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## Doing Business Responsibly

CSR Report 2013



Our vision is to be a global, integrated energy company — a leading international oil company and a world-class operator in natural gas, petrochemicals, solar energy and, tomorrow, biomass. Together, our commitments to safety, ethical practices and corporate social responsibility form a shared foundation for the strategic objectives in each of our business segments.

## CSR\* Report 2013

\*Corporate Social Responsibility.

## Materiality Analysis

### Background Information

In application of Article 225 of France's Grenelle II Act of July 2010, social and environmental information is included in Total's Registration Document, in Section 7 for 2013.

Total has decided nonetheless to continue publishing an annual corporate social responsibility (CSR) report, to give all our stakeholders quick and easy access to information about our CSR challenges, commitments and performance.

### Materiality Process for the CSR Report 2013

Following the same rationale as the previous report, the CSR Report 2013 aims to provide an integrated overview of Total's business, social and environmental strategies, activities and performance. It therefore presents the main challenges associated with our operations in host countries, as well as our stakeholders' expectations, in a constantly changing environment.

The first phase in the process of identifying, selecting and ranking the topics addressed in this report was

a "go-between" committee, which brought together all of the teams responsible for liaising throughout the year with our various stakeholders — employees, customers, investors, SRI rating agencies, suppliers, local communities, host governments, NGOs, journalists and institutions. The committee enabled us to pinpoint the most important issues for each audience.

This was followed by a second phase involving interviews with the executives and senior managers in charge of Total's CSR policies and our three business segments, to identify the most significant challenges and events in their areas of responsibility.

In the final phase of the process, all of these elements were analyzed and the topics selected for inclusion in the report were discussed and approved by members of the Executive Committee during a business review.

To learn more:  
[csr-analysts.total.com](http://csr-analysts.total.com)

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## Abbreviations







B: billion  
 boe: barrel of oil equivalent  
 Btu: British thermal unit  
 FPSO: Floating Production, Storage and Offloading vessel  
 k: thousand  
 kboe/d: thousand barrels of oil equivalent per day  
 M: million  
 Mboe/d: million barrels of oil equivalent per day  
 T: ton

## Cover

Workers on the ICS-3 drilling rig site on the Incahuasi field in Bolivia.

## Environmental Impact

A total of 19,814 copies of last year's publication were printed. Using recycled paper reduced our environmental impact. The savings were:

-  **4,870** kilograms of waste paper
-  **720** kilograms of carbon dioxide
-  **7,200** kilometers driven by an average European car
-  **101,274** liters of water
-  **9,332** kWh of energy
-  **7,912** kilograms of wood

Source: The carbon footprint was assessed by Labelia Conseil using the Bilan Carbone® method developed by French Environment and Energy Management Agency ADEME. Calculations are based on a comparison between the recycled paper used and a virgin fiber paper corresponding to the latest European BREF data available for virgin fiber paper. The results are based on technical data and subject to modification.

This document was printed with vegetable ink on Igloo Offset paper, produced from recycled FSC-certified pulp, reducing pressure on the world's forests. The Ecolabel-certified paper was produced in an ISO 14001- and FSC-certified paper mill. The printer is certified as complying with Imprim'Vert®, the French printing industry's environmental initiative. FSC No. C006774. The Print Time to Market® concept adopted means that only copies actually distributed are printed.

With Ecofolio, Total is encouraging paper recycling. Sort your trash, protect the environment. [www.ecofolio.fr](http://www.ecofolio.fr)

## Illustrations

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## Online ↓

In addition to our corporate website, we have a dedicated site for CSR analysts that presents our reporting process, our CSR reporting standards and our key indicators.

[www.total.com/csr-analysts.total.com](http://www.total.com/csr-analysts.total.com)



## INTERVIEW

"There aren't two Totals, one focused on business and the other on corporate social responsibility.

On the contrary, CSR is fully integrated into our strategy, our business model and our day-to-day operations."

→  
**Christophe de Margerie,**  
Chairman and Chief Executive  
Officer, Total



**"Climate change is considered every time we make a strategic decision."**



**When you co-chaired the World Economic Forum in Davos in early 2014, your closing remarks focused on climate change. Was that your way of bringing energy companies back into the debate?**

**Christophe de Margerie:** One of the things I noticed at Davos was that climate change has finally become a genuine priority. As the global population increases, driving further growth in energy demand, the issue is becoming even more complex. We all know that the responses will have to address this trend and ensure a sufficient supply of energy at affordable prices. So, like it or not, energy companies are not just part of the problem, we're also part of the solution. We can no longer be kept out of the climate change discussions that precede negotiations among world leaders. And I also believe that, rather than simply participating in the discussion, energy companies have a duty to provide decision-makers with a better idea of what can reasonably be achieved and when — and if more needs to be done, at what cost.

**How are you contributing to the energy transition that needs to take place in order to combat climate change?**

**C. de M.:** Total has been implementing measures to reduce greenhouse gas emissions for more than ten years. Our efforts target several avenues. First, we are actively promoting the emergence of a more diverse energy mix. For example, by staying the course as our SunPower affiliate rode out the slump, we have now achieved our objective of becoming a global leader in

solar energy. We are aware of the progress that still needs to be made for solar energy to achieve genuine cost-competitiveness, and it will be some time before new energies replace the ones currently available. In the meantime, we need to tackle the issue of climate change with an energy mix dominated by fossil fuels.

One solution is to increase the use of natural gas, which now accounts for half of Total's resource production. With a much smaller carbon footprint than coal when used for power generation, natural gas is set to become the world's transitional fossil fuel.

Another key avenue for improvement is to enhance the energy efficiency of our facilities and our products and services. This is often seen by our stakeholders as the easiest way to combat climate change. But it's important to remember that efficiency gains are achieved through technological advances, which require considerable R&D and investment. We have also made a public commitment to gradually eliminate gas flaring, which is a significant source of greenhouse gas emissions in our operations.

Oil and gas are vital resources and remain our core business. But it's not just "business as usual," because climate change is considered every time we make a strategic decision.

**You often argue in favor of a more integrated approach to corporate social responsibility. Can more be done in this area?**

**C. de M.:** I certainly think it's a shame that, very often, people look at our financial results and our corporate social responsibility performance separately. In fact, many of our investors have different people looking at these two areas, so they never get a balanced view of



our overall performance. But there aren't two Totals, one focused on business and the other on corporate social responsibility. On the contrary, CSR is fully integrated into our strategy, our business model and our day-to-day operations.

Total probably achieved integration earlier than other companies because our industry elicits such high expectations about how we should manage our environmental impact and deliver benefits for the economy at the same time. Our operational managers find themselves engaging with stakeholders constantly, because their responsibility doesn't end when they're off the clock. I can assure you that no one at Total today thinks we can conduct our business without taking into consideration the environment in which we operate. This applies to both our strategic vision and our frontline operations. The aim of this report is to illustrate this integrated approach.

**These days, cost discipline is also one of Total's key operational priorities. How is this affecting your corporate social responsibility commitment, given the cost associated with acting responsibly?**

**C. de M.:** It's true that managing costs is critical to the long-term viability of our operations, but safety is non-negotiable. The only way we can continue to do business is by operating safely. That's why we will never stop investing in training, campaigns to heighten vigilance and other initiatives that ensure the safety of our teams and asset integrity. On the other hand, we can and must leverage our capacity for innovation to find new, more efficient and cost-effective ways to design our projects and conduct our operations. The soaring costs preva-

lent in the industry for the last decade or more are becoming a real problem. Since 2011, oil prices have stabilized while project costs have continued to climb by 7 or 8% per year. Obviously, project complexity and higher social and environmental standards are part of the equation. But a large portion of the blame can be attributed to higher raw material prices — believe it or not — as well as to the supply and demand situation within the industry.

To explain what I mean, let's look at a real-world example. For the same level of complexity, a deep offshore drilling rig cost around \$100,000 to \$200,000 a day in the early 2000s, compared with \$500,000 to \$600,000 today. Unless this sort of price inflation is reined in, we won't be able to continue investing. And it needs to happen now. Otherwise, projects are going to be delayed, which means that production will eventually shrink while energy demand continues to grow. We could then see a new surge in oil prices, with consequences for the global economy that no one wants to experience again. When we're talking about responsibility, this is a key issue. We have a responsibility to maintain our company's investment capacity, which is critical to our long-term viability, and we also have a responsibility to raise the red flag about industrial inflation, an issue that goes well beyond the oil and gas sector.

**Can the costs associated with meeting social and environmental standards be sustained, under these circumstances?**

**C. de M.:** Anything that helps to protect our environment is a necessity, not a luxury. We therefore have a collective responsibility to accept the fact that cleaner →



**“There’s a lot of talk about the energy transition, and rightly so, but we also need to discuss the changes it entails for energy companies.”**



energies are more expensive. It’s too bad that this subject is so often discussed in conflicting, black-and-white terms: Should we protect consumers’ purchasing power or the environment? To be acceptable, the additional cost must be clearly explained and gradually introduced. Phasing in the additional cost over time is important, both for consumers and for the companies that have to invest in innovation, adjust their products and find new solutions. That’s why business leaders argue so hard for greater visibility over regulatory changes and a more gradual approach. We’re not trying to evade our responsibilities; it’s just that some things take time.

**What about community engagement? Host countries have high expectations for job creation and there’s been a rapid increase in local content across all Total projects.**

**C. de M.:** Host governments and communities expect, quite rightly, that our investments will also create significant value for them. The rapid improvement is due first and foremost to the fact that we have completely rethought the way we do things, so that local content is now integrated into our projects very early in the design phase. It’s no use waiting until the call for tenders has been issued to start thinking about the capacity available locally. Everything has to be prepared in advance. For example, training programs have to be initiated years before the scheduled start-up of operations and a prequalification process has to be set up to give local businesses time to meet our standards. Sometimes we even support the creation of new streams in local schools or universities. Angola provides a good example of how these investments produce results over an extended

period of time. On the Pazflor project, which came on stream in 2011, more than 3 million hours of work were performed locally. With CLOV, we expect to reach 11 million hours.

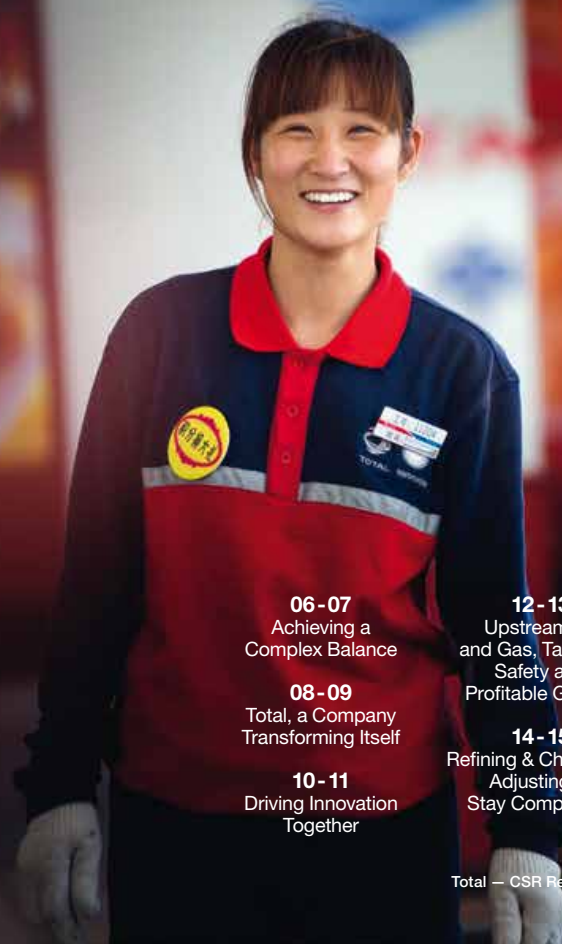
Gauging the long-term effectiveness and impact of our community engagement initiatives is one area where we still need to improve. To help prioritize our initiatives, we need to know whether their impact on the local economy, and particularly job creation, is sustainable or only temporary. At the same time, local capacity building must not compromise our projects’ competitiveness over the long haul.

**Planning ahead is a theme of this report. Do you think it’s a key success factor?**

**C. de M.:** It’s certainly a factor in the successful integration of business and CSR objectives. A responsible company is one that deploys the necessary resources, before the final investment decision, to assess not only the opportunities involved, but also the risks and its ability to manage them. Looking out for subtle clues so that we can anticipate change and give our teams and suppliers time to adapt also gives us a competitive advantage. There’s a lot of talk about the energy transition, and rightly so, but we also need to discuss the changes it entails for energy companies. To find the leeway necessary to build the future, we need to put all the issues on the table as soon as possible and discuss them without prejudice. —

# OUR STRATEGY IN A CHANGING WORLD

The global energy map is being redrawn. The shale boom is revolutionizing the energy picture in North America, new producing basins have been discovered, emerging geographies are driving spiraling energy demand, and developed countries are working to curb their consumption. To top it all off, the economic and geopolitical outlook is constantly changing. Never have we been so acutely aware of how complex the energy future will be.



**06-07**  
Achieving a  
Complex Balance

**08-09**  
Total, a Company  
Transforming Itself

**10-11**  
Driving Innovation  
Together

**12-13**  
Upstream Oil  
and Gas, Targeting  
Safety and  
Profitable Growth

**14-15**  
Refining & Chemicals,  
Adjusting to  
Stay Competitive

**16-17**  
Marketing  
& Services, Close to  
Our Customers

**18**  
Creating Value  
for Our  
Stakeholders

## ACHIEVING A COMPLEX BALANCE

Securing energy supply and fostering economic development while also combating climate change is one of the greatest challenges of the coming decades.

Led by expansion in non-OECD countries, due to both population growth and an understandable desire for more comfortable living standards, global energy demand is projected to rise by around 1.1% per year to 2035. As energy use climbs, our energy resources become even more precious.

At the same time, combating climate change means reducing greenhouse gas emissions in a global energy system where fossil fuels currently meet 81% of demand. The accelerated development of new, lower-carbon energies is there-

fore vital, but further technological advances are required to make them cost-competitive.

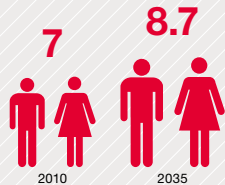
Leaders in every region of the world now face the difficult task of determining how to meet three major objectives:

- **Security of supply.**
- **Affordable energy.**
- **A sustainable mix that will help combat climate change.**

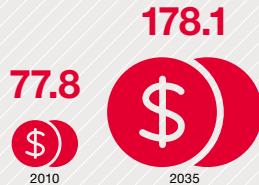
### Continued Growth in Global Demand

Source: U.N., IMF, Total.

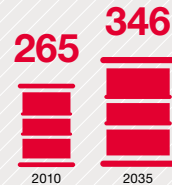
**Population Growth**  
(billion people)



**Economic Growth**  
Global GDP in trillions of 2012 dollars  
(based on purchasing power parity)



**Higher Energy Demand**  
(million barrels of oil equivalent per day)



**Natural Gas Prices**  
**\$3.7/MBtu**  
at Henry Hub\* in the United States

01

#### United States

The U.S. is now the world's biggest oil and gas producer and is expected to start exporting LNG in the near future. Carbon emissions have been reduced by 10% from 2005 levels<sup>1</sup>, thanks partly to the gradual switch from coal to natural gas in power generation.

<sup>1</sup>www.eia.gov



**\$109/b**

That was the average price of Brent crude in 2013. Supply remained sufficient, mainly thanks to the increased production of primarily unconventional oil in North America, while ongoing geopolitical issues continued to put pressure on OPEC countries.

**Natural Gas Prices**  
**\$10.5/MBtu**  
for the National Balancing Point (NBP) in Europe\*

03

02

02

#### Africa

Nearly 600 million people, or 57% of the population<sup>1</sup>, do not have access to electricity. Providing communities with access to a reliable energy supply is a major issue for the region.

<sup>1</sup>World Energy Outlook 2013.

\*Regional price benchmarks for gas trading: Henry Hub in the United States and the National Balancing Point in Europe.

04

04

#### Russia

The world's second biggest oil and gas producer after the United States, Russia is now trying to diversify its markets by supplying gas to China, where demand is growing rapidly.

06

05

**Natural Gas Prices**  
**\$16/MBtu**  
is the average price of LNG delivered to Japan

03

#### Europe

Shale gas development in the United States has affected Europe. Lower natural gas prices have made energy-intensive industries in the U.S. more competitive. In Europe, natural gas used in industry is now three to four times more expensive than in the United States, India and Russia<sup>1</sup>, which is undermining Europe's competitiveness in energy-intensive segments, particularly chemicals.

<sup>1</sup>Energy prices and costs in Europe, a Communication published by the European Commission in 2014.

05

#### Japan

With all of its nuclear power plants currently shut down, Japan is using a wide range of other energies to meet its power generation needs. At the same time, to secure supply, the country is seeking to diversify its sources of imported LNG.

06

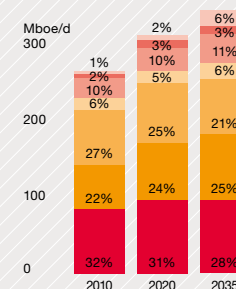
#### China

Around 68% of the country's energy needs are met by coal. To diversify its energy mix and combat growing pollution, China is actively supporting the production and use of natural gas and is investing heavily in renewable energies. It is now the world's biggest investor in solar and wind power combined.

### Our View of the Energy Mix in 2035

→ The overall proportion of renewable energies — excluding biomass — is expected to triple by 2035, to 9% of the energy mix.  
→ As the fossil fuel with the smallest carbon footprint, natural gas will become the second biggest source of energy after oil.  
→ Still critical in meeting transportation energy needs, oil will continue to play a significant role in the energy mix.

● Solar, wind power, other ● Hydropower  
● Biomass ● Nuclear ● Coal  
● Natural Gas ● Oil



## Our Ambition

# An Integrated Business Model

From exploring and producing to refining, processing and marketing, our capabilities span the entire energy value chain in more than 130 countries. Despite the current trend toward segmentation, we firmly believe that having an overview of the energy industry, from resources to end-users, is a competitive advantage that drives innovation and enables us to adapt seamlessly to changes in supply and demand.



## Oil and Gas Production

# 2.3 Mboe/d

or 1.6% of the world's oil and gas production. In response to fast-growing global demand for oil and gas, we are scaling up our production to reach a potential of 3 million barrels of oil equivalent per day in 2017. It is important to find a balance between mitigating climate change and using oil and gas, which currently account for 54% of the primary energy consumed worldwide. Since 1990, we have slashed our greenhouse gas emissions per million barrels of oil equivalent produced by 45%, to 25,900 tons of carbon dioxide equivalent in 2013 from 47,000.



# Safety First

In our business, safety takes precedence over everything else. That's why we continuously invest in risk prevention, safety training and employee awareness initiatives. We have also made safety the number one priority for all our managers, whose exemplary behavior in this area is critical to instill a strong culture of safety.



## A Multicultural Workforce

# 98,799 employees

representing more than 130 nationalities. As our global presence grows, our teams are becoming increasingly multicultural.



# TOTAL, A COMPANY TRANSFORMING ITSELF

Thanks to our teams' energy and expertise and the substantial investments made in recent years, we are securing the future. Our priority today is putting our commitments into practice.

## 2014 Capital Expenditure

# \$26 billion

After peaking at \$28 billion in 2013, organic capital expenditure will return to a more sustainable level in 2014. In addition, we are working hard to reduce operating costs, while maintaining our unwavering commitment to safety.

## Refining & Chemicals

# Three Major Integrated Complexes in the Middle East and Asia

Already firmly established in Europe, we are diversifying our geographic mix by expanding our presence in growth regions and investing to improve our access to feedstock. The commissioning process began at the state-of-the-art SATORP complex in Saudi Arabia in 2013 and production capacity is being increased at our facilities in South Korea and Qatar.

## Climate Change

# 20%

reduction in greenhouse gas emissions from all of our operated sites, from 58 million tons of carbon dioxide equivalent in 2008 to 46 million in 2013.

To pursue sustainable growth while reducing greenhouse gas emissions, we exploit a wide variety of avenues: reducing flaring, enhancing energy efficiency, improving the environmental performance of our products, supporting new energies, increasing the use of natural gas and developing carbon capture and storage solutions.



## Technological Leadership

# A Trailblazer in the Deep Offshore

Deep offshore developments currently account for around 10% of our oil and gas production, a percentage that is set to more than double between 2007 and 2017 as new projects come on stream. Our extensive expertise and extremely high standards have made us a partner of choice in this technology-intensive segment. With eight FPSOs in service in 2017, we will be the top international oil company in the deep offshore.



## Marketing & Services

# 3 million customers

stop at our 15,550 service stations worldwide every day. Being close to customers is one of our hallmarks and a cornerstone of our growth strategy. It's also our primary source of inspiration for developing innovative products and services.



# Access to Energy

Facilitating access to energy for low-income communities is a core component of our commitment to local development. An incubator for ideas, the Total Access to Energy program drives the development of innovative, economically viable solutions that deliver significant social benefits and create new opportunities for our businesses.



## Research & Development

# \$7.1B

has been allocated to R&D for the period 2014-2018, with 25% of it earmarked for clean technologies and the environment.

# Equally Involved in Oil and Gas

Natural gas now accounts for around 50% of our oil and gas production, versus 35% ten years ago. Because it is abundant and emits only half as much carbon dioxide as coal during power generation, it has an increasingly important role to play in the energy transition. Liquefied natural gas (LNG) combines those advantages with the flexibility of shipping. A pioneer in this segment, Total is now one of the main players. In fact, our LNG production capacity is set to double between 2007 and 2017.



## Local Development

# 3,400

community engagement projects were carried out by our affiliates in 2013. We want our operations to create opportunity for local communities in all our host countries. To achieve this, we leverage an approach centered on constructive dialogue with our various stakeholders, working with them to develop initiatives in such areas as economic development, training and education, while also promoting local employment.



## Environmental Performance

# 980

full-time equivalent positions are dedicated to environmental protection. These multidisciplinary teams participate in the project design phase and monitor each site's environmental performance throughout its useful life including, where applicable, during the dismantling process.



## Renewable Energy

# A Global Solar Leader

In 2011, Total became the majority shareholder of SunPower, a world leader in the solar energy industry. This strategic investment has allowed us to develop a more diversified, lower-carbon energy mix and offer our customers and partner countries a comprehensive range of energy solutions.





# DRIVING INNOVATION TOGETHER

To secure our company's future, we need to think about the challenges ahead. In addition to technological developments, we also seek out innovation in applications, business models and operating methods.

## #collaborative consumption #energy efficiency

In France, Total is supporting **BlaBlaCar**, Europe's number one car sharing website, by offering a €20 fuel card to every first-time user. An example of collaborative consumption, car sharing is a relatively new method of transportation, one that is effective, friendly and energy efficient.



## #idea #project

Created by Exploration & Production, our "**Innovation & Expertise Pathways**" program identifies employees who have an idea that could be particularly beneficial for the company and gives them the necessary resources to put it into practice. When the dedicated committee decides that an idea has potential, employees are given a budget, the opportunity to obtain outside support and, most importantly, time. Depending on the project in question, employees can spend between half and all of their working hours on implementing their idea, for a period of one to three years. Six ideas are currently being developed thanks to this program.

## #robots #safety

Enhancing the safety of our operations is the main objective behind the Autonomous Robot for Gas & Oil Sites (**ARGOS**) Challenge launched by Total in partnership with the French National Research Agency (ANR). Still relatively under-developed in our operations, robots offer significant promise for maintaining and inspecting our facilities safely. A total of 31 projects from 15 countries have been submitted via the ANR's website, and between three and five teams will be selected to build their robot.



## #mobile #new service

Our partnership with Orange enables **Orange Money** customers in Africa to access money transfer services and use their cell phones as a means of payment at Total service stations. Already available in five countries, this innovative service will gradually be extended to more than a dozen African nations.

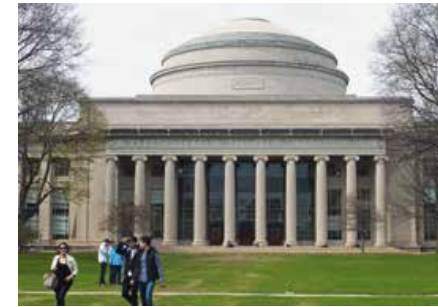


## #3D #process optimization

Hutchinson has trialed 3D printing to create a customized tool for its sealing system production line. The printed part is a mold with integrated cooling channels, which — when tested — shortened production time by 40% and improved the quality of the seals produced.

## #disruptive technologies #open innovation

Because solar energy is intermittent, the key to its widespread use is to find cost-effective solutions for storing electricity. That's why Total signed a \$4 million, five-year agreement with the Massachusetts Institute of Technology (**MIT**) in 2009 to develop a large-capacity, long-life, low-cost stationary battery. Encouraged by the project's very promising results, the partners created the AMBRI start-up to develop these grid-scale energy storage systems. Other aspects of our open innovation approach are carried out via our venture capital arm, Total Energy Ventures,



which has acquired minority interests in three start-ups offering energy storage solutions — EnerVault (redox flow battery systems), LightSail Energy (isothermal compressed air) and Sunfire (solid oxide fuel cells).



## #circular economy #local employment

In April 2013, Total and Veolia inaugurated the **Osilub** plant to regenerate used oil as high-end engine oil. Located in Normandy, the plant has an annual processing capacity of 120,000 metric tons, or nearly half the used engine oil collected in France each year. Representing an investment of €55 million, of which 35% for local contractors, Osilub is also stimulating local employment.



## #demonstration project #biomass

Total is a partner in the **BioTfuel** project, which aims to develop, by 2017, an end-to-end chain of industrial processes capable of producing high-quality, advanced biodiesel and biogas fuel from a wide range of feedstock, including biomass resources such as farming waste and wood chips and fossil resources such as crude oil residues.

## #cost-competitive #solar

Through improved technology and process optimization, our **SunPower** affiliate has slashed its solar panels' manufacturing cost per watt by more than 40% in two years.

## #sustainable mobility #open innovation

What do start-ups **OuiCar**, **RidePal**, **QuickPay**, **Fliinc** and **ez-Wheel** have in common? They are all supported by **Ecomobilité Ventures** (EMV), Europe's first multi-company private equity fund dedicated exclusively to innovative sustainable mobility solutions. Backed by €30 million in capital, EMV was set up by French rail operator **SNCF**, **Total** and **Orange** in 2011, with **Air Liquide** joining in 2014.



## #inspection #safety

Total is testing the use of **drones** to inspect equipment at our industrial sites. This innovative approach improves safety, by eliminating the need for personnel to perform hazardous tasks, and enhances unit availability, by enabling operations to continue during the inspection.



# UPSTREAM OIL AND GAS, TARGETING SAFETY AND PROFITABLE GROWTH

## Fast Facts

- **Exploration and production operations** in more than 50 countries.
- **2.3 million barrels of oil equivalent per day produced in 2013.**
- **More than 13 years** of proved reserves life.
- **A major player** in LNG, active across the value chain, from production to marketing.
- **12.3 million tons of LNG produced** in 2013; interests in 13 liquefaction plants, including three under construction, and capacity reserved in five regasification terminals.

## Our Strategy

**Aiming for profitable growth in production, we are targeting potential of 3 million barrels of oil equivalent per day in 2017.**

- The safety of our operations and the integrity of our facilities are our top priorities.
- We also make every effort to limit our environmental footprint and understand our impact on communities, even before the project design phase. Fostering dialogue and fulfilling our commitments to stakeholders are both critical to our social license to operate.
- We strive to maximize the value of our producing assets, particularly by enhancing recovery rates, which currently average 33% across the industry.
- When making investment decisions, we take care to maintain our geographic diversity and focus on segments where our know-how and capacity for technological innovation give us a competitive edge, such as LNG, the deep offshore, and shale oil and gas.
- Because cost discipline has become a major challenge for our industry, we set up a task force in 2013 to identify ways of optimizing costs without compromising safety.
- We spent \$2.8 billion on exploration in 2013 to help replace our oil and gas reserves.

01

**CLOV, Angola**  
**Deep offshore oil**  
**Total 40%, operator**  
**Capacity: 160 kboe/d**  
**Start-up: 2014**

**Eleven million hours of work will be carried out in Angola by local companies.**

Thanks to the surge in demand created by the succession of major offshore developments, Angolan yards are now able to fabricate and install increasingly complex components. With 64,000 tons of production, CLOV has taken local content to the next level. In addition, an assertive local training and recruitment program has enabled many Angolans to join the project's teams and those of its contractors.

02

**EGINA, Nigeria**  
**Deep offshore oil**  
**Total 24%, operator**  
**Capacity: 200 kboe/d**  
**Start-up: 2017**

**All of the basic engineering and a large portion of the detailed engineering are being carried out by local companies — a first for Nigeria.**

To make this possible, we sped up technology transfers and operator training by encouraging and facilitating partnerships between international companies and Nigerian businesses.

03

**LAGGAN-TORMORE, United Kingdom**  
**Deep offshore gas and condensate**  
**Total 80%, operator**  
**Capacity: 90 kboe/d**  
**Start-up: 2014**

**Safety and the protection of a rich ecosystem.**

The area west of the Shetland Islands is exposed to cold, fierce winds, raging seas and long, dark winters. In this hostile environment, ensuring safe working conditions for the teams onsite is an absolute priority.

Protecting the coastal environment where the gas plant is being built is also a priority, because the local peat bogs are home to a wide variety of protected species, including sea otters, seals and various breeding birds. Thousands of tons of peat have been removed and stored so that it won't deteriorate or release greenhouse gas emissions to the atmosphere. When the gas plant is decommissioned, the peat will be put back into place. The work is being monitored by experts to ensure that it doesn't disturb the local wildlife's habitat or habits.

Consultation with the local community and authorities was initiated in 2009, well before the project began, to jointly determine how the work should be carried out. Project teams have since pursued the dialogue process by engaging with the local community.

- Final investment decision in 2013.
- Start-up in 2014.

**"SINCE 2001, OUR NEW PROJECTS HAVE BEEN DESIGNED WITH NO FLARING UNDER NORMAL OPERATING CONDITIONS."**

04

**MOHO NORD, Republic of the Congo**  
**Deep offshore oil**  
**Total 53.5%, operator**  
**Capacity: 140 kboe/d**  
**Start-up: 2015/2016**

**For the Republic of the Congo, Moho Nord will be a powerful driver for building local manufacturing and service industry capacity,** creating 7,000 to 8,000 jobs, with 12,000 tons of structures fabricated locally. Total intends to support the country for the long term. We are therefore committed to creating development gateways for the future. One avenue is backing businesses that will be able to work with other industries once the development is completed, for instance in mining projects that will get off the ground in the Congo in the coming years.

05

**OFON PHASE 2, Nigeria**  
**Offshore oil, gas and condensate**  
**Total 40%, operator**  
**Capacity: 70 kboe/d**  
**Start-up: 2014**

**Eliminating gas flaring on Ofon.**

Avoiding the flaring of 950,000 cubic meters per day of gas in normal operating conditions is one of the major advances of the Phase 2 development.

Every day:

- 3 million cubic meters of gas will be piped over 70 kilometers to the Amenam offshore gas hub and then exported to the onshore Bonny LNG plant.
- 800,000 cubic meters of gas will be reinjected into the wells to enhance oil recovery.
- 450,000 cubic meters of gas will be used to generate electricity to power the Ofon facilities.

Ofon Phase 2 is also synonymous with energy efficiency. By reusing the heat from turbine exhaust gases, we can significantly curb energy consumption and greenhouse gas emissions at our offshore facilities. This is the first time this innovative technology is being used on a shallow offshore development in Nigeria.

06

**YAMAL LNG, Russia**  
**Onshore LNG**  
**Operated by Yamal LNG, a joint venture owned by Novatek (60%), Total (20%) and CNPC (20%)**  
**Capacity: 16.5 million tons per year from three LNG trains**  
**Start-up: 2017**

**An approach designed to protect the environment and benefit local communities in the Yamalo-Nenets region.**

Located onshore in the estuary of the Ob River, which is ice-bound nine months of the year, the Yamal LNG gas terminal project includes a comprehensive ice management system. A fleet of 16 ice-class LNG carriers is being built especially for the project.

Based on an environmental assessment and a preliminary stakeholder survey, an initial development program has been defined for the communities in the Yamalo-Nenets region. It includes:

- Measures to prevent soil and water pollution, together with compensation contracts to cover any damage to the region's ecosystem and fragile natural resources.
- Cooperation agreements with local authorities, focusing on culture and education and on measures to protect sacred landscapes and places of worship.
- The development of infrastructure.
- Close cooperation with NGOs and local non-profit organizations.

07

**FORT HILLS, Canada**  
**Oil sands**  
**Total (39.2%)**  
**Operated by Suncor Energy**  
**Capacity: 180 kboe/d**  
**Start-up: 2017**

See pages 46 and 47.

# REFINING & CHEMICALS, ADJUSTING TO STAY COMPETITIVE

## Total is pursuing a targeted investment strategy in refining and petrochemicals in Europe.

Despite weaker markets, we believe that we have an industrial future in Europe, as long as we can produce less, more efficiently. As the leading European refiner, we have a responsibility to plan ahead and to reduce capacity in line with shrinking demand.

While making these adjustments, we continue to meet our commitments as a responsible employer, by taking everyone's future into consideration.

### Fast Facts

→ Our Refining & Chemicals segment is a major production hub, covering refining, petrochemicals and specialty chemicals.

→ Total is one of the world's top ten integrated refining and petrochemical producers and the leading refiner and second-ranked petrochemical producer in Europe.

→ Worldwide, we have interests in 21 refineries, located in Europe, the United States, Africa, the Middle East and China, including nine that we operate.

→ In 2013, our refining capacity totaled around 2 million barrels per day, of which 85% in Europe, and our throughput amounted to 1.7 million barrels per day.

### Environment

→ Petroleum product consumption has been decreasing steadily in Europe since 2006, primarily due to continuous improvements in energy efficiency. Higher energy prices and the financial and economic crisis exacerbated the downward trend, resulting in an average decline of 1.5% per year across all petroleum products since 2008.

→ At the same time, the sharp increase in diesel cars on the road has created an imbalance between production capacity and demand. European facilities are being forced to modify their refinery configurations to maintain their competitiveness, which requires a significant financial investment.

### Our Strategy

→ The safety of our operations and the integrity of our assets are our top priorities.

→ To secure its future, the European refining industry needs to become more competitive, which means adjusting production capacity and optimizing facilities. That's why we're focusing our investments on large, integrated refining and petrochemical complexes, to capitalize on synergies between the two activities and to capture economies of scale.

→ In petrochemicals, innovation and technology are the keys to making our products stand out from the commodity products now being imported in bulk and to gaining ground in growth markets. Examples include polypropylene, which is used by carmakers to produce lighter vehicles, and polystyrene for building insulation.

→ Our focus regions for development are Asia, where economic growth is stimulating demand, and the Middle East, where cost-advantaged feedstock and low energy prices combine to make production particularly competitive. The development of unconventional resources is also providing an opportunity to strengthen our petrochemical positions in the United States.

01

## A €1 Billion Upgrade at the Antwerp Complex in Belgium

The complex is being upgraded to meet growing demand for lighter, ultra-low-sulfur diesel and home heating oil, which have a smaller environmental footprint, and to enable gases from the refining process, known as off-gas, to be converted into petrochemical feedstock. The project also entails shutting down two of the site's oldest production units, which are no longer competitive.

Their teams will be able to continue their career paths in the new units being built at the complex. The workforce will therefore be maintained at the current level of around 1,700 employees.



## \$250 Million in Savings Achieved in 2013

By combining refining and petrochemicals into a single manufacturing business segment, we have organized our operations in a way that sets us apart from our competitors. And we're now benefiting from the expected synergies and efficiency gains.

## \$1B

was invested in 2013 in safety, environmental performance, maintenance and asset integrity at our refining and petrochemical facilities.

02

## Plans to Transform the Carling Facility

Total will invest €160 million by end-2016 to turn Carling in eastern France into our European center for hydrocarbon resins and a leading polymer facility. As part of the project, Carling's structurally loss-making steam cracker will be shut down in 2015. Of the 544 jobs at Carling today, 344 will be maintained in 2016 and the changes will be made without any layoffs. Total has made a firm commitment to provide each person concerned with a satisfactory solution tailored to his or her situation (see pages 38 and 39).

01 02

03



## The Virtuous Circle of Availability

A project was launched in 2013 to enhance the competitiveness of our facilities by increasing their availability to 94%, which corresponds to an average three weeks of downtime a year instead of five.

In a particularly volatile market, this means that our production base will be better able to capture profit margins when they are up. By cutting back the number of shutdowns and restarts, which involve hazardous operations, we will also be improving safety, energy efficiency and environmental performance and reducing noise intrusions for neighboring communities.

03

## Start-Up of SATORP, One of the Ten Most Efficient Refineries in the World

Following three years of construction, commissioning of the new SATORP refinery in Jubail, Saudi Arabia, started in 2013. Owned 62.5% by Saudi Aramco and 37.5% by Total, the complex has a refining capacity of 400,000 barrels per day. Its deep conversion units are capable of producing fuels that comply with the most stringent environmental standards.

The refinery will primarily supply Asia and the Middle East, particularly the Saudi market. As many as 37,000 people worked on the site during the construction phase, which involved more than 350 million hours of work and created 8,000 indirect jobs. A strong focus on safety kept the total recordable injury rate (TRIR) to 0.18 — remarkably low for this type of construction project.

Around 38% of the work was performed by Saudi contractors. Ultimately, the SATORP complex will employ nearly 1,100 people and generate business for many local companies. A total of 400 technicians and operators were trained over three years to prepare for the site's start-up.



## A Technological Roadmap Defined for Refining & Chemicals in 2013

The priorities identified include: — Investing in key technologies for the future.

— Developing new feedstock, such as biomass, natural gas, coal and waste, for the production of fuels and polymers.

— Using resources efficiently, especially by enhancing process energy efficiency, and managing and recycling end-of-life plastics.

# MARKETING & SERVICES, CLOSE TO OUR CUSTOMERS

## Fast Facts

→ Our Marketing & Services segment designs and markets products made primarily from petroleum and provides the services associated with them.

→ Present in more than 130 countries, it represents the Total brand among customers and strives to deliver solutions that actively bring a responsible energy future closer.

→ In 2013, petroleum product sales averaged 1.7 million barrels a day. Total is the leading marketer in Western Europe and Africa. At end-2013, we had 15,551 service stations worldwide.

## Our Strategy

→ Our strategy is to accelerate our development by capitalizing on our leadership positions in Europe and Africa and strengthening our presence in growth regions in the Middle East, Asia and Latin America.

→ Ensuring the safety of our operations and managing the impact of our activities and products are key priorities.

→ We emphasize local integration, primarily by hiring, training and promoting local talent at all levels of the organization.

→ Our ability to identify customer and stakeholder expectations and our capacity for continuous innovation enable us to offer our customers effective, reliable solutions that are more environmentally responsible.

→ Our portfolio of services is constantly evolving, particularly at our retail outlets. In addition to offering automotive fuel, they now make our customers' day-to-day lives easier and help them become smarter, more frugal consumers.

01

## 250 More Service Stations in Africa and the Middle East, for a Total of 4,700

While other international oil companies are gradually pulling out of the African market, we are pursuing our long-term investment strategy in this region, which is home to more than 1 billion people. Fulfilling our role as a responsible market leader, we offer our customers reliable, high-quality products and services.

02

## 600 Total Access Service Stations in France

Total Access service stations are winning back retail customers by combining some of the market's lowest prices with Total-quality products and services. Thanks to this innovative concept, we are expanding our retail network in France, despite declining petroleum product consumption, and at the same time meeting a genuine stakeholder need.

03

## Our Lubricants, Supporting Enhanced Transportation in Asia and Driving Significant Improvements in Eco-Efficiency

Our Lubricants business continued to grow strongly in Asia, with sales expanding 6% in 2013.

By protecting the vehicle's engine and reducing friction, lubricants help improve fuel efficiency and reduce carbon dioxide emissions. Thanks to the work carried out at our R&D center in France, Total pioneered fuel economy technology back in the 1990s and has since developed a wide range of fuel economy lubricants for all types of vehicles. In 2013, use of these products by our retail and business customers avoided the emission of more than 370,000 metric tons<sup>1</sup> of carbon dioxide.

<sup>1</sup>Equivalent to the annual emissions of 40,000 Europeans. (Source: European Environment Agency, 2012)



## Road Safety, the Top Priority for Teams in Africa and Asia

Because of its retail operations and the related logistics, Marketing & Services is particularly exposed to transportation risks. Programs are therefore deployed to foster a strong culture of road safety among our teams and in our partner companies, and to raise awareness among the general public, working with local institutions.

In 2013, the Africa/Middle East Division launched a major inspection program to assess how transporters manage safety. Some 273 transporters, representing 73% of the total, have been audited. In addition to the inspection program, five regional conventions were held to encourage experience sharing, dialogue and best practices among our transporters.

Our affiliates also conduct initiatives to educate children and young people about road safety. In China, for example, the Total Teenagers Road Safety Campaign, launched in 2010, promotes road safety awareness among nearly 2,000 teenagers each year in our host communities. In 2013, 24 sessions were organized in 13 schools and nine cities.

## NEW ENERGIES: SOLAR AND BIOMASS LEAD THE WAY

### Fast Facts

→ SunPower is the linchpin of our commitment to solar energy.

Total is SunPower's majority shareholder, with a 64.65% interest at December 31, 2013.

→ SunPower is fully integrated across the entire value chain, from solar cell manufacturing to turnkey design of large-scale solar power plants and installation of residential rooftop solutions.

→ It has 1.3 GW of manufacturing capacity.

→ SunPower teams have installed 2.5 GW of panels in the last five years.

02

## Total, a Leading Partner in the IPVF Solar R&D Center Project

The aim behind the Institut Photovoltaïque d'Ile de France (IPVF) is to create one of the world's five biggest R&D centers focused on next-generation photovoltaics in France.

05

## New Markets

In Chile, SunPower has begun the construction of a 70 MWp solar farm, which is currently the world's biggest merchant solar power project — in other words, competitive without subsidies.

We have also been chosen to build an 86 MW solar park in South Africa. The inclusion of local development opportunities was a key factor in our project's selection (see pages 58 and 59).



## Technological Leadership

With the launch of the X-Series family of solar panels, SunPower broke its own record for conversion efficiency. At 21.5%, versus 16% for conventional panels, it is also a new world record for the solar industry.

04

## Flagship Projects in the United States

In California, SunPower has completed construction of the California Valley Solar Ranch, which has generating capacity of 314 MWdc, and has started building Solar Star, the world's biggest solar power plant. With 709 MWdc of installed power, Solar Star will generate enough electricity to power around 255,000 homes.



## Successful Maiden Flights for Biojet Fuel

In June 2013, an Airbus A321 made a successful Toulouse-Paris flight using fuel containing Total-Amyris A-1 biojet.

This success was confirmed by a demonstration flight in Abu Dhabi in January 2014.

Developing biofuels to help airlines reduce their carbon dioxide emissions is one of the objectives of our R&D programs with Amyris. Total has been the core shareholder in the company since June 2010, and our long-term goal is to produce biofuels from lignocellulose, the non-food part of plants. In late 2013, Total set up a joint venture with Amyris to produce and market renewable fuels worldwide.



# OUR RESPONSIBILITIES, OUR COMMITMENTS

By making energy readily available to communities, our activities help to drive progress worldwide. However, they also present certain risks, which we must prevent, manage and minimize through continuous improvement. To be recognized as a source of opportunity, earn the trust of our stakeholders and enhance our appeal as an employer, partner and neighbor, we must also foster dialogue and transparency about what we do. That's why we place particular importance on measuring and sharing our corporate social responsibility performance and making public commitments on key issues and challenges.

To learn more:  
[csr-analysts.total.com](http://csr-analysts.total.com)

**20-21**  
 Creating Value  
 Through Corporate  
 Social Responsibility

**26-27**  
 Combating  
 Climate Change

**32-33**  
 Driving Local  
 Development

**22-23**  
 Putting Safety First

**28-29**  
 Reducing Our Impact  
 on the Environment  
 Through Tailored  
 Initiatives

**34-35**  
 Scaling Up  
 Access to Energy

**24-25**  
 Demonstrating  
 an Unwavering  
 Commitment to Our  
 Code of Conduct

**30-31**  
 Being a Responsible  
 and Attractive  
 Employer

**36**  
 Taking Our  
 Commitments  
 to the Next  
 Level with the Total  
 Foundation

In 2013, an integrated business model  
 with three business segments and  
 operations in more than 130 countries

→ Upstream  
 → Refining & Chemicals  
 → Marketing & Services

Employees

**98,799**  
 people

Suppliers

**150,000**  
 of which 48,600  
 in France

Investors

**500,000+**  
 shareholders

**4.9%**

of share capital held by employees  
 → 8.1% by individual shareholders  
 → 87% by institutional shareholders

Reinvestment

**€26B**  
 in gross capital  
 expenditure  
 (including  
 acquisitions)

**€949M**  
 spent on R&D

**€2.1B**  
 spent on  
 exploration

Public  
 customers,  
 B2B customers,  
 consumers

**€189B**  
 in revenue

**€10.7B**  
 in adjusted net  
 income

Value created

Employees

**€7.1B**  
 in salaries and  
 payroll expenses

Shareholders

**€5.4B**  
 in dividends  
 paid to shareholders,  
 representing a dividend  
 of €2.38 per share  
 (subject to approval  
 by shareholders  
 at the Annual Meeting  
 on May 16, 2014)

Suppliers

**€31.3B**  
 of purchases, of which:  
 → €19.6 billion in the  
 Upstream  
 → €6.7 billion in Refining  
 & Chemicals  
 → €5 billion in Marketing  
 & Services

Local and  
 National  
 Governments

**€17B**  
 in corporate income  
 tax and production  
 royalties

Communities

**€357M**  
 in community  
 spending

CREATING VALUE FOR  
 OUR STAKEHOLDERS

# CREATING VALUE THROUGH CORPORATE SOCIAL RESPONSIBILITY

We aim to maximize the positive outcomes of our operations by taking into account all social, environmental and economic factors. Minimizing the negative impacts is not enough.

**"OPERATING IN MORE THAN 130 COUNTRIES GIVES US A WEALTH OF FIELD EXPERIENCE."**

## INTERVIEW

**Jérôme Schmitt,**  
Senior Vice President, Sustainable  
Development & Environment

**Most of your career at Total has been in finance-related positions. Does this influence your approach to corporate social responsibility?**

**Jérôme Schmitt:** It might seem counterintuitive, but it isn't really. Corporate social responsibility and financial performance are inextricably linked, because it's important to understand and integrate the expectations of *all* of our stakeholders. In addition, CSR has become more professional in the past few years. Just like finance, it now involves procedures, performance criteria and measurable targets, as well as regular reporting and cooperation with all of the business lines and professional disciplines. Lastly, on a more personal note, after focusing on financial issues for many years, I'm delighted to have this opportunity to work on another strategic aspect of our operations.

**To successfully implement CSR policies, you need an engaged workforce. What's the key to getting employees on board?**

**J. S.:** The vast majority of Total employees have already embraced our corporate social responsibility commitment. Management sets the example by championing the CSR process alongside major operational and financial focuses. In fact, CSR is the whole point and meaning of the new Total baseline "Committed to Better Energy." Most of us are also aware of the importance of CSR because, in both our personal and professional lives, we often come face to face with such issues as safety, health, human rights, diversity, inclusion, environmental protection, social and economic development, and access to energy.

The challenge now is to enhance the consistency and visibility of the work done by our teams on the front line, to multiply the benefits. We must therefore set priority objectives and stay the course to achieve them. That's why we're currently working on a long-term roadmap that will serve as a guide for all employees.

**What are your focus areas at the moment?**

**J. S.:** In-house, we're working to drive further improvement in our processes. For example, we're identifying and mapping all of our risks, in such areas as environmental

protection, safety, community engagement and human rights, to anticipate and manage them more effectively. And we're making sure that employee health and safety remain our top priority every day, as stated in our SHEQ Charter<sup>1</sup>. We also have to improve the deployment and application of our guidelines in all CSR-related areas, continue to set ambitious improvement objectives year after year, and carefully measure our progress in achieving them.

**And with your external stakeholders?**

**J. S.:** We continue to target the big picture issues that are already mobilizing our teams worldwide, because there's still room for improvement. One example is access to energy, where Total has led the way with a dedicated team set up several years ago and a social business program that is up and running in 14 countries. Supporting education and economic development in our host countries is another focus area.

This long-term commitment is essential, to ensure that our presence generates real, sustainable benefits for everyone and to help optimize our projects' cost-competitiveness. Numerous Total divisions and affiliates work together to meet a wide range of challenges. They include more effectively identifying community expectations, our affiliates' long-term needs and the contributions that can realistically be made by local businesses; building a structured approach to education and supporting entrepreneurship; sharing experiences among all our affiliates; and coming up with new ideas and solutions. The extent and variety of the initiatives carried out is reflected in this report.

**And Total is actually a direct stakeholder in the climate change issue.**

**J. S.:** Yes, we're working very hard to make a positive contribution to this challenge while also meeting the world's energy needs. We strive to continuously enhance the

## A Commitment Recognized in Benchmark ESG Indexes

Our environmental, social and governance (ESG) performance has been assessed and recognized by specialized rating agencies worldwide for a number of years. Total is included in a large number of ESG indexes, which helps improve and strengthen our CSR policies.

**DJSI**  
Total has been included in the Dow Jones Sustainability Index World (DJSI World) for ten years in a row and in the DJSI Europe since 2005. These indexes are published by Swiss asset manager RobecoSAM.



**FTSE4Good**  
Total has been a constituent company of the FTSE4Good Index since 2001. The index is managed by global index provider FTSE Group.



energy efficiency of our facilities and products, set ambitious targets to reduce our greenhouse gas emissions, and invest heavily in solar energy and in R&D on the technologies of the future. There's no miracle solution to climate change; it's an issue that needs to be tackled from many angles. And thanks to our global scale and outlook, technological know-how and capacity for innovation, Total and other major energy companies have a lead role to play.

**"THE CHALLENGE NOW IS TO ENHANCE THE CONSISTENCY AND VISIBILITY OF THE WORK CARRIED OUT BY OUR TEAMS ON THE FRONT LINE, TO MULTIPLY THE BENEFITS."**

**How does innovation contribute to Total's CSR process?**

**J. S.:** Operating in more than 130 countries gives us a wealth of field experience in a wide range of environments, which serve as a breeding ground for new ideas and models. We already have an extraordinary capacity for innovation in all areas, from technical disciplines to business and human resources. Now we need to adopt a more systematic approach to encouraging innovation and collecting ideas, so that they can be shared more effectively across the organization.

In addition to the outstanding work carried out by our Scientific Development Department and our various R&D teams, we also have a dedicated venture capital arm that invests in start-ups around the world. Total Energy Ventures helps us identify the technological and business breakthroughs that may ultimately reshape the energy landscape. —

<sup>1</sup> Safety Health Environment Quality Charter.

# PUTTING SAFETY FIRST

Because risks are inherent in all our activities, an unwavering commitment to safety is crucial to protect people and the environment and ensure our long-term viability. Safety is our TOP PRIORITY.



12

## Golden Rules

To more effectively manage the risks specific to our operations, we developed 12 Golden Rules of Safety at Work in 2010, based on feedback from safety incidents.

To strengthen risk management, we leverage three different improvement avenues:

- A culture of standards, primarily involving technical standards.
- A culture of audits and controls, which encompasses supervision of our frontline teams, integration of safety feedback and regular inspections and audits.
- A culture of safety, which aims to have a deep and lasting impact on the behavior of our employees and contractors.

## Significant Events in 2013 and 2014

**Significant Progress in Standardization via MAESTRO** — During the year, we standardized our

182

## new documents

were added to our database of safety feedback notices in 2013, bringing the total to more than 1,300.

internal HSE management guidance, the MAESTRO system, which is applied by both Exploration & Production and Refining & Chemicals. Marketing & Services teams also adopted the same system, making the adjustments necessary for their specific needs.

## A New Global System for Barge Vetting

— We reviewed the organization of our global barge vetting activities for inland waterway transportation to align it with best practices in tanker vetting. As part of the project, vetting requirements were standardized across each region. In Europe, for example, starting this year we only charter double-hull barges for gasoline, after adopting the same measure for heavy fuel oil

in 2011. This puts us ahead of the deadlines set in the applicable regulations.

## “Safety For Me, For You, For All”

— To strengthen our safety culture and ensure complacency does not set in among employees and contractors, we deployed a global awareness campaign that urges everyone to make a commitment to safety, for both themselves and others. Managers will be given more targeted support in 2014, emphasizing the importance of modeling exemplary behavior and listening, to maintain a continuous improvement dynamic. And another global campaign has been launched to encourage employees to report anomalies observed in the field. This was also the theme of the World Day for Safety on April 28 this year.

## Working With Our Partners to Drive Progress

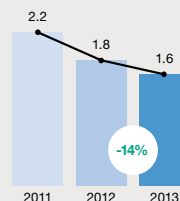
— In June 2013, Exploration & Production brought together 150 people from 80 international companies for a day-long event dedicated to key safety issues. In addition to being a forum for discussion, the event provided an opportunity to listen to our suppliers' needs and share best practices. Refining & Chemicals held a similar event in early 2014. —

1. An operator at Total's refining and petrochemical complex in Antwerp, Belgium.

## A Steady Decline in Workplace Injuries

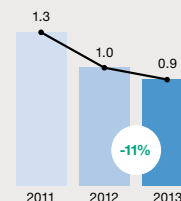
### TRIR: 1.6

Total recordable injury rate per million hours worked



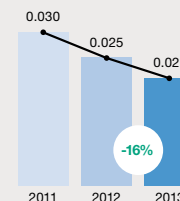
### LTIR: 0.9

Lost time injury rate per million hours worked



### FIR: 0.021

Fatal incident rate per million hours worked (three-year moving average)



**Breakdown for 2013**  
TRIR for Total employees: 1.3  
TRIR for contractors: 1.7

## A New Indicator to Improve Monitoring of the Early Warning Signs Associated With Major Risks

The 66 Tier 1<sup>1</sup> loss of containment incidents reported Group-wide in 2013 were the subject of comparative analyses within Total and across the industry.

<sup>1</sup>For example, one metric ton of gasoline or 500 kilograms of gas (half as much in a confined space).



2. Coordinator watching workers board a boat heading for the different satellites of the AGMP platform offshore Port-Gentil, Gabon.
3. Construction coordinator during work at the Port Arthur, Texas refining and petrochemical complex in the United States.
4. Employees at the shipyard in South Korea during the construction of the Pazflor FPSO.

## Improved Oil Pollution Preparedness

82%

of the sites and affiliates where risk assessments had identified the risk of a spill in surface waters carried out spill response exercises during the year.

In 2013, a major crisis exercise was conducted for the first time offshore Angola.

→ See pages 48 to 53

**“ENCOURAGE LISTENING AND DIALOGUE WITHIN TEAMS, SO THAT EVERYONE FEELS FREE TO SPEAK UP TO PREVENT ACCIDENTS.”**



## A Concerted Effort to Tackle the Too-Slow Decline in Fatal Accidents

In 2013, 15 employees died in 11 separate incidents, including four who were killed in a tragic helicopter accident in late August. The aircraft was transferring personnel from a drilling platform when it crashed into the North Sea.

25%

of the training days provided to employees in 2013 were dedicated to safety.

Management training has been scaled up to strengthen our safety culture

51%

of our executives participated in the HSE Leadership program between September 2012 and January 2014. Our aim is to train all executives by end-2014.

221

managers from around 30 countries participated in the HSE for Managers program in 2013, bringing the total to 554 since its creation in 2010.



## Educating Our Frontline Teams

43

seminars were organized in 15 countries by the Ethics Committee in 2013 to raise awareness of ethics among our affiliate teams.

## Lobbying Ethics Charter

In response to the diversity of practices in this area, we decided to publish a Lobbying Ethics Charter to ensure maximum transparency worldwide. The Charter sets out our commitments and spells out the rules of conduct for all employees involved in lobbying activities. It is available for consultation on our corporate website.

## Incorporating Corporate Social Responsibility into Our Purchasing Process

Our Purchasing Fundamental Business Principles clarify what we expect from our suppliers in such areas as human rights in the workplace, corruption prevention, environmental protection, and promoting economic and social development.

Depending on the purchasing categories involved, we ask suppliers tailored questions about their practices in these areas and monitor their performance alongside other contractual obligations. To support this process, a dedicated training program for buyers was introduced in 2013. In addition, most buyers at corporate headquarters in France have been given specific sustainable purchasing objectives.

# DEMONSTRATING AN UNWAVERING COMMITMENT TO OUR CODE OF CONDUCT

Our activities in more than 130 host countries are built on a common core of values and principles set out in our reference documents. These are updated regularly to take into account any changes to our operating environments. At the same time, we deploy the resources necessary to ensure that our commitments are put into practice by our teams in the field.

## A Human Rights Roadmap

At a meeting in May 2013 attended by Professor John Ruggie, the former Special Representative to the U.N. Secretary-General for Business and Human Rights, Total's Executive Committee approved a roadmap for 2013-2015 that reviews the actions already taken in the area of human rights and identifies avenues for improvement, with a focus on three main topics.

### Human Rights in the Workplace

— We uphold the Fundamental Conventions of the International Labour Organization (ILO) in our relations with employees wherever we operate and we expect our suppliers to do the same, even in countries where the conventions have not been ratified.

Information sheets have been prepared and distributed worldwide to strengthen compliance across all our affiliates.

### Responsible Security Practices

— After applying the Voluntary Principles on Security and Human Rights for a number of years, Total became a Corporate Participant in the initiative in March 2012. Our goal is to better assess and manage human rights risks. With this in mind, a specific risk assessment methodology was tested in Uganda

and Nigeria. It was then used in Jamaica and Haiti in 2013 and will be applied in 22 high-risk countries in 2014.

A three-year training plan is being deployed for the relevant stakeholders, including external service providers.

### Rights of Local Communities

— In 2013, 37% of our organizations had grievance mechanisms in place for local communities concerned about the impact of our operations. In the Republic of the Congo, several audits were carried out by qualified third parties in 2012 and 2013, to fine-tune existing procedures and enhance their efficiency. —

1



## Promoting Transparency

40+

countries were involved in the Extractive Industries Transparency Initiative (EITI) at end-2013. Launched in 2002 to encourage full disclosure of extractive industry revenues in order to improve governance of natural resources, this voluntary, multilateral initiative brings together all of the stakeholders in each country, including governments, oil, gas and mining companies and representatives of civil society. A committed supporter, Total promotes the EITI in our host countries and has a seat on the EITI Board.

2



## CONTINUOUS IMPROVEMENT THROUGH INDEPENDENT ASSESSMENTS

We regularly work with independent experts to gauge stakeholder perceptions of how our operations impact the day-to-day lives of local communities and to ensure that the principles set out in our Code of Conduct are being put into practice by our teams

GoodCorporation assessed eight of our affiliates in 2013, based on 87 evidence points that cover issues relating to business integrity, the environment, respect for people and human rights. These assessments have been carried out at more than 100 Total affiliates since 2002. The findings are used to implement appropriate action plans and follow-up measures.

## Sharing Our Experience

Drawing on our years of experience in sensitive countries, we are helping to disseminate best practices in the area of human rights. We share our resources in this area, such as compliance assessment tools and guidance, with other members of the International Petroleum Industry Environmental Conservation Association (IPIECA) and the Global Business Initiative on Human Rights (GBI). We also engage with civil society on these complex issues and have contributed, for example, to the work done by Shift<sup>1</sup> to prepare new guidelines for assessing human rights compliance in business.

<sup>1</sup>Non-profit center for business and human rights practice that has been chaired by Professor John Ruggie following the conclusion of his mandate with the United Nations.



## Responsible Supplier Relationships

In March 2014, Total received the "Responsible Supplier Relationships" quality label for its corporate and Marketing & Services activities in France. The label is awarded by the French government to businesses that have demonstrated a commitment to forging long-term, balanced relationships with their suppliers.

## AN ONGOING COMMITMENT TO INTEGRITY



3

## Business Integrity Guide

Available in nine languages, the Business Integrity Guide sets out how to avoid and manage situations that may present a risk of fraud, corruption, bribery, conflict of interest, insider trading or non-compliance with antitrust law. The 2013 version drives home Total's zero tolerance approach.

## Preventing Corruption

45,000+

employees had completed our anti-corruption e-learning program, available in 12 languages, at end-2013.

## Compliance Program

We continuously improve our compliance program and monitor its implementation through regular audits. In addition, an independent French monitor will review our anti-corruption program over the next three years and recommend any improvements he considers necessary. The review is part of the settlement reached with the U.S. government in May 2013, to formally conclude the investigation initiated in 2003 into how gas contracts were obtained in Iran in the 1990s.

## Complying with Antitrust Law

An e-learning program on antitrust compliance has been available in 13 languages since October 2013.

## A Dedicated Network

350+

compliance officers provide support to affiliates in the field and help them manage high-risk situations.

1. Consultation with stakeholders in Kikoga, in the Democratic Republic of the Congo.
2. Monitoring and assessing community engagement programs in Myanmar.
3. Business Integrity Guide.

# COMBATING CLIMATE CHANGE

The Fifth Assessment Report published in 2013 by the Intergovernmental Panel on Climate Change (IPCC) has confirmed that human activity is the primary cause of global warming. Reconciling efforts to curb climate change with growing energy needs is one of the major challenges facing the world today. At Total, we have integrated this challenge into our strategic vision.



## Negotiating an International Agreement on Climate Change at COP 21<sup>1</sup>

Total is in favor of an international agreement on limiting greenhouse gas emissions that would be implemented gradually and would not distort competition among the world's regions.

<sup>1</sup>Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC).

To pursue sustainable growth while reducing greenhouse gas emissions, we exploit every possible avenue: reducing flaring and methane emissions, enhancing energy efficiency, improving the environmental performance of our products, supporting new energies, increasing the use of natural gas, and developing carbon capture and storage solutions.

## Speeding Up the Development of Eco-Innovative Products and Services

Around 85% of the greenhouse gas emissions associated with oil and gas occur during use by customers, compared with 15% during production. That's why, in addition to implementing measures at our production facilities, we are also committed to enhancing the energy

efficiency of our products and services. This can make a key contribution to combating climate change and is therefore a major focus of our R&D initiatives. In 2009, we introduced the Total Ecosolutions label, which makes it easy for customers to identify Total products that significantly outperform the market standard from an environmental standpoint across their life cycle (see pages 56 and 57).

## The Lacq Carbon Capture and Storage Facility in France

A pioneer in carbon capture and storage (CCS) technologies, Total began testing an end-to-end carbon capture, transportation and storage chain in Lacq, France, in 2010. Acceptability and monitoring issues aside, by the time injection ceased in mid-March 2013 Lacq had proved the feasibility of an end-to-end commercial-scale CCS chain and shown how it could be achieved.

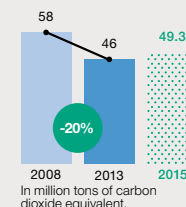
Research is ongoing to further reduce the high costs of capture, and an assessment of regional and global carbon storage capacity still needs to be undertaken. We believe that the immediate priority is to replace coal with natural gas wherever possible and to supplement fossil fuels by developing new energies. —

1. The *Hakuryu* drilling rig in the Total-operated Sisi-Nubi gas and condensate fields, offshore Indonesia.
2. Workers at Total's refining and petrochemical complex in Antwerp, Belgium.
3. A SunPower solar panel on a residential rooftop.

## GREENHOUSE GAS EMISSIONS

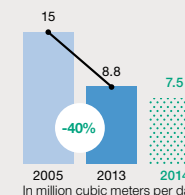
**Objective:** Reduce greenhouse gas emissions by 15% between 2008 and 2015 in our operated scope.

⊕ **On track to meet target ahead of schedule**



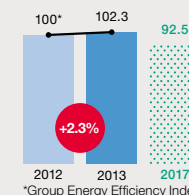
## GAS FLARING, EXCLUDING DURING START-UP

**Objective:** Reduce flaring by 50% between 2005 and 2014 in our operated scope, excluding during start-up.



## ENERGY EFFICIENCY OF OUR FACILITIES

**Objective:** Improve energy efficiency by 1.5% a year between 2012 and 2017.



2



Gas flaring during start-up totaled 2 million cubic meters per day in 2013, because flaring continued for longer than expected on the Usan field in Nigeria due to the reservoir's geological structure.

Total is a very active partner in the Global Gas Flaring Reduction (GGFR) partnership led by the World Bank. We decided back in 2000 not to develop any new projects involving continuous flaring after the start-up phase.

While Refining & Chemicals achieved its target, Total's overall energy efficiency index was affected by continued flaring from Usan in Nigeria.

Energy efficiency is one of our key indicators for tracking energy use and carbon emissions.

## Eco-Innovation

**Objective:**  
**50**  
products and services with the Total Ecosolutions label in 2015. End-2013: 42 products and services. The Total Ecosolutions products and services sold in 2013 will offset the emission of 1.4 million metric tons of carbon dioxide across their life cycle, when compared to the relevant standard products and services.



## Thinking Ahead

**€25**

per ton is the carbon cost assumption applied to our projects, prior to any investment decision, to measure their carbon footprint over the long term and their continued profitability in the event of changes to carbon markets.

## Photovoltaic Solar Energy

**2.5 GW**

of solar panels have been installed by our affiliate SunPower in the last five years. Awarded the Total Ecosolutions label in 2013, its latest generation of high-efficiency panels enables users to cut their greenhouse gas emissions by around 40% compared to the average products available in the market.



3

## Supporting R&D

**54 projects,** submitted primarily by small businesses, had been financed by Total at end-2013 as part of a program to promote energy efficiency in industry launched in 2008 with the French Environment and Energy Management Agency (ADEME), for a total investment of €20 million.

## LED Lighting

**Up to 60%**

less electricity consumed. Energy-efficient LED lighting is gradually being adopted across our service station network. The Tair service station concept uses LED technology for all signage, including totems and banners, and to optimize driveway lighting from the canopy. Based on global figures, these measures can cut energy spending by 5% at some service stations.



# REDUCING OUR IMPACT ON THE ENVIRONMENT THROUGH TAILORED INITIATIVES

Fully aware that our industrial operations can pose potential risks to the environment, we implement a proactive policy of anticipating, measuring and reducing our footprint every step of the way.



## ISO 14001 Environmental Management Systems

**Objective for 2017:** All production sites that emit more than 10,000 tons of carbon dioxide per year and have been operating for more than two years to be certified.

**Status in 2013:** All 84 sites concerned have been certified.

## NanoH2O

One of the innovative start-ups supported by Total Energy Ventures is California-based NanoH2O, which develops thin-film nanocomposite membranes that enhance the efficiency of seawater desalination.

## A Significant Decline in Hydrocarbon Discharges to Water

Water is intrinsically linked to oil and gas operations, both in the production phase and during conversion and processing. In the area of pro-

duction, for example, around one barrel of water is usually produced for every barrel of oil or gas in fields operated by Total. In refining and chemical operations, water is required for a number of purposes, including removing inorganic salts from crude oil, generating steam, and cooling.

To minimize our water consumption, we recycle as much as possible. In addition, we always treat water before discharging it to the natural environment and we strive to continuously improve the performance of our facilities. In our production operations, priority is given to reinjecting produced water into the reservoir after treatment.

In 2013, our reinjection rate improved significantly to 53%, representing an 11% increase from 2012. We have set ourselves the specific objective of reducing hydrocarbon discharges in onshore and

## Confirming Off-Limits Areas

Total pledged in 2012 that we would not conduct operations in the Virunga National Park in the Democratic Republic of the Congo. In 2013, we broadened that commitment by undertaking not to conduct oil or gas exploration or production operations on any site inscribed on the World Heritage List at June 4, 2013. This commitment is an extension of the official biodiversity policy we published in 2005, which sets out the different development methods to be used depending on the sensitivity of the natural surroundings.

In the Arctic, we have ruled out exploring for oil in the ice pack because current techniques do not guarantee an acceptable level of control over the consequences of a spill. Outside the ice pack, in open water, we are focusing our attention on natural gas projects, which present fewer environmental risks. —

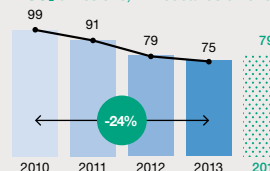
1. Aerial view of the countryside near Yangon in Myanmar.

## AIR EMISSIONS

**Objective:** Reduce our sulfur dioxide (SO<sub>2</sub>) emissions by 20% between 2010 and 2017.

⊕ On track to meet target ahead of schedule.

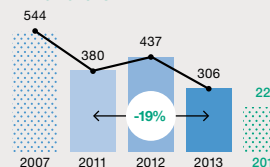
→ SO<sub>2</sub> emissions, in thousands of tons



## DISCHARGES TO WATER

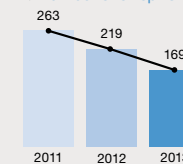
**Objective:** Reduce the hydrocarbon content of our onshore and inshore discharges by 40% between 2011 and 2017 (excluding Specialty Chemicals).

→ Hydrocarbons discharged, in metric tons

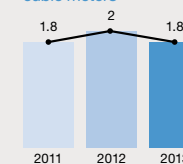


## OIL SPILLS

→ Number of oil spills



→ Total volume of oil spills, in thousands of cubic meters



In line with industry best practices, Total specifically tracks accidental spills of more than one barrel of oil. Remedial action is taken after every spill to restore the environment to its original condition as quickly as possible.

## Biodiversity

**Objective for 2015:**

Have a biodiversity action plan at all industrial sites in (particularly sensitive and/or diverse) IUCN<sup>1</sup> I to IV or Ramsar-protected areas.

**Status in 2013:**

On track to achieve our objective. A practical guide to preparing biodiversity action plans was published in 2013 to help achieve this objective.

<sup>1</sup>International Union for Conservation of Nature.

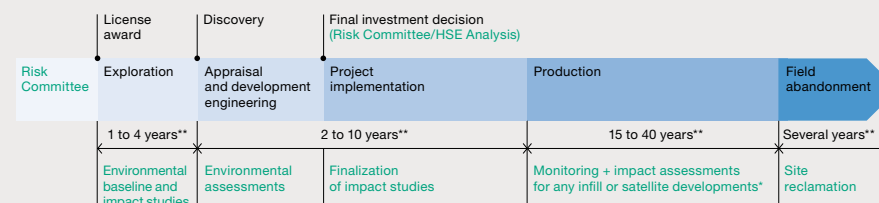
## Site Reclamation

**74,000**

tons of soil were treated in 2013 during site reclamation projects.

2. A flocculation tank used for water treatment at the Donges refinery in France.
3. Aerial view of reclamation operations at the L'Estaque site in France.

## Integrating Environmental Protection Into Each Stage of Our Exploration and Production Operations



Prior to any acquisition or investment decision, projects are submitted to the Risk Committee to determine the type and extent of the risks and impacts they could have for employees, neighboring communities and the environment and to ensure that

appropriate measures are included for mitigating and managing them. As soon as a license has been awarded, a team of environmentalists carries out a baseline study, inventorying plants, wildlife and ecosystems and mapping land use.

The baseline study serves as a reference for integrating local features and requirements into the project design, measuring the impact of operations throughout the project's life, and determining the measures to be taken during site reclamation.

\*During operation, infill or satellite developments can enhance recovery rates.  
\*\*Approximately.



# BEING A RESPONSIBLE AND ATTRACTIVE EMPLOYER

Our ability to attract, reward and retain talent is a strategic strength, especially now that we are ready to implement the ambitious projects we have been investing in over the past several years. We are also committed to continuously enhancing the capabilities of our teams, in an energy market undergoing fast, deep-seated change.



**"EMPLOYMENT IS VERY OFTEN THE KEY CONCERN FOR OUR HOST REGIONS, AND WE SHARE THIS PRIORITY."**

## Providing a Comprehensive Benefits Package for All Employees

Competitive employee benefits are an increasingly important factor for attracting and retaining talent worldwide. In 2011, we laid stronger foundations in this area by defining a common base of benefits for employees worldwide and creating reporting tools to monitor progress. The core components of the package offered include health plans corresponding to at least the median in our industry locally and death benefits equal to at least two years' gross salary.

Projects are gradually being carried out in each country to help affiliates pool their requirements and negotiate contracts that offer better coverage for employees, while also keeping a tight rein on costs. After focusing on Asia in previous years, support was provided in 2013 to our six affiliates in Mexico and their 4,000 employees, as well as to the AS24 service station network in Europe, which encompasses around 100 employees in 10 different countries. —

## Picking Up the Pace of Recruitment

With 15 technology-intensive projects, primarily operated by Total, and new marketing activities worldwide, we have to meet significant hiring needs to be able to achieve our growth objectives. The number of new hires increased for the fourth year in a row in 2013, by 8.8%.

The availability of specialized skills in such areas as drilling, for example, can have a major impact on project deadlines and costs. Our recruitment teams are therefore particularly proactive in securing employees with this expertise and enhancing Total's appeal as an employer in South America, Asia, Africa and the Middle East, our upstream and downstream growth regions.

## Including HSE Criteria in Individual and Overall Performance Objectives

A system was introduced in 2012 to financially reward employees who reach the HSE targets set in their performance objectives. HSE targets are now included in the criteria used to calculate both the bonuses and incentives paid to managers and executives (up to 10% for managers) and the discretionary profit sharing paid to French employees.

## Managing Psychosocial Risk Factors in the Workplace

To raise awareness of psychosocial risk factors in the workplace, a kit was developed for managers in 2013 and training sessions were organized to support its deployment.

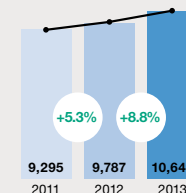
**98,799<sup>1</sup>**  
employees in  
101 countries

**10,649<sup>1</sup>**  
permanent hires  
in 2013

<sup>1</sup> Consolidated scope.

**An Increase in  
New Hires Over the  
Past Few Years<sup>1</sup>**

Permanent hires



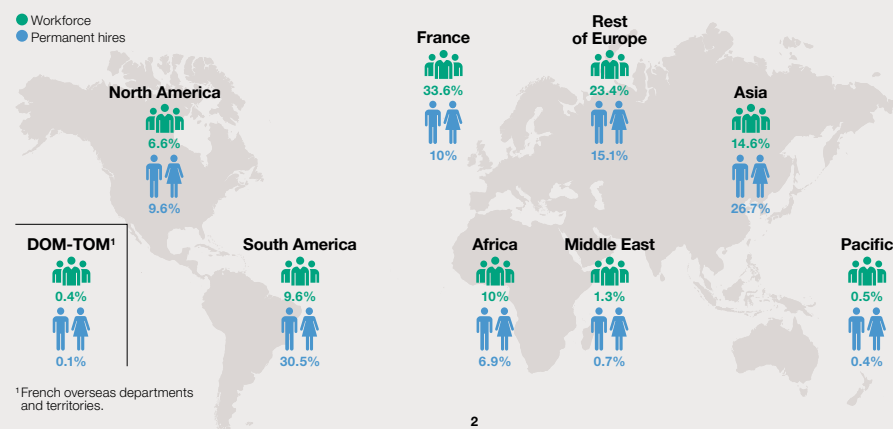
**80+**  
nationalities represented  
among the managers  
hired in 2013. One of  
our objectives is to build  
a management team  
that reflects the diversity  
of our locations around  
the world.

**75%**  
of our employees  
would recommend  
Total as an employer.

**73%**  
of our employees are  
engaged. We have been  
using employee surveys  
since 1999 to gauge the  
satisfaction and, now,  
engagement of our teams,  
identify improvement  
avenues and support  
change management. In  
2013, 68,800 employees  
were invited to participate  
in the Total Survey and  
more than 69% responded,  
representing a 4-point  
increase over 2011.

## Workforce by Region at December 31, 2013

Consolidated Scope



<sup>1</sup> French overseas departments and territories.

**454,000**  
training days

provided to employees  
in the WHRS<sup>2</sup> scope,  
for a total cost of around  
€290 million, versus  
€276 million in 2012.

<sup>2</sup>The Worldwide Human Resources Survey (WHRs) is an annual survey that covers a representative sample of the workforce. In 2013, 149 companies participated in the survey, accounting for 90% of Total employees.

**87%**  
of employees received  
training in 2013.  
HSE topics continued to  
account for a significant  
portion of training last year,  
and the development of  
management programs  
outside France picked  
up speed.

**Promoting Gender  
Equality to Drive  
Progress for All**

**23.9%**  
of our managers  
were women in 2013,  
versus 17% in 2001.

**17%**  
of our executives  
were women in 2013,  
versus 5% in 2001.

**33%**  
of our Board of  
Directors members at  
end-2013 were women.

- Workers on the Ralis drilling rig at the Total-operated Tunu field in Indonesia.
- Workers on the Girassol FPSO in Angola.



**"TO DRIVE FASTER  
PROGRESS TOWARD GENDER  
EQUALITY, WE HAVE  
ADOPTED A PROACTIVE  
APPROACH AND SET  
A TARGET OF 22% WOMEN  
EXECUTIVES IN 2020."**

# DRIVING LOCAL DEVELOPMENT

In all our host countries, we strive to ensure that our operations create value and opportunity for local communities. We leverage an approach centered on constructive dialogue with our various stakeholders.



## Investing to Create Local Jobs

**11 million**

hours will be worked in Angola for the CLOV project, which is scheduled to come on stream in 2014.

In France thanks to the **Total Emploi Local** initiative, the upgrades at our refining and petrochemical complex in Normandy created around

**1,200 jobs**

in the Le Havre region, of which more than half are permanent. In addition, local contractors performed 70% of the work. To ensure its continuation, the local employment initiative was handed over in 2013 to the Le Havre Chamber of Commerce and renamed *Compétences Totalement Estuaire*.

1. A service station employee in Kampala, Uganda.

training center to spur and support entrepreneurship in the region.

A small business support system has also been in place since 2011, thanks to a partnership with French development organization Institut Européen de Coopération et de Développement (IECD). At end-2013, seven classes had graduated from the SME-DN, representing a total of 169 local entrepreneurs. The results are conclusive: 12 months after the training, their revenue had increased significantly (by an average of 33%), driving an equivalent improvement in their living standards.

## A Time-Tested Program

In Africa and the Middle East, the "Young Dealers" program launched in 1960 supports the career development of young service station employees who demonstrate sales and management skills. The program enables employees with potential to become service station managers, by providing them with loans, training and technical support.

Of the 3,500 Total service stations in the Africa/Middle East region, 1,300 (29%) are run by young dealers. —

**€31 billion**

was spent on purchases in 2013, generating opportunities that we take into account in our relationships with suppliers.

## Supporting Local Businesses

In Nigeria, we are committed to promoting local economic development in the Egi region, where we have operated since 1964. In cooperation with local communities, we created the Small & Medium Enterprises-Development Network (SME-DN), a

**IN 2013, €357 MILLION WAS SPENT ON SOME 3,400 COMMUNITY ENGAGEMENT INITIATIVES.**

**IN 2013, WE REORGANIZED OUR REPORTING PROCESS AROUND A SMALL SET OF SPECIFIC INDICATORS TO MORE EFFECTIVELY MEASURE OUR COMMUNITY ENGAGEMENT PERFORMANCE:**



### Fostering Structured Engagement With Stakeholders

**89%**

of our organizations said that their relationships with external stakeholders are good or very good.

**156**

organizations have deployed a formal process in the past five years to gauge stakeholder concerns. To understand our stakeholders' aspirations and identify priority avenues for our community engagement initiatives, we rely in particular on the SRM+ stakeholder relationship management method.

**37%**

of our organizations had formal grievance mechanisms in place to improve their relationships with stakeholders and respond more effectively to their concerns.



### Strengthening the Effectiveness and Sustainability of Our Community Engagement Initiatives

**42%**

of our community engagement initiatives included a capacity building component, which is crucial to our projects' long-term viability.

**25%**

of our community engagement initiatives were conducted through partnerships. The partnerships forged with local institutions and organizations guarantee sustainability. Our goal is to carry out more of our community engagement initiatives in this way, to optimize their effectiveness.



### Partnerships in Education

Our contribution to education is organized around five international programs focusing on:

- Primary and secondary education.
- Scholarships, with more than 10,000 awarded, including 150 international scholarships.
- University partnerships, with more than 60 to date.
- Professional and research chairs, with 35 endowed.
- Vocational training programs, with 50 in all from the high school to the master's level.



2



3

2. Schoolgirls in Myanmar.

3. Vocational training center in Port-Gentil, Gabon.

4. Students in the international scholarship program financed by Total.

## Total Développement Régional

**129**

small businesses received financial support in 2013 from Total Développement Régional (TDR):

**€4.24 million in loans.**

**2,470 jobs planned by the businesses.**

## Support for innovation:

**9**

innovative projects supported and €3 million in loans granted.

## Support for exports:

**231**

companies assisted, including 189 small businesses, by organizing trade missions,

hosting 11 VIE co-op placements in our affiliates and

sharing our network of contacts with 11 businesses.



**"OVER THE PAST THREE YEARS, TOTAL DÉVELOPPEMENT RÉGIONAL HAS COMMITTED A TOTAL OF €12.5 MILLION TO 386 SMALL BUSINESSES, SUPPORTING 6,964 JOBS."**



# SCALING UP ACCESS TO ENERGY

Energy is vital to drive development and improve living standards. That's why we created the Total Access to Energy program.

This innovative incubator identifies and tests solutions designed to improve access to energy for low-income communities.



**1.3 billion** people worldwide do not have access to electricity.

Source: International Energy Agency, World Energy Outlook 2011.

**\$37 billion a year** is spent by poor households worldwide on "traditional" energy

solutions, such as candles, kerosene lamps, batteries and wood.

Source: International Finance Corporation, From Gap to Opportunity: Business Models for Scaling Up Energy Access, 2012.

Launched in 2010, the Total Access to Energy program drives the development of solutions for poor or remote communities that have little or no access to modern, reliable energy sources.

Our approach is practical, innovation-based and embedded in our business operations. Drawing on the initiatives conducted across Total over the past ten years, we test new ideas in the field to confirm their feasibility, suitability and financial viability, identifying avenues for improvement or ruling them out if the results are unconvincing.

By encouraging us to rethink every step in the product and service development process, from design to distribution to end-users, the program also

inspires creativity and generates new opportunities for the affiliates involved. It provides a new perspective on customers, offers new types of solutions and builds additional partnerships and distribution channels to reach the most isolated communities.

## Business is Booming for Awango by Total

Awango by Total is the first large-scale project to emerge from the Total Access to Energy program. By marketing photovoltaic solar solutions that can be used to provide lighting and charge cell phones, our first social business helps meet the basic needs of off-grid communities at the bottom of the pyramid. The

solutions were initially tested in four pilot countries — Cameroon, Kenya, Indonesia and the Republic of the Congo — starting in 2011 and are now being sold in many more countries under the Awango by Total brand. This new business model combines a social purpose with financial self-sustainability.

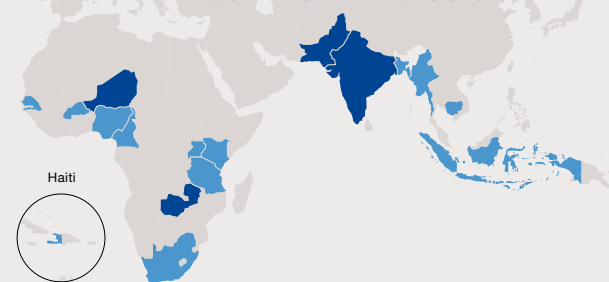
## Social, Financial and Environmental Benefits

In addition to providing an important service, the products in the Awango by Total lineup also enable users to save substantially on their energy costs. The solar lamps pay for themselves in just four to nine months on average, depending on the exact product. They also reduce their users' environmental footprint and have offset emissions of around 40,000 tons of carbon dioxide equivalent to date<sup>1</sup>.

To train resellers, organize micro-finance, contact isolated communities and assess the impact of our operations, we rely on the specific expertise of various partners. They include development aid agencies, such as GIZ and IFC, as well as NGO Entrepreneurs du Monde and local community associations. —

<sup>1</sup>According to the United Nations Framework Convention on Climate Change (UNFCCC), using a solar lamp for two years reduces carbon dioxide emissions by 80 kilograms per year.

## 14 COUNTRIES IN AFRICA, ASIA AND THE CARIBBEAN NOW SELL AWANGO BY TOTAL PRODUCTS



**500,000** lamps sold by end-January 2014, benefiting 2.5 million people.

**Objective for 2015:**  
**1 million**

**solar lamps** sold worldwide, giving 5 million people access to electricity.



**4 countries** are in the launch phase.

**5 countries** will be added to the list in 2014.

● **Deployed**  
Cameroon, Kenya, Indonesia, Senegal, Burkina Faso, Haiti, Cambodia, Uganda, Nigeria, Bangladesh, South Africa, Myanmar, Republic of the Congo and Tanzania.

● **In the launch phase**  
Zambia, Niger, Pakistan and India.

**Creation of the "Socially Inclusive Transportation Laboratory" in France in Late 2013**

In OECD countries, access to transportation is a key factor in fostering social integration. In France, for example, 20% of the population of working age, or around 7 million people<sup>1</sup>, face transportation issues that make it difficult to find or keep a job. Total and non-profit Voiture & co decided to co-create a social innovation laboratory dedicated to this problem. Carmaker Renault, insurer MACIF, France's National Federation of Savings Banks, government employment agency Pôle Emploi, the PSA Peugeot Citroën and FACE Foundations, and non-profit Secours Catholique have since joined the initiative.

Total has been supporting inclusive transportation solutions since 2012, alongside Voiture & co. In 2013, our collaboration resulted in the opening of two platforms offering affordable access to vehicles and the organization of the Rencontres de la Mobilité Inclusive conference in Paris, which brought together more than 200 participants who are helping to make transportation a key to social inclusion.

<sup>1</sup>According to a study published by consultancy Auxilia in 2013.

2



## Other Projects Under Consideration

Leveraging the experiments already conducted in our operations to utilize the gas associated with oil production, we are looking at the possibility of supplying host country communities with power generated from natural gas. Our goal is to provide affordable energy via a profitable business model that covers investment, operating and financing costs — a prerequisite for project replicability and sustainability.

1. Demonstration of the S10 lamp at a Total service station in Burkina Faso.
2. A home lit by an Awango by Total lamp in the village of Endayaza in Myanmar.
3. An S250 lamp being tested by a customer in Burkina Faso.

## Unconvincing Results in Jatropha Pilot Projects

After several years of testing in Mali and Senegal, the idea of using jatropha oil as a biofuel has ultimately been ruled out. To avoid competing with food crops, the plant is cultivated on marginal land where yields have proven insufficient to make jatropha a competitive local energy source.



**"OUR CONTRIBUTION LIES IN OUR CAPACITY TO SUPPORT THE LARGE-SCALE DEVELOPMENT OF RELIABLE SOLUTIONS, IN PARTNERSHIP WITH OTHER INNOVATION STAKEHOLDERS."**







### Community Support

Sport dans la Ville is a French non-profit organization that uses sport to help young people find their place in society and the workforce. The Total Foundation supports two of its programs — *L. dans la Ville*, which aims to build a better future for girls aged 12 to 20, and *Apprenti'Bus*, which is designed to improve oral, physical and written expression among 7- to 12-year-olds.

### Public Health

With the support of the Total Foundation, the Pasteur Institute has developed tools for quick diagnosis to combat childhood diarrhea, a major cause of death in Africa. Public health, prevention and treatment programs have been deployed in Madagascar and, despite the extremely difficult conditions, researchers, physicians and social workers continued their efforts in the Central African Republic in 2013.

### Culture & Heritage

In 2013, the Musée Guimet in Paris dedicated an exhibition to Louis Delaporte, one of the French explorers who helped to rediscover Cambodia's Angkor Wat temple complex in the late 19th century. In addition to supporting the exhibition, the Total Foundation also helped restore Angkor Wat's West Mebon temple, by providing training for archaeologists and facilitating the transfer of site conservation skills.



### Biodiversity

The Foundation is financing a research project to create a database of marine biodiversity in some of the most pristine sites in the South Pacific. The project is being conducted by its partners — France's National Center for Scientific Research (CNRS), French development research institute IRD and Montpellier University.



THE TOTAL FOUNDATION

## TAKING OUR COMMITMENTS TO THE NEXT LEVEL

Through the Total Foundation and our Corporate Philanthropy team, we implement public interest initiatives inspired by Total's values. Our main focus areas are community support, culture, public health and marine biodiversity.

Dedicated to knowledge sharing and social innovation, the Total Foundation has a five-year, €50 million endowment and works with various public and private partners to carry out its public interest initiatives. With the Pasteur Institute, for example, the Foundation has been helping to fight disease in Africa and Asia since 2005, by supporting innovative programs that combine research, fieldwork, treatment and training.

It also encourages the promotion and protection of culture and heritage and has forged partnerships with many museums to make them accessible to a wider audience. The Foundation has been contributing to scientific research into marine biodiversity for more than 20 years and also partners various non-profit organizations in France that combat unemployment, provide access to knowledge or promote universal literacy. Since 2009, we have been working with the French authorities to test new ways of fighting social exclusion. We also help children engage with

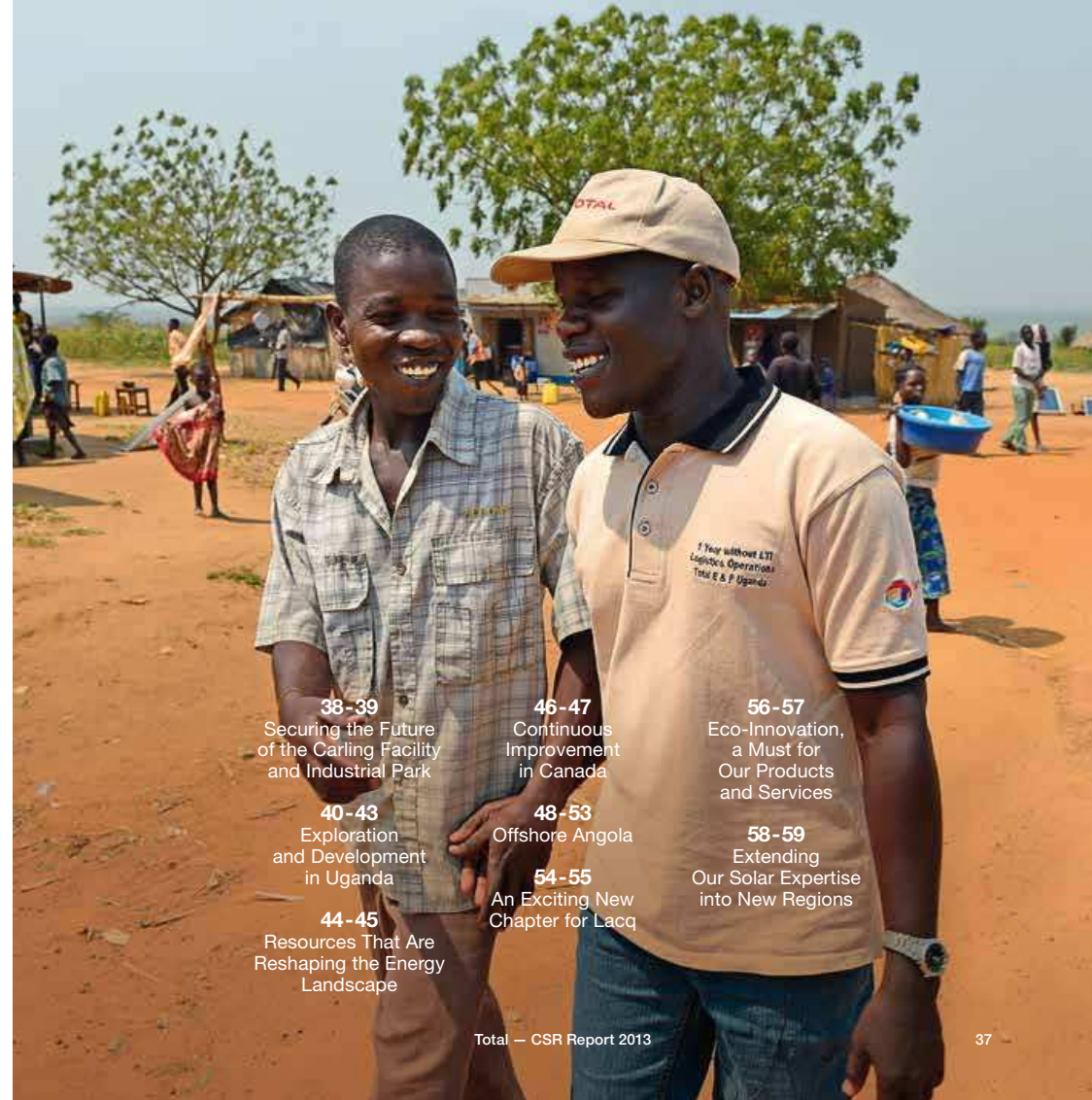
culture and the arts early in life. A total of €36 million has been allocated to these initiatives so far, and they have helped more than 60,000 people in just four years. In 2013, we signed an agreement with the French government to support its program for young people. —

**To learn more:** Read the annual report published by the Total Foundation and the Corporate Philanthropy team.



# IN THE SPOTLIGHT

How do we operate in sensitive environments? How do we live up to our responsibilities as an employer when one of our sites has to be repurposed? To answer these and other questions that are important to our stakeholders, we take a closer look at how our responsibilities are being put into practice in our day-to-day operations.



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## SECURING THE FUTURE OF THE CARLING FACILITY AND INDUSTRIAL PARK

To ensure the long-term viability of our Carling petrochemicals facility in eastern France, we needed to refocus its production on growth markets with high value-added. We therefore decided in 2013 to invest €160 million by end-2016 to turn Carling into our European center for hydrocarbon resins and one of Europe's leading polymer facilities.

### INTERVIEW

#### Michel Charton

General Manager of the Carling Facility

#### How will the changes in Carling's production focus impact employees?

**Michel Charton:** Obviously, there will be some organizational change. However, in line with the commitments made, the project will not result in any dismissals or forced relocations. Of the 554 jobs at Carling today, 344 will be maintained in 2016, including 110 positions created by the new operations. All of the employees affected will be offered a personalized solution, such as retirement or early retirement arrangements, inplacement opportunities, or outplacement support for those who want to create or acquire a business or pursue a personal project or a new career path.

#### How is Total supporting the contractors and service providers affected by the project?

**M. C.:** The work required to upgrade existing units and build the new installations will create 300 jobs over the next two years. We have therefore taken measures to enhance local content, by signing a local employment charter, for example, and integrating a local development clause into our tender specifica-

tions. After 2015, a support fund will be set up to help our contractors and service providers manage the change, by hiring experts, for example, or by shifting their business focus toward new markets, including outside France.

#### What action is being taken to revitalize the local economy?

**M. C.:** As we have made clear right from the start, Total wants to maintain strong, sustainable industrial roots in the Lorraine region. Voluntary agreements will be signed with various stakeholders to stimulate economic development, including a partnership with regional authorities to provide financial and technical support to local small business development projects.

We are also an active participant in the association of Carling industrial operators, which was set up in mid-2013 to enhance the industrial park's appeal and attract new companies and activities, particularly by offering shared services and infrastructure. —

### Fast Facts

**Carling's industrial transformation**, a project built on forward thinking and stakeholder involvement:

- Close collaboration with local stakeholders, which led to an agreement setting out our commitments concerning the future of the facility and its employees and the initiatives to be undertaken to enhance the industrial park's appeal, in addition to consultation with employee representatives.
- Voluntary economic development initiatives, in partnership with local authorities and the French government.

**Growth in global demand** for Carling's future production:

**8%**  
per year  
for hydrocarbon  
resins.

**7%**  
per year  
for polypropylene  
compounds.

**"WE STARTED  
PLANNING WELL  
IN ADVANCE  
TO GIVE EVERYONE  
TIME TO ADJUST."**



#### 1. Carling will become Total's European center for our Cray Valley hydrocarbon resins business and will include:

- The European decision-making center.
- European Research & Development activities.
- A new production unit for high value-added Ricon® and

Krasol® C4 resins, designed to capture the growth in demand for such products as touch screen additives and high-performance tires and lubricants.

- The existing Norsolene® C9 resins unit for adhesives, which will be revamped to produce high-grade transparent resins.



### A NEW INDUSTRIAL PROJECT FOR CARLING

Aim: Adjust  
Production to Restore  
the Facility's  
Competitiveness



#### 3. Carling's structurally loss-making steam cracker will be shut down in the second half of 2015.

Because of the cost of naphtha feedstock and the lack of scale economies or synergies with an integrated refinery, its production costs are particularly high. To respect all of our commitments to customers impacted by the closure, we will also invest in upgrading the site's infrastructure and the rail and pipelines used to deliver ethylene and propylene.

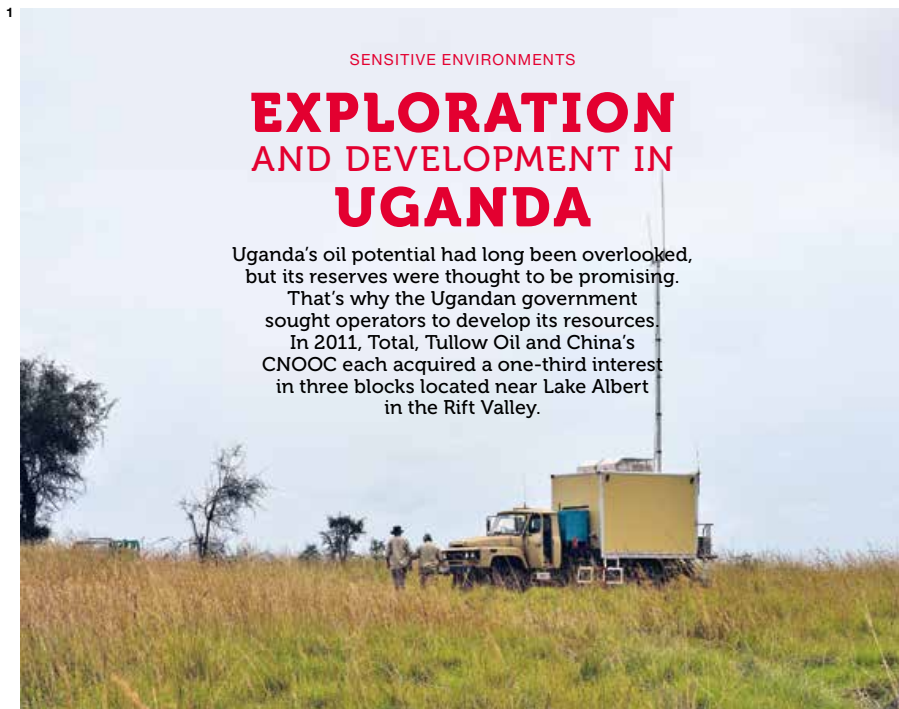


#### 2. The facility's high value-added polymer capabilities will be enhanced by:

- Creating a polypropylene compound/thermoplastics unit to meet demand from the automotive market for innovative plastics that can be substituted for steel. This makes vehicles lighter, thereby reducing fuel consumption and carbon emissions.
- Increasing polystyrene production capacity, to strengthen the facility's leadership position in Europe and make it the priority polystyrene manufacturing hub for Total, which has a nearly 25% share of the European market.
- Upgrading the polyethylene production unit to further improve finished product quality and deliver advanced plastics to the medical and electric cable markets.



**"TO SECURE A SUSTAINABLE  
FUTURE FOR EUROPE'S PETROCHEMICALS  
INDUSTRY, WE MUST ALIGN  
PRODUCTION CAPACITY WITH  
DEMAND, INNOVATE TO DIFFERENTIATE,  
AND FOCUS ON MARKETS WITH  
HIGHER VALUE-ADDED."**



SENSITIVE ENVIRONMENTS

# EXPLORATION AND DEVELOPMENT IN UGANDA

Uganda's oil potential had long been overlooked, but its reserves were thought to be promising.

That's why the Ugandan government sought operators to develop its resources.

In 2011, Total, Tullow Oil and China's CNOOC each acquired a one-third interest in three blocks located near Lake Albert in the Rift Valley.

Since February 2012, Total has operated Block 1, which overlaps Murchison Falls National Park and the Ramsar-listed<sup>1</sup> Murchison Falls-Albert Delta wetland system. The area is densely populated and, in addition to tourism, the locals make their living primarily from fishing and farming. The project therefore includes a range of measures designed to minimize the negative impact of our operations at every level and initiatives developed with stakeholders to maximize the positive outcomes.



## Fast Facts

→ **East Africa** is a medium- to long-term growth driver for Total and could account for 15% of our exploration potential.

→ **Uganda's oil potential** is estimated by Total and our partners at 1.8 billion barrels of oil. Plateau production should therefore average 200,000 to 230,000 barrels per day, enough for a refinery built to serve the local market, as well as for exports via a pipeline.

→ **The exploration and delineation phases** have now been successfully completed, enabling us to enter the development phase.

→ **Murchison Falls National Park** is Uganda's biggest and second most popular national park, attracting 50,000 visitors a year. It is home to an array of iconic wildlife, such as elephants, Rothschild's giraffes, buffalo, lions and various birds, including the rare shoebill. Because of the area's significant environmental value, we are taking very specific precautions in the way we conduct our operations.

<sup>1</sup>A wetland of international importance under the Ramsar Convention on Wetlands, adopted in 1971 to maintain the ecological character of wetlands.



▲ Block operated by Total  
▲ Block in which Total is a partner

1. Recording truck used during the wireless 3D seismic survey in Murchison Falls National Park, Uganda.

**"WE MUST CONTINUOUSLY MAINTAIN DIALOGUE AND EXPLAIN WHAT WE'RE DOING. LACK OF UNDERSTANDING, ABOUT SEISMIC SURVEYS FOR EXAMPLE, CAN LEAD TO NEGATIVE REACTIONS."**

Dorothy Nandawula,  
Community Liaison Officer,  
Total E&P Uganda



2. Giraffes in Murchison Falls National Park, Uganda.

3. Explaining seismic acquisition to villagers from Kisomere in Murchison Falls National Park, Uganda.

4. Two teams of four CLOs work in the field on rotating schedules.

## Community Relations Analyzing the Existing Situation and Nurturing Dialogue

With Marketing & Services operations in the country since the 1960s and a market share of more than 20%, Total has extensive experience doing business in Uganda. Our Exploration & Production teams, however, are relatively new to the country and must establish trust-based relationships with all stakeholders, both locally and nationally.

**Eight Community Liaison Officers (CLOs) have been hired** from among the local communities, so they are fluent in the languages spoken and familiar with customs. Trained to understand oil industry culture, the CLOs are responsible for fostering dialogue between the

affiliate and neighboring communities. To help them, support documents have been published in four local languages. They include flyers and comic strips explaining, for example, the impact of seismic surveys, the procedures for hiring temporary workers and grievance mechanisms.

**Independent experts**, such as non-governmental organizations International Alert and CDA Collaborative Learning Projects are helping us to better understand the social environment and the project's potential impact on local communities.

**Preliminary research was conducted among around 20 communities**, through interviews, focus groups, surveys and field observation. Significant changes were then made to the project to prevent or

**"LISTENING TO CONCERNS, ANSWERING QUESTIONS AND PROVIDING EXPLANATIONS IS ABSOLUTELY CRITICAL."**

David Abang,  
Community Liaison Officer,  
Total E&P Uganda

minimize the impact of planned operations on neighboring communities. The research results were also used to define a strategy for stakeholder engagement and to prepare a certain number of plans for managing community engagement.

**Daily discussions have taken place both locally and with national stakeholders.** To date, more than 400 meetings have been held with various stakeholders to present our activities and development plan, review any potential challenges and resolve the issues that have been identified. A tracking system is in place to ensure that measures have been taken or are under way and a specific mechanism to handle grievances, as part of a community engagement management plan, has been introduced. —

**"A COMPREHENSIVE RISK ASSESSMENT IS THE FIRST STEP TOWARD ACCEPTABILITY FOR OUR PROJECTS IN SENSITIVE ENVIRONMENTS."**



**"OUR GOAL IS TO PROTECT  
AND ENHANCE BIODIVERSITY  
ACROSS THE PARK."**

**Laurent Cazes,**  
Environment & Social Affairs Manager,  
Total E&P Uganda



**Using Wireless  
Seismic Technology  
for the First Time**

Seismic data is logged via lightweight, cylindrical recorders in the ground. By using technology that does not require the installation of aboveground cables, the seismic tests can be performed without clearing vegetation or hindering the passage of wildlife. It also eliminates the need to deal with damaged cables.

1. Installing recorders for the wireless 3D seismic survey in Uganda.
2. Assessing the survey's impact on crops for compensation purposes.

**Environment  
Limiting the Impact  
of Exploration  
Operations on the  
Ecosystem**

Given the area's exceptional biodiversity, in addition to applying the general principles of our official biodiversity policy, we have set a target of leaving the park in a better state than we found it. Exploration operations have therefore been conducted with extreme caution, using technologies that have the least impact on plants and wildlife.

**Drones were employed to precisely map the area's biodiversity** and particular attention was paid to the world-renowned,

Ramsar-listed wetlands. Prior to the arrival of seismic teams, Biodiversity Liaison Officers conduct a systematic survey of the land and identify the biodiversity hotspots to be avoided. Specific monitoring plans (for large mammals, for example) and other procedures designed to minimize impact (such as a single-track policy and minimal clearing) are also implemented.

We are working in partnership with the Uganda Wildlife Authority (UWA), which manages the park, and have also set up an independent committee of local and international experts to help us deploy the best possible practices. —

**38**  
**environmental impact studies** were carried out in Uganda in 2012 and 2013.

**In April 2013, Total E&P Uganda published its own biodiversity charter** aligned with the standards of the International Finance Corporation (IFC).

**Exploration is strictly regulated.** Total regularly obtains environmental permits to drill or test wells on the exploration block that we operate.



**Security  
Protecting Our  
Teams and Local  
Communities**

The block being explored by Total — Block 1 — is located in northern Uganda, which has been plagued by instability for two decades. A risk assessment has been carried out and appropriate measures have been taken to protect our teams. These measures are reviewed regularly to take into account changing circumstances and new situations.

**Upholding the Voluntary Principles on Security and Human Rights<sup>1</sup> (Voluntary Principles)** —

To ensure that our presence is not a source of risk for the local population, security personnel are required to respect the rights of local communities and other stakeholders. Voluntary Principles training programs have been developed to suit a wide variety of audiences, including employees, security company managers, public officials, police officers, military personnel and representatives from NGOs. Regular training sessions have been organized in Kampala, Bugungu and Tangi since 2013. —

<sup>1</sup>The Voluntary Principles on Security and Human Rights are designed to help companies maintain the safety and security of their operations while encouraging respect for human rights.

**12,200**  
**farmers** are affected by the seismic surveys. Compensation is provided for damaged crops.

**1,174**  
**people** have been hired from local communities.

**Local Development  
Meeting Community  
Needs and  
Maximizing Positive  
Outcomes**

In addition to local consultations, we conducted research with our partners in 2013 to get an accurate overview of both the Ugandan businesses that could participate in the project and the educational institutions that could offer oil industry training. It also provided information about the demand the project would generate, in terms of goods and services and labor. Based on the findings, we identified priority areas to ensure that the project benefits Ugandan businesses and local communities as much as possible, thereby contributing to the country's social and economic development.

**At the local level, four priority areas have been identified:**

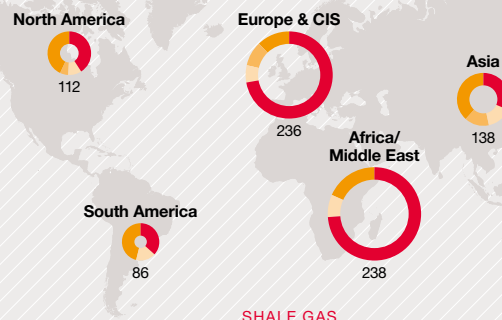
- Access to water.
- Access to energy, via Awango by Total.
- Support for local businesses, by integrating local suppliers, for example, and helping farmers.
- Skills development, by improving the qualifications of Ugandan nationals in administrative and technical fields.

**At the national level,** the infrastructure necessary for the project's development includes an oil pipeline to export production to the Indian Ocean. And to meet the needs of the domestic market, the Ugandan authorities are also considering a project to build a refinery. —



## Breakdown by Type of Gas

Source: IEA, World Energy Outlook 2013.  
Recoverable resources in TCM



# RESOURCES THAT ARE RESHAPING THE ENERGY LANDSCAPE

Shale gas has already turned the U.S. energy market on its head and exploration has begun in other regions. The potential resources identified could dramatically change the geopolitics of natural gas. They would also provide an invaluable opportunity to secure energy supply and support the growth of natural gas during the energy transition.

## A Gas with the Same Chemical Composition as Conventional Natural Gas

Unconventional gas is simply natural gas that is found in an unusual geological formation rather than a typical reservoir. Shale gas is a type of unconventional gas that has remained trapped in the ultra-compact, organic-rich sedimentary rock where the hydrocarbons were initially formed, known as source rock. To free the gas, the rock's permeability needs to be artificially increased by creating a network of very fine cracks, just millimeters wide. This "fracturing" is done by injecting, at very high pressure, water mixed with sand or

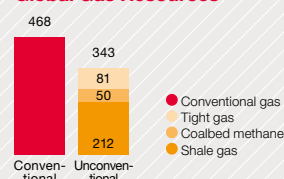
ceramic beads, which keeps the cracks open. Additives are often also used to reduce friction and facilitate gas production.

**Complex, But Proven, Technologies** — We have long known about the natural gas resources trapped in source rock. But it was only the application of technologies designed for other needs that made the development of these resources both feasible and economically viable. The most common technique is hydraulic fracturing, which has been used in the oil industry for more than 60 years. Horizontal wells — another conventional production method —

→ Shale gas is potentially found worldwide. The main producers are the United States and, to a lesser extent, Canada, China, Australia, India and Europe could also be home to significant resources.

→ In Europe, exploration operations have begun in Sweden, Poland, Romania, Germany and the United Kingdom.

## Global Gas Resources



are used to drain the gas over greater distances when it permeates the rock strata over an extended area. This technique is particularly useful in shale gas production, because it enables us to tap larger areas while sharply limiting the number of surface wells to reduce visual impact. Total's extensive expertise in these techniques and our extremely high standards ensure safe, effective management of these operations.

**Continuous Innovation** — Major advances have been made in the shale gas industry since production took off in the 2000s. In addition, around ten years elapse between the time a discovery is made and the time production actually begins. During this period, the technologies continue to evolve.

For all the licenses we operate, we take environmental issues into account right from the outset when considering the feasibility of projects and leverage our R&D resources to reduce the impact of shale gas development. In Europe, and more particularly in Denmark and the United Kingdom, we are stepping up our efforts to ensure that our operations are acceptable to all stakeholders. This includes providing transparent information about our projects (see the [www.skifergas.dk](http://www.skifergas.dk) website dedicated to our licenses in Denmark) and about hydraulic fracturing fluids ([www.ngsfacts.org](http://www.ngsfacts.org)). —

## Fast Facts

### → A Response to Tomorrow's Energy Needs

— Global unconventional gas resources — which include shale gas — are estimated to be at least equivalent to conventional gas resources. They offer a far-reaching response to the world's growing energy needs.

— With unconventional gas resources estimated at 17 trillion cubic meters (TCM), Europe has significant theoretical potential that still needs to be confirmed through exploration.

### → Shale Gas Production in the United States

— Shale gas accounted for around 10% of U.S. natural gas production in 2008, compared to 33% currently and nearly 50% projected in 2030.

— Natural gas prices have fallen by around 66% since 2008.

— Natural gas currently accounts for 30% of power generation capacity.

— Coal's share of total generation has dropped to not quite 35% from 50% in 2005, helping to reduce the country's carbon emissions by close to 10% in just a few years.

→ **Total has shale gas interests in the United States, through our partnership with the country's leading shale gas operator, Chesapeake, as well as in Denmark, Argentina, China, Australia and the United Kingdom, where in early 2014 we became the first oil major to obtain shale gas licenses.**



OUR  
R&D FOCUS  
AREAS

## Conserving and Recycling Water

A considerable amount of water is required to fracture source rock, but some of it is usually recovered during production. Curbing water use is nonetheless a priority. Our efforts in this area focus on:

→ **Innovating with new proppants** (materials that keep the cracks open) designed to be both lighter and stronger than sand and requiring less water and additives.

→ **Developing technologies to enable the recycling of fracture flowback water**, a major challenge because the recycle rate varies according to the formation; it ranges from 15 to 30% in the Barnett Shale to 90% in the Marcellus Shale, both in the United States. Developed by Total in 2010, ultrafiltration is a technique that enables produced water to be reinjected after treatment.

## Protecting Aquifers

→ **Well integrity** is achieved by casing the wells and cementing the annular space between the rock and the casing.

→ **Additives manufactured from food-grade products** are now available for use in fracturing fluid, which consists of 99% water and around 0.5% additives. Despite the small amounts involved, these chemicals are an obstacle to the social acceptability of shale gas development. Research is also under way to develop biodegradable products, which will be tested in our operations in Denmark and the United Kingdom.



1. Trucks creating vibrations during a seismic survey in Fort Worth, Texas.
2. A noise monitoring unit installed at Fort Worth, Texas.
3. Drilling rig in Fort Worth, Texas.

## Reducing Surface Intrusions and Disamenities

To minimize the surface footprint while optimizing horizontal well productivity and keeping costs down, wellheads are grouped on pads. Ten or fifteen — or even more — horizontal wells can be drilled from a single pad. To further decrease road traffic, effluent is transported out by pipeline wherever possible.

## Predicting the Fracture Network in 3D

Total is developing a 3D tool that will improve fracture propagation modeling and help to optimize the most important fracturing parameters, such as water volume and pressure levels and conditions. Ultimately, it should also help to shrink the land footprint by minimizing the number of wells required and allowing them to be spaced farther apart.

**"THE ISSUE OF SHALE GAS MUST BE PART OF THE DISCUSSIONS ON THE ENERGY TRANSITION."**



# CONTINUOUS IMPROVEMENT IN CANADA

In response to the ever-increasing needs of the global market, oil sands development can help secure stable supply. Wherever we invest in these complex projects, managing their social and environmental impact is one of our top priorities.

## Oil Sands: Continuous Innovation and Improvement

Oil sands are a mixture of sand, clay, water and extra-heavy oil that lies relatively close to the surface. At the temperatures prevalent in Canada, the oil is virtually immobile, which is why it is called bitumen. The recovery method used depends on how far below the surface the oil sands lie. Deposits up to 70 meters below the surface, which correspond to about 20% of Alberta's resources, are extracted from open-pit mines.

For deeper deposits, in situ production methods are used to bring the oil to the surface. The most common methods — known as thermal recovery — involve injecting steam into the reservoir to increase the temperature. The two main thermal recovery methods used today are Steam-Assisted Gravity Drainage (SAGD) and Cyclic Steam Stimulation (CSS).

## Some of the Most Innovative Water and Tailings Management Systems in the Mining Industry

— In 2012, net freshwater use per barrel of oil produced — which takes into account the percentage of recycled water — amounted to around 0.4 barrels for *in situ* projects (using SAGD) and around 3.1 barrels for mining projects.

In mining projects, 80% of the water used is recycled and reintroduced into the production process, while the remaining 20% comes from the Athabasca River and the collection of run-off. Regulations prohibit mining project operators from releasing any water into the natural environment during operations, so all used water goes through a closed-loop water treatment and recycling system. In addition, new technologies developed to speed up the consolidation of tailings will reduce the size of tailings ponds.

**For *in situ* recovery by steam injection**, 51% of the water used is saline water from deep underground zones, which is not suitable for human consumption. This water is also reused in the production process.

Around **15% of the water injected** into the reservoir is lost as vapor. In total, **20 to 25% of the water used comes from withdrawals** (10% freshwater and 15% saline). For this type of project, our goal is to **increase the portion of recycled water to 95%.**

**"CANADA'S OIL SANDS ARE THE WORLD'S THIRD-LARGEST OIL RESERVES."**

## Fast Facts

→ **Canada's remaining oil sands reserves are estimated at 168 billion barrels.** (Source: Canadian Association of Petroleum Producers, March 2014)

→ **In the Western Canadian province of Alberta, oil sands are spread over a total area of 142,000 square kilometers.**

The area is divided into three regions: Peace River, Cold Lake and Athabasca, the largest. Just 3% of the total area can be conventionally mined, representing 4,800 square kilometers or around 0.1% of the acreage of Canada's boreal forest.

→ **In 2012, water withdrawals for oil sands development in Alberta represented just 0.6% of the Athabasca River's average annual flow rate and only 3% of its lowest winter flow rate.** They are expected to climb to around 2.5% of the average annual flow rate in 2030, when all of the oil sands mining leases are in operation.

→ **In 2011, oil sands development in Canada accounted for only 7.8% of Canada's total greenhouse gas emissions and 0.14% of global greenhouse gas emissions.**

→ **In Alberta, Total operates the Joslyn North Mine (38.25%).**

**We also have interests in the ConocoPhillips Canada-operated Surmont SAGD project (50%) and the Suncor Energy-operated Fort Hills Mine project (39.2%).** Phase 1 of Surmont is already producing.



▲ Surface mining area

**1. Conserving water resources, by using recycled water or water that is unsuitable for consumption and recycling it after use.** For the Joslyn North Mine, 2.2 barrels of water will be withdrawn from the Athabasca River for each barrel of bitumen produced during stable operation and 80% of that water will be recycled. In addition, the mine will have a 90-day off-stream freshwater storage facility to avoid withdrawals from the river during low flow conditions in winter.



**2. Minimizing clearing, reclaiming land and protecting wildlife.**

At the Joslyn North Mine, which covers 85 square kilometers, we intend to remove the topsoil as development progresses and store it for subsequent reclamation. When the mine closes, around 15% of the surface area will already have been reclaimed. The site should be fully reclaimed within 12 years of closure. In addition, Total has purchased 56 hectares of boreal forest to compensate for the Joslyn operations.

**3. Improving the energy efficiency of our facilities.**

For the Surmont *in situ* project, our objective is to reduce carbon emissions by 12%. For the Joslyn North Mine, we are looking into different cogeneration options, to develop the most energy-efficient configuration that also factors in carbon capture.

## R&D IN ACTION

Right from the project design phase, we select technologies that deliver the best available environmental performance. And we continue to conduct R&D to drive further improvements.



## R&D Focused on Optimizing Environmental Performance

— We are taking advantage of the period before our operated projects start up to develop increasingly innovative technologies. To do this, we created a dedicated oil sands research center in Calgary, Canada, which has been allocated an annual budget of CAD 30 million. The center focuses on identifying new processes that are cleaner, more efficient and more cost-effective. We also helped set up Canada's Oil Sands Innovation Alliance (COSIA), which brings together 13 oil sands producers committed to accelerating the pace of improvement in environmental performance through collaborative action and innovation.

## An Accessible and Transparent Communication Process

— Total makes every effort to engage local communities in oil sands development. In Canada, before oil sands projects are approved by federal and provincial authorities, they are subject to a series of public hearings, attended by all of the project's stakeholders. —



**4. Reducing the size of tailings ponds.**

At the Joslyn North Mine, Total is deploying innovative methods to limit land footprint, optimize water recycling and enable reclamation of the land within years rather than decades.



All public documents relating to the Joslyn North Mine and the associated public hearings are available from Total's corporate website, [www.total.com](http://www.total.com), and Total E&P Canada's website, [www.total-ep-canada.com](http://www.total-ep-canada.com).





A CRISIS EXERCISE  
OF UNPRECEDENTED SCALE

# OFFSHORE ANGOLA

"This is an exercise: there is a spill from an oil well in Block 17." Made by Total E&P Angola to corporate headquarters in Paris at 10:00 a.m. on November 13, 2013, this call signaled the start of the biggest crisis exercise ever organized by Total.

**THE AIM WAS TO TEST  
OUR ABILITY TO RESPOND  
TO A SUBSEA WELL BLOWOUT  
AND FURTHER IMPROVE  
OUR CRISIS MANAGEMENT,  
PARTICULARLY IN THE  
AREA OF ENVIRONMENTAL  
PROTECTION.**



## A CRISIS EXERCISE OF UNPRECEDENTED SCALE



### Effective Oil Spill Prevention and Response

On April 20, 2010, 80 kilometers off the coast of Louisiana, a blowout occurred on the BP-operated Macondo well in 1,500 meters of water. Eleven people were killed. The blowout also caused a fire and an unprecedented oil spill in the Gulf of Mexico. It took nearly five months to stop the leak. Determined to learn from this incident, Total set up three task forces in June 2010, each dedicated to a specific topic:

→ **Deep offshore drilling operations**, to analyze the causes of the incident and use that information to improve well design and drilling procedures and to strengthen inspections and audits.

→ **Spill recovery**, in partnership with other oil companies, to develop and build a system to seal a subsea well, either by capping it or by capturing and containing the effluent for treatment in a surface facility.

→ **Antipollution**, to optimize our major spill response plans and organization, by expanding our equipment and dispersant resources for example.

The work carried out by these task forces is being pursued internally and as part of the Oil Spill Response Joint Industry Project (OSR-JIP), of which Total is a member. This forum for collaboration was set up jointly by two oil and gas industry associations, IPIECA and OGP. Several of the solutions developed by the three task forces were tested during the crisis exercise in Angola.

1. Lowering the connector for the subsea dispersant injection system.
2. Deployment of a surveillance balloon from a boat equipped with a spray system.



**"IT'S ESSENTIAL  
TO HAVE PROCEDURES  
AND EQUIPMENT IN  
PLACE, BUT TESTING  
THEM IS ALSO  
CRITICAL."**



2



3

3. Deployment of an ocean boom.
4. Boom in position to contain oil on the ocean surface.



4

## INTERVIEW

**Thierry Debertrand,**  
Senior Vice President, HSE,  
Total Exploration & Production

### What was the purpose of the exercise?

**Thierry Debertrand:** After three years of intense work by three task forces, we wanted to test our ability to mobilize dedicated internal and external resources to respond to a major oil spill caused by a deep-water subsea well blowout. Total E&P Angola stepped in and offered to conduct an exercise on a well-head located 100 kilometers off the coast, in 1,000 meters of water, with all that implied in terms of organization, logistics and communication. Unprecedented in scale, the exercise — known as Lula — was carried out with the support of the Angolan authorities, as well as the affiliate's partners and other operators in Angola, headquarters teams and various international response organizations. Altogether, more than 400 people were involved.

**The exercise was conducted non-stop over three days. What exactly was involved?**

**T.D.:** The main technical challenges were: getting a dispersant injection system from Norway, taking it down to the seabed and deploying it at the source of the leak to prevent

crude oil from reaching the surface; ensuring the safety of the vessels involved; and limiting the environmental impact on marine life and the coastline.

We then created a real oil slick and implemented various monitoring techniques, including flyovers by helicopter and plane, drifter buoys, a balloon and satellite images. We also organized boat-based pollution response operations at sea and made preparations to protect and clean up the coastline.

The other challenge was coordinating communication, strategic planning and decision-making among the onsite operations unit,

the affiliate's strategic and tactical crisis units, the Angolan authorities and corporate headquarters in Paris.

### What lessons were learned?

**T.D.:** Feedback from the exercise has been positive, with the subsea dispersant injection system used successfully at Total for the first time. It was brought from Norway in record time, thanks to the support of local authorities, and its deployment in 1,000 meters of water was an operational success.

The monitoring tools enabled us to continuously track the oil slick's position and deploy the necessary measures in real time, even at night.

By simulating the dispersant supply chain and the associated logistics, both in Angola and elsewhere, we were also able to obtain invaluable data for determining the initial quantities of dispersant necessary for a crisis of this scale. And lastly, the interactions among the various crisis units involved really helped us to identify the strengths in our crisis management system and the areas that require additional attention. —

**"1,000 METERS  
UNDERWATER, ON  
THE SURFACE, IN THE  
AIR AND ON LAND —  
THIS WAS AN EXERCISE  
OF UNPRECEDENTED  
SCALE."**



1

Significant human resources and equipment were deployed over a three-day period to simulate a response to a major oil spill, at a total cost of around \$10 million.

**1. Transportation of the subsea dispersant injection system to Luanda from OSRL's base in Norway via a special plane.** The system will later be used to pump "dispersant" directly onto the subsea wellhead. The three-day transfer was carried out from October 7 to 9 in cooperation with various Angolan authorities, including Customs, the Airport Authority and the National Police Force, as well as the Sonangol Integrated Logistic Services (SONILS) base. The Ministry of Petroleum provided overall coordination.

2



**2. Onsite deployment of the subsea dispersant injection system from November 13 to 15.**  
 → The system's components (weighing around 8 metric tons) are placed on the seabed using the installation vessel's crane.  
 → The system is then connected to the pumping equipment on the *Skandi Aker*, a brand-new well intervention vessel, so that the "dispersant" can be injected onto the wellhead.  
 → The "dispersant" (actually colored water for the exercise) gushes out of the injection lance connected to the system, right next to the wellhead.

3



4

**3. Surface response resources mobilized by Total E&P Angola, other operators in Angola and international response organizations:**  
 → Vessels to spray dispersant, deploy booms and skimmer systems, and serve as floating storage units.  
 → Dispersant transfer from the airport to the site.  
 → Experts at headquarters and international response organizations, in crisis units and on site.  
 → Simulated mobilization of additional resources, such as dispersant spray aircraft.

**4. Testing of various oil spill monitoring and modeling tools,** including Argos drifters, balloons, satellite images and flyovers by a helicopter and a specialized plane sent from Ghana.

6



5



**5. Development of a coastal response strategy and preparation for its implementation in liaison with local authorities and communities,** to protect sensitive areas, clean up the coastline, and manage waste and wildlife.

**6. Activation of the crisis management unit,** in charge of preparing responses to the strategic issues associated with a crisis of this scale, for the media and for the communities impacted. Its work also encompasses handling all of the related logistics and coordinating the operations, in liaison with stakeholders both in Angola, such as local authorities and partners, and internationally, including Total's corporate headquarters and international response organizations.



## AN EXCITING NEW CHAPTER FOR LACQ

To prepare for the inevitable depletion of the Lacq natural gas field in southwestern France, Total implemented an innovative strategy to manage the site's industrial reconversion and maintain its contribution to the local economy over the long term. While commercial gas production ceased on October 15, 2013, the new gas treatment unit began operating just a month later, on November 14.

### INTERVIEW

**Nicolas Terraz,**  
Chief Executive Officer  
Total E&P France

**The Lacq gas field is nearing depletion. What impact is that having on the region's economy?**

**N. T.:** There are still 3% of the reserves remaining to recover. Total decided to halt commercial gas production in 2013 and produce what's left at reduced flow, to supply local industry for another 30 years. That will maintain the vitality of the site and its 8,000 direct and indirect jobs. Lacq is, by the way, the only industrial hub in France where employment has not declined in the last 30 years.

**Total left the site on December 31, 2013. What happened to your employees?**

**N. T.:** The decision to halt commercial gas production in 2013 was made a whole five years earlier, in 2008. Total E&P France had 380 employees at the time. Some were eligible for early retirement and opted for that. Nearly 130 people transferred within the Group. Some of them joined our RETIA affiliate, which specializes in site reclamation, so it now benefits from their familiarity with the Lacq site. Around 30 others are on expatriate assignments, chiefly in Angola, the Repub-

lic of the Congo and Gabon, countries where their sour gas expertise is a valued commodity.

**The Lacq Basin was well equipped for a successful reconversion, wasn't it?**

**N. T.:** That's true, and not least because of its strong industrial roots. Thanks to the sulfur extracted from Lacq gas, a flourishing chemical industry developed. It was particularly innovative and, over the years, became a flagship for French industry as a whole. But most importantly, all local stakeholders joined forces to capitalize on the site's strengths and secure its future. Forward thinking and shared engagement by all of the region's stakeholders were key factors in the project's success. —



### The Lacq Timeline

The Lacq gas discovery in 1951 led to the creation of a top-tier industrial hub that provided significant stimulus to the local economy. But fields don't produce forever. That's why Total began to plan the site's future, in consultation with local stakeholders, well before the Lacq reservoir was near depletion.

**1975** — Total created Société Béarnaise de Gestion Industrielle (SOBEGI) to manage the Lacq site and maintain its commercial operations over the long term.

**1978** — Total created SOFREA, renamed Total Développement Régional (TDR) in 2005, to support projects to create, acquire or expand small business start-ups, particularly in the Lacq region.

**1983** — The Lacq field showed its first signs of decline.

**2009** — Total E&P France and TDR signed an agreement with the local authorities to create or maintain 300 jobs for 2013.

**2010** — Total transferred ownership of its Lacq assets to SOBEGI.

**2011** — The Lacq Cluster Chimie 2030 (LCC30) gas treatment project was launched, to secure the future of the Lacq industrial park beyond the cessation of Total's operations.

**July 2013** — Total E&P France and TDR confirmed their commitment to supporting the site's industrial redeployment by signing a voluntary agreement with representatives from local authorities to revitalize the Lacq Basin.

**October 2013** — Commercial gas production from the Lacq field ended.

**November 2013** — The LCC30 gas treatment unit started up. Operated by SOBEGI, it will extend production for another 30 years at reduced flow.

**December 2013** — Total wound up its operations in Lacq.

1. Built specifically to treat the 3% of gas reserves remaining in the reservoir, the new unit will supply cost-competitive energy and sulfur feedstock to local industry for another 30 years.

2. The Lacq industrial park now hosts a wide variety of industrial companies that offer great promise for the region's future. They include Arkema, Abengoa, Bioenergy France, SOBEGAL, Air Liquide, PO Systèmes, TIGF and Toray.



1



2

**The New Gas Treatment Unit in Figures**

**€154 million**  
in capital expenditure  
**300,000**  
cubic meters of gas  
treated daily

### CONVERTING THE LACQ INDUSTRIAL PARK INTO A CENTER OF EXCELLENCE IN FINE AND SPECIALTY CHEMICALS.

A field's end-of-life management is prepared years in advance, right from the project design phase. A whole range of technical, environmental, social and economic issues must be taken into consideration each time.

3



**"PLANNING AND CONSULTATION ARE KEY INDUSTRIAL TRANSFORMATION SUCCESS FACTORS."**

3. A wide-ranging program is being deployed to reclaim the site, which will allow some of the land to be subsequently reused for other industrial projects. Initiated in 2012, the work includes plugging 35 wells, dismantling all idled facilities and remediating the soil. Some 150 to 200 people will be involved in site reclamation operations through 2018. Special treatment techniques (using lime, for example) have also been implemented to maximize the reuse of site materials, including as backfill.



1

## ENERGY EFFICIENCY

# ECO-INNOVATION, A MUST FOR OUR PRODUCTS AND SERVICES

Around 85% of the greenhouse gas emissions associated with oil and gas occur during use by customers. That's why, in addition to enhancing the energy efficiency of our facilities, we also target the environmental performance of our products and services. And we turn this into a competitive advantage.

## The Peugeot 208 HYbrid FE

Total teamed up with PSA Peugeot Citroën to take on the challenge of designing a vehicle that emits no more than 49 grams of carbon dioxide per kilometer and can accelerate from 0 to 100 kilometers in eight seconds flat, like the Peugeot 208 GTI. Together, we achieved this in just 18 months, by focusing on two main areas:

- Reducing engine and component friction with the help of teams from our Marketing & Services affiliates Total Lubricants and Total Additives & Special Fuels (ACS).
- Trimming weight with the assistance of our Hutchinson, Total Petrochemicals and CCP Composites affiliates, which supplied composites, lighter plastics and biosourced resins, ultimately shaving 200 kilograms off a standard Peugeot 208.

**"OUR APPROACH IS TO CREATE VALUE-ADDED THAT SETS US APART BY DEVELOPING ENVIRONMENTALLY RESPONSIBLE SOLUTIONS THAT ALSO DELIVER BENEFITS TO THE CUSTOMER."**



2

Unveiled at the Frankfurt Motor Show in September 2013, the Peugeot 208 HYbrid FE (Fuel Economy) prototype consumes just 1.9 liters of fuel per 100 kilometers. Having demonstrated its technical feasibility, this gasoline-electric hybrid — developed from a standard production model — is now paving the way for new technologies.

**Hutchinson** — Thanks to composite suspensions, the Peugeot 208 HYbrid FE shed 18.5 kilograms while remaining as safe and comfortable as a city car. The installation of 100% recyclable, metal-free bodywork sealing systems also shaved another 1.1 kilograms off the vehicle while reducing its environmental impact.

**CCP Composites** — To bring down the weight of the car's hood and front fenders, we came up with a carbon fiber-reinforced vinyl ester resin.

The passenger compartment boasts an innovative, sustainable approach, using biosourced resins reinforced with natural linen fibers for the center console and heater bezels.

**Total Petrochemicals** — Automakers appreciate polypropylene because it offers a cost-effective solution for reducing vehicle weight compared to using steel or technical polymers.

We used the opportunity provided by the Peugeot 208 HYbrid FE prototype to demonstrate the feasibility of natural fiber-reinforced polypropylene for vehicle door panels. Its advantages include low density, enhanced toughness compared to pure polypropylene, impact resistance and a renewable, abundant biosourced material. —

**46 grams**  
of carbon dioxide per  
kilometer, exceeding  
the objective of 49 grams.

## Aerodynamics

**25%**  
improvement  
in drag

## Vehicle Weight

**20%**  
reduction overall

## Powertrain

**10%**  
increase in fuel  
efficiency

## Hybrid Engine

**25%**  
energy recovery  
per cycle

## 42 Products and Services With the Total Ecosolutions Label at End-2013

Introduced in 2009, Total Ecosolutions is an eco-innovation program designed to help our customers use less energy, more efficiently. Under the program, a special label identifies Total products and services that deliver a better overall environmental and health performance than the market standard across their life cycle.

An external review was carried out by Ernst & Young to ensure that the labeling process complies with the ISO 14020 and 14021 standards. —

1. The Peugeot 208 HYbrid FE on the test track.

2. A service station attendant adding engine oil in Shanghai, China.

→ **Latest generation fuel economy engine oils for cars** reduce fuel consumption by close to 3.5%.

→ **The new rollover car wash with water recycling system** reduces the use of potable water by 77%.

→ **Total Excellium diesel** improves fuel efficiency by up to 4%.

→ **The SCRIPTANE® PW range of solvents for printing inks** has an aromatic content at least 60 times lower than the market standard, significantly reducing health impacts.

→ **Total GR's Consommer Moins [Use Less Fuel] solution** helps corporate fleet managers track and reduce fuel consumption.

→ **Using Lumicene® polyethylene and polypropylene grades** in food packaging applications results in materials and energy savings of between 15 and 30%.

**The Total Ecosolutions products and services sold in 2013 will offset the emission of**

**1.4 million**  
tons of carbon dioxide  
across their life cycle,  
when compared to  
the relevant standard  
products and services.



**Salvador is called a merchant project** because the power produced will be sold directly on the spot market, that is over the counter, for a price that will fluctuate based on electricity tariffs in Chile. In this region, unsubsidized solar power is a competitive partner to conventional energy sources.

**20%** renewable energies in the country's energy mix by 2025 is the target recently announced by Chile's government.



**"FOCUSING ON REGIONS THAT RECEIVE LARGE AMOUNTS OF SUNLIGHT, ENHANCING EFFICIENCY AND LOWERING MANUFACTURING COSTS ARE THE THREE MAIN AVENUES FOR MAKING SOLAR ENERGY MORE COMPETITIVE."**

1

#### SOLAR ENERGY

## EXTENDING OUR SOLAR EXPERTISE INTO NEW REGIONS

After a two-year slump, the solar industry has stabilized. Technical progress and cost reductions have led to the emergence of the first markets where solar power is profitable without subsidies. We're leveraging our international reach to support the development of our affiliate SunPower.

### Chile, Home to the World's Largest Merchant Solar Project

In September 2013, Total and affiliate SunPower announced the launch of the Salvador project to build a 70 MW solar power plant in the Atacama region of northern Chile. Salvador is the biggest merchant solar project in the world. "We're very proud to see the project move forward," says Martin Rocher, General Manager of Total Nuevos Energias Chile. "It encourages us to keep working to develop new power

plants in this especially promising region for solar energy."

Total and SunPower teams both made a big contribution, putting together the financing and providing their market expertise and technical know-how. Total will hold a 20% stake in the Salvador project alongside solar power producer Etrion (70%) and Spanish developer Solventus (10%), which already operates in Chile. The roughly \$200 million project will be 70% financed by a loan from the U.S. government's development finance institution, Overseas Private Investment Corporation (OPIC).

**A Favorable Environment** — SunPower will build, operate and maintain the power plant, which will be equipped with Oasis Power Block technology, a fully integrated solution that uses high-efficiency solar panels combined with trackers — a first for SunPower outside the United States.

Construction started in late 2013, with commissioning planned for early 2015. Once up and running, the solar power plant will produce around 200 gigawatt-hours of power a year, enough to supply 80,000 homes.

"Chile has all the right ingredients to develop solar farms, including high electricity prices, rising energy demand and some of the highest solar irradiation in the world," adds Martin Rocher. "That's why, in Chile, solar is competitive with conventional energy sources. We hope Salvador will pave the way for other projects, here and in other regions of the world." —

1. Workers installing SunPower panels during construction of Solar Star Projects in California, the world's biggest photovoltaic solar power developments.



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- High-efficiency SunPower panels at the Solar Star Projects site in California, the United States.
- SunPower's new Greenbotics panel-cleaning robot.

**"SUNPOWER MAKES THE BEST-PERFORMING PANELS IN THE MARKET, BOASTING AN EFFICIENCY OF MORE THAN 21.5%."**

### Our flagship solar projects include:

**Solar Star Projects** in California, the world's biggest photovoltaic solar development, which will produce enough electricity to power around 255,000 homes.

**Shams 1**, the biggest concentrated solar power plant in the Middle East, inaugurated in Abu Dhabi in March 2013.

### Total's First Solar Project in South Africa

Home to one of the most vibrant economies in the world, South Africa has seen its energy demand grow exponentially. Concerned about diversifying its power mix, which is 93% dependent on fossil fuels, the country has set a goal of increasing the share of renewables in its generating capacity to 30% by 2030. In November 2013, Total and its partners were selected to build an 86 MW solar farm in Prieska in Northern Cape Province, representing a \$200 million investment. The electricity will be sold to the local electric utility, Eskom, under a power purchase agreement. Construction is expected to begin in the second half of 2014, with operational start-up scheduled for mid-2015. The plant will generate approximately 210 gigawatt-hours a year, enough to supply around 45,000 people. "We're delighted to have won this tender," enthused South Africa Country Manager Romain Sormani. "The selection of our project underscores its technical quality and cost-competitiveness, as well as its strong corporate social responsibility component."

The creation of local development opportunities, particularly jobs, was an important criterion considered by the South African government when evaluating bids for the plant's construction. —

### Robots to Clean Solar Panels

To support its turnkey solar power solutions, SunPower offers an innovative system of panel-cleaning robots that use less than half a glass of water per panel. This represents a 90% reduction in water use compared to manual cleaning methods. In dusty environments, like the Western United States, the Middle East and Chile, regular cleaning of solar panels can increase annual power generation by nearly 15%.



## Registration Document ↓

The Registration Document 2013 contains a business review, the Group's consolidated financial statements and, in Section 7, the social and environmental information required by Article 225 of France's Grenelle II Act of July 2010.

[www.total.com/en/media/publications/](http://www.total.com/en/media/publications/)



## Factbook ↑

The Factbook presents Total's key financial and operating data for a five-year period.

[www.total.com/en/media/publications](http://www.total.com/en/media/publications)



# TO LEARN MORE

All of our publications can be found on our corporate website, [www.total.com](http://www.total.com).

## Total en France ↑ (in French only)

Total en France 2014 presents the social and economic contributions Total makes in France.

[www.total.com/en/medias/publications](http://www.total.com/en/medias/publications)



## Total Foundation 2013 Activity Report

An annual review of the projects supported by the Total Foundation, which aims to nurture the next generation, celebrate the world's cultural heritage, promote public health campaigns and protect marine biodiversity.

<http://foundation.total.com/version-anglaise-500244.html>



## At a Glance ↑

In 24 pages, At a Glance provides a concise, easy-to-understand overview of Total, suitable for a wide range of audiences. The 2014 version features some of our flagship projects, which perfectly illustrate our challenges, beliefs and ambitions.

[www.total.com/en/media/publications](http://www.total.com/en/media/publications)

