospect, at a water depth of more than 2,000 m. This well revealed two hydrocarbon columns in the gravelly reservoirs.

Two 3D seismic survey campaigns covering a total surface area of more than 5,000 km² were conducted in the center and extreme eastern portions of the block in 2012. The results of the GM-ES-2 appraisal well are disappointing, but they do not call the potential of the license into question. Drilling started on the GM-ES-3 exploration well at the end of 2012, and could be followed by two more exploration wells in 2013 and 2014.

In **Trinidad and Tobago**, where TOTAL has had operations since 1996, the Group's production was 16 kboe/d in 2012, compared to 12 kboe/d in 2011 and 3 kboe/d in 2010. TOTAL holds a 30% stake in the offshore Angostura field located on Block 2C and an 8.5% stake in the adjacent exploration Block 3A. Production started up in May 2011 on Phase 2, which corresponds to the gas development phase. The process to sell the companies owning these two assets was engaged in April 2012, with a sale anticipated in the first half of 2013.

In **Uruguay,** TOTAL acquired Block 14, located about 250 km offshore, in an auction sale in March 2012. The license covers an area of approximately 6,700 km² in water depths ranging from 2,000 m to 3,500 m. Under the terms of the contract to share production, signed in October 2012, TOTAL agreed to conduct a 3D seismic survey of the entire block, which started in November 2012, and to drill one well in the first three-year exploration phase.

In **Venezuela**, where TOTAL has had operations since 1980, the Group's production was 50 kboe/d in 2012, compared to 54 kboe/d in 2011 and 55 kboe/d in 2010. TOTAL has equity stakes in PetroCedeño (30.3%), which produces and upgrades extra heavy oil in the Orinoco Belt, in Yucal Placer (69.5%), which produces gas dedicated to the domestic market, and in the offshore exploration Block 4, located in Plataforma Deltana (49%). The development phase of the southern zone of the PetroCedeño field started in the second half of 2011. Pursuant to an amendment to the gas sale contract, a new development phase of the Yucal Placer field, which will boost the production capacity from 100 Mcf/d to 300 Mcf/d, started in June 2012.

2.1.7.4. Asia-Pacific

In 2012, TOTAL's production in Asia-Pacific was 221 kboe/d, representing 10% of the Group's overall production, compared to 231 kboe/d in 2011 and 248 kboe/d in 2010.

In **Australia**, where TOTAL has held leasehold rights since 2005, the Group owns 30% of the Ichthys project, 27.5% of the Gladstone LNG project and seven offshore exploration licenses, including three that it operates, off the northwest coast in the Browse and Bonaparte basins. The Group's production was 5 kboe/d in 2012, compared to 4 kboe/d in 2011 and 1 kboe/d in 2010.

- At the start of 2013, TOTAL acquired an additional 6% in the Ichthys project, increasing its stake to 30%. This project, launched in early 2012, is aimed at the development of the Ichthys gas and condensates field, located in the Browse basin. This development includes a floating platform designed for gas production, treatment and export, an FPSO (with a maximum capacity of 100 kb/d of condensates) to stabilize and export condensates, an 889 km gas pipeline and an onshore liquefaction plant (capacities of 8.4 Mt/y of LNG and 1.6 Mt/y of NGL) located in Darwin. The LNG has already been sold under long-term contracts mainly to Asian buyers. Production start-up is expected at year-end 2016.
- In late 2010, TOTAL acquired a 20% stake in the GLNG project, followed by an additional 7.5% stake in March 2011. This integrated gas production, transport and liquefaction project is based on the development of coal gas from the Fairview, Roma, Scotia and Arcadia fields. The final investment decision was made in early 2011 and start-up is expected in 2015. LNG production is expected to eventually reach 7.2 Mt/y. The upstream development of the project and the construction of the pipeline are underway.
- Two wells were drilled in 2011 on the WA-403 license (60%, operator). As one well demonstrated the presence of hydrocarbons, additional appraisal work will take place on this Block (3D seismic) in the coming years.
- At the end of 2012, TOTAL reduced its exposure on the WA-408 license (50%, operator) by disposing of 50% of its stake to partners. Three new exploration wells are planned, the first of which started in December 2012.

In 2012, TOTAL signed an agreement to enter four shale gas exploration licenses in the South Georgina basin in the center of the country. Under the terms of the agreement, TOTAL can increase its stake to 68% and become the operator in the event of development, which remains subject to approval by the authorities.

In **Brunei**, where TOTAL has been present since 1986, the Group operates the offshore Maharaja Lela Jamalulalam gas and condensates field located on Block B (37.5%). The Group's production was 12 kboe/d in 2012, compared to 13 kboe/d in 2011 and 14 kboe/d in 2010. The gas is delivered to the Brunei LNG liquefaction plant.

On Block B, the drilling campaign that started in 2009 continued until 2011. Two of the wells were connected to production facilities in 2010 and 2011. The other wells, which were exploratory, revealed new reserves in the southern portion of the field. A ten-year extension of the mining rights period was granted in December 2011 by the Brunei government, which has allowed a project to be launched to develop new reserves which will bring additional gas production, with deliveries to the Brunei LNG liquefaction plant starting in 2015.

On deep-offshore exploration Block CA1 (54%, operator), formerly Block J, exploration operations that were suspended in May 2003 due to a border dispute between Brunei and Malaysia resumed in September 2010. A new seismic survey started before the summer of 2011 and an initial campaign of three drilling operations started in October 2011. This campaign, which continued until October 2012, was disappointing, despite the identification of some layers containing hydrocarbons. Surveys to re-appraise the block's potential are underway and should result in a new exploration strategy.

In **China**, the Group has had operations since 2006 on the South Sulige Block, located in the Ordos basin in the Inner Mongolia province. Following appraisal work by TOTAL, China National Petroleum Corporation (CNPC) and TOTAL agreed to a development plan pursuant to which CNPC is the operator and TOTAL has a 49% stake.

The authorities gave the operator permission to undertake preliminary development work in the spring of 2011.

The first development wells have been drilled and the facilities are presently in the test phase.

TOTAL is discussing with Sinopec a joint study agreement on the potential of the shale gas in a zone of around 4,000 km² near Nanjing, on which Sinopec plans to conduct seismic and drilling operations. An agreement could be negotiated with the authorities to exploit these unconventional resources at a later stage.

In **Indonesia**, where TOTAL has had operations since 1968, the Group's production was 132 kboe/d in 2012, compared to 158 kboe/d in 2011 and 178 kboe/d in 2010.

TOTAL's operations in Indonesia are primarily concentrated on the Mahakam permit (50%, operator), which covers in particular the Peciko and Tunu gas fields. TOTAL also has a stake in the Sisi-Nubi gas field (47.9%, operator). TOTAL delivers most of its natural gas production to the Bontang LNG plant operated by the Indonesian company PT Badak. The overall capacity of the eight liquefaction trains of the Bontang plant is 22 Mt/y.

In 2012, gas production operated by TOTAL decreased to 1,871 Mcf/d from 2,227 Mcf/d in 2011 due to the maturity of most of the fields on the Mahakam field, which is now in decline. The gas operated and delivered by TOTAL accounted for nearly 79% of Bontang LNG's supply. Operated condensates and oil production from the Handil and Bekapai fields are added to this gas production.

– On the Mahakam permit:
  - On the Tunu field in 2012, additional wells were drilled in the main reservoir and development wells targeted shallow gas reservoirs.
  - On the Peciko field, Phase 7 drilling, which started in 2009, is continuing.
  - On South Mahakam, which contains the Stupa, West Stupa and East Mandu condensate gas fields, production started at the end of October 2012. Other development wells are being drilled.
  - On the Sisi-Nubi field, which began production in 2007, drilling operations continue within the framework of a second phase of development. The gas from Sisi-Nubi is produced through Tunu's processing facilities.

– On the Sebuku license (15%), the development of the Ruby gas field started in February 2011. Production start-up is scheduled for the end of 2013, with an estimated capacity of 100 Mcf/d.

– On the Sageri exploration Block (50%), the first exploration well (Lempuk-1X), completed in early 2012, produced negative results.

– In October 2012, TOTAL acquired a 100% stake in the exploration Block Bengkulu I – Mentawai in the offshore Bengkulu basin, southwest of Sumatra.

– In October 2012, the Group also acquired a 100% stake in the exploration Block Telen, in the offshore Kutai basin in the East Kalimantan province.

– In May 2011, TOTAL acquired a 100% stake in the onshore and offshore exploration Block South West Bird's Head, located in the Salawati basin in the province of West Papua. The preparatory work on the Anggrek Hitam 1 exploration well started at the end of 2012 and drilling start up is planned for April 2013.

– In December 2011, the Group signed an agreement for a 18.4% stake in a coal bed methane (CBM) block on Kutai II in East Kalimantan province. This supplements the 50% stake acquired in March 2011 on the similar Kutai Timur Block. The first wells and core drilling operations are planned for 2013.

– Finally, TOTAL conducted surveys of several other exploration blocks in which it holds an interest: Amborip VI (24.5%), Arafura Sea (24.5%), Sadang (30%), South East Mahakam (50%, operator), South Mandar (33%) and South Sageri (45%).

In **Malaysia**, TOTAL signed a production sharing agreement in 2008 for the offshore exploration Blocks PM303 and PM324. TOTAL withdrew from the PM303 offshore exploration Block in early 2011 following seismic surveys. Exploration operations continued on Block PM 324 (50%, operator) and the first high-pressure/high-temperature drilling started in October 2011. The drilling continued under difficult technical conditions until September 2012. In geological terms, the results were disappointing. Surveys are underway to continue the appraisal of the block's potential.

TOTAL also signed in November 2010 a new production sharing agreement for the deep offshore exploration Block SK 317 B (85%, operator) located off the state of Sarawak. The interpretation of the 3D seismic data is underway and could result in the drilling of an exploration well in 2013.

In **Myanmar**, the Group's production was 16 kboe/d in 2012, compared to 15 kboe/d in 2011 and 14 kboe/d in 2010. TOTAL is the operator of the Yadana field (31.2%), which is located on offshore Blocks M5 and M6. This field produces gas that is delivered mainly to PTT (the Thai state-owned company) for use in Thai power plants as well as the domestic market via two pipelines that were built and are operated by MOGE, a state-owned company.

In September 2012, TOTAL entered into an agreement to take a 40% share of a production sharing agreement on the M-11 offshore Block in the Martaban basin. The acquisition was approved by the authorities at the start of 2013. The drilling of an exploration well is planned for 2013.

In **Papua New Guinea**, TOTAL acquired in October 2012, subject to the authorities' approval, a 40% stake, in the PPL234 and PPL244 offshore permits, 50% in the PRL10 offshore permit and an option for 35% of the PPL338 and PPL339 onshore permits. The program includes the drilling of two exploration wells in 2013.

In the **Philippines**, TOTAL has held a 75% stake in the SC56 license in the southern Sulu Sea since September 2012. The program of operations includes the refurbishment of the oldest seismic lines and a new seismic campaign wich was realized at the beginning of year 2013.

In **Thailand**, the Group's production, which was 55 kboe/d in 2012, compared to 41 kboe/d in 2011 and 2010, comes from the Bongkot (33.33%) offshore gas and condensates field. PTT purchases all of the natural gas and condensates production from this field.

– In the northern portion of the Bongkot field, new investments are in progress to allow gas demand to be met and plateau production to be maintained:
  - phase 3J (two well platforms) was launched in late 2010 and started up as scheduled in 2012;
  - phase 3K (two well platforms) was approved in September 2011 with start-up scheduled for 2013;
  - phase 3L (two well platforms) was approved in September 2012 with start-up scheduled for 2015; and
  - the second low-pressure compressor installation phase to increase gas production was completed in the first quarter of 2012.

– The southern portion of the field (Greater Bongkot South) is also being developed in several phases. This development is designed to include a processing platform, a residential platform and thirteen production platforms. Production of the first phase (phase 4A), with a capacity of 350 Mcf/d, started in June 2012.

In **Vietnam**, TOTAL holds a 35% stake in the production sharing contract for the offshore 15-1/05 exploration Block following an agreement signed in 2007 with PetroVietnam. TOTAL has put its share up for sale.

In 2009, TOTAL and PetroVietnam signed a production sharing agreement for the onshore Blocks DBSCL-02 and DBSCL-03 (75%, operator). Based on the seismic information obtained in 2009 and 2010, the partners have decided not to continue the exploration work and the license was returned to the authorities when it expired in April 2012.

2.1.7.5. Commonwealth of Independent States (CIS)

In 2012, TOTAL's production in the CIS was 195 kboe/d, representing 8% of the Group's overall production, compared to 119 kboe/d in 2011 and 23 kboe/d in 2010.

In **Azerbaijan**, where TOTAL has had operations since 1996, on the field of Shah Deniz (10%), production was 16 kboe/d in 2012 and continues to progress regularly from one year to the next since 2010. TOTAL also holds a 10% stake of the South Caucasus Pipeline (SCP) gas pipeline that transports the gas produced in Shah Deniz to the Turkish and Georgian markets. TOTAL also holds a 5% stake of the Baku-Tbilisi-Ceyhan (BTC) oil pipeline, which connects Baku and the Mediterranean Sea and evacuates among others the condensates of Shah Deniz's gas.

Gas deliveries to Turkey and Georgia continued throughout 2012, at a lower pace for Turkey due to weaker demand than expected. Conversely, state-owned SOCAR continued to take greater quantities of gas than provided for by the agreement.

Development studies and business negotiations for the sale of additional gas needed to launch a second development phase in Shah Deniz field continued in 2012. In October 2011, SOCAR and Botas, a Turkish state-owned company, signed an agreement on the sale of additional gas volumes and the transfer conditions for volumes intended for the European market. The front end engineering and design (FEED) for the second phase were officially launched at the end of the first quarter of 2012. Negotiations and investigations into the means of transporting the gas from Shah Deniz to Europe are continuing at the same time. The goal is to reach a final decision on the investment in 2013 concerning the second development phase.

In 2009, TOTAL and SOCAR signed an exploration, development and production sharing agreement for a license located on the Absheron Block in the Caspian Sea. TOTAL (40%) is the operator during the exploration phase and a joint operating company will manage operations during the development and production phase. In September 2011, the first exploration well revealed a significant accumulation of gas that was tested in the first quarter of 2012. A discovery and commerciality declaration was filed in June 2012. Operations on the well continued with the drilling of a sidetrack to the north of the structure, which was completed in September 2012 with positive results. The field's development plan is under preparation and will be submitted to SOCAR for approval in the coming years, as required by the production sharing contract.

In **Kazakhstan**, TOTAL has owned since 1992 a 16.81% stake in the North Caspian license, which covers the Kashagan field in particular.

The Kashagan project is expected to develop the field in several phases. The development plan for the first phase (300 kb/d) was approved in February 2004 by the Kazakh authorities, permitting work to begin on the field. The consortium plans a start-up of production in 2013.

In May 2012, the members of the North Caspian Sea Production Sharing Agreement (NCSPSA) consortium and the Kazakh authorities signed agreements to settle a number of issues regarding the contractual conditions of the first phase.

In November 2012, TOTAL acquired a 75% share in the North and South Nurmunai onshore exploration blocks. These two blocks cover 14,500 km^2 and are located in the southwest of the country.

In **Russia**, where TOTAL has had operations through its subsidiary since 1991, the Group's production, which was 179 kboe/d in 2012 compared to 105 kboe/d in 2011 and 10 kboe/d in 2010, comes from the Kharyaga field (40%, operator) and TOTAL's stake in Novatek (15.34%).

- In March 2012, the partners in the first development phase of the Shtokman project through Shtokman Development AG (TOTAL, 25%) decided to assess the feasibility of a project focusing exclusively on the production of Liquefied Natural Gas (LNG). An analysis of the Shtokman project revealed that the technical solutions initially chosen to produce 23.7 Gm^3/y of gas, half of which to be exported to Europe by pipeline and the other half to be shipped as LNG, involved capital outlay and operational costs that were too high to achieve acceptable profitability. The 2007 agreement between TOTAL and Gazprom expired on July 1, 2012, but technical discussions are ongoing between the two companies in order to agree on an economically viable development.
- TOTAL and the Russian company Novatek, listed in Moscow and London, signed a strategic partnership agreement pursuant to which TOTAL acquired a 12.09% stake in Novatek in April 2011, with the intention of both parties for TOTAL to increase its participation to 19.40% within three years. In December 2011, TOTAL increased its stake in Novatek by 2% to 14.09%. Since April 2012, TOTAL has increased its stake in Novatek to reach 15.34% at year-end 2012.

  TOTAL and its partner Novatek made the final investment decision to develop the Termokarstovoye field (capacity 65 kboe/d) at the end of 2011. This onshore deposit of gas and condensates is located in the Yamalo-Nenets district. The development and production license for the Termokarstovoye field is owned by ZAO Terneftegas, a joint venture between Novatek (51%) and TOTAL (49%).
- In October 2011, TOTAL (20%) and Novatek signed the final agreements for the joint development of the Yamal LNG project. The Yamal LNG project covers the development of the South Tambey gas and condensates field, located on the Yamal Peninsula in the Arctic. The FEED studies were completed at the end of 2012, certain calls for tender have been issued and the final investment decision could be made in 2013.
- On the Kharyaga field, work related to the development plan of phase 3 is ongoing. This development plan is intended to maintain plateau production above the 30 kboe/d level reached in late 2009. TOTAL sold 10% of the field to state-owned Zarubezhneft in January 2010, thereby decreasing its interest to 40%.
- In 2009, TOTAL signed an agreement setting forth the principles of a partnership with KazMunaiGas (KMG) for the development of the Khvalynskoye gas and condensates field, located offshore in the Caspian Sea on the border between Kazakhstan and Russia, under Russian jurisdiction. Pursuant to this agreement,

TOTAL is planning to acquire a 17% share from KMG. This transaction will be subject to approval by the authorities.

In **Tajikistan**, TOTAL signed an agreement in December 2012 with a view to acquiring a 33.3% stake in the Bocktar PSC. This transaction is subject to approval by the authorities.

2.1.7.6. Europe

In 2012, TOTAL's production in Europe was 427 kboe/d, representing 19% of the Group's overall production, compared to 512 kboe/d in 2011 and 580 kboe/d in 2010.

In **Bulgaria**, the Khan Asparuh license (100%, operator), which covers 14,220 km^2 in the Black Sea, was awarded to TOTAL in July 2012 and a concession agreement was signed in August 2012. TOTAL has agreed to collect the seismic data and to drill two wells during the five-year term of the contract. An agreement to divest 30% stakes to OMV and Repsol was concluded in November 2012. Under the terms of this agreement, OMV will be the operator in the seismic phase and will then hand over the operatorship to TOTAL.

In **Cyprus**, TOTAL is present on two deep offshore exploration licenses for Blocks 10 and 11, which were obtained in the second offshore exploration round launched by the Cypriot government in 2012.

TOTAL signed two production-sharing contracts at the beginning of 2013 for these blocks which extend over 2,572 km^2 and 2,958 km^2, respectively, and are located in the southwest of Cyprus, in water depths ranging from 1,000 m to 2,500 m. The exploration of these blocks will begin with seismic surveys.

In **Denmark**, TOTAL has owned since 2010 an 80% stake in and the operatorship for licenses 1/10 (Nordjylland) and 2/10 (Nordsjaelland, formerly Frederoskilde). These onshore licenses, the shale gas potential of which has yet to be assessed, cover areas of 3,000 km^2 and 2,300 km^2, respectively. Following geoscience surveys on license 1/10 in 2011, the decision was made to drill a well. Initially planned for 2013, this well is expected to be delayed due to additional environmental studies requested by the local authorities. Geoscience surveys are ongoing on license 2/10.

In **France**, the Group's production was 13 kboe/d in 2012, compared to 18 kboe/d in 2011 and 21 kboe/d in 2010. TOTAL's major assets are the Lacq (100%) and Meillon (100%) gas fields, located in the southwest part of the country.

On the Lacq field, operated since 1957, a carbon capture and storage pilot was commissioned in January 2010. In connection with this project, a boiler has been modified to operate in an oxy-fuel combustion environment and the carbon dioxide emitted is captured and re-injected in the depleted Rousse field. As part of TOTAL's Sustainable Development policy, this project will allow the Group to assess one of the technological possibilities for reducing carbon dioxide emissions. Most of the objectives of the experiment having been reached, the injection of carbon dioxide, came to an end in the first quarter 2013. For additional information, see Chapter 12.

Agreements were signed in December 2011 for the sale of the Itteville, Vert-le-Grand, Vert-le-Petit, La Croix Blanche, Dommartin Lettrée and Vic-Bilh assets. The operation of these concessions and the production rights were transferred in January 2012. Agreements for the sale of the Lacq, Lagrave and Pécorade assets were also signed in February 2012. These agreements remain subjet to approval by the authorities, expected in 2013.

The Montélimar exclusive exploration license, awarded to TOTAL in 2010 to assess, in particular, the shale gas potential of the area, was revoked by the government in October 2011. This revocation stemmed from the law of July 13, 2011, prohibiting the exploration and extraction of hydrocarbons by drilling followed by hydraulic fracturing. The Group had submitted the required report to the government, in which it undertook not to use hydraulic fracturing in light of the current prohibition. An appeal has therefore been filed in December 2011 with the administrative court requesting that the judge cancel the revocation of the license.

In **Italy,** the Tempa Rossa field (75%, operator), discovered in 1989 and located on the unitized Gorgoglione concession (Basilicate region), is one of the Group principal exploration and production assets in the country. In March 2013, TOTAL has finalized an agreement to sell a 25% interest in the Tempa Rossa fields. The transfer of interests will take effect after the Italian authorities have approved the transactions.

In 2011, Total Italia acquired an additional 25% stake in the Tempa Rossa field, thereby increasing its share to 75%, as well as an interest in two exploration licenses. Although preparation work started in early August 2008, the proceedings initiated by the Prosecutor of the Potenza Court against Total Italia led to a freeze in the preparation work (for additional information, see paragraph 5., Chapter 7, Legal and arbitration proceedings). New calls for tenders were launched related to certain contracts that had been cancelled.

Drilling of the Gorgoglione 2 appraisal well that started in June 2010 reached its final depth and was tested in 2012, confirming the results of the previous wells. The final investment decision was made in July 2012, following the approval of the state and regional authorities. The extension plan for the Tarente refinery export system, needed for the development of the Tempa Rossa field, was approved at the end of 2011. Start-up of production is expected in 2016 with a capacity of 55 kboe/d.

In **Norway**, where the Group has had operations since the mid-1960s, TOTAL has equity stakes in ninety-one production licenses on the Norwegian continental shelf, twenty-three of which it operates. In 2012, the Group's production was 275 kboe/d, compared to 287 kboe/d in 2011 and 310 kboe/d in 2010. 90 kboe/d is from the Greater Ekofisk Area located in the southern sector of the North Sea, 106 kboe/d comes from the central and northern portions of the North Sea and 79 kboe/d comes from the Haltenbanken region and the Barents Sea.

– In the Norwegian North Sea, where a numerous of development projects have just been launched, the most substantial contribution to the Group's production, for the most part non-operated, comes from the Greater Ekofisk Area (*e.g.*, Ekofisk, Eldfisk, Embla).
  - Several projects are underway on the Greater Ekofisk Area, located in the south. The Group owns a 39.9% stake in the Ekofisk and Eldfisk fields. The Ekofisk South and Eldfisk 2 projects, each with a capacity of 70 kboe/d, were launched in June 2011 following approval of the development and operation plans by the authorities. The production is scheduled to start in 2014 for Ekofisk South and in 2015 for Eldfisk 2. The project relating to the construction and installation of the new Ekofisk accommodation and field services center platform is now in its third year.
  - On the Greater Hild Area, located in the north and in which the Group has a 51% stake (operator), the Martin Linge development scheme (capacity of 80 kboe/d, formerly known as Hild) was selected at the end of 2010 and approved by the authorities in 2012, with production start-up scheduled for 2016.

- The Islay field, operated by the Group and fully owned by TOTAL, was put into production in April 2012. The Islay field extends on each side of the Norwegian/Great Britain border and the Group's interest in the Norwegian part is 5.51%.
- A number of successful exploration and appraisal activities were carried out in the North Sea in the 2010-2012 period. These activities have led to the launch of several development projects, some of them are already finalized, others are underway or are expected to be approved soon by the authorities:
  . In the central section of the North Sea, on license PL102C (40%, operator), a fast-track development project had been launched for the Atla field (formerly known as David), which was discovered in 2010. Gas production started in October 2012, less than two years after the discovery of the field.
  . Gas production on the Beta West field (10%), a satellite of Sleipner, located in the central section of the North Sea, started in April 2011.
  . In the Visund area of the Nordic North Sea on license PL120 (7.7%), the Visund South fast-track development project for the Pan/Pandora discoveries was completed in the fourth quarter of 2012. Production started up in November 2012. Visund North, a second fast-track development project, was launched at the end of 2011 to redevelop the northern portion of the Visund field and provide development infrastructure for the nearby exploration prospects and discoveries (Titan) inside the license. Production is scheduled to start at the end of 2013. The authorities approved the extension of the PL20 license (Visund) until the end of 2034.
  . The Stjerne project was launched in 2011 to develop the Katla structure discovered in 2009, located on license PL104 (14.7%) south of Oseberg in the Nordic North Sea. Start-up of production is expected in 2013.
  . The fast-track development project of the Vigdis North East structure (PL089, sold as part of the 2012 transaction with ExxonMobil described below), which was discovered in 2009 and is located south of Snorre, was launched in 2011.
  . A positive appraisal well was drilled in 2010 on the southern slope of the Dagny structure (38%) north of Sleipner. The development project was sanctioned at the end of 2012 and the plan of development and operation (PDO) submitted to the authorities, with an approval expected for mid-2013. Production is scheduled to start in 2017.

– In the Norwegian Sea, the Haltenbanken area includes the Tyrihans (23.2%), Linnorm (20%), Mikkel (7.7%) and Kristin (6%) fields as well as the Åsgard (7.7%) field and its satellites Yttergryta (24.5%) and Morvin (6%). Morvin started up in August 2010 as planned, with two producing wells.

  The Åsgard sub-sea compression project, which will increase hydrocarbon recovery on the Åsgard and Mikkel fields, was approved by the Norwegian authorities in 2012. All the main contracts have been awarded.

  On the Linnorm gas field, the Onyx South exploration well is expected to be drilled in 2013. Gas from Linnorm will be exported from the Nyhamna onshore terminal through a new pipeline (Polarled project).

  The Polarled project (5.11%) was sanctioned in December 2012 and the development plan was submitted to the Norwegian authorities in January 2013. The project consists in the installation of a 481 km long pipeline from the Aasta Hansen field to the Nyhamna terminal and in the expansion of the terminal.

– In the Barents Sea, LNG production on Snøhvit (18.4%) started in 2007. This project included the development of the Snøhvit, Albatross and Askeladd natural gas fields, and the construction of the associated liquefaction facilities (capacity of 4.2 Mt/y). A project has been launched in 2012 with the objective of improving the performances of the plant.

– Several exploration wells were successfully drilled over the 2011-2012 period:
  - In October 2012, TOTAL drilled a positive exploration well on the Garantiana structure (40%, operator) on license PL554 in the Nordic North Sea. The drilling of additional exploration and appraisal wells in the license is currently under study.
  - In July 2012, TOTAL announced a major gas and condensate discovery on the King Lear prospect in licenses 146 and 333 in the southern Norwegian North Sea (22.2%). An appraisal well is planned to be drilled in 2014.
  - In 2011, TOTAL successfully drilled an exploration well on the Alve North structure on license PL127 (50%, operator) near the Norne field. Preliminary studies have been performed. The data from a new seismic campaign is being interpreted.
  - In 2011, TOTAL drilled a positive exploration well on the Norvarg structure in the Barents Sea on license PL535 (40%, operator), which was awarded during the twentieth licensing round. The preliminary development studies have been completed and an appraisal well should be drilled in 2013.

The Group improved its asset portfolio in Norway by obtaining new licenses and divesting a number of non-strategic assets:

– In the beginning of 2013, TOTAL obtained eight new licences of which four as operator at the occasion of licensing round APA 2012 (Awards in Predefined Areas). All these licenses are localized in the Nowergian North sea: PL661 (60%, operator), PL662 (60%, operator) and PL667 (50%, operator) in the Ekofisk area, PL675 (40%) and PL676S (20%) in the central part, and PL190B (10%), PL684 (5%) and PL685 (40%, operator) in the north.

– In October 2012, TOTAL and ExxonMobil exchanged interests in a range of producing and undeveloped assets already in production or on the verge of being developed. In exchange for its interests in the PL089 license (5.6%) and in the Sygna (2.52%), Statfjord Øst (2.8%) and Snorre (6.18%) fields, TOTAL received the interest held by ExxonMobil in the Oseberg field (4.7%), the Oseberg gas transportation system (4.33%) and the PL029c (100%) and PL029b (30%) licenses, which contain part of the Dagny field. The agreement was finalized and approved by the Norwegian authorities in the fourth quarter of 2012. TOTAL's share of the PL104 license is 14.7% and it holds a 38% stake in the Dagny structure. TOTAL no longer holds a stake in license PL089.

– At the beginning of 2012, during licensing round APA 2011, TOTAL obtained eight new licenses including five as operator.

  In 2011, TOTAL obtained four new exploration licenses during licensing round APA 2010, including one as operator. The Group also acquired in 2011 a 40% stake and the role of operator of license PL554, north of Visund. The exploration well drilled on this license in 2012 resulted in the discovery of Garantiana.

– In June 2011, TOTAL announced that it had signed an agreement for the planned sale of its entire stake in Gassled (6.4%) and the associated entities. The sale became effective at the end of 2011.

– In 2010, the Group divested its stake in the Valhall and Hod fields.

In the **Netherlands**, TOTAL has had natural gas exploration and production operations since 1964 and currently owns twenty-four offshore production licenses, including twenty that it operates, and two offshore exploration licenses, E17c (16.92%) and K1c (30%). The Group's production was 33 kboe/d in 2012, compared to 38 kboe/d in 2011 and 42 kboe/d in 2010.

- The L4-D field (55.66%, operator) started production in November 2012.
- A 3D seismic survey of several offshore permits covering an area of 3,500 km^2 was conducted between May and September 2012. The interpretation of the results of this campaign is expected at the end of 2013.
- The K4-Z development project (50%, operator) began in 2011. This development is comprised of two sub-sea wells connected to the existing production and transport facilities. Start-up of production is expected in 2013.
- The K5-CU development project (49%, operator) was launched in 2009 and production started up in early 2011. This development includes four wells supported by a platform that was installed in 2010 and connected to the K5-A platform by a 15 km gas pipeline.

In late 2010, TOTAL disposed of 18.19% of its equity stake in the NOGAT gas pipeline and decreased its stake to 5%.

In **Poland**, at the beginning of 2012, TOTAL signed an agreement to acquire a 49% stake in the Chelm and Werbkowice exploration concessions in order to assess their shale gas potential. A well was drilled and tested on the Chelm permit. The results from the well are being analyzed. TOTAL asked the authorities to relinquish the Werbkowice permit in September 2012 since it did not meet expectations.

In the **United Kingdom**, where TOTAL has had operations since 1962, the Group's production was 106 kboe/d in 2012, compared to 169 kboe/d in 2011 and 207 kboe/d in 2010. About 90% of production comes from operated fields located in two major zones: the Alwyn zone in the northern North Sea, and the Elgin/Franklin zone in the Central Graben. In 2012, the shutdown of the Elgin, Franklin and West Franklin fields due to a gas leak from well G4 in Elgin severely impacted production.

- On the Alwyn zone (100%), start-up of satellite fields or new reservoir compartments allowed production to be maintained. Wells N54, N53 and N52 started production in May 2012, September 2011 and February 2010, respectively.

  On the Dunbar field (100%), a new drilling survey (Dunbar phase IV) should begin in the middle of 2013 including three work overs and six new wells.

  The production on the Islay field (94.49%, gas and condensates) started in April 2012.

  In February 2012, TOTAL finalized the divestment of its stake in the Otter field.

  In October 2011, the decision was made to redevelop the Brent South West formation in Alwyn by drilling two wells: one production well, which was started in August 2012, and one water injection well, which is expected to be drilled during the second semester 2013.

- In Central Graben, at the end of 2011, TOTAL increased its stake in Elgin Franklin Oil & Gas (EFOG), a company through which it holds a stake in the Elgin and Franklin fields (46.2%, operator), from 77.5% to 100%. Following a gas leak on the Elgin field on March 25, 2012, the production on the Elgin, Franklin and West Franklin fields was stopped and the personnel of the site were evacuated.

  In May 2012, TOTAL confirmed that the leak from well G4 had been successfully stopped and at the end of October 2012, well G4 was definitively secured by installing five cement plugs.

  The enquiry led by TOTAL permitted the clear identification of the causes of the accident and the definition of new criteria for well integrity to allow the restart of the production of Elgin/Franklin in total security.

  The production on the Elgin/Franklin area restarted on March 9, 2013, following the approval of the safety case by the UK Health and Safety Executive (HSE). Production is resuming gradually, and is expected to soon reach close to 70 kboe/d (approximately 30 kboe/d in TOTAL's share), corresponding to approximately 50% of the production potential from the fields.

  In order to recover by 2015 the production level that existed before the Elgin incident, a redevelopment project envisaging drilling of new infill wells on Elgin and Franklin is currently under study.

  In addition, the West Franklin Phase II development project remains ongoing with production start-up scheduled for 2014.

- In addition to Alwyn and the Central Graben, a third area, West of Shetland, is undergoing development. This area covers the Laggan and Tormore fields, in which TOTAL acquired an 80% stake in early 2010.

  The decision to develop these two fields was made in March 2010 and production is scheduled to start in 2014 with an expected capacity of 90 kboe/d. The joint development scheme includes:
  - sub-sea production facilities,
  - off-gas treatment (gas and condensates) at a plant located near the Sullom Voe terminal in the Shetland Islands, 150 km away, and
  - a new pipeline connected to the Frigg gas pipeline (FUKA) for the export of gas to the Saint Fergus terminal.

  In early 2011, a gas and condensate discovery was made on the Edradour license (75%, operator), near Laggan and Tormore. The development of Edradour East by using the infrastructures in place was decided in the end of December 2012.

  In 2010, the Group's stake in the P967 license (operator), which includes the Tobermory gas discovery, increased to 50% from 43.75%. This license is located north of Laggan/Tormore.

  TOTAL also holds a stake in three assets operated by other parties: the Bruce (43.25%), Keith (25%), and Markham (7.35%) fields. The Group's stakes in other fields operated by third parties (Seymour, Alba, Armada, Maria, Moira, Mungo/Monan and Everest) were sold off in 2012.

Nine new licenses (three in the Northern North Sea, three in Central Graben and three in West Shetland) were awarded to TOTAL in the twenty-seventh exploration round, the results of which were announced on October 25, 2012.

2.1.7.7. Middle-East

TOTAL's production in the Middle East in 2012 was 493 kboe/d, representing 21% of the Group's overall production, compared to 570 kboe/d in 2011 and 527 kboe/d in 2010.

In the **United Arab Emirates**, where TOTAL has had operations since 1939, the Group's production was 246 kboe/d in 2012, compared to 240 kboe/d in 2011 and 222 kboe/d in 2010. In 2012, the country maintained a steady rhythm of production, which led to a slight increase of TOTAL's share of production. The increase in production in 2011 was mainly due to higher production by Abu Dhabi Company for Onshore Oil Operations (ADCO) and Abu Dhabi Marine (ADMA).

TOTAL holds a 75% stake (operator) in the Abu Al Bu Khoosh field, a 9.5% stake in ADCO, which operates the five major onshore fields in Abu Dhabi, and a 13.3% stake in ADMA, which operates two offshore fields. TOTAL also has a 15% stake in Abu Dhabi Gas Industries (GASCO), which produces NGL and condensates from the associated gas produced by ADCO, and a 5% stake in Abu Dhabi Gas Liquefaction Company (ADGAS), which produces LNG, NGL and condensates.

The ADCO license expires in January 2014. In 2012, the Abu Dhabi authorities started the discussions to define the future of ADCO beyond that date.

In early 2011, TOTAL and IPIC, a government-owned entity in Abu Dhabi, signed a memorandum of understanding (MOU) with a view to developing projects of common interest in the Upstream oil and gas sectors. The analyses continue.

The Group has a 24.5% stake in Dolphin Energy Ltd. alongside Mubadala, a company owned by the government of Abu Dhabi, to market gas produced primarily in Qatar to the United Arab Emirates.

The Group also owns 33.33% of Ruwais Fertilizer Industries (FERTIL), which produces urea. FERTIL 2, a new project, was launched in 2009 to build a new granulated urea unit with a capacity of 3,500 t/d (1.2 Mt/y). This project is currently being started and is expected to permit FERTIL to double its production to reach 2 Mt/y by mid-2013.

In **Iraq**, TOTAL holds an 18.75% stake in the development and production contract of the Halfaya field in the Missan province. Production of phase 1 of the project (capacity of 100 kb/d) started in June 2012 and was 12 kboe/d over the last six months of 2012 (6 kboe/d on overage over the year). The definitive development plan (estimated capacity of 535 kb/d) was submitted to the authorities in the beginning of 2013.

In mid-2012, TOTAL finalized the acquisition of a 35% stake in the Safen (TOTAL will become the operator when a discovery is declared) and Harir exploration Blocks (respectively covering 424 km^2 and 705 km^2, northeast of Erbil), and a 20% stake in the Taza Block (505 km^2, southwest of Souleimaniye). The drilling of the Harir 1 well was completed in the beginning of 2013 and the drilling of the Taza 1 well is in progress. Two new wells are scheduled in 2013.

In **Iran**, the Group has had no production since 2010. The 2010 production of 2 kb/d came from remaining payments under buyback contracts. For additional information, see Chapter 4 (Risk Factors).

In **Oman**, the Group's production in 2012 was 37 kboe/d, stable compared to 2011 and 2010. The Group produces oil primarily on Block 6 (4%)(1) as well as on Block 53 (2%)(2), and it produces Liquefied Natural Gas through its stake in the Oman LNG (5.54%)/Qalhat LNG (2.04%) liquefaction plant(3),which has a capacity of 10.5 Mt/y.

In **Qatar**, where TOTAL has had operations since 1936, the Group's production in 2012 was 139 kboe/d, compared to 155 kboe/d in 2011 and 164 kboe/d in 2010. The Group has equity stakes in the Al Khalij field (100%), the NFB Block (20%) in the North field and the Qatargas 1 liquefaction plant (10%). The Group also holds a 16.7% in Qatargas 2 train 5.

- In November 2012, TOTAL and Qatar Petroleum signed a new agreement to continue their partnership on the Al Khalij field for an additional 25-year period. Under the terms of this protocol, as from 2014, TOTAL will remain the operator with a 40% stake and Qatar Petroleum will hold a 60% stake.
- The production contract for the Dolphin gas project, signed in 2001 with state-owned Qatar Petroleum, provides for the sale of 2 Bcf/d of gas from the North Field for a 25-year period. The gas is processed in the Dolphin plant in Ras Laffan and exported to the United Arab Emirates through a 360 km gas pipeline.
- Production of Qatargas 2 train 5, which started in 2009, is 8 Mt/year. TOTAL has been a shareholder in this train since 2006. An agreement to share the two liquefaction trains of the Qatargas project (trains 4 and 5) was signed in 2011. The agreement provides for a 50/50 split of the physical production of the two trains as well as the associated operating costs and capital outlay. In addition, TOTAL began to off-take part of the LNG produced in compliance with the contracts signed in 2006, which provide for the purchase of 5.2 Mt/y of LNG from Qatargas 2 by the Group.

The Group became a partner in the offshore BC exploration permit (25%) in May 2011.

In **Syria**, TOTAL has interests in the Deir Ez Zor permit through its 50% stake in DEZPC (100%, operator) and through the Tabiyeh contract, which came into effect in October 2009. The Group had no production in 2012 compared to 53 kboe/d in 2011 and 39 kboe/d in 2010. TOTAL suspended its activities contributing to the production of hydrocarbons in Syria in December 2011, in compliance with the European Union's regulations regarding this country. For additional information, see Chapter 4 (Risk Factors).

In **Yemen**, where TOTAL has had operations since 1987, production was 65 kboe/d in 2012, compared to 86 kboe/d in 2011 and 66 kboe/d in 2010.

TOTAL has an equity stake in the Yemen LNG project (39.62%). As part of this project, the Balhaf liquefaction plant on the southern coast of Yemen is supplied with the gas produced on Block 18, located near Marib in the center of the country, through a 320 km gas pipeline. The first LNG train was commissioned in October 2009 and the second came online in April 2010. The plant's nominal capacity is 6.7 Mt of LNG per year. 2012 witnessed eight sabotage attacks on the pipeline, which resulted in production losses of nearly 24%.

TOTAL also has stakes in two oil basins, as the operator of Block 10 (Masila Basin, East Shabwa license, 28.57%) and as a partner on Block 5 (Marib basin, Jannah license, 15%).

TOTAL owns stakes in five onshore exploration licenses: Blocks 69 and 71 (40%), Block 70 (50.1%, operated by TOTAL since July 2010), and Block 72 (36%, operated by TOTAL since October 2011).

In December 2012, TOTAL's acquisition of a 40% interest in the Block 3 exploration license, which it will operate, became effective.

(1) TOTAL has a direct interest of 4.00% in Petroleum Development Oman LLC, operator of Block 6, in wich TOTAL has an indirect interest of 4.00% via Pohol (equity affiliate).
(2) TOTAL has indirect interest of 2.00% in Block 53.
(3) TOTAL's indirect stake in Qalhat LNG through its stake in Oman LNG.

2.1.8. Oil and gas acreage

As of December 31, (in thousands of acres)		2012 Undeveloped acreage[a]	2012 Developed acreage	2011 Undeveloped acreage[a]	2011 Developed acreage	2010 Undeveloped acreage[a]	2010 Developed acreage
Europe	Gross	10,015	724	6,478	781	6,802	776
	Net	6,882	176	3,497	185	3,934	184
Africa	Gross	135,610	1,256	110,346	1,229	72,639	1,229
	Net	88,457	337	65,391	333	33,434	349
Americas	Gross	16,604	1,705	15,454	1,028	16,816	1,022
	Net	6,800	330	5,349	329	5,755	319
Middle East	Gross	32,369	1,896	31,671	1,461	29,911	1,396
	Net	3,082	256	2,707	217	2,324	209
Asia	Gross	37,208	955	40,552	930	36,519	539
	Net	18,184	270	19,591	255	17,743	184
Total	**Gross**	**231,806**	**6,536**	**204,501**	**5,429**	**162,687**	**4,962**
	Net[b]	**123,405**	**1,369**	**96,535**	**1,319**	**63,190**	**1,245**

(a) Undeveloped acreage includes leases and concessions.
(b) Net acreage equals the sum of the Group's equity stakes in gross acreage.

2.1.9. Number of productive wells

As of December 31, (number of wells)		2012 Gross productive wells	2012 Net productive wells[a]	2011 Gross productive wells	2011 Net productive wells[a]	2010 Gross productive wells	2010 Net productive wells[a]
Europe	Oil	410	111	576	151	569	151
	Gas	330	117	358	125	368	132
Africa	Oil	2,216	593	2,275	576	2,250	628
	Gas	156	48	157	44	182	50
Americas	Oil	898	258	877	247	884	261
	Gas	2,892	546	2,707	526	2,532	515
Middle East	Oil	6,488	462	7,829	721	7,519	701
	Gas	371	49	372	49	360	49
Asia	Oil	206	75	209	75	196	75
	Gas	1,912	578	1,589	498	1,258	411
Total	**Oil**	**10,218**	**1,499**	**11,766**	**1,770**	**11,418**	**1,816**
	Gas	**5,661**	**1,338**	**5,183**	**1,242**	**4,700**	**1,157**

(a) Net wells equal the sum of the Group's equity stakes in gross wells.

2.1.10. Number of net oil and gas wells drilled annually

As of December 31,	2012			2011			2010		
	Net productive wells drilled(a)	Net dry wells drilled(a)	Total net wells drilled(a)	Net productive wells drilled(a)	Net dry wells drilled(a)	Total net wells drilled(a)	Net productive wells drilled(a)	Net dry wells drilled(a)	Total net wells drilled(a)
Exploratory									
Europe	0.9	3.3	4.2	1.5	1.7	3.2	1.7	0.2	1.9
Africa	4.9	2.8	7.7	2.9	1.5	4.4	1.6	4.3	5.9
Americas	3.9	0.6	4.5	1.2	1.3	2.5	1.0	1.6	2.6
Middle East	-	-	-	1.2	0.8	2.0	0.9	0.3	1.2
Asia	2.4	1.4	3.8	2.1	3.7	5.8	3.2	1.2	4.4
Subtotal	**12.1**	**8.1**	**20.2**	**8.9**	**9.0**	**17.9**	**8.4**	**7.6**	**16.0**
Development									
Europe	6.0	0.7	6.7	7.5	-	7.5	5.0	-	5.0
Africa	22.7	-	22.7	24.7	-	24.7	18.1	-	18.1
Americas	70.6	131.7	202.3	113.1	82.2	195.3	135.3	112.5	247.8
Middle East	43.3	-	43.3	32.6	2.6	35.2	29.5	1.4	31.0
Asia	127.8	-	127.8	118.4	-	118.4	59.3	-	59.3
Subtotal	**270.4**	**132.4**	**402.8**	**296.3**	**84.8**	**381.1**	**247.3**	**113.9**	**361.2**
Total	282.5	140.5	423.0	305.2	93.8	399.0	255.7	121.5	377.2

(a) Net wells equal the sum of the Group's equity stakes in gross wells.

2.1.11. Drilling and production activities in progress

As of December 31, (number of wells)	2012		2011		2010	
	Gross	Net(a)	Gross	Net(a)	Gross	Net(a)
Exploratory						
Europe	1	1.0	2	2.0	3	2.1
Africa	4	1.3	2	0.8	4	1.4
Americas	7	3.4	3	1.0	2	0.9
Middle East	2	1.1	-	-	2	1.2
Asia	2	1.3	1	0.6	2	1.1
Subtotal	**16**	**8.1**	**8**	**4.4**	**13**	**6.7**
Development						
Europe	23	6.2	21	4.5	21	3.8
Africa	25	6.4	31	11.3	29	6.4
Americas	29	8.2	22	5.7	99	29.2
Middle East	93	6.1	26	3.5	20	5.1
Asia	171	49.2	11	5.1	23	9.8
Subtotal	**341**	**76.1**	**111**	**30.1**	**192**	**54.3**
Total	357	84.2	119	34.5	205	61.0

(a) Net wells equal the sum of the Group's equity stakes in gross wells.

2.1.12. Interests in pipelines

The table below sets forth TOTAL's interests in oil and gas pipelines as of December 31, 2012.

Pipeline(s)	Origin	Destination	% interest	Operator	Liquids	Gas
Europe						
France						
TIGF	Network South West	-	100.00	x	-	x
Norway						
Frostpipe (inhibited)	Lille-Frigg, Froy	Oseberg	36.25	-	x	-
Heimdal to Brae Condensate Line	Heimdal	Brae	16.76	-	x	-
Kvitebjorn pipeline	Kvitebjorn	Mongstad	5.00	-	x	-
Norpipe Oil	Ekofisk Treatment center	Teeside (UK)	34.93	-	x	-
Oseberg Transport System	Oseberg, Brage and Veslefrikk	Sture	12,98	-	x	-
Sleipner East Condensate Pipe	Sleipner East	Karsto	10.00	-	x	-
Troll Oil Pipeline I and II	Troll B and C	Vestprosess (Mongstad refinery)	3.71	-	x	-
Vestprosess	Kollsnes (Area E)	Vestprosess (Mongstad refinery)	5.00	-	x	-
The Netherlands						
Nogat pipeline	F3-FB	Den Helder	5.00	-	-	x
WGT K13-Den Helder	K13A	Den Helder	4.66	-	-	x
WGT K13-Extension	Markham	K13 (via K4/K5)	23.00	-	-	x
United Kingdom						
Alwyn Liquid Export Line	Alwyn North	Cormorant	100.00	x	x	-
Bruce Liquid Export Line	Bruce	Forties (Unity)	43.25	-	x	-
Central Graben Liquid Export Line (LEP)	Elgin-Franklin	ETAP	15.89	-	x	-
Frigg System: UK line	Alwyn North, Bruce and others	St.Fergus (Scotland)	100.00	x	-	x
Ninian Pipeline System	Ninian	Sullom Voe	16.00	-	x	-
Shearwater Elgin Area Line (SEAL)	Elgin-Franklin, Shearwater	Bacton	25.73	-	-	x
SEAL to Interconnector Link (SILK)	Bacton	Interconnector	54.66	x	-	x
Africa						
Gabon						
Mandji Pipes	Mandji fields	Cap Lopez Terminal	100.00[(a)]	x	x	-
Rabi Pipes	Rabi fields	Cap Lopez Terminal	100.00[(a)]	x	x	-
Americas						
Argentina						
Gas Andes	Neuquen Basin (Argentina)	Santiago (Chile)	56.50	x	-	x
TGN	Network (Northern Argentina)		15.40	-	-	x
TGM	TGN	Uruguyana (Brazil)	32.68	-	-	x
Bolivia						
Transierra	Yacuiba (Bolivia)	Rio Grande (Bolivia)	11.00	-	-	x
Brazil						
TBG	Bolivia-Brazil border	Porto Alegre via São Paulo	9.67	-	-	x
Colombia						
Ocensa	Cusiana	Covenas Terminal	5.20	-	x	-
Asia						
Yadana	Yadana (Myanmar)	Ban-I Tong (Thai border)	31.24	x	-	x
Rest of world						
BTC	Baku (Azerbaijan)	Ceyhan (Turkey, Mediterranean)	5.00	-	x	-
SCP	Baku (Azerbaijan)	Georgia/Turkey Border	10.00	-	-	x
Dolphin (International transport and network)	Ras Laffan (Qatar)	U.A.E.	24.50	-	-	x

(a) Interest of Total Gabon. The Group has a financial interest of 58.28% in Total Gabon.

2.2. Gas & Power

Gas & Power's primary objective is to contribute to the growth of the Group by ensuring sales outlets for its current and future natural gas reserves and production.

In order to optimize these gas resources, particularly liquefied natural gas (LNG), Gas & Power's activities include trading and marketing of natural gas, liquefied natural gas, liquefied petroleum gas (LPG) and electricity, as well as shipping. Gas & Power also has stakes in infrastructure companies (re-gasification terminals, natural gas transport and storage, power plants) necessary to implement its strategy.

Gas & Power also manages a coal business line, handling everything from production to marketing.

2.2.1. Liquefied Natural Gas

A pioneer in the LNG industry, TOTAL today is one of the world's leading players(1) in the sector and has sound and diversified positions both in the upstream and downstream portions of the LNG chain. LNG development is key to the Group's strategy, with TOTAL strengthening its positions in most major production zones and markets.

Through its stakes in liquefaction plants(2) located in Qatar, the United Arab Emirates, Oman, Nigeria, Norway and Yemen, and its gas supply agreement with the Bontang LNG plant in Indonesia, TOTAL markets LNG in all worldwide markets.
In 2012, TOTAL sold 11.4 Mt of LNG, a decrease of 13% compared to 2011 LNG sales (13.2 Mt) and 7% compared to 2010 sales (12.3 Mt). This decrease is due in particular to the decline of the Bontang LNG plant production and to the force majeure events reported by the Yemen LNG project in 2012. The planned start-up of the Angola LNG plant in 2013, together with the Group's liquefaction projects in Australia, Russia and Nigeria are expected to allow for growth in the coming years.

Gas & Power is responsible for LNG operations downstream from liquefaction plants. It is in charge of LNG marketing to third parties on behalf of Exploration & Production, developing the Group's LNG portfolio for its trading, marketing and transport operations as well as re-gasification terminals.

In **Nigeria**, TOTAL holds a 15% interest in the Nigeria LNG plant. The Group signed an LNG purchase agreement, initially intended for deliveries to the United States and Europe, for an initial 0.23 Mt/y over a 23-year period starting in 2006, to which an additional 0.94 Mt/y was added when the sixth train came on stream in 2007.

TOTAL also holds a 17% stake in the Brass LNG project, which calls for the construction of two liquefaction trains, each with a capacity of 5 Mt/y. In conjunction with this acquisition, TOTAL signed a preliminary agreement with Brass LNG Ltd setting forth the principal terms of an LNG purchase agreement for approximately one-sixth of the plant's capacity over a 20-year period. This contract is subject to the final investment decision for the project.

In **Norway**, as part of the Snøhvit project, in which the Group holds an 18.4% stake, TOTAL signed in 2004 a purchase agreement for 0.78 Mt/y of LNG over a 15-year period primarily intended for North America and Europe. LNG deliveries started in 2007.

In **Qatar**, TOTAL signed purchase agreements in 2006 for 5.2 Mt/y of LNG from train 5 (16.7%) of Qatargas 2 over a 25-year period. This LNG is marketed mainly in France, the United Kingdom and North America. LNG deliveries started in 2009.

In **Yemen**, TOTAL signed an agreement with Yemen LNG Ltd (39.62%) in 2005 to purchase 2 Mt/y of LNG over a 20-year period, starting in 2009, which is initially intended for delivery in the United States and Europe. LNG deliveries started in 2009.

Since 2009, part of the volume purchased by the Group pursuant to its long-term contracts related to the LNG projects mentioned above has been diverted to markets in Asia.

In **Australia**, TOTAL increased its stake in the Ichthys LNG project from 24% to 30% in early 2013. This project was launched at the beginning of 2012 and calls for the construction of two LNG trains, each with a capacity of 4.2 Mt/y. In conjunction with this acquisition, TOTAL signed an LNG purchase agreement for 0.9 Mt/y over a 15-year period. Deliveries are expected to start in 2017.

In **Angola**, TOTAL is involved in the Angola LNG liquefaction project (13.6%), which includes a 5.2 Mt/y train. The start-up of the project is planned for mid-2013. A subsidiary of Angola LNG Ltd, Angola LNG Marketing, in which TOTAL holds an 8.6% stake, was created in London in July 2012. This subsidiary acts as an intermediary in charge of marketing LNG volumes from the project.

In the **United States**, TOTAL entered into an agreement with Kogas in 2012 for the purchase of 0.7 Mt/y of LNG, over a 20-year period, from train 3 of the Sabine Pass gas terminal (Louisiana). LNG deliveries are expected to start in 2017. This contract is conditional to the final investment decision for the project.

In parallel to this, TOTAL also entered into an agreement with Sabine Pass Liquefaction LLC for the purchase over a 20-year period of 2 Mt/y of LNG from train 5 of the Sabine Pass terminal. LNG deliveries will begin on the date on which train 5 is commissioned, which is scheduled for 2018. This agreement is conditional on, among other things, export and construction permits being obtained by Cheniere for the construction of train five and the final investment decision for the project.

In addition, TOTAL has signed certain sale agreements for LNG from the Group's global LNG portfolio:

In **China**, TOTAL signed an LNG sale agreement with China National Offshore Oil Company (CNOOC). Under this agreement, which became effective in 2010, TOTAL supplies up to 1 Mt/y of LNG to CNOOC over a 15-year period.

In **South Korea**, TOTAL signed an LNG sale agreement in 2011 with Kogas. Under this agreement, TOTAL will deliver up to 2 Mt/y of LNG to Kogas between 2014 and 2031.

With regard to LNG transport operations, TOTAL has been the direct long-term charterer since 2004 of the Arctic Lady, a 145,000 m^3 LNG tanker that ships TOTAL's share of production from the Snøhvit liquefaction plant in Norway. In November 2011, TOTAL signed a second long-term contract for the chartering of a 165,000 m^3 LNG tanker, the Meridian Spirit (former Maersk Meridian), in order to strengthen its transport capacities with regard to its lifting commitments in Norway.

(1) Company data, based on upstream and downstream LNG portfolios.
(2) Exploration & Production is in charge of the Group's natural gas liquefaction and production operations.

The Group also holds a 30% stake in Gaztransport & Technigaz (GTT), which focuses mainly on the design and engineering of membrane cryogenic tanks for LNG tankers. At year-end 2012, out of a worldwide tonnage estimated at 388 LNG tankers(1), 260 active LNG tankers were equipped with membrane tanks built under GTT licenses.

2.2.2. Trading

In 2012, TOTAL continued to pursue its strategy of developing its operations downstream from natural gas and LNG production. The aim of this strategy is to optimize access for the Group's current and future production to traditional markets (with long-term contracts) and to markets open to international competition (with short-term contracts and spot sales). In the context of deregulated markets, which allow customers to more freely access suppliers, in turn leading to marketing arrangements that are more flexible than traditional long-term contracts, TOTAL is developing trading, marketing and logistics businesses to offer its natural gas and LNG production directly to customers.

In parallel, the Group has operations in electricity trading and LPG as well as coal marketing. Furthermore, TOTAL began to market in 2011 the petcoke production of the Port Arthur refinery (United States) on the international market.

Gas & Power's trading teams are located in London, Houston, Geneva and Singapore and conduct most of their business through the Group's wholly-owned subsidiaries Total Gas & Power and Total Gas & Power North America.

2.2.2.1. Gas and electricity

TOTAL has gas and electricity trading operations in Europe and North America with a view to selling the Group's production and supplying its marketing subsidiaries.

In **Europe**, TOTAL marketed 1,488 Bcf (42.1 Bm^3) of natural gas in 2012, including approximately 11% coming from the Group's production, compared to 1,500 Bcf (42.5 Bm^3) in 2011 and 1,278 Bcf (36.2 Bm^3) in 2010. In addition, TOTAL marketed mainly from external resources 53.3 TWh of electricity in 2012 compared to 24.2 TWh in 2011 and 27.1 TWh in 2010.

In **North America**, TOTAL marketed from its own production or external resources 1,256 Bcf (36 Bm^3) of natural gas in 2012, compared to 1,694 Bcf (48 Bm^3) in 2011 and 1,798 Bcf (51 Bm^3) in 2010.

2.2.2.2. LNG

TOTAL has LNG trading operations through spot sales and fixed-term contracts as described in section 2.2.1. Since 2009, new purchase agreements from the Qatargas 2 and Yemen LNG projects and new sale agreements in China, India, Japan, South Korea and Thailand have substantially developed the Group's LNG marketing operations, particularly in Asia's most buoyant markets. This spot and fixed-term LNG portfolio allows TOTAL to supply gas to its main customers worldwide, while retaining a sufficient degree of flexibility to react to market opportunities.

In 2012, TOTAL purchased eighty-seven contractual cargoes and eight spot cargos from Qatar, Yemen, Nigeria, Norway, Russia and Egypt, compared to ninety-nine and ten, respectively, in 2011 and ninety-four and twelve, respectively, in 2010. This decrease is due in particular to the force majeure events reported by the Yemen LNG project and the Snøhvit project in 2012.

2.2.2.3. LPG

In 2012, TOTAL traded and sold approximately 6.0 Mt of LPG (butane and propane) worldwide, compared to 5.7 Mt in 2011 and 4.5 Mt in 2010. Approximately 20% of these quantities came from fields or refineries operated by the Group. LPG trading involved the use of eleven time-charters, representing 220 voyages in 2012, and approximately seventy-three spot charters.

2.2.2.4. Coal

In 2012, TOTAL marketed 8.5 Mt of coal in the international market, compared to 7.5 Mt in 2011 and 7.3 Mt in 2010. More than 80% of this coal comes from South Africa. Approximately 70% of the volume was sold in Asia, where coal is used primarily to generate electricity. The remaining volume was marketed in Europe.

2.2.2.5. Petcoke

In 2011, TOTAL began to market the petcoke produced by the coker at the Port Arthur refinery. Approximately 1.1 Mt of petcoke was sold on the international market in 2012, compared to 0.6 Mt in 2011, to cement plants and electricity producers mainly in Mexico, Brazil, Turkey, China, Dominican Republic and other Latin Americas.

2.2.3. Marketing

To unlock value from the Group's production, TOTAL is developing gas, electricity and coal marketing operations with end users in the United Kingdom, France, Spain and Germany. At the end of 2012, the Group enlarged its European marketing coverage by creating two marketing affiliates: Total Gas & Power North Europe in Belgium, and Total Gas & Power Nederland B.V. in the Netherlands.

In the **United Kingdom**, TOTAL markets gas and electricity to the industrial and commercial segments through its subsidiary Total Gas & Power Ltd. In 2012, volumes of gas sold amounted to 146 Bcf (4.2 Bm^3), compared to 162 Bcf (4.6 Bm^3) in 2011 and 173 Bcf (4.9 Bm^3) in 2010. Sales of electricity totaled approximately 3.9 TWh in 2012, compared to 4.1 Twh in 2011 and in 2010.

In **France**, TOTAL markets natural gas through its subsidiary Total Energie Gaz (TEGAZ), the overall sales of which were 176 Bcf (5.0 Bm^3) in 2012, compared to 208 Bcf (5.9 Bm^3) in 2011 and 226 Bcf (6.4 Bm^3) in 2010. The Group also markets coal to its French customers through its subsidiary CDF Energie, with sales of approximately 0.975 Mt in 2012, compared to 1.2 Mt in 2011 and 1.3 Mt in 2010.

In **Spain**, TOTAL markets natural gas to the industrial and commercial segments through Cepsa Gas Comercializadora, in which it holds a 35% stake. In 2012, volumes of gas sold amounted to 101 Bcf (2.9 Bm^3), compared to 2.4 Bm^3 in both 2011 and 2010.

In **Germany**, Total Energie created a marketing subsidiary in 2010, Total Energy Gas GmbH, which began commercial operations in 2011. In 2012, this subsidiary marketed 0.15 Bm^3 of gas to industrial and commercial customers.

The Group also holds stakes in the marketing companies that are associated with the Altamira and Hazira LNG re-gasification terminals located in Mexico and India, respectively.

(1) Gaztransport & Technigaz data.

2.2.4. Gas facilities

TOTAL develops natural gas transport networks, gas storage facilities (both liquid and gaseous) and LNG re-gasification terminals downstream from its natural gas and LNG production.

2.2.4.1. Transport of natural gas

In **France**, TIGF (Transport Infrastructures Gaz France) comprises the Group's transport operations located in the southwest. This wholly-owned subsidiary operates
a regulated transport network of 5,000 km of gas pipelines. As part of the development of Franco-Spanish interconnections, TOTAL decided in 2011 to complete the Euskadour (France-Spain link) project with commissioning scheduled in 2015. This decision followed the decisions made in 2010 to invest in the Artère du Béarn and Girland gas pipeline projects (reinforcement of Artère de Guyenne), with commissioning scheduled in 2013.

In addition, in 2012 TIGF continued to implement the Third Energy Package adopted by the European Union in July 2009, which entails splitting network operations from production and supply operations.

New conditions in the European gas market and, in particular, the plan for reorganization of gas transmissions launched by Europe in 2012, have caused TOTAL to seek buyers capable of ensuring TIGF's long-term development. On February 5, 2013, TOTAL has entered into exclusive negotiations with a consortium comprising Snam, EDF and GIC that has submitted a firm offer to acquire all outstanding shares of TIGF.

In **South America**, TOTAL owns interests in several natural gas transport companies in Argentina, Chile and Brazil. These assets represent a total integrated network of approximately 9,500 km of pipelines serving the Argentinean, Chilean and Brazilian markets from gas-producing basins in Bolivia and Argentina, where the Group has natural gas reserves. These natural gas transport companies face a difficult operational and financial environment in Argentina stemming from the absence of an increase in transport tariffs and restrictions imposed on gas exports. However, GasAndes, a company in which TOTAL holds a 56.5% stake, successfully negotiated positive financial arrangements with all its customers.

2.2.4.2. Storage of natural gas and LPG

In **France**, the Group's storage operations located in the southwest are grouped under TIGF. This subsidiary operates two storage units under a negotiated legal regime with a usable capacity of 95 Bcf (2.7 Bm^3).

Through its 29.5% stake in Géométhane, TOTAL owns natural gas storage in a salt cavern in Manosque with a capacity of 10.5 Bcf (0.3 Bm^3). A 7 Bcf (0.2 Bm^3) increase in storage capacity is scheduled to be commissioned in 2017-2018.

In **India**, TOTAL holds a 50% stake in South Asian LPG Limited (SALPG), a company that operates an underground import and storage LPG terminal located on the east coast of the country. This cavern, the first of its kind in India, has a storage capacity of 60 kt. In 2012, inbound vessels transported 950 kt of LPG, compared to 850 kt in 2011 and 779 kt in 2010.

2.2.4.3. LNG re-gasification

TOTAL has entered into agreements to obtain long-term access to LNG re-gasification capacity on the three continents that are the largest consumers of natural gas: North America (the United States and Mexico), Europe (France and the United Kingdom), and Asia (India). This diversified presence allows the Group to access new liquefaction projects by becoming a long-term buyer of a portion of the LNG produced at these plants, thereby strengthening its LNG supply portfolio.

In **France**, TOTAL holds a 27.54% stake in the Company Fosmax, formerly called Société du Terminal Méthanier de Fos Cavaou, and has, through its subsidiary Total Gas & Power Ltd., a re-gasification capacity of 2.25 Bm^3/y. The terminal received fifty-six vessels in 2012, compared to fifty-nine in 2011.

In 2011, TOTAL acquired a 9.99% stake in Dunkerque LNG in order to develop a methane terminal project with a capacity of 13 Bm^3/y. Trade agreements have also been signed which allow TOTAL to reserve up to 2 Bm^3/y of re-gasification capacity over a 20-year period. The project is underway and commissioning of the terminal is scheduled for the end of 2015.

In the **United Kingdom**, through its equity interest in the Qatargas 2 project, TOTAL holds an 8.35% stake in the South Hook LNG re-gasification terminal and an equivalent right of use to the terminal. Phase 2 of the terminal was commissioned in 2010, which increased the terminal's total capacity to 742 Bcf/y (21 Bm^3/y). In 2012, the terminal re-gasified sixty-eight cargoes from Qatar, compared to nearly one hundred in 2011.

In **Mexico**, TOTAL sold in 2011 its entire stake in the Altamira re-gasification terminal, but it retained a 25% reservation of the terminal's capacity (*i.e.*, 59 Bcf/y, or 1.7 Bm^3/y) through its 25% stake in Gas del Litoral.

In the **United States**, TOTAL has reserved a re-gasification capacity of approximately 353 Bcf/y (10 Bm^3/y) at the Sabine Pass terminal (Louisiana) for a 20-year period ending in 2029. In April 2012, the Sabine Pass terminal received the authorization to export LNG from four trains of liquefaction, which would involve converting the re-gasification plants into liquefaction plants. As a result, TOTAL negotiated financial compensation with Cheniere, the terminal's operator, in the event that the capacity reserved by TOTAL for re-gasification is restricted before 2029 as a result of the conversion of the terminal.

In **India**, TOTAL holds a 26% stake in the Hazira terminal, which in 2013 is expected to have a natural gas re-gasification capacity of 244 Bcf/y (6.9 Bm^3/y). The terminal, located on the west coast of India in the Gujarat state, is a merchant terminal with operations that cover both LNG re-gasification and gas marketing. After a year of sluggish activity in 2010, the terminal's full capacities are under contract for 2011 and 2012 as well as 2013. The Indian market's strong growth prospects have led to plans for an investment decision in 2013 aimed at increasing the terminal's capacity to at least 343 Bcf/y (9.7 Bm^3/y) by 2017.

2.2.5. Electricity generation

In a context of increasing global demand for electricity, TOTAL has developed expertise in the power generation sector, especially through cogeneration and combined-cycle power plant projects.

In **Abu Dhabi**, the Taweelah A1 plant combines electricity generation and water desalination. It is owned by Gulf Total Tractebel Power Cy, in which TOTAL holds a 20% stake. The Taweelah A1 power plant, in operation since 2003, currently has net power generation capacity of 1,600 MW and water desalination capacity of 385,000 m^3 per day. The plant's production is sold to Abu Dhabi Water and Electricity Company (ADWEC) as part of a long-term agreement.

In **Nigeria**, TOTAL and its partner, the state-owned Nigerian National Petroleum Corporation (NNPC), own interests in two gas-fired power plant projects that are part of the government's objectives to develop power generation and increase the share of natural gas production for domestic use:

- The Afam VI project, part of the Shell Petroleum Development Company (SPDC) joint venture in which TOTAL holds a 10% stake, concerns the development of a 630 MW combined-cycle power plant in production since the end of 2010;
- The development of a new 417 MW combined-cycle power plant near the city of Obite (Niger Delta) in connection with the OML 58 gas project, part of the joint venture between NNPC and TOTAL (40%, operator). A final investment decision is expected in 2014 and commissioning is scheduled in 2015 in open-cycle and 2016 in closed-cycle. The power plant will be connected to the existing power grid through a new 108 km high-voltage transmission line.

In **Thailand**, TOTAL owns 28% of Eastern Power and Electric Company Ltd, which operates the combined-cycle gas power plant in Bang Bo, with a capacity of 350 MW, in operation since 2003. The plant's production is sold to the Electricity Generating Authority of Thailand under a long-term agreement.

2.2.6. Coal production

For nearly thirty years, TOTAL has produced and exported coal from South Africa primarily to Europe and Asia. In 2012, TOTAL produced 4.4 Mt of coal.

The subsidiary Total Coal South Africa (TCSA) owns and operates five mines in South Africa. The Group continues to study other projects aimed at developing its mining resources.

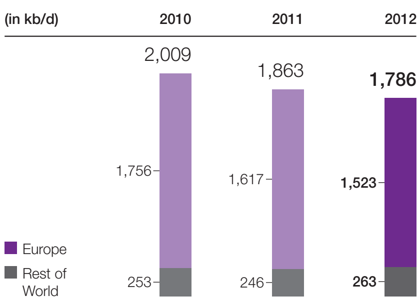
The South African coal produced by TCSA or bought from third-parties' mines is either marketed locally or exported through the port of Richard's Bay, in which TOTAL holds a 5.7% interest.

3. Refining & Chemicals segment

In October 2011, the Group announced a proposed reorganization of its Downstream and Chemicals segments. The reorganization became effective on January 1, 2012, with the creation of a Refining & Chemicals segment, a large industrial group that encompasses refining, petrochemicals, fertilizers and specialty chemicals operations. This segment also includes oil trading and shipping activities. As a result, certain information has been restated according to the new organization.

- Among the world's ten largest integrated producers[1]
- Refining capacity of approximately **2 Mb/d** at year-end 2012
- One of the leading traders of oil and refined products worldwide
- **€1,9** billion invested in 2012
- **51,545** employees

Refinery throughput[(a)]



(a) Including TOTAL's share in CEPSA, through July 31, 2011, and in TotalErg.

In 2012, refinery throughput decreased by 4% compared to 2011, reflecting essentially the portfolio effect relating to the sale of the Group's interest in CEPSA at the end of July 2011 and the closure of the Rome refinery at the end of the third quarter 2012. Excluding these portfolio effects, throughput increased by 4% due to increased availability of the Group's refineries. As in 2011, 2012 was marked by higher levels of planned maintenance at European refineries, in particular the temporary shut-down of the Normandy refinery during the upgrading project at the end of 2012, as well as scheduled maintenance at the Provence and Feyzin refineries.

Refining & Chemicals segment financial data

(M€)	2012	2011	2010
Non-Group sales	91,117	77,146	65,156
Adjusted operating income	1,513	613	793
Adjusted net operating income	1,414	848	1,012
Contribution of Specialty Chemicals	384	423	475

For 2012, the ERMI was 36.0 $/t, more than double the average during 2011.

Adjusted net operating income from the Refining & Chemicals segment in 2012 was €1,414 million, an increase of 67% compared to €848 million in 2011. Expressed in dollars, adjusted net operating income was $1.8 billion, an increase of 54% compared to 2011. This increase is mainly due to the positive effect of improved refining margins in Europe, noting that throughput at the Group's refineries decreased on a global basis by 4% between the two periods, and the petrochemical environment weakened, particularly in Europe and in polymers. The decrease in adjusted net operating income for the Specialty Chemicals is attributable entirely to the sale of the resins business in mid-2011.

The ROACE[2] for the Refining & Chemicals segment was 9% for 2012, compared to 5% for 2011.

3.1. Refining & Chemicals

Refining & Chemicals includes the Group's refining, petrochemicals, fertilizers and specialty chemicals businesses. The petrochemicals business includes base petrochemicals (olefins and aromatics) and polymer derivatives (polyolefins and polystyrene). The specialty chemicals business includes elastomer processing, adhesives and electroplating chemistry. TOTAL is one of the world's ten largest integrated producers[1].

In a context of growing worldwide demand for oil and petrochemicals driven by non-OECD countries, the strategy of Refining & Chemicals, in addition to the priority placed on safety and environmental protection, involves adapting production capacities to changes in demand in Europe and the United States by focusing on integrated platforms, and expanding in Asia and the Middle East in order to access, in particular, dedicated oil and gas resources and to benefit from market growth. This strategy is underpinned by an effort to differentiate through the technology used and innovation found in its products and processes, and involves pursuing asset portfolio management to focus on core businesses.

3.1.1. Refining & Petrochemicals

TOTAL's worldwide refining capacity was 2,048 kb/d at year-end 2012, compared to 2,096 kb/d in 2011 and 2,459 kb/d in 2010[3]. The Group's worldwide refined products sales (including trading operations) in 2012 were 3,403 kb/d, compared to 3,639 kb/d in 2011 and 3,776 kb/d in 2010.

TOTAL has equity stakes in twenty refineries (including nine that it operates) located in Europe, the United States, the French West Indies, Africa, the Middle East and China.

(1) Based on publicly available information, 2011 consolidated sales.
(2) Calculated based on adjusted net operating income and average capital employed, using replacement cost.
(3) The 2010 and 2011 data was restated to take into account notably the Ras Laffan refinery in Qatar, which was formerly part of Exploration & Production prior to the 2012 reorganization.

Refining & Chemicals manages the refining operations located in Europe (excluding the joint ventureTotalErg in Italy), the United States, the Middle East and Asia, for a capacity of 1,953 kb/d at year-end 2012 (*i.e.*, 95% of the Group's total capacity[1]).

The petrochemicals businesses (production and marketing of base petrochemicals and polymer derivatives) are located mainly in Europe, the United States, Qatar and in South Korea. Most of these sites are either adjacent or connected by pipelines to Group refineries. As a result, TOTAL's petrochemical operations are integrated within its refining operations.

The goal of the Refining & Petrochemicals business is to improve the profitability of its operations, including in particular by implementing synergies related to refining-petrochemicals integration, and to improve operational efficiency (plant availability, cost control, energy efficiency) in order to take full advantage of its assets.

In March 2012, TOTAL finalized the acquisition of 35% of Fina Antwerp Olefins, Europe's second largest base petrochemicals (monomers) production plant[2]. The acquisition will open new opportunities to strengthen the competitiveness of the platform in Antwerp and to pursue its integration, which is one of the foundations of TOTAL's strategy.

In July 2011, TOTAL closed the sale to IPIC of its 48.83% stake in CEPSA as part of a public takeover bid on the entire share capital of CEPSA. With respect to refining operations, this sale concerned mainly four Spanish refineries (Huelva, Algeciras, Tenerife, Tarragona) and, with respect to petrochemicals operations, aromatics and their derivatives.

3.1.1.1. Europe

TOTAL is the largest refiner in Western Europe[3].

In **Western Europe**, TOTAL's refining capacity was 1,742 kb/d in 2012, compared to 1,787 kb/d in 2011 and 2,135 kb/d in 2010, accounting for 85% of the Group's overall refining capacity. The decrease in 2012 was due primarily to the shutdown of the Rome refinery, while the decrease in 2011 stemmed mainly from the sale of the Group's stake in CEPSA. The Group operates eight refineries in Western Europe (one in Antwerp, Belgium, five in France in Donges, Feyzin, Gonfreville, Grandpuits and La Mède, one in Immingham in the United Kingdom and one in Leuna, Germany) and owns stakes in the Schwedt refinery in Germany, the Zeeland refinery in the Netherlands and the Trecate refinery in Italy through its interest in TotalErg.

The main petrochemical sites are located in Belgium, in Antwerp (steam crackers, polyethylene, aromatics) and Feluy (polyolefins, polystyrene), and in France, in Carling (steam cracker, polyethylene, polystyrene, aromatics), Feyzin (steam cracker, aromatics), Gonfreville (steam crackers, styrene, polyolefins, polystyrene, aromatics) and Lavéra (steam cracker, polypropylene, aromatics). Europe accounts for 56% of the Group's petrochemicals capacity, *i.e.* 11,803 kt in 2012, compared to 11,013 kt in 2011 and 12,721 kt in 2010. The increase in 2012 was due mainly to the acquisition of 35% of Fina Antwerp Olefins (discussed above), while the decrease in 2011 was due mainly to the sale of the Group's stake in CEPSA.

– **In France**, the Group owns five refineries and continues to adapt its refining capacities and shift the production emphasis to diesel due to the structural decline in the demand for petroleum products in Europe and an increase in gasoline surpluses.

  Since 2010, TOTAL has been implementing its project to repurpose the Flanders site. The shutdown of the refining business results in the gradual dismantling of the units. The Group has commenced repurposing the site through the creation of four areas: a technical support center, a refining jobs training school, an oil depot, and a department whose role is to support the general revitalization of the site.

  In 2010, the Group divested its minority interest (40%) in the Société de la Raffinerie de Dunkerque (SRD), a company that specializes in bitumen and base oil production.

  In addition, the industrial plan intended to reconfigure the Normandy refinery is ongoing. The project is intended to upgrade the refinery and shift the production emphasis to diesel. For this purpose, the investments resulted in the eventual reduction of the annual distillation capacity to 12 Mt from 16 Mt, upsizing the hydrocracker unit for heavy diesel cuts and improving energy efficiency by lowering carbon dioxide emissions. The new design should be operational early 2014.

  In parallel, the project to modernize the Normandy platform's petrochemical operations was completed in early 2012. This project did notably improve the energy efficiency of the steam cracker and the high-density polyethylene unit.

– In **Belgium** and **the Netherlands**, the Group is studying a project intended to increase the conversion capacities of the Antwerp and Zeeland refineries. This project would make the refineries more complementary and allow the residual gases produced by the Antwerp refinery to be used as feedstock for the petrochemical steam crackers. In addition, in Feluy, TOTAL is building a new-generation expandable polystyrene manufacturing plant targeted for the fast-growing insulation market, with start-up scheduled for first half 2013.

– In the **United Kingdom**, the commissioning in 2011 of the hydrodesulphurization (HDS) unit at the Lindsey refinery allowed the refinery to increase its crude processing flexibility (up to 70% of high-sulphur crudes, compared to 10% previously) and its low-sulphur diesel production. After announcing in 2010 that it would put the Lindsey refinery up for sale as part of the sale of downstream activities in the United Kingdom, the Group, after receiving no offer meeting its requirements, decided in early 2012 to keep it in its portfolio.

– In **Italy**, TotalErg (49%) holds a 25.9% stake in the Trecate refinery. The Rome refinery, which was wholly-owned by TotalErg, was turned into a depot in October 2012.

(1) Earnings related to the refining assets in Africa, the French West Indies and of the joint venture TotalErg are reported in the results of the Marketing & Services segment.
(2) Company data, 2011 production capacity.
(3) Based on publicly available information, 2011 refining capacities and quantities sold.

3.1.1.2. North America

The main sites are located in Texas, in Port Arthur (refinery, steam cracker), Bayport (polyethylene) and La Porte (polypropylene), and in Carville, Louisiana (styrene, polystyrene).

In 2008, TOTAL launched a program to upgrade the Port Arthur refinery that included the construction of a desulphurization unit commissioned in 2010, a vacuum distillation unit, a deep-conversion unit (coker) and other associated units, which were successfully commissioned in 2011. This upgrade enables the refinery to process more heavy and high-sulphur crudes and to increase production of lighter products, in particular low-sulphur distillates.

In 2011, TOTAL and BASF purchased Shell's stakes in Sabina, a butane processing plant, which they transferred to BTP (40%), their joint subsidiary that owns the Port Arthur steam cracker. This new structure increases synergies between the refinery and the steam cracker, which are located on the same site in Port Arthur. Furthermore, from April 2013, the BTP cracker will be able to produce up to 35% of its ethylene from ethane and 35% from butane, which will allow it to benefit from favorable market conditions in the United States.

3.1.1.3. Asia and the Middle East

TOTAL is continuing to expand in growth areas and is developing sites in countries with favorable access to raw materials.

In **Saudi Arabia**, TOTAL and Saudi Arabian Oil Company (Saudi Aramco) created a joint venture in 2008, Saudi Aramco Total Refining and Petrochemical Company (SATORP) held by Saudi Aramco (62.5%) and TOTAL (37.5%), to build a 400 kb/d refinery in Jubail. TOTAL and Saudi Aramco each plan to retain a 37.5% interest, with the remaining 25% expected to be listed on the Saudi stock exchange. The main contracts for the construction of the refinery were signed in mid-2009, concurrent with the start-up of work. Gradual commissioning of the different units is expected in 2013.

The configuration of this refinery is designed for processing heavy crudes produced in Arabia and selling fuels and other light products that meet strict specifications and that are mainly intended for export. The refinery is also integrated with the petrochemical units: a 700 kt/y paraxylene unit, a 200 kt/y propylene unit, and a 140 kt/y benzene unit.

In **China**, TOTAL holds a 22.4% stake in WEPEC, a company that operates a refinery located in Dalian and produces also polypropylene.

The Group is also active through its polystyrene plant in Foshan (Guangzhou region), the capacity of which doubled to 200 kt/y at the beginning of 2011. TOTAL decided to build a new 200 kt/y polystyrene plant in Ningbo in the Shanghai region that is scheduled to start up in 2014.

In **South Korea**, TOTAL holds a 50% stake in Samsung Total Petrochemicals Co., Ltd., which operates the petrochemical site located in Daesan (condensate splitter, steam cracker, styrene, paraxylene, polyolefins). The joint venture completed in mid-2011 the first debottlenecking phase of the units at the Daesan site, with the aim of bringing them to full capacity. This first phase included increasing the capacity of the steam cracker to 1,000 kt/y and the polyolefin units to 1,150 kt/y. A second phase took place in September 2012 and involved increasing the capacity of the paraxylene unit to 700 kt/y.

In addition, to keep up with growth in the Asian markets, two major investments have been approved for planned start-up in 2014: a new 240 kt/y EVA(1) unit and a new aromatic unit with a capacity of 1.5 Mt/y of paraxylene and benzene, the raw material of which will be supplied by a new condensate splitter that will also produce kerosene (1.5 Mt/y) and diesel (1.0 Mt/y). As a result, the site's paraxylene production capacity will be increased to 1.8 Mt/y. Overall, these projects should result in the plant doubling its production capacity between 2011 and 2015.

In **Qatar**, the Group holds interests(2) in two steam crackers (Qapco, Ras Laffan) and four polyethylene lines (Qapco, Qatofin). A linear low-density polyethylene plant with a capacity of 450 kt/y, which is operated by Qatofin in Messaied, started up in 2009. An ethane-based steam cracker in Ras Laffan, designed to produce 1.3 Mt/y of ethylene, started up in 2010. The new 300 kt/y low-density polyethylene line operated by Qapco was commissioned in the third quarter 2012.

TOTAL holds a 10% stake in the Ras Laffan condensate refinery, which has a capacity of 146 kb/d. Plans to double the refinery's capacity are being studied.

(1) Ethylene and vinyl acetate copolymers.
(2) TOTAL interests: Qapco 20%; Qatofin 49%; Ras Laffan Olefin Cracker 22.5% along with Qatar Petroleum.

3.1.1.4. Crude oil refining capacity

The table below sets forth TOTAL's daily crude oil refining capacity:

As of December 31, (kb/d)	2012	2011	2010
Nine refineries operated by Group companies			
Normandy (100%)[a]	247	247	338
Provence (100%)	153	153	153
Donges (100%)	219	219	219
Feyzin (100%)	109	109	109
Grandpuits (100%)	101	101	101
Antwerp (100%)	338	338	338
Leuna (100%)	227	227	227
Lindsey-Immingham (100%)	207	207	207
Port-Arthur (100%)	169	169	169
Subtotal	**1,770**	**1,770**	**1,861**
Other refineries in which the Group has equity stakes[b]	278	326	598
Total	**2,048**	**2,096**	**2,459**

(a) 2010 capacity restated in accordance with the effective date of the final closure of a unit in 2011. End-2011 and end-2012 capacities take into account a distillation unit debottlenecking.
(b) TOTAL share in the eleven refineries in which TOTAL has equity stakes ranging from 10% to 55% (one in the Netherlands, in Germany, in China, in Qatar, in Italy, in Martinique and five in Africa). TOTAL divested its stake in CEPSA (four refineries) in 2011 and shut down the Rome refinery in 2012.

3.1.1.5. Refined products

The table below sets forth by product category TOTAL's net share of refined quantities produced at the Group's refineries[a]:

(kb/d)	2012	2011	2010
Gasoline	351	350	345
Aviation fuel[b]	153	158	168
Diesel and heating oils	734	804	775
Heavy fuels	160	179	233
Other products	338	335	359
Total	**1,736**	**1,826**	**1,880**

(a) For refineries not 100% owned by TOTAL, the production shown is TOTAL's equity share of the site's overall production.
(b) Avgas, jet fuel and kerosene.

3.1.1.6. Utilization rate

The tables below set forth the utilization rate of the Group's refineries:

On crude and other feedstock[a][b]	2012	2011	2010
France	82%	91%	64%
Europe (excluding CEPSA and TotalErg)	90%	77%	85%
Americas	99%	81%	83%
Asia	67%	67%	81%
Africa	75%	80%	76%
CEPSA and TotalErg[c]	58%	83%	94%
Average	**86%**	**83%**	**77%**

(a) Including equity share of refineries in which the Group has a stake.
(b) Crude + crackers' feedstock/distillation capacity at the beginning of the year.
(c) For CEPSA in 2011: calculation of the utilization rate based on production and capacity prorated on the first seven months of the year.

On crude[a][b]	2012	2011	2010
Average	82%	78%	73%

(a) Including equity share of refineries in which the Group has a stake.
(b) Crude/distillation capacity at the beginning of the year.

NB: utilization rates do not include Ras Laffan refinery contribution.

3.1.1.7. Petrochemicals: breakdown of TOTAL's main production capacities

As of December 31,

(in thousands of tons)				2012	2011	2010
	Europe	North America	Asia and Middle East[a]	Worldwide	Worldwide	Worldwide
Olefins[b]	5,318	1,264	1,457	8,039	7,097	7,060
Aromatics[c]	3,098	1,512	1,185	5,795	5,730	6,910
Polyethylene	1,180	445	614	2,239	2,094	1,948
Polypropylene	1,325	1,200	350	2,875	2,835	2,810
Polystyrene	587	700	308	1,595	1,555	1,350
Other[d]	295	-	63	358	358	858
Total	**11,803**	**5,121**	**3,976**	**20,900**	**19,668**	**20,935**

(a) Including interests in Qatar and 50% of Samsung Total Petrochemicals capacities.
(b) Ethylene + Propylene + Butadiene.
(c) Including Monomer Styrene.
(d) Mainly Monoethylene Glycol (MEG) and Cyclohexane.

End-2010 and end-2011 capacities were restated to take into account TOTAL's share in CEPSA as of end-2010 and other petrochemicals products.

3.1.1.8. Development of fuel and polymer production technologies not based on hydrocarbons

In addition to optimizing existing processes, TOTAL is exploring new ways for valorizing carbon resources, conventional or otherwise. A number of innovative projects are being examined, and entail defining access to the resource (nature, location, supply method, transport), the nature of the molecules and targeted markets (fuels, lubricants, petrochemicals, specialty chemicals), and the most appropriate, efficient and environmentally-friendly conversion processes.

3.1.1.8.1. Coal to polymers

TOTAL has developed know-how in the various processes used to convert coal into higher value products by gasification. These efforts allow a better understanding of the technological issues specific to each process, such as Fischer-Tropsch, methanol, di-methyl ether (DME) and methane, particularly in terms of energy optimization, water consumption and carbon capture.

TOTAL has been involved in the feasibility of a coal to olefin (CTO) conversion project, in partnership with the China Power Investment utility company. This project includes the innovative methanol-to-olefins (MTO/OCP) process tested on a demonstration unit basis in Feluy (Belgium), and would be located in Inner Mongolia (China).

In parallel, TOTAL pursues a program to develop new carbon capture and storage technologies to reduce the environmental footprint of the Group's industrial projects based on fossil energy.

In partnership with the French IFP Énergies Nouvelles (French Institute for Oil and Alternative Energies), TOTAL is involved in an R&D program related to chemical looping combustion, an innovative process to burn solid and gas feedstock that includes carbon capture at a very low energy cost. In 2010, this partnership resulted in the construction of a pilot at the Solaize site in France.

3.1.1.8.2. Biomass to polymers

TOTAL is involved in the development of processes dedicated or related to the conversion of biomass to polymers. The main area of focus is the development of a poly (lactic acid) (PLA) production technology through Futerro, a joint venture with Galactic, a lactic acid producer as well as developing a technology for dehydration of bio-alcohols into olefins (monomers for the manufacture of large conventional polymers), in collaboration with IFPen/Axens.

3.1.1.8.3. Biomass to fuels

TOTAL is a member of the BioTFuel consortium, the objective of which is to develop a chain for converting lignocellulose into fungible, sulphur-free liquid products through gasification and Fischer-Tropsch synthesis. To benefit from economies of scale, it will be possible to convert lignocellulosic feedstock into a blend with fossil resources. This development involves an initial pilot demonstration phase.

TOTAL has also been involved in the Swedish BioDME project, which aims to demonstrate the feasibility of the entire chain, from DME production through gasification of biomass (black liquor, residue from the paper industry) to logistics and tests on a fleet of fourteen dedicated trucks. Although the European program ended in late 2012, the tests on the fleet of trucks are continuing in 2013.

More generally, TOTAL is paying close attention to the emergence of the first second-generation biofuel production plants.

In 2012, the Group incorporated:

- in gasoline, 531 kt of ethanol[1] at its European refineries and several oil depots[2], compared to 494 kt in 2011 and 464 kt in 2010[3], and
- in diesel, 1,927 kt of VOME[4] at its European refineries and several oil depots[5], compared to 1,859 kt in 2011 and 1,737 kt in 2010[3].

(1) Including ethanol from ETBE (Ethyl-tertio-butyl-ether) and biomethanol from bio-MTBE (Methyl-tertio-butyl-ether), expressed in ethanol equivalent. Reference for bio content of ETBE and bio-MTBE is the RED directive.
(2) PCK and Zeeland Refinery included (TOTAL share).
(3) PCK and Zeeland Refinery included (TOTAL share).TotalErg (100% JV) included.
(4) VOME: Vegetable-oil- Methyl-ester. Including HVO (Hydrotreated vegetable oil).
(5) Including TotalErg's Rome and Trecate refinery/depots and TotalErg depots in Italy (100% TotalErg). PCK and Zeeland Refinery included (TOTAL share).

3.1.2. Fertilizers

Through its French subsidiary GPN, TOTAL manufactures and markets mostly nitrogen fertilizers made from natural gas.

In 2012, GPN's production was limited by the unavailability of the Rouen ammonia plant during primarily the first half of the year. This lack of availability had a negative impact on GPN's results.

In recent years, GPN's manufacturing system was updated through two investments: the construction of a nitric acid plant in Rouen, which started up in the second half of 2009, and a urea plant in Grandpuits, where production is stabilizing. This additional urea production will enable GPN to position itself in the growing markets of products that contribute to reducing nitrogen oxide emissions, including Adblue® for transportation applications.

In January 2012, the Group finalized the divestment of its stake in Pec-Rhin. GPN's mines and quarries business at the Mazingarbe site was divested in January 2011.

These actions are intended to improve the competitiveness of GPN by concentrating its operations on two sites with updated facilities and a production capacity above the European average.

TOTAL announced in February 2013 that it had received a firm offer from the Borealis Group for its fertilizing businesses in Europe. This offer will now be presented to the employees representatives concerned, as part of the information and consultation procedures.

3.1.3. Specialty chemicals

The specialty chemicals businesses include elastomer processing (Hutchinson), adhesives (Bostik) and electroplating chemistry (Atotech). They serve the automotive, construction, electronics, aerospace and convenience goods markets, for which marketing, innovation and customer service are key drivers. TOTAL markets specialty products in more than sixty countries and intends to develop by combining organic growth and targeted acquisitions. This development is focused on high-growth markets and the marketing of innovative products with high added value that meet the Group's Sustainable Development approach.

In 2012, the specialty chemicals businesses enjoyed a favorable business environment due to the resilience of the North American market and continued growth in emerging countries, despite such growth slowing down during the year. Although the situation deteriorated in Europe, it had no notable impact on earnings. In this context and on a like-for-like basis (excluding Resins), 2012 sales were €5.7 billion, a 7% increase compared to 2011.

The Hutchinson consumer goods business (Mapa® and Spontex®) was divested in spring 2010.

The Cray Valley coating resins and Sartomer photocure resins businesses were divested in July 2011. Sales for the divested lines of business were €860 million in 2010. The hydrocarbon and structural resins business lines were kept and have been incorporated into the Petrochemicals division.

3.1.3.1. Elastomer processing

Hutchinson manufactures and markets products derived from elastomer processing that are principally intended for the automotive, aerospace and defense industries.

Among the industry's leaders worldwide[1], Hutchinson provides its customers with innovative solutions in the areas of fluid transfer, air and fluid seals, anti-vibration, sound and thermal insulation, and transmission and mobility.

Hutchinson has eighty production sites worldwide, including fifty-one in Europe, sixteen in North America, seven in South America, five in Asia and one in Africa.

In 2012, Hutchinson's sales were €3.17 billion, up 6% compared to 2011. Sales for the automotive business increased 5% due to significantly increased sales on the North American market and increased sales on the Latin American and Chinese markets. Sales in Europe fell slightly (-3%) compared to 2011. On the industrial markets, turnover increased 7% as a result of increased sales in the civil aviation, railway and offshore oil markets.

To strengthen its position in the aerospace industry, in early 2011 Hutchinson acquired Kaefer, a German company specializing in aircraft interior equipment (*e.g.*, insulation, ventilation ducts) and, at the end of 2012, the Canadian company Marquez specializing in air-conditioning circuits. In the automotive sector, in 2011, Hutchinson acquired Keum-Ah, a South Korean company specializing in fluid transfer systems. In 2012, Hutchinson announced the divestment of 30% of its automobile brake hose business in Palamos (Spain) through the creation of a joint venture with Japanese company Nichirin, one of the world leaders in this segment. Additionally, Hutchinson closed the Oyartzun production plant in Spain at the end of 2012.

Hutchinson continues to develop in strong growth potential markets and among the most dynamic strongest customers. Hutchinson continuously strives to innovate, offering its customers high-performance materials and high-value added solutions capable of performing the most demanding functions.

3.1.3.2. Adhesives

Bostik is one of the world leaders in the adhesive sector[1] and has significant positions in the industrial, hygiene and construction markets, complemented by both consumer and professional distribution channels.

Bostik has fourty-nine production sites worldwide, including twenty in Europe, nine in North America, eight in Asia, six in Australia-New Zealand, four in South America and two in Africa.

In 2012, sales were €1.55 billion, up 8% compared to 2011.

Bostik continues to strengthen its technological position in the construction and industrial sectors, accelerate its program for innovation focused on Sustainable Development, pursue its expansion in high-growth countries and improve its operational performance.

After the start-up of a new production unit in Vietnam in 2011, in 2012 Bostik commissioned a new production unit in Egypt and a third production unit in China, located at Changshu, which is expected to be Bostik's largest plant worldwide, and opened a new regional technology center for Asia in Shanghai.

(1) Based on publicly available information, 2012 consolidated sales.

In the United States, Bostik acquired StarQuartz in 2011, increasing its range of construction adhesives. Bostik is strengthening its position in growth areas with the acquisition in 2012 of Usina Fortaleza, a Brazilian company specializing in construction adhesives.

In France, Bostik announced in late 2011 an investment in a new specialty polyester adhesive production workshop in Ribécourt and, in October 2012, an investment in a new worldwide and regional R&D center near Compiègne. In addition, Bostik continued to rationalize its industrial base with the closure of the Ibos site in France at year-end 2011 and the announcement in the fourth quarter of 2012 of the shutdown of production, in mid-2013, at the sites in Dublin, Ireland, and Barcelona, Spain.

3.1.3.3. Electroplating

Atotech is the second largest company in the electroplating sector based on worldwide sales[1]. It is active in the markets for electronics (printed circuits boards, semiconductors) and general surface treatment applications (automotive, construction, furnishing).

Atotech has seventeen production sites worldwide, including seven in Asia, six in Europe, three in North America and one in South America.

In 2012, Atotech's sales were €0.97 billion, up 8% compared to 2011.

Atotech successfully pursued its strategy designed to differentiate its products through a comprehensive service provided to its customers in terms of equipment, processes, design and chemical products and through the development of green, innovative technologies to reduce the environmental footprint. This strategy relies on global coverage provided by its technical centers located near customers.

In order to strengthen its position in the electronics market, Atotech started up in 2011 a new production unit aimed at the semiconductors market in Neuruppin (Germany) and acquired adhesive technologies (molecular interfaces) in the nanotechnology domain in the United States.

Atotech intends to continue to develop in Asia, which represents already close to 65% of its global sales.

3.2. Trading & Shipping

Trading & Shipping's main focus is serving the Group, and its activities primarily involve:

– selling and marketing the Group's crude oil production;

– providing a supply of crude oil for the Group's refineries;

– importing and exporting the appropriate petroleum products for the Group's refineries to be able to adjust their production to the needs of local markets;

– chartering appropriate ships for these activities; and

– undertaking trading on various derivatives markets.

Trading & Shipping conducts its activities worldwide through various wholly-owned subsidiaries, including TOTSA Total Oil Trading S.A., Atlantic Trading & Marketing Inc., Total Trading Asia Pte, Total Trading and Marketing Canada L.P., Total Trading Atlantique S.A. and Chartering & Shipping Services S.A.

3.2.1. Trading

TOTAL is one of the world's largest traders of crude oil and refined products on the basis of volumes traded. The table below sets forth selected information with respect to Trading's worldwide crude oil sales and supply sources and refined products sales for each of the past three years.

Trading of physical volumes of crude oil and refined products amounted to 4.5 Mb/d in 2012.

Trading's crude oil sales and supply and refined products sales[a]

(kb/d)	2012	2011	2010
Group's worldwide liquids production	**1,220**	**1,226**	**1,340**
Purchased by Trading from Exploration & Production	976	960	1,044
Purchased by Trading from external suppliers	1,904	1,833	2,084
Total of Trading's supply	**2,880**	**2,793**	**3,128**
Sales by Trading to Refining & Chemicals and Marketing & Services segments	1,569	1,524	1,575
Sales by Trading to external customers	1,311	1,269	1,553
Total of Trading's sales	**2,880**	**2,793**	**3,128**
Total of Trading's refined products sales	1,608	1,632	1,641

(a) Including condensates.

(1) Based on publicly available information, 2012 consolidated sales.

Trading operates extensively on physical and derivatives markets, both organized and over the counter. In connection with its trading activities, TOTAL, like most other oil companies, uses derivative energy instruments (futures, forwards, swaps and options) to adjust its exposure to fluctuations in the price of crude oil and refined products. These transactions are entered into with various counterparties.

For additional information concerning Trading & Shipping's derivatives, see Notes 30 (Financial instruments related to commodity contracts) and 31 (Market risks) to the Consolidated Financial Statements.

All of TOTAL's trading activities are subject to strict internal controls and trading limits.

In 2012, the oil market remained tight, with a slight increase in oil prices during the year and crude oil prices firmly in backwardation(1). Freight rates improved slightly in 2012, despite the ever growing availability in charter capacities.

		2012	2011	2010	2012/11	min 2012		max 2012	
Brent ICE - 1st Line(a)	($/b)	111.68	110.91	80.34	0.7%	89.23	(Jun. 21)	126.22	(Mar. 13)
Brent ICE - 12th Line(b)	($/b)	106.66	108.12	84.61	-1.3%	91.40	(Jun. 21)	119.39	(Mar. 13)
Contango time structure (12th - 1st)(c)	($/b)	-5.01	-2.79	4.27	79.6%	-9.37	(Mar. 1)	2.17	(Jun. 21)
WTI NYMEX - 1st Line(a)	($/b)	94.15	95.11	79.61	-1.0%	77.69	(Mar. 13)	109.77	(Jul. 9)
WTI vs. Brent 1st Line	($/b)	-17.53	-15.80	-0.73	11.0%	-25.53	(Nov. 15)	-8.55	(Jan. 1)
Gasoil ICE - 1st Line(a)	($/t)	953.42	933.30	673.88	2.2%	808.00	(Jun. 25)	1 043.50	(Mar. 19)
ICE Gasoil vs ICE Brent	($/b)	16.30	14.36	10.11	13.5%	9.30	(Mar. 1)	23.62	(Oct. 19)
VLCC Ras Tanura Chiba - BITR(d)	($/t)	12.82	11.99	13.41	6.9%	9.05	(Jul. 19)	19.13	(Apr. 4)

(a) 1st Line: quotation on ICE or NYMEX Futures for first nearby month delivery.
(b) 12th Line: quotation on ICE Futures for twelfth nearby month delivery.
(c) Contango +/Backwardation -.
(d) VLCC: Very Large Crude Carrier. BITR: Baltic International Tanker Routes.

An overview of global oil markets in 2012 is set forth below.

Despite the challenging economic environment, oil demand underwent sound growth in 2012 (+1.0 Mb/d according to estimations), especially gasoil (+0.3 Mb/d) and gasoline (+0.5 Mb/d). Growth was concentrated in Asia (+0.9 Mbd), while demand shrank in the Atlantic Basin.

The new economic sanctions imposed against Iran in 2012 deprived the market of 0.7 Mb/d of crude supply on average. In spite of an otherwise abundant crude supply, the loss of Iranian crude oil sparked tensions during the first half of 2012 with certain countries restructuring their supplies and stockpiling (especially in China). The loss of Iran's crude supply was exacerbated by production losses in other OPEC and non-OPEC countries. Despite such production losses, OPEC crude oil production was estimated to have risen in 2012 by approximately +1.8 Mb/d, fuelled by the resumption of Libyan production and the production efforts of Saudi Arabia, Iraq, Kuwait and the United Arab Emirates. Non-OPEC production only rose by +0.6 Mb/d in 2012, driven upward by North America (+1.0 Mb/d), while production was down in most other regions. In particular, various problems affected supplies from Yemen (attacks on oil infrastructures), Syria (embargo), Sudan (disputes on transport tariffs), United Kingdom (accidents) and Brazil (accidents). NGL production (natural gas liquids) has increased according to estimations (+0.3 Mb/d), but biofuel production stagnated due to problems in Brazil.

After a relatively stable January 2012, the dated Brent price followed the trend spawned in Q4 2011 by quickly climbing from $110/b on January 31 to culminate in the year's highest price of $128/b on March 8. The price then fell steadily to $89/b around June 25, due to abundant supply in the market and a rapid increase in inventories. Prices took off again during Q3 2012 following a major fall in stock levels, reaching $118/b on August 23 (the year's second highest price). Prices subsequently eased off before stabilizing around $110/b at the end of the year.

Global refining capacity rose overall by approximately +1.1 Mb/d, boosting refinery throughput by +1.0 Mb/d. Refiners faced an especially high level of unscheduled shutdowns, but that did not prevent them from increasing their utilization rates, particularly in Europe and the United States. Product supply remained tight, and OECD oil industry inventories fell to their lowest level in seven years by the end of June. Such tensions increased the price differential between diesel fuel and crude oil.

2012 was once again marked by a widening of the price differential between WTI crude (West Texas Intermediate, confined to the central United States) and Brent crude (delivered in the North Sea and accessible internationally). Brent crude especially came under tension due to extended maintenance at the Buzzard field in the North Sea and regular cargo exports to South Korea. In 2012, WTI continued to experience downward pressure from a rise in local production and exports from Canada, the combination of which exceeded local refining capacity requirements and pipeline capacities to American refineries in the Gulf of Mexico. WTI prices fell during 2012, while Brent prices continued to rise, thereby widening their price differential.

3.2.2. Shipping

The transportation of crude oil and refined products necessary to develop the Group's activities is arranged by Shipping. These needs are met through transactions on the spot market and the development of a balanced time charter policy. Shipping's rigorous safety policy is due mainly to the strict selection of the vessels that it charters. Like a certain number of other oil companies and shipowners, the Group uses freight rate derivative contracts to adjust its exposure to freight rate fluctuations.

(1) "Backwardation" is a term used to describe an energy market in which the anticipated value of the spot price in the future is lower than the current spot price. The reverse situation is described as "contango".

In 2012, Shipping chartered more than 3,000 voyages to transport approximately 115 Mt of crude oil and refined products. As of December 31, 2012, it employed a fleet of fifty-one vessels, none of which were single-hulled, that were chartered under long-term or medium-term agreements (including ten LPG carriers). The fleet has an average age of approximately five years.

Freight rate averages of three representative routes for crude transportation

		2012	2011	2010	min 2012		max 2012	
VLCC Ras Tanura Chiba-BITR[a]	($/t)	12.82	11.99	13.41	9.05	(Jul. 19)	19.13	(Apr. 4)
Suezmax Bonny Philadelphia-BITR	($/t)	14.44	13.86	14 .50	11.52	(Dec. 7)	21.99	(Mar. 15)
Aframax Sullom Voe Wilhemshaven-BITR	($/t)	6.48	6.51	6.39	5.98	(Aug. 20)	8.65	(Jan. 19)

(a) VLCC: Very Large Crude Carrier. BITR: Baltic International Tanker Routes.

The year 2012 was difficult for the oil shipping business with heightened activity levels during the first half of the year in strong contrast to those of the second half of the year. At the same time, marine fuel attained record-breaking levels with a strong knock-on effect on transport costs.

In the first half of 2012, VLCC crude transportation increased by nearly 10% compared to the first half of 2011 due to high exports from the Persian Gulf to the United States and stockpiling in China. At the same time, growth of the fleet was offset by the large number of delayed deliveries and the high demolition rate. The balance between supply and demand improved, allowing rates to rise substantially.

The situation worsened considerably during the second half of the year, mirroring the same situation witnessed in 2011. Following the loss of the economic effects felt during the first half of the year, charter rates plummeted at the beginning of the summer, leaving the crude transportation market at a historic low.

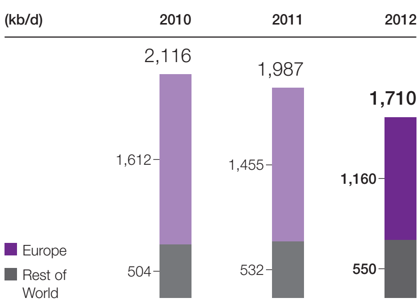
With regard to the product tanker market, the situation has generally improved compared to 2011. Arbitrage in favor of longer routes, especially to Asia, has been beneficial for larger-sized vessels.

4. Marketing & Services segment

In October 2011, the Group announced a proposed reorganization of its Downstream and Chemicals segments. The reorganization became effective on January 1, 2012, with the creation of a Marketing & Services segment which is dedicated to worldwide supply and marketing activities in the oil products field. Since July 1, 2012, it includes the activities of New Energies. As a result, certain information has been restated according to the new organization.

- Among the **largest** marketers in Western Europe[(1)]
- **No.1** marketer in Africa and the Middle East[(1)]
- **14,725** service stations at year-end 2012 (excluding AS24 service stations)
- **€1.3** billion invested in 2012
- **26,071** employees

2012 refined products sales[(a)]



(a) Excludes trading and refining bulk sales, includes share of CEPSA through July 31, 2011, and of TotalErg.

For 2012, the decrease in sales of 14% compared to 2011 was almost entirely attributable to the sale of the Group's interest in CEPSA and the sale of marketing activities in the United Kingdom. Excluding these portfolio effects, sales would have decreased by 1% on an annual basis with a notable decrease in Europe (3%) partially offset by increased sales in Asia and the Middle East.

Marketing & Services segment financial data

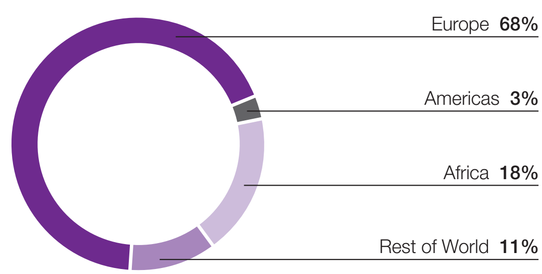
(M€)	2012	2011	2010
Non-Group sales	86,614	85,325	75,580
Adjusted operating income	1,365	1,187	1,310
Adjusted net operating income	837	813	981
Contribution of New Energies	(169)	(197)	n/a

For 2012, Marketing & Services segment sales were €86.6 billion, an increase of 2% compared 2011.

Adjusted net operating income from the Marketing & Services segment was €837 million in 2012, an increase of 3% compared to €813 million in 2011. This increase is explained principally by the improved performance of New Energies. Marketing activities continued to provide stable results despite sales volumes generally decreasing, due in particular to improved results from activities in the Asia-Pacific and Eastern European regions.

The ROACE[(2)] for the Marketing & Services segment was 12% for 2012, compared to 13% for 2011.

2012 refined products sales by geographical area: 1,710 kb/d[(a)]



(a) Excludes trading and refining bulk sales, includes share of TotalErg.

(1) Based on publicly available information based on quantities sold.
(2) Calculated based on adjusted net operating income and average capital employed, using replacement cost.

4.1. Marketing & Services

TOTAL is one of the leading marketers in Western Europe[1]. It is also the leader[2] on the African continent and in the Middle East.

TOTAL sells a wide range of products produced from its refineries and other facilities. TOTAL is among the leading companies in the specialty products market, in particular for lubricants, LPG, jet fuel, special fluids, bitumen, heavy fuels and marine fuels, with products marketed in approximately 150 countries[3].

TOTAL also sells numerous services for consumers and professionals in the mobility, residential and industrial sectors.

As part of its activities, Marketing & Services holds stakes in five refineries in Africa, one in Europe, through its share in TotalErg (49%), and one in the Caribbean.

Marketing & Services restructured its organization in 2012 in order to achieve its ambitions for growth. Marketing & Services now comprises four geographical divisions: Europe, Africa-Middle East, Asia-Pacific and the Americas. An operational division was set up to manage activities that are worldwide by nature due to their markets, customers and offers. The functional divisions were adapted in order to support the attainment of growth targets.

4.1.1. Europe

In Europe, TOTAL has a network of more than 9,100 service stations in France, Belgium, the Netherlands, Luxembourg and Germany, as well as in Italy through its share in TotalErg (49%).

TOTAL also operates a network of 700 AS24-branded service stations dedicated to commercial transporters in twenty-seven European countries. In 2012, the Group continued to develop its network of service stations by entering the market in Georgia. The AS24 network is expected to continue to grow, mainly through expansion in the Mediterranean Basin and Russia and through its toll payment card service, which covers more than sixteen countries.

TOTAL is among the leaders in Europe for fuel-payment cards, with approximately 3.5 million cards issued in twenty-seven European countries.

In specialty products, the Group benefits from its extensive presence in continental Europe and relies on numerous industrial facilities to produce lubricants (mainly Rouen in France and Ertvelde in Belgium), special fluids (Le Havre in France), bitumen (Brunsbüttel in Germany) and grease (Lille in France).

In **Western Europe**, TOTAL continued to optimize its Marketing business in 2012.

– In **France**, the dense network includes almost 1,850 TOTAL-branded service stations and 1,650 Elan service stations which are located mainly in rural areas. In October 2011, TOTAL launched "Total access", a new service station concept combining low prices with TOTAL brand fuel and service quality. By the end of 2012, 316 Total access stations had been opened out of the 600 planned for the end of 2013. The 121 Elf stations remaining at the end of 2012 will be converted into Total access service stations in 2013.

TOTAL leads the heating oil market in France[4], with eight local subsidiaries covering the entire country. TOTAL continued its diversification strategy in 2012, with the commercial launch of wood pellets and services with fioulmarket.fr, France's first website for online heating oil sales to consumers.

TOTAL completed the adaptation of its logistics assets in 2012 with the closure of the Brive, Chambéry and BTT Honfleur depots and the transfer of the operations of the Lorient and Lyon depots to third parties, and strengthened its position in eastern France by acquiring an 18% interest in the Strasbourg depot owned by Société Européenne de Stockage. As a result of this adaptation, TOTAL now holds stakes in twenty-three depots, of which it operates eight.

– In **Italy**, as part of the optimization of the Group's downstream portfolio in Europe, TotalErg (49%) was created in autumn 2010 through the merger of Total Italia and ERG Petroli. TotalErg has become the third largest operator in the Italian market with a network market share of nearly 12%[5] and more than 3,150 service stations. Production at the Rome refinery, owned by TotalErg, was stopped in October 2012 and the site will be converted into a logistics hub for petroleum products storage.

– In October 2011, TOTAL sold its network of service stations and its fuel and heating oil marketing business in the **United Kingdom**, the Channel Islands and the Isle of Man. TOTAL retains a market presence in the United Kingdom through its specialty products activities, particularly lubricants and aviation fuel.

In **northern, central and eastern Europe**, TOTAL continued in 2012 to expand its direct presence in these growing markets, in particular for lubricants and bitumen. The Group is seeking to speed up the growth of its specialty products business, mainly in Russia, and to consolidate its production units in the region.

4.1.2. Africa & the Middle East

TOTAL is the leading marketer of petroleum products on the African continent and in the Middle East, with a market share of 12%[6] in 2012. The Group operates almost 4,500 service stations in more than forty countries in these high-growth markets, as well as major networks in South Africa, Turkey, Nigeria, Kenya and Morocco.

In November 2012, TOTAL was granted a distribution license in Jordan that paves the way for a rapid development of a network of service stations and a wholesale business. As part of the optimization of its portfolio, the Group divested its subsidiary in Benin in late 2010.

Moreover, TOTAL has become a leading partner for mining customers by delivering supply chain and management solutions for fuels and lubricants.

In 2012, TOTAL strengthened its logistics in western Africa. The Group increased its stake in the Senstock storage company in Senegal from 25% to 35% and is developing an import terminal project in Ghana.

(1) Publicly available information, based on quantities sold (2011).
(2) PFC Energy and Company data.
(3) Including via national distributors.
(4) CPDP 2012 and Company data.
(5) PFC Energy: Italy report 2012.
(6) Market share in the countries where the Group operates, based on 2012 publicly available information, quantities sold.

TOTAL is pursuing its strategy for growth on the specialty products markets. The Group, which relies in particular on the lubricants blending plant in Dubai, started up a new plant in Egypt in November 2012.

4.1.3. Asia-Pacific

At year-end 2012, TOTAL was present in nearly twenty countries in the Asia-Pacific region, primarily in the specialty products market. The Group is developing its position as a fuel marketer in the region, in particular in China. TOTAL operates service stations in Pakistan, the Philippines, Cambodia and Indonesia, and is a significant player in the Pacific Islands.

In China, the Group operated nearly 175 service stations at year-end 2012 through two TOTAL/Sinochem joint ventures.

In India, TOTAL inaugurated its first lubricants, bitumen, special fluids and additives technical center outside Europe in September 2012.

In Vietnam, TOTAL continues to strengthen its position in the specialty products market. The Group became one of the leaders in the Vietnamese LPG market with the acquisition of Vinagas in June 2012.

In the lubricants sector, TOTAL continues to grow in the region, with a 6.4% increase in lubricant sales in 2012 compared with 2011. The Group is building in Tianjin its third lubricants blending unit in China. Commissioning is expected in the first half of 2013.

Finally, the Group also extended its commercial footprint with the creation of a branch in Papua New Guinea in December 2012.

4.1.4. Americas

In Latin America and the Caribbean, TOTAL is active in about twenty countries in the specialty products markets (lubricants and special fluids) and in the major products sector (retail, wholesale, aviation). The Group holds a significant position[1] in the fuel distribution business in the Caribbean.

In the United States and Canada, TOTAL mainly markets specialty products, in particular lubricants, and is continuing to grow since the acquisition at year-end 2009 of lubricant assets in the province of Quebec in Canada. The Group is also looking into the construction of a special fluids production plant in Texas.

TOTAL operates a significant number of industrial units throughout the Americas and the Caribbean (production of lubricants, storage and conditioning of LPG).

(1) Fuel distribution in three of the four main opened markets in the region.

4.1.5. Sales of refined products

The table below sets forth TOTAL's sales of refined products by region:

(kb/d)	2012	2011	2010
France	566	574	606
Europe, excluding France[a]	594	881	1,006
Americas	53	56	53
Africa	307	304	292
Rest of the World	190	172	159
Total excluding Trading and refinery bulk sales	**1,710**	**1,987**	**2,116**
Trading	1,161	1,215	1,281
Refinery bulk sales	532	437	379
Total including Trading and refinery bulk sales	**3,403**	**3,639**	**3,776**

(a) Including TOTAL's share in CEPSA (up to end of July 2011) and, as from October 1, 2010, in TotalErg.

For data on biofuels, refer to Chapter 2, paragraph 3.1.1.8.

4.1.6. Service stations

The table below sets forth the number of service stations of the Group (excluding AS24):

As of December 31,	2012	2011	2010
France[a]	3,911	4,046	4,272
Europe, excluding France	5,200	5,375	7,790
of which TotalErg	3,161	3,355	3,221
of which CEPSA	-	-	1,737
Africa	3,601	3,464	3,570
Rest of the World	2,013	1,934	1,858
Total	**14,725**	**14,819**	**17,490**

(a) TOTAL, Total access, Elf and Elan-branded service stations.

4.1.7. Product and services developments

In 2012, TOTAL continued its technical and R&D partnerships in Formula 1 with Renault Sport F1 and in the WRC with Citroën Sport, and it entered into a partnership with Toyota in endurance racing. The purpose of these partnerships is to demonstrate TOTAL's technical excellence in the formulation of fuels and lubricants under extreme conditions and restrictions on fuel consumption. The TOTAL brand was associated with four world titles in 2012.

TOTAL continued its Clean Energy Partnership in Germany, centered on hydrogen distribution. An experimental service station, located near TOTAL Deutschland's new head office in Berlin, was completed in 2012. A new hydrogen station should be opened in 2013 near Berlin's new airport. The "H2 Mobility" study, looking into the potential deployment of a hydrogen fuel distribution network in Germany by 2015-2020, was completed. TOTAL has now entered negotiations between industrial partners with a view to implementing the business plan based on the study.

The number of prototype electric vehicle fueling stations (fast charge) is also increasing. Today, TOTAL has around twenty charging stations in the Netherlands, Belgium, Germany and France.

In 2012, TOTAL launched a program of six experimental pilot schemes of multi-energy and energy services offers designed to encourage reductions in consumption, to develop hybrid fuel/photovoltaic technical solutions and to facilitate access to energy in rural Africa.

4.2. New Energies

New Energies is developing renewables that will complement hydrocarbons so as to meet the increasing global demand for energy. In meeting this objective, the Group has two main focuses: solar energy, which benefits from unlimited energetic resources and is expected to play a key role by 2030, in particular in certain geographical zones where the Group has a significant presence, and the transformation of biomass, which aims to develop new bio-sourced product solutions for the Group's downstream markets, Marketing & Services and Refining & Chemicals. An active watch is kept on other technologies, such as marine energy.

4.2.1. Solar energy

TOTAL is developing upstream operations through industrial production and downstream marketing activities in the photovoltaic sector based on crystalline silicon technology. The Group is also pursuing R&D in this field through several partnerships, as well as in the concentrated solar power field.

4.2.1.1. Solar photovoltaic

The photovoltaic industry has undergone significant changes since 2011, with the disappearance of numerous players and cuts in subsidy programs prompted by the collapse of prices and excess production capacity. The competitiveness of photovoltaic solar energy has been strengthened by the significant drop in the cost of modules over the past eighteen months, which should cause its share of the energy mix rise while helping to cut greenhouse gas emissions at the same time.

4.2.1.1.1. SunPower

TOTAL now holds 66% of SunPower, a U.S. company based in San Jose, California, and listed on NASDAQ (NASDAQ: SPWR), following a friendly takeover bid in June 2011 and a capital increase in January 2012 in conjunction with SunPower's integration of Tenesol, TOTAL's long-established solar subsidiary present mainly in Europe and Africa.

SunPower is an integrated player that designs, manufactures and supplies the highest-efficiency solar panels in the market. It is active throughout the solar chain, from cell production based on crystalline silicon to the design and construction of turnkey large power plants, passing by the commercialization of solar solutions for residential and commercial markets.

Upstream, SunPower manufactures all of its cells in Asia (Philippines, Malaysia) and has a total production capacity of 1,200 MW/y. The company is continuing to adjust its production capacity while maintaining its technological leadership. The cells are assembled into modules, or solar panels, in plants located in Asia, North America, Europe and South Africa.

Downstream, SunPower is present in most major geographic markets (United States, Europe, Australia, Asia and Africa), with operations ranging from residential roof tiles to large solar power plants.

4.2.1.1.2. Photovoltech

TOTAL holds a 50% interest in Photovoltech, a Belgian company specialized in manufacturing multicrystalline photovoltaic cells. Against the crisis context, the company, which suffered structural losses, is in the process of closing down.

4.2.1.1.3. Other assets

The overseas activities previously operated by Tenesol are now managed by Sunzil, in which TOTAL holds a 50% stake.

Elsewhere, the Group is continuing its projects to display solar application solutions as part of decentralized rural electrification projects in a number of countries, including in South Africa via Kwazulu Energy Services Company (KES), in which TOTAL holds a 35% stake.

4.2.1.2. Concentrated solar power

TOTAL won in 2010 the call for tenders for the construction and 25-year operation of a 109 MW concentrated solar power plant in Abu Dhabi. The Shams project (20%) is being carried out in partnership with Masdar through the Abu Dhabi Future Energy Company (ADFEC). Construction work started in July 2010 and the plant started up in early 2013. The production will be sold to Abu Dhabi Water and Electricity Company (ADWEC).

4.2.1.3. New solar technologies

In order to strengthen its technological leadership in the crystalline silicon field, TOTAL invests considerable efforts in R&D programs through a partnership network with major laboratories and international research institutes in France and abroad operated by mixed research teams.

They are tasked with optimizing the photovoltaic solar chain (silicon, wafers, cells, modules and systems) by cutting production costs and multiplying its applications, while increasing the efficiency of the components in terms of electric conversion.

The IMEC (Interuniversity MicroElectronics Center – Belgium) research center hosts an R&D team from TOTAL and is involved in research programs looking into the reduction of quantities of silicon required by cells and the improvement of their efficiency.

TOTAL is also conducting researches into next-generation photovoltaic cells and modules through a partnership with the *École Polytechnique*'s Laboratory of physics of interfaces and thin layers which is specialized in plasma-deposition processes at low temperatures. Following on from this partnership, in March 2012, TOTAL and EDF, the CNRS and the *École Polytechnique* announced the creation of the IPVF (Institut photovoltaïque d'Île-de-France), created to become one of the top five worldwide centers conducting research into latest-generation photovoltaic devices.

Another team from TOTAL is collaborating with scientists from the LAAS-CNRS (*Laboratoire d'Analyse et d'Architecture des Systèmes*) in Toulouse, France, on improving module energy performance through a system-based approach.

With respect to electricity storage, TOTAL continues its research program started in 2009 with a laboratory from the Massachusetts Institute of Technology (MIT) in the United States to develop a new battery technology. TOTAL also invested in 2011 in the Ambri start-up which comes from the same laboratory.

The difficulties experienced in improving the technology developed by AEP Polysilicon Corporation (AEP) (30%) to produce solar-quality silicon resulted in the project being abandoned and the industrial pilot being shut down. The Konarka Technologies Inc. start-up (25%) did not succeed in raising the capital needed to the continuation of its activities is being wound up.

4.2.2. Biotechnologies and the conversion of biomass

TOTAL is exploring a number of avenues for developing biomass transformation, which vary depending on the resource used, markets targeted (fuels, lubricants, petrochemicals, specialty chemicals, etc.) and the nature of the conversion processes. New Energies has chosen to target one out of the two primary conversion processes: biochemicals.

Since 2010, TOTAL has been pursuing its strategic biotechnologies partnership with Amyris Inc., an American company (NASDAQ: AMRS) specializing in this domain. The Group holds an 18.5% stake in the company as of December 31, 2012, and entered into a collaboration agreement regarding research, development, production and commercialization of new bio-based molecules that will be used in the upstream markets of oil and green chemicals. A common R&D team will be implemented. Amyris owns a cutting-edge industrial synthetic biological platform designed to create and optimize micro-organisms that can convert sugars into molecules of interest through fermentation. Amyris also owns a research laboratory and pilot units in California as well as in Brazil. Amyris started its industrial production facility in Paraiso, Brazil, at the beginning of 2013.

In addition, the Group continues to develop a network of R&D partnerships in technology segments that are complementary with Amyris' platform (deconstruction of lignocelluloses, new biosynthesis processes, tools for metabolism engineering and processes linked to biochemicals routes), including with the Joint BioEnergy Institute (JBEI) (United States), Novogy (United States), the University of Wageningen (Holland) and the Toulouse White Biotechnology consortium (TWB) (France).

The Group is also assessing the potential of phototrophic processes and bio-engineering of microalgae. It entered into a partnership with Cellectis S.A. to conduct exploratory research on this field. The Group also takes part in the AlgaePark consortium (Netherland).

4.2.3. Other renewable energies

In wind power, TOTAL owns a 12 MW wind farm in Mardyck (near Dunkirk, France), which was commissioned in 2003.

In marine energy, TOTAL holds a 26.6% share in Scotrenewables Tidal Power, located in the Orkney Islands in Scotland. Tests are being conducted on a 250 kW prototype. A 2 MW commercial model is being developed.

5. Investments

5.1. Major investments over the 2010-2012 period[1]

(M€)	2012	2011	2010
Upstream	19,618	20,662	13,049
Refining & Chemicals	1,944	1,910	2,124
Marketing & Services	1,301	1,834	1,019
Corporate	80	135	81
Total	**22,943**	**24,541**	**16,273**

Organic capital expenditure, including net investment in equity affiliates and non-consolidated subsidiaries, amounted to $23.8 billion in 2012 (€18.5 billion[2]), compared with $20.6 billion in 2011 (€14.8 billion). In addition to this, $4 billion (€3.1 billion) was invested in acquisitions.

TOTAL investment (including acquisitions) therefore decreased from $34.2 billion (€24.5 billion) in 2011 to $29.5 billion (€22.9 billion) in 2012. The decrease in capital expenditure comes mainly from the Upstream and Marketing & Services segments. While continuing to develop its major Exploration & Production projects in 2012, the Group significantly reduced the amount spent on acquisitions, which came to $4 billion in 2012 compared with more than $12 billion in 2011. These acquisitions were primarily in the Upstream Segment, and included in particular the acquisition of interests in exploration and production licenses in Uganda, an additional 1.3% stake in Novatek, various exploration licenses and the carry agreement in the Utica shale gas and condensates field in the United States. In the Refining & Chemicals segment, the Group also acquired a minority interest in Fina Antwerp Olefins.

In addition to these acquisitions, capital expenditure in the Upstream segment was mainly intended to develop new hydrocarbon production facilities, exploration operations and acquisition of new licenses. In 2012, development expenditure was devoted primarily to the following projects: GLNG and Ichthys in Australia, Surmont in Canada, the Ekofisk and Eldfisk areas in Norway and the Mahakam area in Indonesia, Kashagan in Kazakhstan; the Laggan Tormore projects in the United Kingdom, CLOV in Angola; Anguille and Mandji in Gabon and Ofon II in Nigeria.

In the Refining & Chemicals segment, capital expenditure was devoted to the maintenance of facilities and safety and to projects to increase the production of lighter products, add desulphurization capacities, adapt the refining base to new specifications and improve energy efficiency. 2012 was marked by the upgrading project at the Normandy refinery in France and ongoing construction of the Jubail refinery in Saudi Arabia.

In the Marketing & Services segment, capital expenditure in 2012 was mainly dedicated to the network, logistics and specialty production and storage facilities.

In 2012, asset sales totaled $5.9 billion compared with nearly $11 billion in 2011, comprised essentially of sales of the remainder of the Group's shares of Sanofi, a stake in the Gassled pipeline in Norway, Upstream assets in Nigeria, the United Kingdom, Colombia and France, as well as interests in Pec-Rhin and Geostock in France and in Composites One in the US.

5.2. Major investments anticipated

For the year 2013, TOTAL announced an organic capital expenditure budget[3] of $28 billion, over 80% of which is dedicated to the Upstream segment. A $23 billion capital expenditure in the Upstream segment is expected to be mainly dedicated to major development projects, including GLNG in Australia, Surmont in Canada, the Ekofisk and Eldkisk areas in Norway, Kashagan in Kazakhstan, the Laggan Tormore projects in the United Kingdom, CLOV in Angola, Ofon II in Nigeria and Moho North in Congo. Approximately 30% of the Upstream segment's overall capital expenditure budget is expected to be dedicated to maintenance and integrity work on assets already in production and 70% is intended for future projects and exploration.

In the Refining & Chemicals segment, the nearly $3 billion capital expenditure budget is expected to be dedicated to the refining, petrochemicals and specialty chemicals businesses. In particular, 2013 is expected to be marked by the ongoing construction and start-up of the Jubail refinery in Saudi Arabia. A significant portion of the segment's budget will also be allocated to maintenance and safety, which are vital to this type of industrial activity.

The Marketing & Services segment has a nearly $2 billion capital expenditure budget for 2013 to finance, in particular, the service station network, logistics, specialty production and storage facilities (lubricants, LPG, etc.) and the development of its activities in New Energies. Most of the Marketing & Services budget will be allocated to growth areas (Africa, Middle East, Asia and Latin America).

Beyond 2013, TOTAL plans to make sustained investments to support the growth of its activities, prioritizing the Upstream segment.

TOTAL self-finances most of its capital expenditure from cash flow from operations (see the consolidated statement of cash flow, Chapter 9, point 5.), which is essentially increased by accessing the bond market on a regular basis, when conditions on the financial markets are favorable (see Note 20 to the Consolidated Financial Statements, Chapter 9, point 7.). However, capital expenditure for joint ventures between TOTAL and external partners are generally funded through project financing.

For 2013, the Group has also announced that it wishes to divest certain assets from its portfolio, and its budget provides for asset disposals worth over $6 billion more than planned acquisitions.

(1) Major acquisitions and disposals for fiscal years 2010-2012 are detailed in Note 3 to the Consolidated Financial Statements of this Registration Document.
(2) Based on average exchange rates for 2012 of $1.2848/€.
(3) Including net investments in equity affiliates and non-consolidated companies, excluding acquisitions and divestments, based on €1 = $1.30 for 2013.

In November 2012, TOTAL announced the sale of the Group's interest in the offshore OML 138 Block in Nigeria, which includes the Usan field, and in February 2013 receipt of a firm offer and the start of exclusive negotiations with a consortium of buyers for the sale of TIGF, a natural gas transport and storage affiliate in France.

As part of certain project financing arrangements, TOTAL S.A. has provided guarantees. These guarantees ("Guarantees given on borrowings") as well as other information on off-balance sheet commitments and contractual obligations for the Group appear in Note 23 to the Consolidated Financial Statements (Chapter 9, point 7.). The Group does not currently consider that these guarantees, or any other off-balance sheet arrangements of TOTAL S.A. nor any other members of the Group, currently have or are reasonably likely to have in the future a material effect on the Group's financial situation, revenues or expenses, liquidity, capital expenditure or capital resources.

6. Organizational structure

6.1. Position of the Company within the Group

TOTAL S.A. is the Group's parent company. As of December 31, 2012, there were 883 consolidated subsidiaries, of which 803 were fully consolidated and 80 were accounted for under the equity method.

The decision of TOTAL S.A.'s major subsidiaries to declare dividends is made by their relevant Shareholders' Meetings and is subject to the provisions of applicable local laws and regulations. As of December 31, 2012, there is no restriction under such provisions that would materially restrict the distribution to TOTAL S.A. of the dividends declared by those subsidiaries.

As of December 31, 2012, the Group's businesses are organized as indicated on the chart in paragraph 8. of this Chapter. The Group's businesses receive assistance from Corporate divisions (Finance, Legal, Ethics, Insurance, Strategy & Business Intelligence, Human Resources and Communications) that are grouped within the parent company, TOTAL S.A.

6.2. Company subsidiaries

A list of the major subsidiaries directly or indirectly held by the Company is given in Note 35 to the Consolidated Financial Statements (Scope of Consolidation) in Chapter 9, point 7. of this Registration Document.

7. Property, plant and equipment

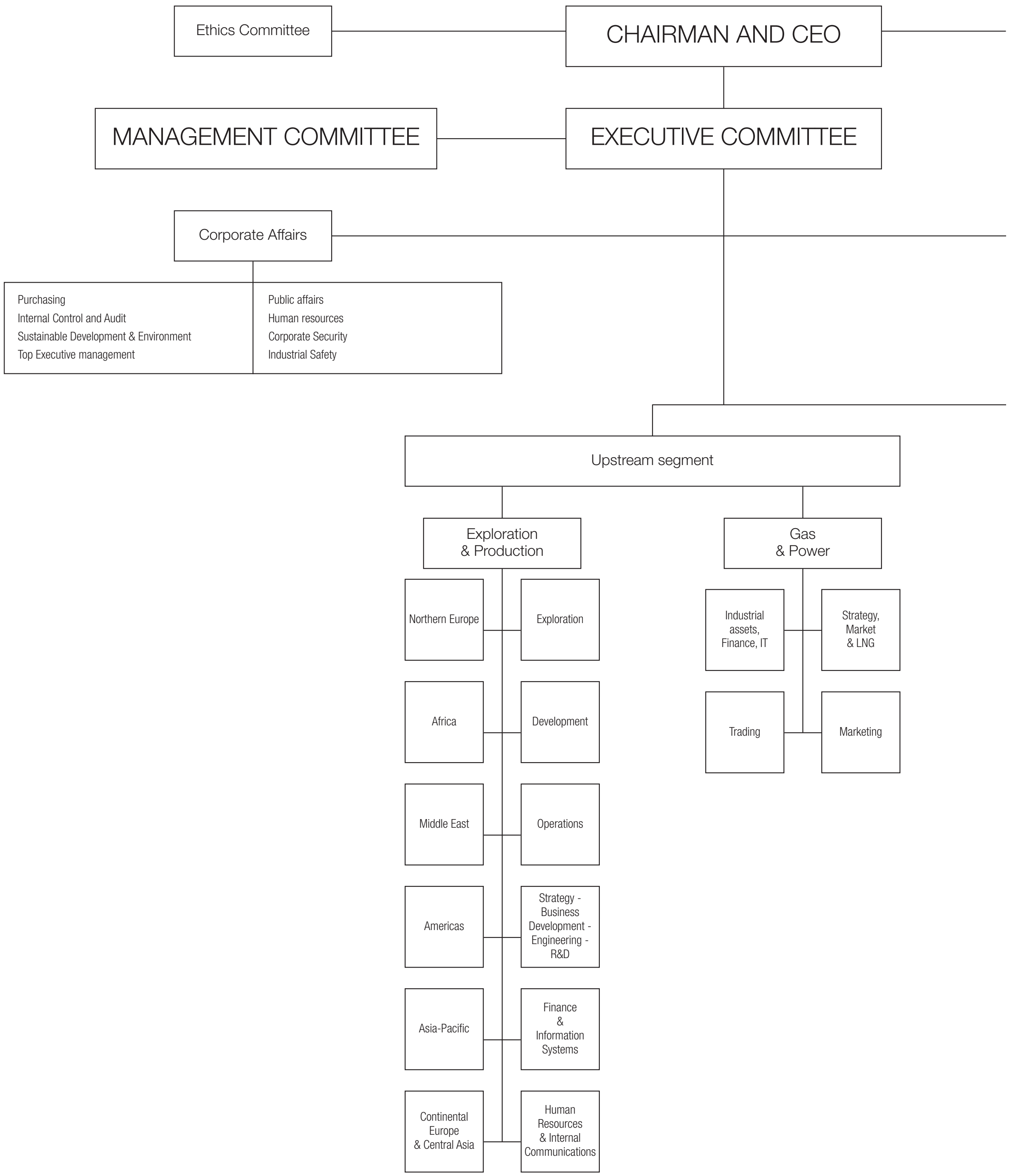
TOTAL has freehold and leasehold interests in over 130 countries throughout the world. Operations in properties, oil and gas fields or any other industrial, commercial or administrative facility, as well as the production capacities and utilization rates of these facilities, are described in this Chapter for each business segment (Upstream, Refining & Chemicals, Marketing & Services).

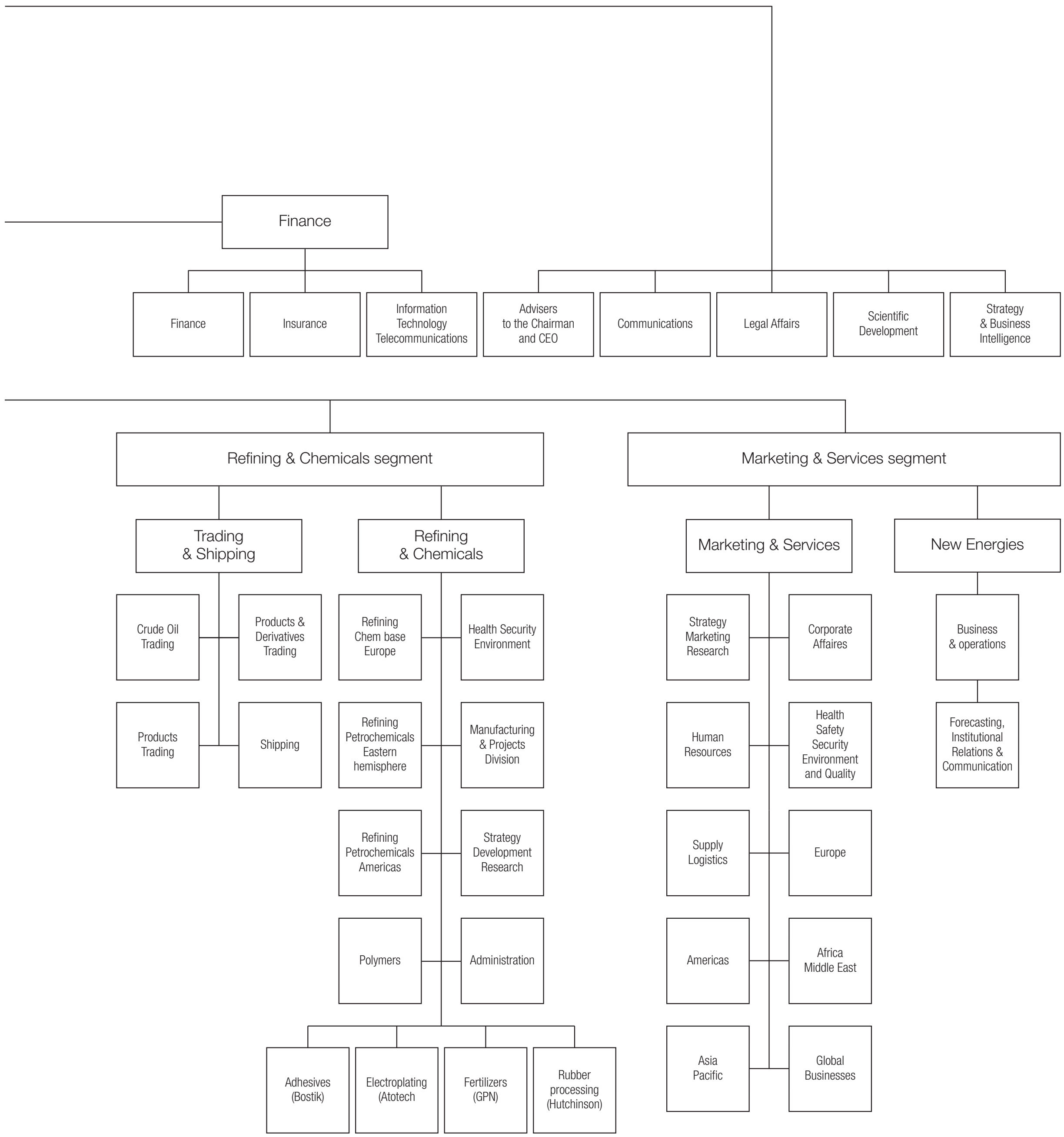
A summary of the Group's property, plant and equipment and their main related expenses (depreciation and impairment) is included in Note 11 to the Consolidated Financial Statements (Chapter 9, point 7.).

Minimum royalties from finance lease agreements regarding properties, service stations, vessels and other equipment are given in Note 22 to the Consolidated Financial Statements (Chapter 9, point 7.).

Information about the Company's environmental policy, in particular that related to the Group's industrial sites or facilities, is presented in Chapter 12 - Social and environmental information of this Registration Document.

8. Organization chart as of December 31, 2012




Finance
Finance
Insurance
Information Technology Telecommunications
Advisers to the Chairman and CEO
Communications
Legal Affairs
Scientific Development
Strategy & Business Intelligence
Refining & Chemicals segment
Marketing & Services segment
Trading & Shipping
Refining & Chemicals
Marketing & Services
New Energies
Crude Oil Trading
Products & Derivatives Trading
Products Trading
Shipping
Refining Chem base Europe
Health Security Environment
Refining Petrochemicals Eastern hemisphere
Manufacturing & Projects Division
Refining Petrochemicals Americas
Strategy Development Research
Polymers
Administration
Adhesives (Bostik)
Electroplating (Atotech
Fertilizers (GPN)
Rubber processing (Hutchinson)
Strategy Marketing Research
Corporate Affaires
Human Resources
Health Safety Security Environment and Quality
Supply Logistics
Europe
Americas
Africa Middle East
Asia Pacific
Global Businesses
Business & operations
Forecasting, Institutional Relations & Communication

Management Report

The Management report was approved by the Board of Directors on February 12, 2013 and has not been updated with subsequent events.

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1. Summary of results and financial position

1.1. Overview of the 2012 fiscal year for TOTAL

The year 2012 was marked by an economic slowdown that damped the oil demand from OECD countries. The dynamism of emerging countries and the needs brought about by the Fukushima accident in Japan however sustained the overall growth of the demand for oil products, particularly in Asia at the year end. Market supplies remained adequate mainly due to the increase in non-conventional oil production in North America, whereas the persistence of geopolitical factors put a strain on the supply. The average price of Brent therefore remained stable, standing at $111.7/b in 2012 against $111.3/b in 2011.

Gas spot prices remained stable in Europe and Asia in 2012, sustained by the demand on Asian markets. However, spot prices for gas in the United States dropped to very low levels due to the abundant supply of natural gas following the development of shale gas, further strengthened by associated gas production from the production of unconventional liquids.

The further progressive decline in European refining capacity combined with very high level of maintenance downtime in the global refining industry limited the overcapacity observed since 2009, thereby causing refining margins to rebound from $17/t in 2011 to $36/t in 2012[1]. Margins in petrochemicals in Europe declined on average over the year due to the drop in demand caused by the economic slowdown. On the other hand, in the United States, the petrochemicals segment benefited from the decrease in the prices of ethane and liquefied petroleum gases, driving a rebound in margins.

In this environment, TOTAL's adjusted net income amounted to €12.4 billion, up from the year 2011. This result essentially reflects the good performance of the segments, in an environment conducive to the Upstream segment and marked by a temporary but significant rebound in refining margins in the downstream segment. The Upstream segment's adjusted net operating income reached €11.2 billion in 2012, a 6% increase from the previous year, supported mainly by the change in the €-$ exchange rate. The Refining & Chemicals segment reported a 67% increase in its adjusted net operating income. This increase is primarily due to the increase in refining margins. Lastly, the Marketing & Services segment recorded a 3% increase in income compared with 2011.

The year 2012 was marked by a significant decline in acquisitions compared with 2011, and asset sales of $6 billion reflecting the Group's intention to optimize and simplify its portfolio, by developing its Upstream assets with high growth potential.

TOTAL benefited from the rise in its operating cash flow and the drop in acquisitions to fund its investments while increasing its dividend by nearly 3% to €2.34 per share, which will be submitted for approval to the Shareholders' Meeting on May 17, 2013. The balance sheet was further strengthened with a ratio of net debt to equity of 21% at the end of 2012 compared with 23% at the end of 2011.

In terms of operations, the Group had to deal with accidents in the North Sea and Nigeria in 2012, as well as safety issues in its facilities in Yemen which affected its productions. With responsibility and transparency, TOTAL reasserted the utmost priority it gives to the safety of operations and its commitment to environmental protection. It improved its safety performance further, with an 18% drop in the Group-wide TRIR[2] compared with 2011.

In the Upstream segment, four major discoveries in Argentina, the United States in the Gulf of Mexico, Nigeria and Norway were made as a result of the Group's bolder exploration strategy. The year 2012 also witnessed successful production start-ups especially in the fields of Usan, Islay, Bongkot South, Halfaya and South Mahakam. New major projects, such as Ofon II, Hild and Tempa Rossa, were launched in order to secure growth in the years to come. In 2012, the Group also extended its oil and gas acreage by obtaining licenses in promising exploration areas, particularly in Iraq, Bulgaria, Uruguay, Kenya and Kazakhstan.

At the same time, TOTAL disposed of certain mature or non-strategic Upstream assets, such as stakes in pipelines in Norway, its production subsidiary in Columbia or minority stakes in assets in Nigeria and the North Sea. It also announced the sale of its stakes in the OML 138 offshore Block in Nigeria including the Usan field.

In the Refining & Chemicals segment, TOTAL set out its strategy of increasing the competitive performance of its activities to boost the segment's profitability from 6% in 2010 to 13% in 2015 in the market environment of 2010, scaling down its exposure to mature zones, mainly Europe, and bolstering its presence in high-growth areas. Thus, the year 2012 witnessed advances in the modernization of the refinery in Normandy, France, and the construction of the Jubail refinery in Saudi Arabia slated to start production in 2013.

In the Marketing & Services segment, the Group restructured its organization in 2012 in order to achieve its ambitions for growth. It consolidated its leading position in the African continent and in the Middle-East notably with the development of its activities in Jordan and its sale of specialty products. In Europe, it continued to optimize its activities by deploying its new concept of Total Access in 300 service stations by the end of 2012. In the New Energies segment, TOTAL stepped up its efforts to enhance its competitiveness in the field of photovoltaic solar energy against a backdrop of profound changes in the industry, and at the end of 2012, it announced the commercial success of its subsidiary SunPower with the sale of the Antelope Valley project in the United States.

The process initiated in 2004 to increase R&D budgets continued with expenditures of €805 million in 2012, up 4% compared with 2011, with the aim, in particular, of the continued improvement of the Group's technological expertise in the development of oil and gas resources and the development of solar, biomass, carbon capture and storage technologies in order to contribute to changes in the global energy mix.

Finally, in 2012, TOTAL reasserted the priority on safety and the environment as part of its operations throughout its business. For all of its projects conducted in a large number of countries, the Group puts an emphasis on Corporate Social Responsibility (CSR) challenges and the development of the local economies.

(1) Based on TOTAL's "European Refining Margin Indicator".
(2) Total Recordable Injury Rate.

As of December 31, 2012, the Group's activities were conducted through three business segments as defined below:

- an Upstream segment including the activities of Exploration & Production and Gas & Power;
- a Refining & Chemicals segment that is a major production hub combining TOTAL's refining, petrochemicals, fertilizers and specialty chemicals operations. This segment also includes oil Trading & Shipping activities;
- a Marketing & Services segment including the global supply and marketing of oil products as well as New Energies activities.

Moreover, the Corporate segment includes the operating and financial activities of the holding companies. As a result of the reorganizations carried out in 2012, information by business segment for comparative periods has been adjusted according to the new organization in force as from December 31, 2012.

1.2. 2012 Group results

(M€)	2012	2011	2010
Sales	200,061	184,693	159,269
Adjusted operating income from business segments[a]	24,986	24,409	19,797
Adjusted net operating income from business segments[a]	13,437	12,263	10,622
Net income (Group share)	10,694	12,276	10,571
Adjusted net income (Group share)[a]	12,361	11,424	10,288
Fully-diluted weighted-average shares (millions)	2,267	2,257	2,244.5
Adjusted fully-diluted earnings per share (euros)[a][b]	5.45	5.06	4.58
Dividend per share (euros)[c]	2.34	2.28	2.28
Net-debt-to-equity ratio (as of December 31)	21%	23%	22%
Return on Average Capital Employed (ROACE)[d]	16%	16%	16%
Return on Equity (ROE)	18%	18%	19%
Cash flow from operations	22,462	19,536	18,493
Investments	22,943	24,541	16,273
Divestments	5,871	8,578	4,316

(a) Adjusted results are defined as income using replacement cost, adjusted for special items, excluding the impact of changes for fair value from January 1, 2011, and, through June 30, 2010 excluding TOTAL's equity share of adjustments related to Sanofi.
(b) Based on fully-diluted weighted-average number of common shares outstanding during the period.
(c) Dividend 2012 is subject to the approval by the Shareholder's Meeting on May 17, 2013.
(d) Based on adjusted net operating income and average capital employed at replacement cost (excluding after-tax inventory effect).

Market environment	2012	2011	2010
Exchange rate €-$	1.28	1.39	1.33
Brent ($/b)	111.7	111.3	79.5
European Refinery Margin Indicator (ERMI) [a] ($/t)	36.0	17.4	27.4

(a) ERMI is an indicator intended to represent the margin after variable costs for a hypothetical complex refinery located around Rotterdam in Northern Europe. The indicator margin may not be representative of the actual margins achieved by TOTAL in any period because of TOTAL's particular refinery configurations, product mix effects or other specific operating conditions.

Adjustments to operating income from business segments

(M€)	2012	2011	2010
Special items affecting operating income from the business segments	(2,342)	(873)	(1,394)
Restructuring charges	(2)	-	-
Impairments	(1,474)	(781)	(1,416)
Other	(866)	(92)	22
Effect of change in fair value	(9)	45	-
Pre-tax inventory effect (FIFO vs, replacement cost) [a]	(234)	1,215	993
Total adjustments affecting operating income from the business segments	**(2,585)**	**387**	**(401)**

(a) See Note 1N to the Consolidated Financial Statements.

Adjustments to net income (Group share)

(M€)	2012	2011	2010
Special items affecting net income (Group share)	(1,503)	(14)	(384)
Gain on asset sales	581	1,538	1,046
Restructuring charges	(77)	(122)	(53)
Impairments	(1,112)	(1,014)	(1,224)
Other	(895)	(416)	(153)
Equity share of adjustment items related to Sanofi[a]	-	-	(81)
Effect of changes in fair value	(7)	32	-
After-tax inventory effect (FIFO vs, replacement cost[b])	(157)	834	748
Total adjustments to net income (Group share)	**(1,667)**	**852**	**283**

(a) Effective July 1, 2010, Sanofi is no longer treated as an equity affiliate. TOTAL's share in Sanofi. TOTAL's share in Sanofi was 5.5% on December 31, 2010, and 0% on December 31, 2012.
(b) See Note 1N to the Consolidated Financial Statements.

1.2.1. Sales

Consolidated sales increased by 8% to € 200,061 million in 2012 from €184,693 million in 2011.

1.2.2. Operating income

On average, the oil market environment was stable compared to the previous year. For 2012, the average Brent price remained around 111.7 $/b and the average realized price of gas for the Group increased by 3% to 6.74 $/Mbtu, compared to 6.53 $/Mbtu in 2011. In the downstream, the ERMI increased to 36.0 $/t on average for 2012, compared to 17.4 $/t in 2011.

The euro-dollar exchange rate averaged 1.28 $/€ in 2012 compared to 1.39 $/€ in 2011.

In this environment, the adjusted operating income from the business segments was €24,986 million, an increase of 2% compared to 2011[1]. Expressed in dollars[2], the adjusted operating income for the business segments was $32.1 billion, a decrease of 6% compared to 2011, essentially due to lower Upstream results which were partially offset by improved results from Refining & Chemicals and Marketing & Services.

The effective tax rate[3], for the business segments was 55.2% in 2012 compared to 57.9% in 2011, essentially due to a decrease in the effective tax rate for Upstream and the increased contribution of downstream activities to the Group results.

Adjusted net operating income from the business segments was €13,437 million compared to €12,263 million in 2011, an increase of 10%.

Expressed in dollars, adjusted net operating income from the business segments increased by 1%. The fact that adjusted net operating income from the business segments increased in 2012 while the adjusted operating income from the business segments decreased compared to 2011 is explained mainly by the decrease in the effective tax rates in the two periods and an increase in the contribution of equity affiliates to adjusted results.

1.2.3. Net income (Group share)

Adjusted net income was €12,361 million in 2012, an increase of 8% compared to €11,424 million in 2011. Expressed in dollars, adjusted net income of $15.9 billion was stable compared to 2011.

Adjusted net income excludes the after-tax inventory effect, special items and the effect of changes in fair value:

- The after-tax inventory effect had a negative impact on net income of €157 million in 2012 and a positive impact of €834 million in 2011.
- Changes in fair value had a negative impact on net income of €7 million in 2012 and a positive impact of €32 million in 2011.
- Special items had a negative impact on net income of €1,503 million in 2012, comprised essentially of an impairment of assets in the Barnett in the US, provisions for abandonment costs relating to Elgin in the UK, a one-off tax of 4% on petroleum stocks in France, an impairment of chemicals assets in Europe, and a provision relating to a settlement agreement in progress with the SEC and DoJ in the US. These special items were partially offset by gains on asset sales. In 2011, special items had a negative impact of €14 million.

Net income (Group share) was €10,694 million compared to €12,276 million. The effective tax rate for the Group was 56.2% in 2012 compared to 58.4% in 2011. On December 31, 2012, there were 2,270.4 million fully-diluted shares compared to 2,263.8 million on December 31, 2011.

In 2012, adjusted fully-diluted earnings per share, based on 2,266.6 million fully-diluted weighted-average shares, was €5.45, an increase of 8% compared to €5.06 in 2011.

Expressed in dollars, adjusted fully-diluted earnings per share was $7.01 compared to $7.05 in 2011, a decrease of 1%.

1.2.4. Investments - divestments

Investments, excluding acquisitions and including changes in non-current loans, were €18.5 billion ($23.8 billion) in 2012 compared to €14.8 billion ($20.6 billion) in 2011, due to an increase in investments relating to new Upstream projects under development.

Acquisitions were €3.1 billion ($4.0 billion) in 2012, comprised essentially of the acquisition of interests in exploration and production licenses in Uganda, an additional 1.3% stake in Novatek[4], various

(1) Special items affecting operating income from the business segments had a negative impact of €2,342 million in 2012 and a negative impact of €873 million in 2011.
(2) Dollar amounts represent euro amounts converted at the average €-$ exchange rate for the period: 1.2848 $/€ for the full year 2012; 1.3920 $/€ for the full year 2011; 1.3257 $/€ for the full year 2010.
(3) Defined as: (tax on adjusted net operating income) / (adjusted net operating income – income from equity affiliates – dividends received from investments + tax on adjusted net operating income).
(4) The Group's interest in Novatek was 15.3% at December 31, 2012.

exploration licenses, the minority interest in Fina Antwerp Olefins and the carry agreement in the Utica shale gas and condensates field in the US.

For 2012, asset sales were €4.6 billion ($5.9 billion), comprised essentially of sales of the remainder of the Group's shares of Sanofi, a stake in the Gassled pipeline in Norway, Upstream assets in Nigeria, the UK, Colombia and France, as well as interests in Pec-Rhin and Geostock in France and in Composites One in the US.

Net investments were €17.1 billion ($21.9 billion) in 2012, compared to €16.0 billion ($22.2 billion) in 2011, an increase of 7%.

Expressed in dollars, net investments in 2012 decreased 1%, mainly due to a significant decrease in acquisitions compared to 2011.

1.2.5. Profitability

The ROACE for the Group for 2012 was 16%, stable compared to 2011. Return on Equity for 2012 was 18%, also stable compared to 2011, and 19% in 2010.

1.3. Upstream results

Environment - liquids and gas price realizations[a]	2012	2011	2010
Brent ($/b)	111.7	111.3	79.5
Average liquids price ($/b)	107.7	105.0	76.3
Average gas price ($/Mbtu)	6.74	6.53	5.15
Average hydrocarbons price ($/boed)	77.3	74.9	56.7

(a) Consolidated subsidiaries, excluding fixed margin. Effective first quarter 2012, over/under-lifting valued at market prices.

TOTAL benefited from favorable market conditions for Upstream in 2012. The Group's average realizations for liquids and gas rose by 3% during 2012 compared to 2011.

Hydrocarbons production	2012	2011	2010
Liquids (kb/d)	1,220	1,226	1,340
Gas (Mcf/d)	5,880	6,098	5,648
Combined productions (kboe/d)	2,300	2,346	2,378

In 2012, hydrocarbon production was 2,300 kboe/d, a decrease of 2% compared to 2011, essentially as a result of:

- +4.5% for start-ups and ramp-ups from new projects,
- -4% for normal decline,
- +1.5% for changes in the portfolio, comprised essentially of an increased share of Novatek production and the impact of the sale of CEPSA and assets in the UK, France, Nigeria, and Cameroon,
- -2% for incidents at Elgin in the UK North Sea and Ibewa in Nigeria,
- -1.5% for disruptions related to security conditions in Yemen and the production shut-down in Syria, net of the positive effect of the return of production in Libya, and
- -0.5% for price effect[1].

Year-end reserves	2012	2011	2010
Liquids (Mb)	5,686	5,784	5,987
Gas (Bcf)	30,877	30,717	25,788
Hydrocarbon reserves (Mboe)	11,368	11,423	10,695

Proved reserves based on SEC rules (based on Brent at 111.13 $/b) were 11,368 Mboe at December 31, 2012. Based on the 2012 average rate of production, the reserve life is more than 13 years.

The 2012 proved reserve replacement rate[2], based on SEC rules, was 93%.

The 2012 organic proved reserve replacement rate[3] was 100% in a constant price environment.

At year-end 2012, TOTAL had a solid and diversified portfolio of proved and probable reserves[4] representing more than 20 years of reserve life based on the 2012 average production rate, and resources[5] representing more than 45 years of production.

Effective July 1, 2012, the Upstream segment no longer includes the activities of New Energies, which are now reported with Marketing & Services. As a result, certain information has been restated according to the new organization.

Results (M€)	2012	2011	2010
Adjusted operating income	22,108	22,609	17,694
Adjusted net operating income	11,186	10,602	8,629
Cash flow from operating activities	18,950	17,044	15,617
Adjusted cash flow	18,306	17,661	14,176
Investments	19,618	20,662	13,049
Divestments	2,798	2,591	2,067
Return on Average Capital Employed[a]	18%	21%	-

(a) 2009 capital employed was not recalculated according the new organization.

Adjusted net operating income from the Upstream segment in 2012 was €11,186 million compared to €10,602 million in 2011, an increase of 6%. Expressed in dollars, adjusted net operating income from the Upstream segment was $14.4 billion, a decrease of 3% compared to 2011 explained mainly by the decrease in hydrocarbon production, since the increase technical costs (as discussed below) was largely offset by the decrease in the effective tax rate for the Upstream.

Technical costs for consolidated subsidiaries, in accordance with ASC 932[6], were 22.8 $/boe in 2012, compared to 18.9 $/boe in 2011, mainly due to increased depreciation of tangible assets relating to start-ups such as Pazflor, Halfaya, and Usan, as well as increased exploration expenses.

The Return on Average Capital Employed (ROACE) for the Upstream segment was 18% in 2012 compared to 21% in 2011.

(1) Impact of changing hydrocarbon prices on entitlement volumes.
(2) Change in reserves excluding production *i.e.* (revisions + discoveries, extensions + acquisitions – divestments) / production for the period.
(3) The reserve replacement rate in an environment with a constant 110.96 $/b oil price, excluding acquisitions and divestments.
(4) Limited to proved and probable reserves covered by E&P contracts on fields that have been drilled and for which technical studies have demonstrated economic development in a 100 $/b Brent environment, including projects developed by mining.
(5) Proved and probable reserves plus contingent resources (potential average recoverable reserves from known accumulations - Society of Petroleum Engineers - 03/07).
(6) FASB Accounting Standards Codification Topic 932, Extractive industries – Oil and Gas.

1.4. Refining & Chemicals results

Operational data[a]	2012	2011	2010
Total refinery throughput (kb/d)	1,786	1,863	2,009

(a) Includes share of CEPSA, through July 31, 2011, and of TotalErg. Results for refineries in South Africa, French Antilles and Italy are reported in the Marketing & Services segment.

In 2012, refinery throughput decreased by 4% compared to 2011, reflecting essentially the portfolio effect relating to the sale of the Group's interest in CEPSA at the end of July 2011 and the closure of the Rome refinery at the end of the third quarter 2012. Excluding these portfolio effects, throughput increased by 4% due to increased availability of the Group's refineries. As in 2011, 2012 was marked by higher levels of planned maintenance at European refineries, in particular the temporary shut-down of the Normandy refinery during the upgrading project at the end of 2012, as well as scheduled maintenance at the Provence and Feyzin refineries.

Results

(M€)	2012	2011	2010
Adjusted operating income	1,513	613	793
Adjusted net operating income	1,414	848	1,012
Including Specialty Chemicals	*384*	*423*	*475*
Cash flow from operating activities	2,127	2,146	1,226
Adjusted net operating income	2,170	1,318	2,115
Investments	1,944	1,910	2,124
Divestments	304	2,509	763
Return on Average Capital Employed[a]	9%	5%	-

(a) 2009 capital employed was not recalculated according the new organization.

For 2012, the ERMI was 36.0 $/t, more than double the average during 2011.

Adjusted net operating income from the Refining & Chemicals segment in 2012 was €1,414 million, an increase of 67% compared to €848 million in 2011.

Expressed in dollars, adjusted net operating income was $1.8 billion, an increase of 54% compared to 2011. This increase is mainly due to the positive effect of improved refining margins in Europe, noting that throughput at the Group's refineries decreased on a global basis by 4% between the two periods, and the petrochemical environment weakened, particularly in Europe and in polymers. The decrease in adjusted net operating income for the Specialty Chemicals is attributable entirely to the sale of the resins business in mid-2011. Excluding this portfolio effect, the adjusted net operating income for the Specialty Chemicals would have increased slightly.

The ROACE for the Refining & Chemicals segment was 9% for 2012, compared to 5% for 2011.

1.5. Marketing & Services results

Operational data [a]	2012	2011	2010
Refined products sales (kb/d)	1,710	1,987	2,116

(a) Excludes trading and bulk sales, includes share of CEPSA, through July 31, 2011, and of TotalErg.

For 2012, the decrease in sales of 14% compared to 2011 was almost entirely attributable to the sale of the Group's interest in CEPSA and the sale of marketing activities in the UK.

Effective July 1, 2012, Marketing & Services includes the activities of New Energies. As a result, certain information has been restated according to the new organization.

Results

(M€)	2012	2011	2010
Sales	86,614	85,325	75,580
Adjusted operating income	1,365	1,187	1,310
Adjusted net operating income	837	813	981
Including New Energies	*(169)*	*(197)*	*n/a*
Cash flow from operating activities	1,132	541	1,105
Adjusted cash flow	1,192	1,103	1,405
Investments	1,301	1,834	1,019
Divestments	152	1,955	83
Return on Average Capital Employed [(a)]	12%	13%	-

(a) 2009 capital employed was not recalculated according the new organization.

For 2012, Marketing & Services sales were €86.6 billion, an increase of 2% compared 2011.

Adjusted net operating income from the Marketing & Services segment was €837 million in 2012, an increase of 3% compared to €813 million in 2011. This increase is explained principally by the improved performance of New Energies. Marketing activities continued to provide stable results despite sales volumes generally decreasing, due in particular to improved results from activities in the Asia-Pacific and Eastern European regions.

The ROACE for the Marketing & Services segment was 12% for 2012, compared to 13% for 2011.

1.6. TOTAL S.A. 2012 results

Net income for TOTAL S.A., the parent company, was €6,520 million in 2012, compared to €9,766 million in 2011.

1.7. Proposed dividend

After closing the 2012 accounts, the Board of Directors decided to propose at the May 17, 2013, Annual Shareholders' Meeting a dividend of 2.34 euros per share for 2012, an increase of approximately 3% compared to the previous year.

Based on 2012 adjusted net income, the payout ratio would be 43%.

Taking into account the three 2012 interim dividends, the remaining 0.59 euros per share would be paid on June 27, 2013[(1)].

2. Liquidity and capital resources

2.1. Long-term and short-term capital

Long-term capital
As of December 31,

(M€)	2012	2011	2010
Shareholders' equity	72,894[(a)]	68,134	58,718
Non-current financial debt	22,274	22,557	20,783
Hedging instruments of non-current financial debt	(1,626)	(1,976)	(1,870)
Total net non-current capital	**93,542**	**88,715**	**77,631**

(a) Based on a 2012 dividend of €2.34 per share.

(1) The ex-dividend date for the remainder of the 2012 dividend would be June 24, 2013 ; for the ADR (NYSE:TOT) the ex-dividend date would be June 19, 2013.

Short-term capital
As of December 31,

(M€)	2012	2011	2010
Current borrowings	11,016	9,675	9,653
Net current financial assets	(1,386)	(533)	(1,046)
Net current financial debt	**9,630**	**9,142**	**8,607**
Cash and cash equivalents	(15,469)	(14,025)	(14,489)

2.2. Cash flow

(M€)	2012	2011	2010
Cash flow from operating activities	22,462	19,536	18,493
Changes in working capital at replacement cost	850	(524)	497
Cash flow from operating activities before changes in working capital at replacement cost	**21,612**	**20,060**	**17,996**
Investments	(22,943)	(24,541)	(16,273)
Total divestments	5,871	8,578	4,316
Net cash flow at replacement cost, before changes in working capital	**4,540**	**4,097**	**6,039**
Dividends paid	(5,288)	(5,312)	(5,250)
Purchase of treasury shares	(68)	-	-
Net-debt-to-equity ratio at December 31	21%	23%	22%

Cash flow from operations was €22,462 million in 2012, an increase of 15% compared with 2011, essentially due to the favorable change in working capital requirements between the two periods.

Adjusted cash flow from operations(1) was €21,612 million, an increase of 8%. Expressed in dollars, adjusted cash flow from operations was $27.8 billion, a decrease of 1% compared with 2011.

The Group's net cash flow(2) was €5,390 million against €3,573 million in 2011. Expressed in dollars, the Group's net cash flow was $6.9 billion in 2012.

The net-debt-to-equity ratio was 21.4% on December 31, 2012, compared with 23.0% on December 31, 2011.

2.3. Borrowing requirements and funding structure

The Group's policy consists of incurring non-current debt primarily at a floating rate, or, if the opportunity arises at the time of an issuance, at a fixed rate. Debt is incurred in dollars, euros or Canadian dollars according to general Corporate needs. Long-term interest rate and currency swaps may be used to hedge bonds at their issuance in order to create a variable or fixed rate synthetic debt. In order to partially modify the interest rate structure of the long-term debt, TOTAL may also enter into long-term interest rate swaps.

The non-current debt is generally raised by the Corporate treasury entities either directly in dollars, euros or Canadian dollars, or in other currencies which are then exchanged for dollars, euros or Canadian dollars through swap issues to appropriately match general Corporate needs.

The Group has established standards for market transactions under which bank counterparties must be approved in advance, based on an assessment of the counterparty's financial soundness (multi-criteria analysis including a review of the market capitalization and of the Credit Default Swap (CDS), its ratings with Standard & Poor's and Moody's, which must be of high quality, and its overall financial condition).

An overall authorized credit limit is set for each bank and is allotted among the subsidiaries and the Group's central treasury entities according to their needs.

To reduce the market values risk on its commitments, in particular for swaps set as part of bonds issuance, the Group also developed a system of margin call that is implemented with significant counterparties.

(1) Cash flow from operations at replacement cost before changes in working capital.
(2) Net cash flow = cash flow from operations + divestments - gross investments.

2.4. External financing available

As of December 31, 2012, the aggregate amount of the major confirmed credit facilities granted by international banks to Group companies (including TOTAL S.A.) was $11,328 million (compared with $11,447 million on December 31, 2011), of which $10,921 million were unused ($11,154 million unused on December 31, 2011).

TOTAL S.A. has confirmed credit facilities granted by international banks, which allow the Company to fund a significant cash reserve. As of December 31, 2012, these credit facilities amounted to $10,519 million (compared with $10,139 million on December 31, 2011), of which $10,463 million were unused (compared with $10,096 million unused on December 31, 2011).

The agreements for the lines of credit granted to TOTAL S.A. do not contain conditions related to the Company's financial ratios, to its financial ratings from specialized agencies, or to the occurrence of events that could have a material adverse effect on its financial position.

Credit facilities granted to Group companies other than TOTAL S.A. are not intended to finance the Group's general needs; they are intended to finance either the general needs of the borrowing subsidiary or a specific project.

As of December 31, 2012, no restrictions applied to the use of the Group companies' capital (including TOTAL S.A.) that could significantly impact the Group's activities, directly or indirectly.

2.5. Anticipated sources of financing

Investments, working capital and dividend payments are financed essentially by the cash flow generated from operating activities, asset disposals and, if necessary, by net borrowings.

For the coming years and based on the current financing conditions, the Company intends to maintain this method of financing the Group's investments and activities.

3. Research & Development

In 2012, Research & Development (R&D) expenses amounted to €805 million, compared with €776 million in 2011 and €715 million in 2010. The process initiated in 2004 to increase R&D budgets continued in 2012.

The portfolio managed by the entity tasked with developing SMEs specialized in innovative energy technologies and cleantechs has grown regularly since 2009.

In 2012, 4,110 people were dedicated to R&D activities, compared with 3,946 in 2011 and 4,087 in 2010. This is mainly due to changes in the scope of the Group's activities.

There are six major R&D focuses at TOTAL:

– developing knowledge, tools and technological mastery to discover and profitably operate complex oil and gas resources to help meet the global demand for energy;

– developing and industrializing solar, biomass and carbon capture and storage technologies to help prepare for future energy needs;

– developing practical, innovative and competitive materials and products that meet customers' specific needs, contribute to the emergence of new features and systems, enable current materials to be replaced by materials showing higher performance for users, and address the challenges of improved energy efficiency, lower environmental impact and toxicity, better management of their life cycle and waste recovery;

– developing, industrializing and improving first-level competitive processes for the conversion of oil, coal and biomass resources to adapt to changes in resources and markets, improve reliability and safety, achieve better energy efficiency, reduce the environmental footprint and maintain the Group's economic margins in the long term;

– understanding and measuring the impacts of the Group's operations and products on ecosystems (water, soil, air, biodiversity) to improve environmental safety, as part of the regulation in place, and reduce their environmental footprint to achieve sustainability in the Group's operations; and

– mastering and using innovative technologies such as biotechnologies, materials sciences, nanotechnologies, high-performance computing, information and communications technologies and new analytic techniques.

These issues are addressed synergistically within a portfolio of projects. Different aspects may be looked at independently by different divisions.

3.1. Upstream

3.1.1. Exploration & Production

In addition to continuously optimizing the development of deep-offshore projects and gas resources, TOTAL continues to improve its computing, exploration, seismic acquisition and processing tools in the long term as well as those for the initial appraisal of hydrocarbon reservoirs and simulation of field evolution during operations, especially for tight, very deep or carbonated reservoirs.

R&D activity has been intensified in the shale gas and oil sector, with a strong focus on water management throughout the production cycle and the search for alternatives to hydraulic fracking.

In 2012, the Group decided to join the consortium that is developing the Intersect simulator. The Group also launched a major effort to develop exploration and operational technologies in very cold regions.

Enhancing oil recovery from mature reservoirs and recovery of heavy oil and bitumen with lesser environmental impacts are also subjects involving major research. In particular, new technologies for the exploitation of oil shales by pyrolysis are being developed.

The oxycombustion CO_2 capture and storage project in the depleted Rousse reservoir in Lacq (France) is about to reach the end of the active reinjection phase, before progressing to the monitoring phase. The Group now has a strong command of the methods used to characterize reservoirs for this type of injection. New projects will look into new and more economical capturing solutions.

Finally, water management and the production of hydrocarbons are also the subject of increased R&D activities.

3.1.2 Gas & Power

The program to develop new LNG (Liquefied Natural Gas) solutions is continuing.

3.2. Refining & Chemicals

3.2.1. Refining & Petrochemicals

R&D in the realm of refining and petrochemicals came under review in 2012 as part of the reorganization of the Group. The priorities are:

- to make the best possible use of synergy between industrial units;
- to maximize value creation, by benefiting from diversified resources;
- to continuously improve the safety, performance and energy efficiency of processes through a better understanding of the mechanisms involved and the relations between the structure and the properties of the loads and products;
- to propose a differentiated variety of products to meet the market's needs, and in particular for fuels and polymers;
- to give the Group the means of meeting the environmental obligations of its units and products, as part of its drive for continuous improvement.

In Refining & Chemicals, TOTAL is preparing for the emergence of tomorrow's resources, including non-conventional oil and biomass, and develops products that meet the market's needs, such as higher-performance and energy-saving fuels and base oils.

Several R&D projects are ongoing in the field of the production of second-generation biofuels, in partnerships with industrial manufacturers (the BioTfueL project) or universities.

Sustained efforts are also being made to continuously improve the performance of processes and to improve the results of the manufacturing sites.

The development of new grades of polymers remains a cornerstone of the Petrochemicals strategy. Futerro, the joint venture formed by Galactic and TOTAL, is the technological leader in the polylactic acid (PLA) production chain, from monomer production to polymer recycling.

The optimization of the UOP-Total olefin production process from methanol (MTO/OCP) has reached its objectives. An industrial project is currently being examined and efforts continue to support the licensing of this technology.

Finally, through Hutchinson, Bostik and Atotech in the Refining & Chemicals segment, Petrochemicals is involved in "Materials Sciences" projects aimed at developing and bringing to light the division's skills and innovations in the field of materials. The third generation of the "Total Car Concept" project aims to demonstrate the benefits of these technologies.

3.2.2. Specialty Chemicals

R&D has strategic importance for the Specialty Chemicals. It is closely linked to the needs of subsidiaries and industrial customers.

Hutchinson is continuing to pursue its four main areas of research: energy efficiency, mass reduction, electrification and control, comfort and safety. Hutchinson develops products and technologies on the strength of its capacity to formulate original and advanced materials and its command of the systems in which its products are integrated. Significant developments have been made in chemical analysis and digital simulation.

Bostik is focusing its research activities on three technology platforms: hot-melt adhesives, reactive elastomers and hydraulic polymer-binder systems. Based on these technologies, R&D is developing practical, sustainable assembly solutions that meet the needs of markets in terms of energy efficiency (construction, transport), material efficiency (health, industry) and environmental impacts throughout their life cycle.

Atotech is one of the world leaders for integrated production systems (chemicals, equipment, know-how and service) for industrial surface finishing and the manufacturing of integrated circuits. Given the environmental challenges related to electroplating, nearly half of Atotech's R&D projects are intended to develop cleaner technologies and create conditions for the Sustainable Development of these industries.

3.3. Marketing & Services

3.3.1. Marketing & Services

The Marketing & Services R&D strategy and organization came under review in 2012 in line with the organization and the challenges facing the sector.

The priorities are:

– the development of fuels, specification and high-performance additives and heating fuels that meet the market's needs, such as the changes in environmental regulations and the adaptation to new resources, including those from the biomass;

– the development of new families of bitumen, by working on its properties and issues of logistics and product applications;

– the development of advanced lubricants for a broad range of sectors and customers;

– the development of analytical and screening methods that optimize the product development process.

Moreover, know-how in the realm of engine tests and analytical product characterization is also deemed to be critical.

3.3.2. New Energies

R&D efforts in New Energies cover both the production processes of SunPower cells, which aim to speed up the reduction of production costs, and the future generations of photovoltaic cells, as part of several partnerships with recognized academic research institutes and start-ups. In particular, TOTAL is a partner in the important institutional project, IPVF, launched by the Université Paris-Saclay.

Energy production from biomass is the other major R&D challenge in the development of New Energies. Through its own biotechnology research team, the Group is taking part in a program to develop several production processes using biomass, and in biotechnological projects to transform the biomass into advanced biofuels or molecules that can be used in chemical applications. The Group's main partnership is with Amyris, in which the Group holds a stake.

3.4. Environment

Environmental issues are important throughout the Group and are taken into account in all R&D projects. They involve environmental risk management, including in particular:

– water management, notably by reducing the use of water from natural continental environments and by lowering emissions in compliance with the regulations in force;

– reduction of greenhouse gases through the improvement of energy efficiency and carbon capture and storage;

– detection and reduction of emissions into the air and simulation of their dissemination;

– prevention of soil contamination and regulatory compliance with regard to historical aspects and the rehabilitation of sites;

– changes in the Group's different products and management of their life cycle, in particular in compliance with the REACH Directive.

3.5. R&D organization

The Group intends to increase R&D in all of its business units through cross-functional themes and technologies. Attention is paid to synergies of R&D efforts between business units.

The Group has twenty-one R&D sites worldwide and has developed approximately 600 partnerships with other industrial groups and academic or highly specialized research institutes. TOTAL also has a permanently renewed network of scientific advisors worldwide that monitor and advise on matters of interest to the Group's R&D activities. Long-term partnerships with universities and academic laboratories, deemed strategic in Europe, the United States, Japan and China, as well as innovative small businesses are part of the Group's approach.

Each segment is developing an active intellectual property activity, aimed at protecting its innovations, allowing its activity to develop without constraints as well as facilitating its partnerships. In 2012, more than 250 new patent applications were issued by the Group.

4. Trends and outlook

4.1. Outlook

To create profitable and sustainable growth, TOTAL invests in value-creating projects and optimizes its portfolio, in particular by divesting non-core assets and subsidiaries with limited growth potential or those in which the Group has a low working interest.

The net investment budget of TOTAL for 2013 is $22 billion, stable compared to 2011 and 2012. In executing its 2012-14 asset sale program of $15-20 billion, the Group sold $6 billion of assets in 2012 and anticipates reaching the low-end of its target range by the end of 2013 with the closing of the Usan sale and other divestments already in progress. The organic investment budget for 2013 is $28 billion, more than 80% of which will be dedicated to Upstream, principally for highly competitive and profitable projects scheduled to start-up before 2017.

The Group also confirms its commitment with respect to R&D with a budget of about $1.3 billion in 2013.

In the Upstream, TOTAL confirms its production growth targets for 2015, 3% per year on average over the period 2011-2015, and for 2017, a potential of 3 Mboe/d, all based on improved visibility. TOTAL is focused on delivering its projects on time and in budget. In 2013, production growth should be fueled by 2012 start-ups as well as anticipated 2013 start-ups, including Anguille in Gabon, Angola LNG, Kashagan in Kazakhstan, and the extension of OML 58 in Nigeria. In addition, the Group continues to work in cooperation with the UK authorities towards a safe and progressive restart of Elgin-Franklin during the first quarter 2013. Visibility on the Group's production growth targets will be further enhanced this year by the launch of additional major projects, notably in West Africa.

The exploration budget has been increased to $2.8 billion for 2013, and the high-potential exploration program for 2013 reflects the new dynamic of the Group, with prospects to be drilled in Côte d'Ivoire, Gabon, Kenya, and Brazil.

In Refining & Chemicals, the restructuring in progress should yield productivity gains and provide synergies in 2013, and in turn contribute to increased profitability, in line with the objective of a segment ROACE of 13% in 2015. The year 2013 also should be highlighted by the start-up of Jubail in Saudi Arabia. This fully-integrated refinery will have a 400 kb/d capacity for heavy crude and will provide refined products to growth markets like the Middle East and Asia.

Marketing & Services seeks to continue to strengthen its worldwide positions and to capitalize on its ability to respond to its customers' needs. New Energies will pursue its productivity, development, and innovation programs to increase its contribution.

The Group confirms its commitment in favor of a competitive policy for returns to shareholders, in keeping with its objective of sustainable growth.

4.2. Risks and uncertainties

Due to the nature of its business, the Group's activities remain subject to the usual market risks (sensitivity to the environmental parameters of the oil and financial markets), industrial and environmental risks related to its operations, and to political or geopolitical risks stemming from the global presence of most of its activities.

Risks relative to cash management operations and to interest rate and foreign exchange financial instruments are managed according to rules set by the Group's General Management, which provide for regular pooling of available cash balances, open positions and management of the financial instruments by the Group's General Management.

Detailed information is given in the Risk Factors section (Chapter 4), of this Registration Document. For more information, also refer to the Chairman's report in paragraph 1.10. of Chapter 5.

4.3. Sensitivity of the 2013 results to market environment(a)

Market environment parameters	Scenario	Change	Estimated impact on adjusted operating income	Estimated impact on adjusted net operating income
Dollar	1.30 $/€	+0.1 $ per €	-2.2 B€	-0.95 B€
Brent	100 $/b	+1 $/b	+0.24 B€/0.31 B$	+0.11 B€/0.14 B$
European refining margins (ERMI)	30 $/t	+1 $/t	+0.08 B€/0.1 B$	+0.05 B€/0.06 B$

(a) Sensitivities revised once per year upon publication of the previous year's fourth quarter results. Indicated sensitivities are approximate and based upon TOTAL's current view of its 2013 portfolio. Results may differ significantly from the estimates implied by the application of these sensitivities. The impact of the €-$ sensitivity on adjusted operating income and adjusted net operating income attributable to the Upstream segment are approximately 80% and 70% respectively. The remaining impact of the sensitivity is essentially in the Refining & Chemicals segment.

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1. Financial risks

Financial risks are detailed in Note 31 to the Consolidated Financial Statements (point 7., Chapter 9).

1.1. Sensitivity to market environment

The financial performance of TOTAL is sensitive to a number of factors, the most significant being crude oil and natural gas prices, refining margins and exchange rates, in particular that of the dollar versus the euro.

Generally, a rise in the price of crude oil has a positive effect on earnings as a result of an increase in revenues from oil and gas production. Conversely, a decline in crude oil prices reduces revenues. For the year 2013, according to the scenarios retained, the Group estimates that an increase or decrease of $1.00 per barrel in the price of Brent crude would respectively increase or decrease the annual adjusted net operating income by approximately €0.11 billion ($0.14 billion[1]). The impact of changes in crude oil prices on downstream operations depends upon the speed at which the prices of finished products adjust to reflect these changes. The Group estimates that an increase or decrease in European refining margins (ERMI) of $1.00 per ton would increase or decrease the annual adjusted net operating income by approximately €0.05 billion ($0.06 billion[1]).

All of the Group's activities are, to various degrees, sensitive to fluctuations in the dollar/euro exchange rate. The Group estimates that a strengthening or weakening of the dollar against the euro by $0.10 per euro would respectively improve or reduce the annual adjusted net operating income, expressed in euro, by approximately €0.95 billion.

The Group's results, particularly in the Chemicals activity, also depend on the overall economic environment.

Summary of sensitivities 2013[a]	Scenario retained	Change	Estimated impact on adjusted operating income	Estimated impact on adjusted net operating income
€-$	1.30 $/€	+ $0.10 per €	-2.2 B€	-0.95 B€
Brent	100 $/b	+1 $/b	+0.24 B€/0.31 B$	+0.11 B€/0.14 B$
European refining margins (ERMI)	30 $/t	+1 $/t	+0.08 B€/0.1 B$	+0.05 B€/0.06 B$

(a) Sensitivities revised once per year upon publication of the previous year's fourth quarter results. The impact of the €-$ sensitivity on adjusted operating income and adjusted net operating income attributable to the Upstream segment are approximately 80% and 70% respectively. The remaining impact of the sensitivity is essentially on the Refining & Chemicals segment. Indicated sensitivities are estimates based upon assumptions of the Group's portfolio in 2013. Results may differ significantly from the estimates implied by the application of these sensitivities.

1.2. Oil and gas market related risks

Due to the nature of its business, the Group has significant oil and gas trading activities as part of its day-to-day operations in order to optimize revenues from its oil and gas production and to obtain favorable pricing to supply its refineries.

In its international oil trading business, the Group follows a policy of not selling its future production. However, in connection with this trading business, the Group, like most other oil companies, uses energy derivative instruments to adjust its exposure to price fluctuations of crude oil, refined products, natural gas, power and coal. The Group also uses freight rate derivative contracts in its shipping business to adjust its exposure to freight-rate fluctuations. To hedge against this risk, the Group uses various instruments such as futures, forwards, swaps and options on organized markets or over-the-counter markets. The list of the different derivatives held by the Group in these markets is detailed in Note 30 to the Consolidated Financial Statements.

The Trading & Shipping division measures its market risk exposure, *i.e.* potential loss in fair values, on its crude oil, refined products and freight rates trading activities using a value-at-risk technique. This technique is based on an historical model and makes an assessment of the market risk arising from possible future changes in market values over a 24-hour period. The calculation of the range of potential changes in fair values takes into account a snapshot of the end-of-day exposures and the set of historical price movements for the last 400 business days for all instruments and maturities in the global trading activities. Options are systematically re-evaluated using appropriate models.

The potential movement in fair values corresponds to a 97.5% value-at-risk type confidence level. This means that the Group's portfolio result is likely to exceed the value-at-risk loss measure once over 40 business days if the portfolio exposures were left unchanged.

(1) Calculated with a base case exchange rate of $1.30 per €1.00.

Trading & Shipping: value-at-risk with a 97.5% probability

As of December 31, (M€)	High	Low	Average	Year end
2012	**13.0**	**3.8**	**7.4**	**5.5**
2011	10.6	3.7	6.1	6.3
2010	23.1	3.4	8.9	3.8

As part of its gas, power and coal trading activity, the Group also uses derivative instruments such as futures, forwards, swaps and options in both organized and over-the-counter markets. In general, the transactions are settled at maturity date through physical delivery. The market risk exposure, *i.e.* potential loss in fair values, on its trading business is measured using a value-at-risk technique. This technique is based on an historical model and makes an assessment of the market risk arising from possible future changes in market values over a one-day period. The calculation of the range of potential changes in fair values takes into account a snapshot of the end-of-day exposures and the set of historical price movements for the past two years for all instruments and maturities in the global trading business.

Gas and power trading: value-at-risk with a 97.5% probability

As of December 31, (M€)	High	Low	Average	Year end
2012	**20.9**	**2.6**	**7.4**	**2.8**
2011	21.0	12.7	16.0	17.6
2010	13.9	2.7	6.8	10.0

The Group has implemented strict policies and procedures to manage and monitor these market risks. These are based on the separation of control and front-office functions and on an integrated information system that enables real-time monitoring of trading activities.

Limits on trading positions are approved by the Group's Executive Committee and are monitored daily. To increase flexibility and encourage liquidity, hedging operations are performed with numerous independent operators, including other oil companies, major energy producers or consumers and financial institutions. The Group has established counterparty limits and monitors outstanding amounts with each counterparty on an ongoing basis.

1.3. Financial markets related risks

As part of its financing and cash management activities, the Group uses derivative instruments to manage its exposure to changes in interest rates and foreign exchange rates. These instruments are mainly interest rate and currency swaps. The Group may also occasionally use futures contracts and options. These operations and their accounting treatment are detailed in Notes 1 paragraph M, 20, 28 and 29 to the Consolidated Financial Statements.

Risks relative to cash management operations and to interest rate and foreign exchange financial instruments are managed according to rules set by the Group's General Management, which provide for regular pooling of available cash balances, open positions and management of the financial instruments by the Treasury Department.

Excess cash of the Group is deposited mainly in government institutions, deposit banks, or major companies through deposits, reverse repurchase agreements and purchase of commercial paper. Liquidity positions and the management of financial instruments are centralized by the Treasury Department, where they are managed by a team specialized in foreign exchange and interest rate market transactions.

The Cash Monitoring-Management Unit within the Treasury Department monitors limits and positions per bank on a daily basis and results of the Front Office. This unit also prepares marked-to-market valuations of used financial instruments and, when necessary, performs sensitivity analysis.

1.4. Counterparty risk

The Group has established standards for market transactions under which bank counterparties must be approved in advance, based on an assessment of the counterparty's financial soundness (multi-criteria analysis including a review of market prices and of the Credit Default Swap (CDS), its ratings with Standard & Poor's and Moody's, which must be of high quality, and its overall financial condition).

An overall authorized credit limit is set for each bank and is allotted among the subsidiaries and the Group's central treasury entities according to their needs.

To reduce the market values risk on its commitments, in particular for swaps set as part of bonds issuance, the Treasury Department also developed a system of margin call that is gradually implemented with significant counterparties.

1.5. Currency exposure

The Group seeks to minimize the currency exposure of each entity to its functional currency (primarily the euro, the dollar, the Canadian dollar, the pound sterling and the Norwegian krone).

For currency exposure generated by commercial activity, the hedging of revenues and costs in foreign currencies is typically performed using currency operations on the spot market and, in some cases, on the forward market. The Group rarely hedges future cash flows, although it may use options to do so.

With respect to currency exposure linked to non-current assets booked in a currency other than the euro, the Group has a policy of reducing the related currency exposure by financing these assets in the same currency.

Net short-term currency exposure is periodically monitored against limits set by the Group's senior management.

The non-current debt described in Note 20 to the Consolidated Financial Statements is generally raised by the Corporate treasury entities either directly in dollars, in euros or in Canadian dollars, or in other currencies which are then exchanged for dollars or euros through swaps issues to appropriately match general Corporate needs. The proceeds from these debt issuances are loaned to affiliates whose accounts are kept in dollars, in Canadian dollars or in euros. Thus, the net sensitivity of these positions to currency exposure is not significant.

The Group's short-term currency swaps, the notional value of which appears in Note 29 to the Consolidated Financial Statements, are used to attempt to optimize the centralized cash management of the Group. Thus, the sensitivity to currency fluctuations which may be induced is likewise considered negligible.

1.6. Short-term interest rate exposure and cash

Cash balances, which are primarily composed of euros and dollars, are managed according to the guidelines established by the Group's General Management (maintain an adequate level of liquidity, optimize revenue from investments considering existing interest rate yield curves, and minimize the cost of borrowing) over a less than twelve-month horizon and on the basis of a daily interest rate benchmark, primarily through short-term interest rate swaps and short-term currency swaps, without modifying currency exposure.

1.7. Interest rate risk on non-current debt

The Group's policy consists of incurring non-current debt primarily at a floating rate, or, if the opportunity arises at the time of an issuance, at a fixed rate. Debt is incurred in dollars, in euros or in Canadian dollars according to general corporate needs of the Group. Long-term interest rate and currency swaps may be used to hedge bonds at their issuance in order to create a variable or fixed rate synthetic debt. In order to partially modify the interest rate structure of the long-term debt, TOTAL may also enter into long-term interest rate swaps.

1.8. Sensitivity analysis on interest rate and foreign exchange risk

The tables below present the potential impact of an increase or decrease of 10 basis points on the interest rate yield curves for each of the currencies on the fair value of the current financial instruments as of December 31, 2012, 2011 and 2010.

Assets/(Liabilities) (M€)	Carrying amount	Estimated fair value	Change in fair value due to a change in interest rate by +10 basis points	Change in fair value due to a change in interest rate by -10 basis points
As of December 31, 2012				
Bonds (non-current portion, before swaps)	(21,346)	(21,545)	97	(97)
Swaps hedging fixed-rates bonds (liabilities)	*(11)*	*(11)*	-	-
Swaps hedging fixed-rates bonds (assets)	*1,626*	*1,626*	-	-
Total swaps hedging fixed-rates bonds (assets and liabilities)	1,615	1,615	(58)	58
Current portion of non-current debt after swap (excluding capital lease obligations)	4,251	4,251	4	(4)
Other interest rates swaps	-	-	2	(2)
Currency swaps and forward exchange contracts	(50)	(50)	-	-
As of December 31, 2011				
Bonds (non-current portion, before swaps)	(21,402)	(22,092)	83	(83)
Swaps hedging fixed-rates bonds (liabilities)	*(146)*	*(146)*	-	-
Swaps hedging fixed-rates bonds (assets)	*1,976*	*1,976*	-	-
Total swaps hedging fixed-rates bonds (assets and liabilities)	1,830	1,830	(49)	49
Current portion of non-current debt after swap (excluding capital lease obligations)	3,488	3,488	3	(3)
Other interest rates swaps	(1)	(1)	3	(3)
Currency swaps and forward exchange contracts	47	47	-	-
As of December 31, 2010				
Bonds (non-current portion, before swaps)	(20,019)	(20,408)	86	(84)
Swaps hedging fixed-rates bonds (liabilities)	*(178)*	*(178)*	-	-
Swaps hedging fixed-rates bonds (assets)	*1,870*	*1,870*	-	-
Total swaps hedging fixed-rates bonds (assets and liabilities)	1,692	1,692	(59)	59
Current portion of non-current debt after swap (excluding capital lease obligations)	3,483	3,483	4	(4)
Other interest rates swaps	(2)	(2)	3	(3)
Currency swaps and forward exchange contracts	(101)	(101)	-	-

The impact of changes in interest rates on the cost of net debt before tax is as follows:

For the year ended December 31, (M€)	2012	2011	2010
Cost of net debt	(571)	(440)	(334)
Interest rate translation of:			
+10 basis points	(11)	(10)	(11)
-10 basis points	11	10	11
+100 basis points	(106)	(103)	(107)
-100 basis points	106	103	107

As a result of the policy for the management of currency exposure previously described, the Group's sensitivity to currency exposure is primarily influenced by the net equity of the subsidiaries whose functional currency is the dollar and, to a lesser extent, the pound sterling, the Norwegian krone and the Canadian dollar.

This sensitivity is reflected in the historical evolution of the currency translation adjustment recorded in the statement of changes in shareholders' equity which, in the course of the last three fiscal years, is essentially related to the fluctuation of dollar and pound sterling and is set forth in the table below:

	Euro/Dollar exchange rates	Euro/Pound sterling exchange rates
As of December 31, 2012	1.32	0.82
As of December 31, 2011	1.29	0.84
As of December 31, 2010	1.34	0.86

As of December 31, 2012 (M€)	Total	Euro	Dollar	Pound sterling	Other currencies and equity affiliates
Shareholders' equity at historical exchange rate	74,400	45,999	22,510	4,651	1,240
Currency translation adjustment before net investment hedge	(1,488)	-	(781)	(823)	116
Net investment hedge - open instruments	-	-	-	-	-
Shareholders' equity at exchange rate as of December 31, 2012	72,912	45,999	21,729	3,828	1,356

As of December 31, 2011 (M€)	Total	Euro	Dollar	Pound sterling	Other currencies and equity affiliates
Shareholders' equity at historical exchange rate	69,025	41,396	21,728	4,713	1,188
Currency translation adjustment before net investment hedge	(962)	-	127	(923)	(166)
Net investment hedge - open instruments	(26)	-	(25)	(1)	-
Shareholders' equity at exchange rate as of December 31, 2011	68,037	41,396	21,830	3,789	1,022

As of December 31, 2010 (M€)	Total	Euro	Dollar	Pound sterling	Other currencies and equity affiliates
Shareholders' equity at historical exchange rate	62,909	32,894	22,242	4,997	2,776
Currency translation adjustment before net investment hedge	(2,501)	-	(1,237)	(1,274)	10
Net investment hedge - open instruments	6	-	6	-	-
Shareholders' equity at exchange rate as of December 31, 2010	60,414	32,894	21,011	3,723	2,786

As a result of this policy, the impact of currency exchange rate fluctuations on consolidated income, as illustrated in Note 7 to the Consolidated Financial Statements, has not been significant over the last three years despite the considerable fluctuation of the dollar (a gain of €26 million in 2012, a gain of €118 million in 2011, nil result in 2010).

1.9. Stock market risk

The Group holds interests in a number of publicly-traded companies (see Notes 12 and 13 to the Consolidated Financial Statements). The market value of these holdings fluctuates due to various factors, including stock market trends, valuations of the sectors in which the companies operate, and the economic and financial condition of each individual company.

1.10. Liquidity risk

TOTAL S.A. has confirmed lines of credit granted by international banks, which are calculated to allow it to manage its short-term liquidity needs as required.

As of December 31, 2012, these lines of credit amounted to $10,519 million, of which $10,463 million was unused. The agreements for the lines of credit granted to TOTAL S.A. do not contain conditions related to the Company's financial ratios, to its financial ratings from specialized agencies, or to the occurrence of events that could have a material adverse effect on its financial position. As of December 31, 2012, the aggregate amount of the principal confirmed lines of credit granted by international banks to Group companies, including TOTAL S.A., was $11,328 million, of which $10,921 million was unused. The lines of credit granted to Group companies other than TOTAL S.A. are not intended to finance the Group's general needs; they are intended to finance either the general needs of the borrowing subsidiary or a specific project.

The following tables show the maturity of the financial assets and liabilities of the Group as of December 31, 2012, 2011 and 2010 (see Note 20 to the Consolidated Financial Statements).

As of December 31, 2012

Assets/(Liabilities) (M€)	Less than one year	1-2 years	2-3 years	3-4 years	4-5 years	More than 5 years	Total
Non-current financial debt (notional value excluding interests)	-	(3,832)	(3,465)	(2,125)	(3,126)	(8,100)	(20,648)
Current borrowings	(11,016)	-	-	-	-	-	(11,016)
Other current financial liabilities	(176)	-	-	-	-	-	(176)
Current financial assets	1,562	-	-	-	-	-	1,562
Assets and liabilities available for sale or exchange	(756)	-	-	-	-	-	(756)
Cash and cash equivalents	15,469	-	-	-	-	-	15,469
Net amount before financial expense	**5,083**	**(3,832)**	**(3,465)**	**(2,125)**	**(3,126)**	**(8,100)**	**(15,565)**
Financial expense on non-current financial debt	(746)	(625)	(519)	(405)	(352)	(1,078)	(3,725)
Interest differential on swaps	371	335	225	106	62	(37)	1,062
Net amount	**4,708**	**(4,122)**	**(3,759)**	**(2,424)**	**(3,416)**	**(9,215)**	**(18,228)**

As of December 31, 2011

Assets/(Liabilities) (M€)	Less than one year	1-2 years	2-3 years	3-4 years	4-5 years	More than 5 years	Total
Non-current financial debt (notional value excluding interests)	-	(4,492)	(3,630)	(3,614)	(1,519)	(7,326)	(20,581)
Current borrowings	(9,675)	-	-	-	-	-	(9,675)
Other current financial liabilities	(167)	-	-	-	-	-	(167)
Current financial assets	700	-	-	-	-	-	700
Cash and cash equivalents	14,025	-	-	-	-	-	14,025
Net amount before financial expense	**4,883**	**(4,492)**	**(3,630)**	**(3,614)**	**(1,519)**	**(7,326)**	**(15,698)**
Financial expense on non-current financial debt	(785)	(691)	(521)	(417)	(302)	(1,075)	(3,791)
Interest differential on swaps	320	331	221	120	55	44	1,091
Net amount	**4,418**	**(4,852)**	**(3,930)**	**(3,911)**	**(1,766)**	**(8,357)**	**(18,398)**

As of December 31, 2010

Assets/(Liabilities) (M€)	Less than one year	1-2 years	2-3 years	3-4 years	4-5 years	More than 5 years	Total
Non-current financial debt (notional value excluding interests)	-	(3,355)	(3,544)	(2,218)	(3,404)	(6,392)	(18,913)
Current borrowings	(9,653)	-	-	-	-	-	(9,653)
Other current financial liabilities	(159)	-	-	-	-	-	(159)
Current financial assets	1,205	-	-	-	-	-	1,205
Cash and cash equivalents	14,489	-	-	-	-	-	14,489
Net amount before financial expense	**5,882**	**(3,355)**	**(3,544)**	**(2,218)**	**(3,404)**	**(6,392)**	**(13,031)**
Financial expense on non-current financial debt	(843)	(729)	(605)	(450)	(358)	(1,195)	(4,180)
Interest differential on swaps	461	334	153	33	2	(78)	905
Net amount	**5,500**	**(3,750)**	**(3,996)**	**(2,635)**	**(3,760)**	**(7,665)**	**(16,306)**

In addition, the Group guarantees bank debt and finance lease obligations of certain non-consolidated companies and equity affiliates. A payment would be triggered by failure of the guaranteed party to fulfill its obligation covered by the guarantee, and no assets are held as collateral for these guarantees. Maturity dates and amounts are set forth in Note 23 to the Consolidated Financial Statements ("Guarantees given against borrowings").

The Group also guarantees the current liabilities of certain non-consolidated companies. Performance under these guarantees would be triggered by a financial default of these entities. Maturity dates and amounts are set forth in Note 23 to the Consolidated Financial Statements ("Guarantees of current liabilities").

The following table sets forth financial assets and liabilities related to operating activities as of December 31, 2012, 2011 and 2010 (see Note 28 to the Consolidated Financial Statements).

As of December 31, (M€) Assets/(Liabilities)	2012	2011	2010
Accounts payable	(21,648)	(22,086)	(18,450)
Other operating liabilities	(5,904)	(5,441)	(3,574)
including financial instruments related to commodity contracts	*(482)*	*(606)*	*(559)*
Accounts receivable, net	19,206	20,049	18,159
Other operating receivables	6,158	7,467	4,407
including financial instruments related to commodity contracts	*707*	*1,074*	*499*
Total	**(2,188)**	**(11)**	**542**

These financial assets and liabilities mainly have a maturity date below one year.

1.11. Credit risk

Credit risk is defined as the risk of the counterparty to a contract failing to perform or pay the amounts due.

The Group is exposed to credit risks in its operating and financing activities. The Group's maximum exposure to credit risk is partially related to financial assets recorded on its balance sheet, including energy derivative instruments that have a positive market value.

The following table presents the Group's maximum credit risk exposure:

As of December 31, (M€) Assets/(Liabilities)	2012	2011	2010
Loans to equity affiliates *(note 12)*	2,360	2,246	2,383
Loans and advances *(note 14)*	2,207	2,055	1,596
Hedging instruments of non-current financial debt *(note 20)*	1,626	1,976	1,870
Accounts receivable *(note 16)*	19,206	20,049	18,159
Other operating receivables *(note 16)*	6,158	7,467	4,407
Current financial assets *(note 20)*	1,562	700	1,205
Cash and cash equivalents *(note 27)*	15,469	14,025	14,489
Total	**48,588**	**48,518**	**44,109**

The valuation allowance on loans and advances and on accounts receivable and other operating receivables is detailed respectively in Notes 14 and 16 to the Consolidated Financial Statements.

As part of its credit risk management related to operating and financing activities, the Group has developed margin call contracts with certain counterparties. As of December 31, 2012, the net amount received as part of these margin calls was €1,635 million (against €1,682 million as of December 31, 2011 and €1,560 million as of December 31, 2010).

Credit risk is managed by the Group's business segments as follows:

Upstream segment

– Exploration & Production

Risks arising under contracts with government authorities or other oil companies or under long-term supply contracts necessary for the development of projects are evaluated during the project approval process. The long-term aspect of these contracts and the high-quality of the other parties lead to a low level of credit risk.

Risks related to commercial operations, other than those described above (which are, in practice, directly monitored by subsidiaries), are subject to procedures for establishing and reviewing credit.

Customer receivables are subject to provisions on a case-by-case basis, based on prior history and management's assessment of the facts and circumstances.

– **Gas & Power**

Gas & Power deals with counterparties in the energy, industrial and financial sectors throughout the world. Financial institutions providing credit risk coverage are highly rated international bank and insurance groups.

Potential counterparties are subject to credit assessment and approval before concluding transactions and are thereafter subject to regular review, including re-appraisal and approval of the limits previously granted.

The creditworthiness of counterparties is assessed based on an analysis of quantitative and qualitative data regarding financial standing and business risks, together with the review of any relevant third party and market information, such as data published by rating agencies. On this basis, credit limits are defined for each potential counterparty and, where appropriate, transactions are subject to specific authorizations.

Credit exposure, which is essentially an economic exposure or an expected future physical exposure, is permanently monitored and subject to sensitivity measures.

Credit risk is mitigated by the systematic use of industry standard contractual frameworks that permit netting, enable requiring added security in case of adverse change in the counterparty risk, and allow for termination of the contract upon occurrence of certain events of default.

Refining & Chemicals segment

– **Refining & Chemicals**

Credit risk is primarily related to commercial receivables. Each business unit implements procedures for managing and provisioning credit risk that differ based on the size of the subsidiary and the market in which it operates. The principal elements of these procedures are:

– implementation of credit limits with different authorization procedures for possible credit overruns;

– use of insurance policies or specific guarantees (letters of credit);

– regular monitoring and assessment of overdue accounts (aging balance), including collection procedures; and

– provisioning of bad debts on a customer-by-customer basis, according to payment delays and local payment practices (provisions may also be calculated based on statistics).

– **Trading & Shipping**

Trading & Shipping deals with commercial counterparties and financial institutions located throughout the world. Counterparties to physical and derivative transactions are primarily entities involved in the oil and gas industry or in the trading of energy commodities, or financial institutions. Credit risk coverage is concluded with financial institutions, international banks and insurance groups selected in accordance with strict criteria.

Trading & Shipping has a strict policy of internal delegation of authority governing establishment of country and counterparty credit limits and approval of specific transactions. Credit exposures contracted under these limits and approvals are monitored on a daily basis.

Potential counterparties are subject to credit assessment and approval prior to any transaction being concluded and all active counterparties are subject to regular reviews, including re-appraisal and approval of granted limits. The creditworthiness of counterparties is assessed based on an analysis of quantitative and qualitative data regarding financial standing and business risks, together with the review of any relevant third party and market information, such as ratings published by Standard & Poor's, Moody's Investors Service and other agencies.

Contractual arrangements are structured so as to maximize the risk mitigation benefits of netting between transactions wherever possible and additional protective terms providing for the provision of security in the event of financial deterioration and the termination of transactions on the occurrence of defined default events are used to the greatest permitted extent.

Credit risks in excess of approved levels are secured by means of letters of credit and other guarantees, cash deposits and insurance arrangements. In respect of derivative transactions, risks are secured by margin call contracts wherever possible.

Marketing & Services segment

Internal procedures for Marketing & Services business unit include rules on credit risk that describe the basis of internal control in this domain, including the separation of authority between commercial and financial operations. Credit policies are defined at the local level, complemented by the implementation of procedures to monitor customer risk (credit Committees at the subsidiary level, the creation of credit limits for Corporate customers, portfolio guarantees, etc.).

Each entity also implements monitoring of its outstanding receivables. Risks related to credit may be mitigated or limited by subscription of credit insurance and/or requiring security or guarantees.

Bad debts are provisioned on a case-by-case basis at a rate determined by management based on an assessment of the risk of credit loss.

2. Industrial and environmental risks

2.1. Types of risks

TOTAL is exposed to risks related to the safety and security of its operations.

TOTAL engages in a broad scope of activities, which include drilling, oil and gas production, processing, transportation, refining and petrochemical activities, storage and distribution of petroleum products, and production of base and specialty chemicals, and involve a wide range of operational risks. These risks include explosions, fires, accidents, equipment failures, leakage of toxic products, emissions or discharges into the air, water or soil, and related environmental and health risks. In the transportation area, the type of risk depends not only on the hazardous nature of the products transported, but also on the transportation methods used (mainly maritime, river-maritime, pipelines, rail and road), the volumes involved, and the sensitivity of the regions through which the transport passes (quality of infrastructure, population density, environmental considerations). Most of the Group's activities will also eventually require environmental site remediation, closure and decommissioning after production is discontinued.

The following table shows a correlation between TOTAL's operations and the most significant industrial and environmental risks:

Activity/Risk	Fire, explosion	Leakage of toxic products	Accidental pollution	Pollution of soil and subsoil	Consumer health and safety	Emissions into the air, water and soil
Drilling	x	x	x	x	-	x
Hydrocarbon production	x	x	x	x	-	x
On-site processing of hydrocarbons	x	x	x	x	-	x
Transport of petroleum products and chemicals	x	x	x	x	-	x
Refining, petrochemicals	x	x	x	x	x	x
Storage of petroleum products	x	x	x	x	-	x
Distribution of petroleum products	x	-	x	x	x	x
Specialty chemicals	x	x	x	x	x	x

The industrial events that could have the most significant impact are primarily:

– a major industrial accident (fire, explosion, leakage of highly toxic products);

– large-scale accidental pollution.

All the risks described correspond to events that could potentially cause death, damage property, disrupt business activities, cause environmental damage or harm human health. Group's employees, contractors, residents living near the facilities or customers can suffer injuries. Property damage can involve the facilities of the Group as well as the property of third parties. The seriousness of the consequences of these events varies according to the vulnerability of the people, ecosystems and business activities impacted, on the one hand, and the number of people in the impact area and the location of the ecosystems and business activities in relation to TOTAL's facilities or to the trajectory of the products after the event, on the other hand.

Acts of terrorism against the Group's plants and sites, pipelines, transportation or computer systems could also severely disrupt business and operations and could cause harm to people and property damage.

Like most industrial groups, TOTAL is concerned by reports of occupational illnesses, particularly those caused by past exposure of the Group's employees to asbestos. Asbestos exposure has been subject to close monitoring at all of the Group's business segments. As of December 31, 2012, the Group estimates that the ultimate cost of all pending or future asbestos-related claims is not likely to have a material impact on the Group's financial position.

Certain segments or activities face specific additional risks.

TOTAL's Upstream segment activities face risks related to the physical characteristics of oil or gas fields. These risks include eruptions of oil or gas, discovery of hydrocarbon pockets with abnormal pressure, crumbling of well openings, leaks that can harm the environment and explosions or fires. These events, which may cause injury, death or environmental damage, can also damage or destroy oil or gas wells as well as equipment and other property, lead to a disruption of the Group's operations or reduce its production. In addition, since exploration and production activities may take place on sites that are ecologically sensitive (for example, in tropical forests or in a marine environment), each site requires a risk-based approach to avoid or minimize the impact on human health, flora and fauna, the ecosystem and biodiversity. In certain situations where the operator is not a Group entity, the Group may have reduced influence and control over third parties, which may limit its ability to manage and control these risks.

The activities of the Refining & Chemicals and Marketing & Services business segments also entail additional health, safety and environmental risks related to the overall life cycle of the products manufactured, as well as the raw materials used in the manufacturing process, such as catalysts, additives and monomers. These risks can arise from the intrinsic characteristics of the products involved (flammability, toxicity, or long-term environmental impacts such as greenhouse gas emissions), their use (including by customers), emissions and discharges resulting from their manufacturing process, and from recycling or disposing of materials and wastes at the end of their useful life.

Contracts signed by the Group's entities may provide for indemnification obligations either by TOTAL in favor of third parties or by third parties for the benefit of TOTAL if, for example, an event occurs leading to death, personal injury, property damage or discharge of hazardous materials into the environment. With respect to joint ventures the assets of which are operated by an entity of the Group, contractual terms generally provide that this entity assumes liability for damage caused by its gross negligence or willful misconduct. With respect to joint ventures in which an entity of the Group has an interest but the assets of which are operated by others, contractual terms generally provide that the operator assumes liability for damages caused by its gross negligence or willful misconduct. All other liabilities of these types of joint venture are generally assumed by the partners in proportion to their respective ownership interests. With respect to third party providers of goods and services, the amount and nature of the liability assumed by the third party depends on the context and may be limited by contract. With respect to their customers, the Group's entities seek to ensure that their products meet applicable specifications and abide by all applicable consumer protection laws. Failure to do so could lead to personal injury, environmental harm, regulatory violations and loss of customers, and could negatively impact the Group's results of operations, financial condition and reputation.

To manage these risks, TOTAL maintains worldwide third-party liability insurance coverage for all its subsidiaries. TOTAL also maintains insurance to protect against the risk of damage to Group property and/or business interruption at its main refining and petrochemical sites. TOTAL's insurance and risk management policies are described in point 4. of this Chapter ("Insurance and risk management").

Crisis management systems are necessary to respond effectively to emergencies and to avoid potential disruptions in TOTAL's business and operations.

TOTAL has crisis management plans in place to deal with emergencies, such as the leak in the Elgin field in the North Sea (see Chapter 12, paragraph 2.2.3.). If TOTAL does not respond to such emergencies in an appropriate manner, its business and operations could be severely disrupted. TOTAL also has implemented business continuity plans in order to continue or resume operations following a shutdown or incident (see paragraph 2.2.3. below). An inability to timely restore or replace critical capacity could prolong the impact of any disruption and could have a material adverse effect on the Group's business and operations.

TOTAL is subject to stringent environmental, health and safety laws in numerous countries and may incur material costs to comply with these laws and regulations.

TOTAL's workforce and the public are exposed to risks inherent to the Group's operations that potentially could lead to loss of life, injuries, property damage or environmental damage and could result in regulatory action and legal liability against the entities of the Group and damage to its reputation.

TOTAL incurs, and will continue to incur, substantial expenditures to comply with increasingly complex laws and regulations aimed at protecting worker health and safety and the natural environment.

These expenditures include:

– costs incurred to prevent, control, eliminate or reduce certain types of air and water emissions, including those costs incurred in connection with government action to address climate change;
– remedial measures related to environmental contamination or accidents at various sites, including those owned by third parties;
– compensation of persons claiming damages caused by the Group's activities or accidents;
– increased production costs or costs related to changes in product specifications or sales; and
– costs related to the decommissioning of drilling platforms and other facilities.

If the Group's financial reserves prove inadequate, such expenditures incurred could have a material effect on the results of operations of the Group and its financial position.

Furthermore, in countries where the Group operates or plans to operate, the introduction of new laws and regulations, stricter enforcement or news interpretations of existing laws and regulations or the imposition of tougher license requirements may also cause the Group's entities to incur higher costs resulting from actions taken to comply with such laws and regulations, including:

– modifying operations;
– installing pollution control equipment;
– implementing additional safety measures; and
– performing site clean-ups.

As a further result of the introduction of any new laws and regulations or other factors, the Group could also be compelled to curtail, modify or cease certain operations or implement temporary shutdowns of facilities, which could diminish the Group's productivity and materially and adversely impact its results of operations, including its profits.

All TOTAL entities monitor legal and regulatory developments in order to remain in compliance with local and international rules and standards for the assessment and management of industrial and environmental risks. With regard to the permanent shutdown of an activity, the Group's environmental contingencies and asset retirement obligations are addressed in the "Asset retirement obligation" and "Provisions for environmental contingencies" sections of the Group's Consolidated Balance Sheet (see Note 19 to the Consolidated Financial Statements, Chapter 9, point 7.). Future expenditures related to asset retirement obligations are accounted for in accordance with the accounting principles described in Note 1Q to the Consolidated Financial Statements (Chapter 9, point 7.).

Laws and regulations related to climate change and its physical effects may adversely affect the Group's business.

Growing public concern in a number of countries over greenhouse gas emissions and climate change, as well as a multiplication of stricter regulations in this area, could adversely affect the Group's businesses and product sales, increase its operating costs and reduce its profitability.

The regulation concerning the market for CO_2 emission allowances in Europe, EU-ETS (European Trading Scheme), entered a third phase on January 1, 2013. This phase marks the end of the overall free allocation of emission allowances, particularly for electricity production plants, which no longer benefit from free allowances, and establishes allowance auctioning by the States. The Group is impacted in Europe by this new phase of the regulation, especially for its refining and petrochemicals facilities and, to a lesser extent, its Upstream operations. In phase 3, free allocations are limited to those resulting from a calculation based on a benchmark within the same industrial sector. This benchmark is set on the basis of the top 10% most efficient installations in terms of emissions. Installations other than the top 10% must have missing allowances bought at market price. Moreover, the Group's plants will need to indirectly bear the cost of allowances for all electricity consumed, including electricity generated internally at its own facilities. Although the allocations of free allowances for phase 3 have not yet been made public, the Group believes that it will continue to receive free allowances that will cover approximately 80% of its emissions subject to the EU-ETS during the 2013-2020 period. Given the amount of free allocations at the beginning of the period and the ability to use in phase 3 its surplus allowances purchased or received in phase 2, the Group's exposure should be limited during the period in question.

In addition, more of TOTAL's future production is expected to come from unconventional sources in order to help meet the world's growing demand for energy. Since energy intensity of oil and gas production from unconventional sources can be higher than that of production from conventional sources, the CO_2 emissions produced by the Group's activities may increase. Therefore, TOTAL may incur additional costs from delayed projects or reduced production from certain projects.

In addition, TOTAL's business operates in varied locales where the potential physical impacts of climate change, including changes in weather patterns, are highly uncertain and may adversely impact the results of the Group's operations.

2.2. Management and monitoring of industrial and environmental risks

2.2.1. TOTAL policies regarding health, safety and the environment

TOTAL has developed a "Health Safety Environment Quality Charter" (Chapter 12, point 2.) which sets out the basic principles applicable within the Group regarding the protection of people, property and the environment. This charter is rolled out at several levels within the Group by means of management systems.

Along these lines, TOTAL has developed efficient organizations as well as safety, environmental and quality management systems, which it makes every effort to have certified or assessed (standards such as the International Safety Rating System, ISO 14001 and ISO 9001). For example, in 2010, TOTAL received ISO 9001 certification for "development and management of the database of technical businesses" in Exploration and Production.

In most countries, TOTAL's operations are subject to laws and regulations concerning environmental protection and Industrial Safety. The main laws and regulations are:

1) In Europe: IPPC- Large Combustion Plants Directives (recasted by IED Directive), SEVESO Directive, Pressure Equipment Directive, Water Framework Directive, Waste Directive, ETS Directive (CO_2 quotas), Fuel Directive, REACH and CLP Regulations.
2) In France: laws and regulations on natural and technological risks also apply to several sites.
3) In the United States: several activities are subject to the Occupational Safety and Health Administration ("OSHA") Process Safety Management of Highly Hazardous Materials and the Superfund Act.

TOTAL ensures compliance with applicable laws and regulations, including in particular the REACH regulation, the purpose of which is to protect the health and safety of the employees, producers and users of chemicals and chemical substances, such as by providing detailed information through safety data sheets (SDS/ESDS) (see also Chapter 12, point 2.).

2.2.2. Assessment

As part of its policy, TOTAL systematically assesses risks and impacts in the areas of industrial safety (particularly technological risks), the environment and the protection of workers and local residents:

– prior to approving new projects, investments, acquisitions and disposals;
– periodically during operations (safety studies, environmental impact studies, health impact studies and risk prevention plan in France as part of the 2003 legislation on the prevention of major technological risks);
– prior to releasing new substances on the market (toxicological and ecotoxicological studies and life cycle analyses); and
– based on the regulatory requirements of the countries where these activities are carried out and generally accepted professional practices.

In countries where prior administrative authorization and supervision is required, projects are not undertaken without the authorization of the relevant authorities based on the studies provided to the authorities.

In particular, TOTAL has developed a common methodology for analyzing technological risks which must gradually be applied to all activities carried out by the Group's companies.

2.2.3. Management

TOTAL develops risk management measures based on risk and impact assessments. These measures involve facility and structure design, the reinforcement of safety devices and remedies of environmental degradations.

In addition to developing organizations and management systems as described above, TOTAL strives to minimize industrial and environmental risks inherent in its operations by conducting thorough inspections and audits, training personnel and raising awareness among all those involved.

In addition, performance indicators (in the areas of HSE) and risk monitoring have been put in place, objectives have been set and action plans have been implemented to achieve these objectives.

Although the emphasis is on preventing risks, TOTAL takes regular steps to prepare for crisis management based on the risk scenarios identified.

In particular, TOTAL has developed emergency plans and procedures to respond to an oil spill or leak. These plans and procedures are specific to each TOTAL affiliate and adapted to its organization, activities and environment and are consistent with the Group plan. They are reviewed regularly and tested through exercises (see Chapter 12, point 2).

At the Group level, TOTAL has set up the alert scheme PARAPOL (Plan to Mobilize Resources Against Pollution) to facilitate crisis management and provide assistance by mobilizing both internal and external resources in the event of pollution of marine, coastal or inland waters, without geographical restriction. The PARAPOL procedure is made available to TOTAL subsidiaries and its main goal is to facilitate access to internal experts and physical response resources.

Furthermore, TOTAL and its subsidiaries are currently members of certain oil spill cooperatives that are able to provide expertise, resources and equipment in all geographic areas where TOTAL has operations, including in particular Oil Spill Response Limited, the CEDRE (Center for Documentation, Research and Experimentation on Accidental Water Pollution) and Clean Caribbean & Americas.

Following the blow-out on the Macondo well in the Gulf of Mexico in 2010 (in which the Group was not involved), TOTAL created three Task Forces in order to analyze risks and issue recommendations.

In Exploration & Production, Task Force 1 reviewed the safety aspects of deep offshore drilling operations (well architecture, design of blow-out preventers, training of personnel based on lessons learned from serious accidents that have occurred recently in the industry). Its efforts have led to the implementation of even more stringent controls and audits on drilling operations.

Task Force 2, in coordination with the Global Industry Response Group (GIRG) created by the OGP (International Association of Oil and Gas Producers), is studying deep offshore oil capture and containment operations in case of a pollution event in deep waters. Capture devices will be available in several regions of the world where TOTAL has a strong presence in exploration-production.

Task Force 3 involved plans to fight accidental spills in order to strengthen the Group's ability to respond to major accidental pollution, such as a blow-out or a total loss of containment from an FPSO (Floating Production, Storage and Offloading facility). This initiative has led, in particular, to a sharp increase in the volume of dispersants available within the Group.

The task forces finalized most of their work in 2012, and the Group has continued deploying solutions to minimize such risks. Detailed information on TOTAL's initiatives in the fields of safety and protection of the environment is provided in Chapter 12.

The Group believes that it is impossible to guarantee that the contingencies or liabilities related to the above mentioned concerns will not have a material impact on its business, assets and liabilities, consolidated financial situation, cash flow or income in the future.

3. Other risks

3.1. Economic environment

The operating results and future rate of growth of the Group are exposed to the effects of changing commodity prices.

Prices for oil and natural gas historically have fluctuated widely due to many factors over which TOTAL has no control. These factors include:

- global and regional economic and political developments in resource-producing regions, particularly in the Middle East, Africa and South America;
- global and regional supply and demand;
- the ability of the Organization of Petroleum Exporting Countries (OPEC) and other producing nations to influence global production levels and prices;
- prices of unconventional energies as well as changes in the valorization of oil sands, which may affect the Group's realized prices, notably under its long-term gas sales contracts and asset valuations, notably in North America;
- cost and availability of new technology;
- governmental regulations and actions;
- global economic and financial market conditions;
- war or other conflicts;
- changes in demographics, including population growth rates and consumer preferences; and
- adverse weather conditions (such as hurricanes) that can disrupt supplies or interrupt operations of the Group's facilities.

Substantial or extended declines in oil and natural gas prices would adversely affect TOTAL's results of operations by reducing its profits. Sensitivity to market environment are described above and discussed in greater detail in point 1.1. of this Chapter 4.

In addition to the adverse effect on revenues, margins and profitability from any fall in oil and natural gas prices, a prolonged period of low prices or other indicators could lead to a review of the Group's properties and oil and natural gas reserves. Such review would reflect the Company's view based on estimates, assumptions and judgments and could result in a reduction in the Group's reported reserves and/or a charge for impairment that could have a significant effect on the Group's results in the period in which it occurs. Lower oil and natural gas prices over prolonged periods may also reduce the economic viability of projects planned or in development, negatively impact the asset sale program of the Group and reduce liquidity, thereby decreasing the Group's ability to finance capital expenditures and/or causing it to cancel or postpone investment projects. If TOTAL is unable to follow through with investment projects, the opportunities for future revenue and profitability growth with the Group would be reduced, which could materially impact the Group's financial condition.

However, in a high oil and gas price environment, the Group can experience significant increases in cost and fiscal take, and, under some production-sharing contracts, the Group's entitlement to reserves could be reduced. Higher prices can also reduce demand for the Group's products.

The Group's downstream earnings are primarily dependent upon the supply and demand for refined products and the associated margins on refined product sales, with the impact of changes in oil and gas prices on downstream earnings being dependent upon the speed at which the prices of refined products adjust to reflect movements in oil and gas prices.

3.2. Risks related to oil and gas exploration and production

The Group's long-term profitability depends on cost effective discovery, acquisition and development of new reserves; if the Group is unsuccessful, its results of operations and financial condition would be materially and adversely affected.

A significant portion of the Group revenues and the majority of its operating income are derived from the sale of oil and gas that the Group extract from underground reserves developed as part of its Upstream business. The development of oil and gas fields, the construction of facilities and the drilling of production or injection wells is capital intensive, requires advanced technology and due to difficult environmental challenges, cost projections are uncertain. In order for this Upstream business to continue to be profitable, the Group needs to replace depleted reserves with new proved reserves. Furthermore, the Group needs to accomplish such replacement in a manner that allows subsequent production to be economically viable. However, TOTAL's ability to discover or acquire and develop new reserves successfully is uncertain and can be negatively affected by a number of factors, including:

- the geological nature of oil and gas fields, notably unexpected drilling conditions including pressure or irregularities in geological formations;
- the risk of dry holes or failure to find expected commercial quantities of hydrocarbons;
- equipment failures, fires, blow-outs or accidents;
- the Group's inability to develop or deploy new technologies that permit access to previously inaccessible fields;
- the Group's inability to anticipate market changes in a timely manner;
- adverse weather conditions;
- compliance with both anticipated and unanticipated governmental requirements, including U.S. and EU regulations that may give a competitive advantage to companies not subject to such regulations;
- shortages or delays in the availability or delivery of appropriate equipment;
- industrial action;
- competition from publicly held and state-run oil and gas companies for the acquisition and development of assets and licenses;
- increased taxes and royalties, including retroactive claims; and
- problems with legal title.

Any of these factors could lead to cost overruns and impair the Group's ability to make discoveries and acquisitions or complete a development project, or to make production economical.
It is impossible to guarantee that new reserves of oil and gas will be discovered in sufficient quantities to replace the Group's reserves currently being developed, produced and marketed. Furthermore, some of these factors may also affect the Group's projects and facilities further down the oil and gas chain. If TOTAL fails to develop new reserves cost-effectively on an ongoing basis, the results of the Group's operations, including profits, and the Group's financial condition, would be materially and adversely affected.

The Group's oil and gas reserves data are only estimates, and subsequent downward adjustments are possible. If actual production from such reserves is lower than current estimates indicate, the Group's results of operations and financial condition would be negatively impacted.

The proved reserves figures of the Group are estimates reflecting applicable reporting regulations as they may evolve. Proved reserves are those reserves which, by analysis of geosciences and engineering data, can be estimated with reasonable certainty to be economically producible – 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, unless evidence indicates that renewal is reasonably certain, regardless of whether deterministic or probabilistic methods are used for the estimation. Reserves are estimated by teams of qualified, experienced and trained geoscientists, petroleum engineers and project engineers, who rigorously review and analyze in detail all available geosciences and engineering data (*e.g.*, seismic, electrical logs, cores, fluids, pressures, flow rates, facilities parameters). This process involves making subjective judgments, including with respect to the estimate of hydrocarbons initially in place, initial production rates and recovery efficiency, based on available geological, technical and economic data. Consequently, estimates of reserves are not exact measurements and are subject to revision. In addition, they may be negatively impacted by a variety of factors that are beyond the Group's control and that could cause such estimates to be adjusted downward in the future, or cause the Group's actual production to be lower than its currently reported proved reserves indicate. The main such factors include:

- a decline in the price of oil or gas, making reserves no longer economically viable to exploit and therefore not classifiable as proved;
- an increase in the price of oil or gas, which may reduce the reserves to which the Group is entitled under production sharing and risked service contracts and other contractual terms;
- changes in tax rules and other government regulations that make reserves no longer economically viable to exploit; and
- the actual production performance of the Group's reservoirs.

The Group's reserves estimates may therefore require substantial downward revisions to the extent its subjective judgments prove not to have been conservative enough based on the available geosciences and engineering data, or the Group's assumptions regarding factors or variables that are beyond its control prove to be incorrect over time. Any downward adjustment would indicate lower future production amounts, which could adversely affect the Group's results of operations, including profits as well as its financial condition.

3.3. Major projects and production growth

The Group's production growth depends on the delivery of its major development projects.

The Group's targeted production growth relies heavily on the successful execution of its major development projects, which are complex and capital-intensive. These major projects are subject to a number of challenges, including:

– negotiations with partners, governments, suppliers, customers and others;

– cost overruns and delays related to the availability of skilled labor or delays in manufacturing and delivery of critical equipment, or shortages in the availability of such equipment;

– unforeseen technical difficulties that could delay project startup or cause unscheduled project downtime;

– the actual performance of the reservoir and natural field decline; and

– timely issuance or renewal of permits and licenses by government agencies.

Poor delivery of any major project that underpins production or production growth could adversely affect the Group's financial performance.

3.4. Equity affiliates

Many of the Group's projects are conducted by equity affiliates. This may reduce the degree of control, as well as the ability of the Group to identify and manage risks.

A significant and growing number of the Group's projects are conducted by equity affiliates. In cases where a company in which the Group holds an interest is not the operator, it may have limited influence over, and control of, the behavior, performance and costs of the partnership, its ability to manage risks may be limited and it may, nevertheless, be pursued by regulators or claimants in the event of an incident. Additionally, the partners of the Group (particularly local partners in developing countries) may not be able to meet their financial or other obligations to the projects, which may threaten the viability of a given project, and they may not have the financial capacity to fully indemnify the Group in the event of an incident.

3.5. Risks related to economic or political factors

TOTAL has significant production and reserves located in politically, economically and socially unstable areas, where the likelihood of material disruption of the Group's operations is relatively high.

A significant portion of TOTAL's oil and gas production and reserves is located in countries outside of the Organisation for Economic Co-operation and Development (OECD). In recent years, a number of these countries have experienced varying degrees of one or more of the following: economic instability, political volatility, civil war, violent conflict and social unrest and actions of terrorist groups. Any of these conditions alone or in combination could disrupt the Group's operations in any of these regions, causing substantial declines in production. In Africa, which represented 31% of the Group's 2012 combined liquids and gas production, certain of the countries in which the Group has production have recently suffered from some of these conditions, including Nigeria, where the Group had in 2012 its highest hydrocarbon production, and Libya. The Middle East, which represented 21% of the Group's 2012 combined liquids and gas production, has recently suffered increased political volatility in connection with violent conflict and social unrest, including Syria, where European Union (EU) economic sanctions have prohibited TOTAL from producing oil and gas, and Yemen. In South America, which represented 8% of the Group's 2012 combined liquids and gas production, certain of the countries in which TOTAL has production have recently suffered from some of above-mentioned conditions, including Argentina and Venezuela. In addition, uncertainties surrounding enforcement of contractual rights in these regions may adversely impact the Group's results. Furthermore, in addition to current production, TOTAL is also exploring for and developing new reserves in other regions of the world that are historically characterized by political, social and economic instability, such as the Caspian Sea region where TOTAL has large projects currently underway. The occurrence and magnitude of incidents related to economic, social and political instability are unpredictable. It is possible that they could have a material adverse impact on the Group's production and operations in the future and/or cause certain investors to reduce their holdings of TOTAL's securities.

TOTAL, like other major international energy companies, has a geographically diverse portfolio of reserves and operational sites, which allows it to conduct its business and financial affairs so as to reduce its exposure to political and economic risks. However, there can be no assurance that such events will not have a material adverse impact on the Group.

The Group's operations throughout emerging countries are subject to intervention by the governments of these countries, which could have an adverse effect on its results of operations.

TOTAL has significant exploration and production activities, and in some cases refining, marketing or chemicals operations, in developing countries whose governmental and regulatory framework is subject to unexpected change and where the enforcement of contractual rights is uncertain. In addition, the Group's exploration and production activity in such countries is often done in conjunction with state-owned entities, for example as part of a joint venture, where the state has a significant degree of control. In recent years, in various regions globally, TOTAL has seen governments and state-owned enterprises imposing more stringent conditions on companies pursuing exploration and production activities in their respective countries, increasing the costs and uncertainties of its business operations, which is a trend the Group expects to continue. Potential increasing intervention by governments in such countries can take a wide variety of forms, including:

– the award or denial of exploration and production interests;

– the imposition of specific drilling obligations;

- price and/or production quota controls and export limits;
- nationalization or expropriation of assets;
- unilateral cancellation or modification of license or contract rights;
- increases in taxes and royalties, including retroactive claims;
- the renegotiation of contracts;
- payment delays; and
- currency exchange restrictions or currency devaluation.

Imposition of any of these factors by a host government in a developing country where TOTAL has substantial operations, including exploration, could cause the Group to incur material costs or cause the Group's production or the value of the Group's assets to decrease, potentially having a material adverse effect on its results of operations, including profits.

For example, the Nigerian government has been contemplating new legislation to govern the petroleum industry which, if passed into law, could have an impact on the existing and future activities of the Group in that country through increased taxes and/or costs of operation and could adversely affect financial returns from projects in that country.

3.6. Ethical misconduct and non compliance risks

Ethical misconduct or breaches of applicable laws by the Group's employees could expose TOTAL to criminal and civil penalties and be damaging to TOTAL's reputation and shareholder value.

The Code of Conduct of the Group, which applies to all of its employees, defines the Group's commitment to integrity, compliance with all applicable legal requirements, high ethical standards and the behaviors and actions the Group expects of the businesses and people of the Group wherever it operates. Ethical misconduct or non-compliance with applicable laws and regulations, including non-compliance with anti-bribery, anticorruption and other applicable laws by TOTAL, its partners, agents or others that acts on the Group's behalf, could expose TOTAL and its employees to criminal and civil penalties and could be damaging to TOTAL's reputation and shareholder value. In addition to such penalties, a monitor is likely to be appointed to review the Group's compliance and internal control procedures and may, if need be, recommend improvements of such procedures. Refer to paragraph 5.6. in Chapter 7 Legal and arbitration proceedings - Iran for an overview of the investigation since 2003 by the SEC and Department of Justice (DoJ) concerning the pursuit of business in Iran by certain oil companies, including TOTAL. At this point, the Company considers that the resolution of this matter is not expected to have a significant impact on the Group's financial situation or its future planned operations.

The Group has been deploying ethics and compliance programs since 2009, as a priority of the General Management. Refer to paragraph 1.10.1. in Chapter 5 of this Registration Document for more details.

3.7. Legal aspects of the Group's activities

3.7.1. Legal aspects of the Upstream segment's activities

TOTAL's Upstream segment conducts activities in various countries which are therefore subject to a broad range of regulations. These cover virtually all aspects of exploration and production operations, including leasehold rights, production rates, royalties, environmental protection, exports, taxes and foreign exchange rates. The terms of the concessions, licenses, permits and contracts governing the Group's ownership of oil and gas interests vary from country to country. These concessions, licenses, permits and contracts are generally granted by or entered into with a government entity or a state-owned company and are sometimes entered into with private owners. These arrangements usually take the form of concessions or production sharing contracts.

In the framework of oil concession agreements, the oil company owns the assets and the facilities and is entitled to the entire production.

In exchange, the operating risks, costs and investments are the oil Company's responsibility and it agrees to remit to the relevant State, usually the owner of the subsoil resources, a production-based royalty, income tax, and possibly other taxes that may apply under local tax legislation.

The production sharing contract (PSC) involves a more complex legal framework than the concession agreement: it defines the terms and conditions of production sharing and sets the rules governing the cooperation between the Company or consortium in possession of the license and the host State, which is generally represented by a state-owned company. The latter can thus be involved in operating decisions, cost accounting and production allocation.

The consortium agrees to undertake and finance all exploration, development and production activities at its own risk. In exchange, it is entitled to a portion of the production, known as "cost oil", the sale of which should cover all of these expenses (investments and operating costs). The balance of production, known as "profit oil", is then shared in varying proportions, between the Company or consortium, on the one hand, and with the State or the state-owned company, on the other hand.

In some instances, concession agreements and PSCs coexist, sometimes in the same country. Even though there are other contractual models, TOTAL's license portfolio is comprised mainly of concession agreements.

In every country, the authorities of the host State, often assisted by international accounting firms, perform joint venture and PSC cost audits and ensure the observance of contractual obligations.

In some countries, TOTAL has also signed contracts called "risked service contracts", which are similar to production sharing contracts. However, the profit oil is replaced by risked monetary remuneration, agreed by contract, which depends notably on the field performance. Thus, the remuneration under the Iraqi contract is based on an amount calculated per barrel produced.

Oil and gas exploration and production activities are subject to authorization granted by public authorities (licenses), which are granted for specific and limited periods of time and include an obligation to return a large portion, or the entire portion in case of failure, of the area covered by the license at the end of the exploration period.

TOTAL pays taxes on income generated from its oil and gas production and sales activities under its concessions, production sharing contracts and risked service contracts, as provided for by local regulations. In addition, depending on the country, TOTAL's production and sales activities may be subject to a number of other taxes, fees and withholdings, including special petroleum taxes and fees. The taxes imposed on oil and gas production and sales activities may be substantially higher than those imposed on other industrial or commercial businesses.

The legal framework of TOTAL's exploration and production activities, established through concessions, licenses, permits and contracts granted by or entered into with a government entity, a state-owned company or, sometimes, private owners, is subject to certain risks that, in certain cases, can reduce or challenge the protections offered by this legal framework.

3.7.2. Legal aspects of the Group's other activities

The activities of the Group's Refining & Chemicals and Marketing & Services are also subject to a wide range of regulations.

In European countries and in the United States, sites and products are subject to environmental (water, air, soil, noise, protection of biodiversity, waste management, impact studies, etc.), health (on-the-job safety, chemical product risks) and safety (safety of personnel and residents, major risk facilities) regulations. Product quality and consumer protection are also subject to regulations. Within the European Union, EU regulations must be transposed into Member States' national laws or directly enforced. In such Member States, EU legislation and regulations may be in addition to national and local government regulations. In addition, in all Member States of the European Union, industrial facilities operate pursuant to licenses issued by competent local authorities that are based on national laws and EU regulations. It is the same in the United States, where federal rules are in addition to those of the various states.

In other countries where the Group operates, legislation is often inspired by EU and U.S. regulations. These countries may more fully develop certain aspects of regulation in particular fields, for example those relating to protecting water, nature and health.

Irrespective of the particular country in which the Group operates, TOTAL has developed standards based on best practices existing in countries with strong regulations and progressively upgrades policies with respect to these standards.

In addition, depending on the country where the Group operates, its other activities are subject to specific sector requirements that impose constraints with respect to, for example, strategic oil reserves holding requirements or and shipping capacities owned or in chartered.

3.7.3. Competition law

Competition laws apply to the Group's companies in the vast majority of countries in which it does business. Violations of competition laws carry fines and expose the Group and its employees to criminal sanctions and civil suits. Furthermore, it is now common for persons or corporations allegedly injured by violations of competition laws to sue for damages.

The broad range of activities and countries in which the Group operates requires local analysis, by business segment, of the legal risks in terms of competition law. Some of the Group's business segments have already been implementing competition law conformity plans for a long time. In 2012, a Group policy for compliance with competition law and prevention of violations in this area was adopted. Its deployment is based on a dedicated organization, the involvement of hierarchies and staff, and a warning process.

3.8. Critical IT system services and information security

Disruption of the Group's critical IT services or breaches of information security could adversely affect its operations.

The businesses of the Group depend heavily on the reliability and security of its information technology ("IT") systems. If the integrity of the IT systems were compromised due to, for example, technical failure or cyber attack, the business operations and assets of the Group could sustain serious damage, material intellectual property could be divulged and, in some cases, personal injury, environmental harm and regulatory violations could occur potentially having a material adverse effect on the Group's results of operations, including profits.

The Information Technology Department has developed and distributed governance and security rules that describe the recommended infrastructure, organization and procedures to maintain information systems that are appropriate to the organization's needs and to limit information security risks. These rules are implemented across TOTAL under the responsibility of the various business segments.

3.9. Countries targeted by economic sanctions

TOTAL has activities in certain countries that are targeted by economic sanctions under relevant U.S. and EU laws, and if the Group's activities are not conducted in accordance with the relevant conditions, TOTAL could be sanctioned or otherwise penalized.

The United States has adopted various laws and regulations designed to restrict trade with Cuba, Iran, Sudan and Syria, and the U.S. Department of State has identified these countries as state sponsors of terrorism. The European Union ("EU") has similar restrictions with respect to Iran and Syria. A violation of these laws or regulations could result in criminal and material financial penalties, including being prohibited from transacting in U.S. dollars. The Group currently has limited marketing and trading activities in Cuba and a limited presence in Iran and Syria (for more information, see paragraph 3.9.2. below). Since the independence of the Republic of South Sudan on July 9, 2011, TOTAL is no longer present in Sudan.

3.9.1. U.S. and European restrictions

With respect to Iran, the United States has adopted a number of measures since 1996 that provide for the possible imposition of sanctions against non-U.S. companies engaged in certain activities in and with Iran, especially in Iran's energy sector. The United States first adopted legislation in 1996 authorizing sanctions against non-U.S. companies doing business in Iran and Libya (the Iran and Libya Sanctions Act, referred to as "ILSA"). In 2006, ILSA was amended to concern only business in Iran (then renamed the Iran Sanctions Act, referred to as "ISA"). Pursuant to ISA, which as described below has since been amended and expanded, the President of the United States is authorized to initiate an investigation into the activities of non-U.S. companies in Iran's energy sector and the possible imposition of sanctions against persons found, in particular, to have knowingly made investments of $20 million or more in any 12-month period in the petroleum sector in Iran. In May 1998, the U.S. government waived the application of ISA sanctions for TOTAL's investment in the South Pars gas field. This waiver, which has not been modified since it was granted, does not address any of TOTAL's other activities in Iran. In each of the years since the passage of ILSA and until 2007, TOTAL made investments in Iran in excess of $20 million (excluding the investments made as part of the development of South Pars). Since 2008, TOTAL's position has consisted essentially in being reimbursed for its past investments as part of buyback contracts signed between 1995 and 1999 with respect to permits on which the Group is no longer the operator. Since 2011, TOTAL has had no production in Iran.

ISA was amended in July 2010 by the Comprehensive Iran Sanctions, Accountability and Divestment Act of 2010 ("CISADA"), which expanded both the list of activities with Iran that could lead to sanctions and the list of sanctions available. In particular, CISADA authorized sanctions for knowingly providing refined petroleum products above certain monetary thresholds to Iran and for providing goods, services, technology, information or support that could directly and significantly either facilitate Iran's domestic production of refined petroleum products or contribute to Iran's ability to import refined petroleum products. Investments in the petroleum sector commenced prior to the adoption of CISADA appear to remain subject to the pre-amended version of ISA. The new sanctions added by CISADA would be available with respect to new investments in the petroleum sector or any other sanctionable activity occurring on or after July 1, 2010.

Prior to CISADA's enactment, TOTAL discontinued potentially sanctionable sales of refined petroleum products to Iran. On September 30, 2010, the U.S. State Department announced that the U.S. government, pursuant to the "Special Rule" provision of ISA added by CISADA that allows it to avoid making a determination of sanctionability under ISA with respect to any party that provides certain assurances, would not make such a determination with respect to TOTAL. The U.S. State Department further indicated at that time that, as long as TOTAL acts in accordance with its commitments, TOTAL will not be regarded as a company of concern for its past Iran-related activities.

Since the applicability of the "Special Rule" to TOTAL was announced by the U.S. State Department, the United States has imposed a number of additional measures targeting activities in Iran. On November 21, 2011, President Obama issued Executive Order 13590, which authorized sanctions for knowingly, on or after November 21, 2011, selling, leasing, or providing to Iran goods, services, technology or support above certain monetary thresholds that could directly and significantly contribute to the maintenance or expansion of Iran's ability to develop petroleum resources located in Iran, or domestic production of petrochemical products. TOTAL does not conduct activities in Iran that could be sanctionable under Executive Order 13590. In any event, there is no provision in Executive Order 13590 that modifies the aforementioned "Special Rule", and the U.S. State Department issued guidance that completion of existing contracts is not sanctionable under Executive Order 13590.

On July 30, 2012, President Obama issued Executive Order 13622, which authorized sanctions for, amongst other activities, (i) knowingly, on or after July 30, 2012, engaging in a significant transaction for the purchase or acquisition of petroleum, petroleum products or petrochemical products from Iran, and (ii) materially assisting, sponsoring or providing financial, material, or technological support for, or goods or services in support of, the National Iranian Oil Company, the Naftiran Intertrade Company, or the Central Bank of Iran. There is no provision in Executive Order 13622 that modifies the aforementioned "Special Rule". In addition, Executive Order 13622 contains an exception for the Shah Deniz gas field pipeline project, in which TOTAL (10%) and Naftiran Intertrade Company ("NICO") (10%) participate, to supply natural gas from the Shah Deniz gas field in Azerbaijan to Europe and Turkey. TOTAL does not conduct activities targeted by Executive Order 13622.

On August 10, 2012, President Obama signed into law the Iran Threat Reduction and Syria Human Rights Act of 2012 ("ITRSHRA"), which, amongst other things, amended ISA and CISADA. ITRSHRA, like CISADA before it, expanded both the list of activities with Iran that could lead to sanctions and the list of sanctions available. Amongst other things, ITRSHRA authorized sanctions for (i) provision to Iran of goods, services, technology, information or support above a certain market value that could directly and significantly facilitate the maintenance or expansion of Iran's domestic production of refined petroleum products, including any direct and significant assistance with the construction, modernization, or repair of petroleum refineries or infrastructure directly associated with petroleum refineries, (ii) participation in a joint venture established on or after January 1, 2002 with respect to the development of petroleum resources outside of Iran where either the Government of Iran is a substantial partner or investor or where the joint venture could enhance Iran's ability to develop petroleum resources in Iran, and (iii) owning, operating, controlling or insuring a vessel used to transport crude oil from Iran to another country. ITRSHRA also contains an exception for the Shah Deniz gas field project. TOTAL does not conduct activities targeted by ITRSHRA.

ITRSHRA also added a new Section 13(r) to the Securities Exchange Act of 1934, as amended ("Exchange Act"), which requires TOTAL to disclose whether it or any of its affiliates has engaged during the calendar year in certain Iran-related activities, including those targeted under ISA, without regard to whether such activities are sanctionable under ISA, and any transaction or dealing with the Government of Iran that is not conducted pursuant to a specific authorization of the U.S. government (see paragraph 3.9.2., below). Section 13(r) also requires TOTAL to file a separate notice to the United States Securities and Exchange Commission ("SEC") concerning any Section 13(r)-related disclosure provided in its annual report. Following receipt of this notice, the SEC must transmit a report to the President and Congress, and the President must initiate an investigation and make a sanctions determination within 180 days after initiating the investigation. TOTAL believes that its Iran-related activities required to be disclosed by Section 13(r) are not sanctionable.

Also with regard to Iran, France and the EU have adopted measures, based on United Nations Security Council resolutions, which restrict the movement of certain individuals and goods to or from Iran as well as certain financial transactions with Iran, in each case when such individuals, goods or transactions are related to nuclear proliferation and weapons activities or likely to contribute to their development. In July and October 2010, the EU adopted new restrictive measures regarding Iran. Among other things, the supply of key equipment and technology in the following sectors of the oil and gas industry in Iran are prohibited: refining, Liquefied Natural Gas, exploration and production. The prohibition extends to technical assistance, training and financial assistance in connection with such items. Extension of loans or credit to, acquisition of shares in, entry into joint ventures with or other participation in enterprises in Iran (or Iranian-owned enterprises outside of Iran) engaged in any of the targeted sectors also is prohibited. Moreover, with respect to restrictions on transfers of funds and on financial services, any transfer of at least €40,000 or equivalent to or from an Iranian individual or entity shall require a prior authorization of the competent authorities of the EU Member States. TOTAL conducts its activities in compliance with these EU measures.

On January 23, 2012, the Council of the EU prohibited the purchase, import and transport of Iranian oil and petroleum and petrochemical products by European persons and by entities constituted under the laws of an EU Member State. Prior to that date, TOTAL had ceased these now-prohibited activities.

With respect to Syria, the EU adopted measures in May 2011 with criminal and financial penalties that prohibit the supply of certain equipment to Syria, as well as certain financial and asset transactions with respect to a list of named individuals and entities. These measures apply to European persons and to entities constituted under the laws of an EU Member State.
In September 2011, the EU adopted further measures, including, notably, a prohibition on the purchase, import or transportation from Syria of crude oil and petroleum products. Since early September 2011, the Group ceased to purchase hydrocarbons from Syria. On December 1, 2011, the EU extended sanctions against, among others, three state-owned Syrian oil firms, including General Petroleum Corporation, TOTAL's co-contracting partner in PSA 1988 (Deir Es Zor licence) and the Tabiyeh contract.

The U.S. also has various measures regarding Syria. Since early December 2011, the Group has ceased its activities that contribute to oil and gas production in Syria.

The U.S. Treasury Department's Office of Foreign Assets Control (referred to as "OFAC") administers and enforces economic sanctions programs, some of which are based on the United Nations Security Council resolutions referred to above, against targeted foreign countries, territories, entities and individuals (including those engaged in activities related to terrorism or the proliferation of weapons of mass destruction and other threats to the national security, foreign policy or economy of the United States). The activities that are restricted depend on the sanctions program and targeted country or parties, and civil and/or criminal penalties, imposed on a per transaction basis, can be substantial. These OFAC sanctions generally apply to U.S. persons and activities taking place in the United States or that are otherwise subject to U.S. jurisdiction. Sanctions administered by OFAC target, among others, Cuba, Iran, Sudan and Syria. TOTAL does not believe that these sanctions are applicable to any of its activities in the OFAC-targeted countries.

In addition, many U.S. states have adopted legislation requiring state pension funds to divest themselves of securities in any company with active business operations in Iran, and state contracts not to be awarded to such companies. State insurance regulators have adopted similar initiatives relating to investments by insurance companies in companies doing business with the Iranian oil and gas, nuclear, and defense sectors. If TOTAL's presence in Iran was determined to fall within the prohibited scope of these laws, and TOTAL was not to qualify for any available exemptions, certain U.S. institutions holding interests in TOTAL may be required to sell their interests. If significant, sales of securities resulting from such laws and/or regulatory initiatives could have an adverse effect on the prices of TOTAL's securities.

TOTAL continues to closely monitor legislative and other developments in France, the EU and the United States in order to determine whether its limited activities or presence in sanctioned or potentially sanctioned jurisdictions could subject TOTAL to the application of sanctions. TOTAL cannot assure that current or future regulations or developments will not have a negative impact on its business or reputation.

3.9.2. Cuba, Iran and Syria

Provided in this section is certain information relating to TOTAL's activities in Cuba and its presence in Iran and Syria. For more information on U.S. and EU restrictions relevant to TOTAL in these jurisdictions, see paragraph 3.9.1. above.

Cuba

In 2012, Marketing & Services had limited marketing activities for the sale of specialty products to non-state entities in Cuba and paid taxes on such activities. In addition, Trading & Shipping purchased hydrocarbons pursuant to spot contracts from a state-controlled entity for approximately €62 million.

Iran

The Iran Threat Reduction and Syria Human Rights Act of 2012 ("ITRSHRA"), signed into law by President Obama on August 10, 2012, added a new Section 13(r) to the Securities Exchange Act of 1934, as amended, which requires TOTAL to disclose whether it or any of its affiliates has engaged during the 2012 calendar year in certain Iran-related activities. While the Group has not engaged in any activity that would be required to be disclosed pursuant to subparagraphs (A), (B), (C), (D)(i) or (D)(ii) of Section 13(r)(1), affiliates of TOTAL may be deemed to have engaged in a transaction or dealing with the government of Iran pursuant to Section 13(r)(1)(D)(iii), as discussed below.

The Group has no exploration and production activities in Iran. Some payments are yet to be reimbursed to the Group with respect to past expenditures and remuneration under buyback contracts entered into between 1997 and 1999 with the National Iranian Oil Company ("NIOC") for the development of the South Pars 2&3 and Dorood fields. With respect to these contracts, development operations have been completed and the Group, which is no longer involved in the operation of these fields, has no information on the production from these fields. The Group maintains a local office in Iran solely for non-operational functions. In 2012, Total E&P Iran (100%), Elf Petroleum Iran (99.7%) and Total South Pars 2&3 (99.7%) collectively made payments of approximately €1 million to the Iranian administration with respect to certain taxes and social security in relation to payments made in 2012 to the Group under the Dorood and South Pars 2&3 buyback contracts and the maintenance of the local office mentioned above and its personnel. TOTAL did not recognize any revenues or profits from the aforementioned in 2012. Payments for taxes and social security are expected to be made in 2013.

In 2012, as part of its ongoing global strategy for the protection of its intellectual property, TOTAL filed two patent applications in Iran that it had filed in many other countries. The filing of an application to obtain a patent in Iran is an activity that OFAC licenses, and, although TOTAL is not a U.S. person, it believes its activity is consistent with this license.

Total E&P UK Limited ("TEP UK"), a wholly-owned affiliate of TOTAL, had limited contacts in 2012 with the Iranian Oil Company UK Ltd ("IOC"), a subsidiary of NIOC. These contacts related to agreements governing certain transportation, processing and operation services formerly provided to a joint venture at the Rhum field in the UK, co-owned by BP (50%, operator) and IOC (50%), by a joint venture at the Bruce field between BP (37%, operator), TEP UK (43.25%), BHP Billiton Petroleum Great Britain Ltd (16%) and Marubeni Oil & Gas (North Sea) Limited (3.75%) and by TEP UK's Frigg UK Association pipeline (100%). To TOTAL's knowledge, no services have been provided under the aforementioned agreements since November 2010, when the Rhum field stopped production following the adoption of EU sanctions, other than critical safety-related services (*i.e.*, monitoring and marine inspection of the Rhum facilities). These agreements led to the signature in 2005 of an agreement by TEP UK and Naftiran Intertrade Co. ("NICO") (IOC's parent company and a subsidiary of NIOC) for the purchase by TEP UK of Rhum field natural gas liquids from NICO. There have been no purchases under this agreement since November 2010. TEP UK's contacts with IOC and NICO in 2012 in regard to the aforementioned agreements were limited to exchanging letters and notifications regarding contract administration and declarations of force majeure. TEP UK may have similar limited contacts with IOC and NICO in 2013. TOTAL did not recognize any revenues or profits from the aforementioned in 2012.

The Group does not own or operate any refineries or chemicals plants in Iran. Until December 2012, at which time TOTAL sold its entire interest, it held a 50% interest in the company Beh Total along with Behran Oil (50%), a company controlled by entities with ties to the government of Iran. Beh Total produced and marketed in 2012 small quantities of lubricants (16,885 t) for sale to domestic consumers in Iran. In 2012, revenue generated from Beh Total's activities in Iran was approximately €50 million, net income was approximately €3 million and Beh Total paid approximately €1 million in taxes and approximately €4 million of dividends for fiscal year 2010 (share of TOTAL: approximately €2 million).

Total Marketing Middle East FZE ("TMME"), a wholly-owned affiliate of TOTAL, sold in 2012 lubricants and additives to Beh Total in Iran. In 2012, these activities generated gross revenue of approximately €3.9 million and a net profit of approximately €0.8 million. TMME stopped such sales at the end of 2012.

Total Oil Turkiye A.S. ("TOT A.S."), a company wholly-owned by the Group and by two Group Employees, obtained in 2012, after discussions with Beh Total, administrative authorizations from the French authorities to export to Iran additives for blending by Beh Total with base oils to produce lubricants for sale by Beh Total. However, no transactions with or payments to Beh Total took place in 2012 in relation to such proposed activity, and TOT A.S. does not anticipate pursuing this business activity with Beh Total.

Total Ethiopia Ltd ("TEL"), an Ethiopian company wholly-owned by the Group and by three Group employees, paid approximately €70,000 in 2012 to Merific Iran Gas Co, an Ethiopian company majority-owned by entities affiliated with the government of Iran, pursuant to a contract for the transport and storage of LPG in Ethiopia purchased by TEL from international markets. TEL will continue such activity until it secures access to other local facilities, which is expected in late 2013.

Total Raffinage Marketing S.A., a French company wholly-owned by the Group and by five Group Employees, and Total Belgium NV, a company held 99.99% by the Group and by an individual, provided in 2012 fuel payment cards to Iranian diplomatic missions in France and in Belgium, respectively, for use in the Group's service stations. In 2012, these activities generated gross revenue of approximately €50,000 and a net profit of approximately €2,000. The Group has terminated these contractual agreements in France and is in the process of terminating them in Belgium.

In addition, the Group holds a 50% interest in, but does not operate, Samsung Total Petrochemicals Co. Ltd ("STC"), a South Korean incorporated joint venture with Samsung General Chemicals Co., Ltd. (50%). During the first six months of 2012 and prior to Executive Order 13622, STC purchased 292,000 t of condensates directly or indirectly from companies affiliated with the Iranian government for approximately €264 million. As such condensates are used by STC as inputs for its manufacturing processes, it is not possible to estimate the revenues from sales or net income attributable to such purchases. In reliance on the exemption provided in Section 1245(d)(4)(D) of the National Defense Authorization Act (NDAA) announced on December 7, 2012, STC contracted to recommence such purchases. However, STC's management has recently stated that STC would no longer take deliveries under such contractual arrangement as from March 31, 2013. In addition STC sold 1,450 t of polymers for approximately €1 million to two Korean traders, Skyplast and Tera Korea, which may have subsequently exported some or all of this product to Iran. Taking into account the uses for such polymers (*e.g.*, food packaging, pipes, car interiors), the end-customers likely were private companies. STC may make similar sales in the future.

Prior to January 23, 2012, Trading & Shipping ceased its purchase of Iranian hydrocarbons. Before this date, Total International Limited, a wholly-owned subsidiary of TOTAL, purchased in Iran during 2012 pursuant to a mix of spot and term contracts approximately 2 million barrels of hydrocarbons from state-controlled entities for approximately €189 million, which it subsequently resold for approximately €176 million. As the Group hedges the risk associated with a fluctuation in hydrocarbon prices during its trading activities, the net income before tax attributable to such activity was €3 million. Trading & Shipping owed to state controlled entities in Iran approximately €235 million as of December 31, 2011 and €83 million as of December 31, 2012, which represented the value of the hydrocarbons purchased prior to the cessation of such activity.

Syria

Since early December 2011, TOTAL has ceased its activities that contribute to oil and gas production in Syria and maintains a local office solely for non-operational administrative functions. In 2012, TOTAL made payments of less than €2 million to Syrian government agencies in the form of taxes and contributions for services rendered by the Syrian public sector in relation to the maintenance of the aforementioned office and its personnel.

3.10. Risks related to competition

TOTAL's competitors are comprised of national oil companies and international oil companies. The evolutions of the energy sector have opened the door to new competitors, increased market price volatility and called the viability of long-term contracts into question.

TOTAL is subject to competition from other oil companies in the acquisition of assets and licenses for the exploration and production of oil and natural gas as well as for the sale of manufactured products based on crude and refined oil. In the gas sector, major producers are becoming interested in the downstream value chain and are competing directly with established distribution companies, including those that belong to the Group. Increased competitive pressure could have a significant negative effect on the sales prices, margins and market shares of the Group's companies.

The pursuit of unconventional gas development, particularly in the United States, has contributed to falling market prices and a marked difference between spot and long-term contract prices. The competitiveness of long-term contracts indexed to oil prices could be affected if this discrepancy persists and if it should prove difficult to invoke price revision clauses.

The major international oil companies in competition with TOTAL are ExxonMobil, Royal Dutch Shell, Chevron and BP. As of December 31, 2012, TOTAL ranked fifth among these companies in terms of market capitalization[1].

3.11. Legal and arbitration proceedings

The principal legal proceedings in which the Group's companies are involved are described in Chapter 7 of this Registration Document.

4. Insurance and risk management

4.1. Organization

TOTAL has its own reinsurance company, Omnium Reinsurance Company (ORC). ORC is integrated within the Group's insurance management and is used as a centralized global operations tool for covering the Group companies' insurable risks. It allows the Group's worldwide insurance program to be implemented in compliance with the specific requirements of local regulations applicable in the countries where the Group operates.

Some countries may require the purchase of insurance from a local insurance company. If the local insurer accepts to cover the subsidiary of the Group in compliance with its worldwide insurance program, ORC negotiates a retrocession of the covered risks from the local insurer. As a result, ORC enters into reinsurance contracts with the subsidiaries' local insurance companies, which transfer most of the risk to ORC.

At the same time, ORC negotiates a reinsurance program at the Group level with oil industry mutual insurance companies and commercial reinsurance markets. ORC allows the Group to better manage price variations in the insurance market by taking on a greater or lesser amount of risk corresponding to the price trends in the insurance market.

In 2012, the net amount of risk retained by ORC after reinsurance was a maximum of $90 million per third-party liability insurance claim and $75 million per property damage and/or business interruption insurance claim. Accordingly, in the event of any loss giving rise to an aggregate insurance claim, the effect on ORC would be limited to its maximum retention of $165 million per occurrence.

(1) Source: Reuters.

4.2. Risk and insurance management policy

In this context, the Group risk and insurance management policy is to work with the relevant internal department of each subsidiary to:

– define scenarios of major disaster risks (estimated maximum loss);

– assess the potential financial impact on the Group should a catastrophic event occur;

– help to implement measures to limit the probability that a catastrophic event occurs and the financial consequences if such event should occur; and

– manage the level of risk from such events to be either covered internally by the Group or transferred to the insurance market.

4.3. Insurance policy

The Group has worldwide property insurance and third-party liability coverage for all its subsidiaries. These programs are contracted with first-class insurers (or reinsurers and oil and gas industry mutual insurance companies through ORC).

The amounts insured depend on the financial risks defined in the disaster scenarios and the coverage terms offered by the market (available capacities and price conditions).

More specifically for:

– Third-party liability insurance: since the maximum financial risk cannot be evaluated by a systematic approach, the amounts insured are based on market conditions and oil and gas industry practice. In 2012, the Group's third-party liability insurance for any liability (including potential accidental environmental liabilities) was capped at $850 million (onshore) and $750 million (offshore).

– Property damage and business interruption: the amounts insured vary by sector and by site and are based on the estimated cost of and scenarios of reconstruction under maximum loss scenarios and on insurance market conditions. The Group subscribed for business interruption coverage in 2012 for its main refining and petrochemical sites.

For example, for the Group's highest risks (North Sea platforms and main refineries and petrochemical plants), in 2012 the insurance limit for the Group share of the installations was approximately $1.7 billion for the Refining & Chemicals segment and approximately $1.6 billion for the Upstream segment.

Deductibles for property damage and third-party liability fluctuate between €0.1 and €10 million depending on the level of risk and liability, and are borne by the relevant subsidiaries. For business interruption, coverage is triggered sixty days after the occurrence giving rise to the interruption.

Other insurance contracts are bought by the Group in addition to property damage and third-party liability coverage, mainly for car fleets, credit insurance and employee benefits. These risks are mostly underwritten by outside insurance companies.

The above-described policy is given as an example of a situation as of a given date and cannot be considered as representative of future conditions. The Group's insurance policy may be changed at any time depending on the market conditions, specific circumstances and on the General Management's assessment of the risks incurred and the adequacy of their coverage.

TOTAL believes that its insurance coverage is in line with industry practice and sufficient to cover normal risks in its operations. The Group is however not insured against all potential risks. In the event of a major environmental disaster, for example, TOTAL's liability may exceed the maximum coverage provided by its third-party liability insurance. The loss TOTAL could suffer in the event of such disaster would depend on all the facts and circumstances of the event and would be subject to a whole range of uncertainties, including legal uncertainty as to the scope of liability for consequential damages, which may include economic damage not directly connected to the disaster. The Group cannot guarantee that it will not suffer any uninsured loss and there can be no guarantee, particularly in the case of a major environmental disaster or industrial accident, that such loss would not have a material adverse effect on the Group.