The energy transition towards a decarbonized world is ongoing and, together with society, Total is fully involved in this ambition and aimed at getting to net-zero emissions by 2050. However, over the next two decades, oil and gas will continue to play a vital role in meeting the world’s energy demand. In 2040, they should still account for nearly half of the global primary energy mix. Our Exploration & Production business therefore is fully committed to supplying affordable, reliable and clean energy to a growing world population while also addressing climate change.

At E&P, we continue to leverage our strengths to meet this challenge. Facing complex technical, economic and geopolitical constraints, our employees deploy their expertise and innovation capabilities to deliver exploration, development and production targets safely.

In 2019, for the first time in our history, we have exceeded the three-million barrel daily production mark thanks to the ramp-up and start-up of major projects, such as Yamal LNG in Russia, Egina in Nigeria, Kaombo in Angola, Iara 1 in Brazil, Culzean in the UK and Johan Sverdrup in Norway. We have strengthened our position in liquefied natural gas and deep offshore through the acquisition of the Mozambique LNG project and the launch of the Arctic LNG 2 and Mero 2 developments in Russia and Brazil respectively. Thanks to our strong discipline, we have slashed production costs down to 5.4 dollars per barrel and reduced our operating expenses by more than 250 million dollars.

Supplying energy to the world
Delivering historic production growth
Bringing major projects on stream
Benefiting from a leading deep offshore position
Valorizing strong conventional offshore expertise

Building strong foundations for the future
Being driven to discover
Launching the next wave of profitable projects
Harnessing the power of gas through LNG
Climate change, R&D on the front line

Improving the efficiency of our operations. All this while helping the local communities to further develop, wherever we are present. With the three pillars of our strategy – responsibility, profitability, sustainability, we are building a more successful and resilient Exploration & Production business to support Total’s ambition of becoming the responsible energy major.

Arnaud Breuillac
President, Exploration & Production

A message from Arnaud
In 2019, for the first time in our history, we have exceeded the three-million barrel daily production mark.”

Above all, safety is a core value for us and the foundation of our operational excellence. All our operations are carried out in the strictest respect for the safety and environmental rules of the sites where we operate. We also actively participate in reducing the Group’s greenhouse gas emissions by...
In 2019 Total’s Exploration & Production (E&P) continued to identify avenues to more profitable production and to cut its production costs. The historical production record achieved is consistent with its commitment to supply more affordable energy to an ever-larger world population.

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$8.6B of E&P organic investments

3.014M barrels of oil equivalent produced every day

$5.4 production costs per barrel of oil equivalent (ASC 932)

+9% hydrocarbon production growth in 2019

+345,000 barrels of oil equivalent produced versus 2018

13,200 E&P employees as of Dec 31, 2019
In 2019, for the first time in its history, Total’s production exceeded three million barrels of hydrocarbons per day.

Delivering historic production growth

The 9% production growth has been made possible thanks to major oil, gas and LNG (liquefied natural gas) start-ups more than offsetting the decline in legacy assets. These major achievements include the first oil of Iara 1 and Lapa NE Phase 2 in Brazil and the full-field production on Kaombo in Angola – all three deep offshore; the first gas of the conventional offshore UK Culzean field as well as the start-up of the giant oil project Johan Sverdrup in Norway, and the restart of the Tema Rossa project in Italy. LNG growth has been of nearly 50%. In the United States for example, the first phase of the Cameron LNG project, located in Louisiana, has started up.

Underpinning this record production growth was outstanding operational performance. Top-tier performance across E&P operations delivered a production efficiency of 93%. With only 5.4 dollars per barrel of oil equivalent, E&P also has one of the lowest production costs of the industry. This is the result of a long journey to infuse a genuine cost-conscious culture in view of structurally and sustainably reduce opex and capex. In 2019 this approach continued to yield a significant operating cost reduction of 250 million dollars. A goal which has been achieved without ever compromising safety, environment and integrity of its operations.
Bringing major projects on stream

**Johan Sverdrup (Phase 1)**

Located 150 kilometers offshore, production at Johan Sverdrup, the largest oil discovery in the North Sea for a generation, has started more than two months ahead of schedule and 30% under the initial budget. Phase 2 is under development and could raise production to 660,000 barrels per day by 2022.

8.44% 440,000 b/d

**Iara**

First oil from Iara, with P-68 FPSO, a new milestone for Total in Brazil, increasing its share of production from the highly prolific pre-salt Santos Basin, adding to current output from the Lapa and Mero fields. The second FPSO is expected to come on stream in 2020 with a capacity of 150,000 barrels per day.

22.5% 150,000 b/d

**Culzean**

Culzean is a gas condensate field located on Block 22/25a, 230 kilometers off the coast of Aberdeen. It has been delivered ahead of schedule and more than 10% below the initial budget. The project includes the drilling of six wells, the construction of three bridge-linked platforms and of a Floating Storage and Offloading (FSO) unit.

49.99% and operator 100,000 boe/d

**Lapa**

The first IOC operating a pre-salt field in Brazil, Total has been developing the deep offshore Lapa oil and gas field, 270 kilometers off the coast of Brazil in the Santos Basin, since 2018. The second phase of the Lapa development focused on the Northeast area of the field in 2019-2020.

35% and operator 100,000 b/d

**Tempe Rossa**

Located onshore in the Gulf of Taranto, the Tempe Rossa production site covers an area of 27 hectares at an altitude of 1,050 meters. It includes six wells – drilled up to a depth of 7,148 meters - producing a heavy, viscous and sulfur oil with an API gravity of 10° to 22°. The oil is transported to the Taranto refinery via a 136-kilometer pipe.

50% 50,000 boe/d

**Kaombo Sul**

Located on Block 32, 260 kilometers off the coast of Luanda, the full Kaombo development consists of six fields over an area of 800 km² and two Floating Production Storage and Offloading (FPSO) units have been converted from Very Large Crude Carriers (VLCC). Kaombo Sul, the second FPSO, stands out as a good example of standardization to reduce cost and improve efficiency. The associated gas from Kaombo will be exported to the Angola LNG plant as part of Total’s commitment to halt routine flaring.

50% 50,000 b/d

**Cameron LNG**

Located in Louisiana, Phase 1 of the Cameron LNG project includes three LNG (liquefied natural gas) trains of 4.5 million tons per annum capacity each. The project has a landmark 2019, bringing first production on stream and exporting its first cargo. Cameron LNG and its expansion is in line with Total’s strategy to continue building a strong position on the US LNG market.

16.6% 13.5 Mtpa

**A Glance**

**Bringing major projects on stream**

8

20

9

**AT A GLANCE**

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20

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**AT A GLANCE**
Benefitting from a leading deep offshore position

Over the last 20 years, since its first major development in Angola, E&P has kept up its world-leading track record of delivering on time and within budget, while operating technically challenging deep offshore mega-projects.

Already a leading major in West Africa, the Group is now building a resilient business in deep offshore Brazil and the Gulf of Mexico. By simplifying and standardizing designs and equipment, digitizing facilities and operations, Total constantly aims to reduce its costs and enhance the commerciality of its resources.

Developing in new areas

In Brazil, Total’s production comes from the Mero field in the Libra Block, as well as from the Lapa (operator) and Iara Blocks. Overall, its portfolio includes more than 20 blocks, located in the Campos, Santos, Barreirinhas, Ceará, Espírito Santo, Foz do Amazonas and Peotas basins.

E&P has continued to build its position in Brazil, launching the second phase of the giant Mero field development in June 2019, potentially unleashing between three and four billion barrels. The Libra Consortium is aiming to leverage the excellent productivity of the field to develop a major oil project with technical costs below 20 dollars per barrel and low breakeven. Once the full potential of the field is developed, production should reach more than 600,000 barrels per day.

As operator, the Group also acquired in October 2019 a new deep offshore exploration license, the C-M-541 Block in the pre-salt Campos basin at a water depth of 3,000 meters. This demonstrates E&P’s ability to seize high quality exploration acreage in a key growth area for Total.

Capitalizing on historical positions

In Angola, Total, with its partners, signed an agreement in December 2019 to extend all Block 17 production licenses to 2045. Located 150 kilometers off the Angolan coast in water depths ranging from 600 to 1,400 meters, Block 17 has been a true success story, with almost three billion barrels of oil produced since 2001. This highly prolific block is currently producing around 440,000 barrels of oil equivalent per day and its potential is still high, with more than 1 billion barrels yet to be recovered. After 20 years, three short-cycle brownfield projects – Zinia Phase 2, CLOV Phase 2 and Dalia Phase 3 – are currently under development to add 150 million barrels of reserves.

The “Golden Block” has allowed Total to demonstrate its deep offshore excellence with numerous technological developments and innovations. A further boost to Total’s Angolan business was announced in December 2019 with the acquisition of interests in Blocks 20/11 and 21/09 located in the Kwanza Basin, offshore Luanda, in water depths ranging from 300 to 1,800 meters. The Cameia, Mavinga, Bicuar and Golfinho discoveries have already been made. Total and its partners will seek to unlock the value of these prospects by creating a brand-new development hub.
The Danish asset Tyra also entered a crucial development phase and will secure Danish gas production and potentially unleash near-field developments for decades to come.

Finally, successful exploration drilling West of Shetland demonstrates Total’s deep and continued commitment to this important resource basin. As a seasoned operator in the North Sea, E&P there brings its know-how and rigorous opex approach to prolong the commerciality of brown resources in the United Kingdom, Denmark, the Netherlands and beyond. Using transformative and innovative technologies can at the same time improve safety, keep costs down and potentially unlock previously uneconomic resources.

2019 was a bumper year for E&P in the North Sea, where it is an historic player in conventional offshore, both in the UK and Norwegian sectors with Culzean and Johan Sverdrup coming on stream.

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Project snapshot: Culzean

Culzean was E&P’s flagship conventional offshore development in 2019 and the biggest gas field to be developed in the United Kingdom in the last 25 years. This HP/HT mega-project will deliver a 100,000 barrels of oil equivalent per day production plateau, bringing to 18% the proportion of the UK’s gas demand met by Total.

Thanks to the excellent performance of the teams in charge of construction and drilling operations, the project has been delivered ahead of schedule and more than 10% below the initial budget, which represents capex savings of more than 500 million dollars. Culzean is located in the Central Graben area, close to the Elgin-Franklin fields, also operated by Total, thus generating synergies, and exemplifies E&P’s efforts to upgrade its North Sea portfolio. New digital technologies applied on the project, such as the latest smart rooms, will deliver higher efficiency during operations and create a safer working environment.
In 2019, to ensure its long-term sustainability, Total’s Exploration & Production (E&P) worked to renew its reserves and to launch new projects that will support its future production. E&P carries out this mission responsibly in the face of the climate challenge by developing its gas and liquefied natural gas production and by relentlessly innovating.

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- 12.7B barrels of oil equivalent of proved reserves as of Dec 31, 2019
- 12 yrs of proved reserves
- 53% share of gas and associated products in the overall production
- +50% LNG production growth
- +800,000 barrels of oil equivalent per day to fuel growth post 2023
- 22 final investment decisions (long-term and short-cycle projects)
In 2019, the exploration budget amounted to 1.55 billion dollars, focusing in very diversified areas, such as Brazil, Suriname, French Guiana, Guyana, Mexico, the United States, the United Kingdom, Cyprus, South Africa and Senegal. Reserves have been boosted with a 157% reserve replacement rate thanks to the acquisition of Anadarko’s African assets as well as the extension of license agreements in Angola and Oman. At the end of 2019, the Group’s proved reserves (SEC) totaled 12,681 billion barrels of oil equivalent.

Worldwide discoveries

In South Africa, Total has opened a new-world class gas and oil play in a challenging deepwater environment. In February 2019, E&P made a significant gas condensate discovery on the Brulpadda prospect (Block 11B/12B) in the Outeniqua basin, located 175 kilometers off southern coast. The exploration well encountered 57 net meters of gas condensate in Lower Cretaceous reservoirs, then was deepened to a final depth of 3,633 meters.

To achieve this, Total used the latest generation drilling ship and was able to leverage its experience in similar environments, such as the West of Shetland in the United Kingdom. It was in this country that another important discovery was made, in January 2019, in the Glengorm prospect in the Central Graben. Drilled to a final depth of 5,056 meters, the well encountered 37 meters net of high-quality gas and condensate pay in an Upper Jurassic reservoir.

Finally, in December 2019, in Suriname, E&P acquired a 50% work interest and operatorship in the highly prospective offshore Block 58, further expanding its footprint in the prolific Guyana-Suriname basin. A first significant discovery of more than 123-meter net pay of high-quality light oil and gas condensate in multiple stacked reservoirs in Upper Cretaceous Campanian and Santonian formations has been announced. The Maka Central-1 well was drilled in a water depth of 1,000 meters.
Launching the next wave of profitable projects

E&P executes its strategy by investing with strict discipline, selecting low break-even projects, and by optimizing its portfolio. Projects sanctioned over 2018-2019 are profitable with an internal rate of return greater than 15% at 50 dollars per barrel of oil equivalent. They will represent a cumulative production of more than 800,000 barrels per day by 2023.

The geographical spread gives a good measure of the quality and resilience of the pipeline of projects that will fuel E&P profitable growth in the coming years. E&P focuses primarily on its core areas (Africa, Middle East and Northern Europe) and builds up on its technical expertise in deepwater and liquefied natural gas (LNG). For new projects, 2019 was a good example of this strategy with a total of 22 final investment decisions including Mozambique LNG and Ikike (Nigeria), Ekofisk (Norway), Mero 2 (Brazil) and Anchor (USA), all in deep water, and Arctic LNG 2 (Russia) in LNG.

In order to high-grade its portfolio, E&P has also performed asset sales in various areas, such as the offshore Block CA1 in Brunei for 300 million dollars and several UK assets formerly owned by Maersk Oil in the Eastern North Sea for 635 million dollars. These transactions fit in with the E&P portfolio management, aimed at lowering its breakeven point, and contribute to Total’s program to dispose of five billion dollars of non-core assets over the period 2019-2020.

Project snapshot: E&P investments in the US Gulf of Mexico

December 12, 2019 marked the announcement of the final investment decision to develop the Anchor oil field. It will be developed with seven subsea wells connected to a semi-submersible floating production unit operated at a capacity of 75,000 barrels of oil and 28 million cubic feet of gas per day. Production is scheduled to start in 2024. Anchor will be the first development to use the high-pressure 20,000-pounds-per-square-inch (psi) technologies developed at industry level over the last few years.

On the same day, Total, operator, announced that front-end engineering and design (FEED) has been launched for the deepwater North Platte discovery. The field development plan, which requires technologies identical to those used for Anchor, is based on eight subsea wells connected via two production loops to a floating production unit (FPU). North Platte oil production at plateau level is expected to average 75,000 barrels per day, plus associated gas.
Harnessing the power of gas through LNG

In a world seeking to shift away from higher-carbon content fuels, natural gas, as the fossil fuel with the least carbon emissions, is a key component in the energy transition. Gas can serve as a flexible, inexpensive partner to intermittent renewable energies and switching away from coal to natural gas for power generation would reduce carbon emissions by five billion tons annually. In step with these expectations, the E&P portfolio evolves accordingly. In 2019, gas and associated products, such as condensates and natural gas liquids, accounted for 53% of its overall production compared to 50% in 2018.

A pioneer in the LNG (liquefied natural gas) industry, Total is also strongly integrated along the whole LNG value chain with a truly diversified presence in most major production zones and markets. Benefitting from an overall portfolio of around 50 million tons per year by 2025 and a worldwide market share of 10%, Total is the second-largest private global LNG player. This growing part of LNG is in line with the Group’s commitment to addressing climate change and meeting the world’s energy needs at an affordable cost.

Two major new projects in 2019

In 2019, E& P continued to ramp-up production from world-class projects, as in Russia with Yamal LNG and in Australia with Ichthys LNG, and to sanction new major LNG projects. In June 2019, the final investment decision on the Mozambique LNG project was announced, followed swiftly by the kick-off of the construction. Project snapshot: the acquisition of Mozambique LNG

In September 2019, Total announced the closing of the acquisition of Anadarko’s 26.5% operated interest in the Mozambique LNG project for a purchase price of 3.9 billion dollars. The closing comes after Total reached a binding agreement with Occidental in May 2019 to acquire Anadarko’s assets in Africa.

According to the IEA’s (International Energy Agency) Sustainable Development Scenario, natural gas consumption will soar between now and 2040, when it is expected to meet 25% of the global energy demand. This acquisition is perfectly in line with E&P strategy to grow in areas where the Group is strong such as in Africa and LNG. The agreement gives Total access to more than three billion barrels of oil equivalent of resources and will boost its production by around 160,000 barrels per day by 2025.

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In 2019, Total’s Exploration & Production (E&P) continued its research-development and innovation efforts on issues related to the climate challenge. It designs and develops solutions for tomorrow to meet growing global energy demand while transitioning toward a lower-carbon energy mix and making its operations increasingly environmentally responsible.

Climate change, R&D on the front line

Learn more about our key projects at ep.total.com
Total is a broad energy company that produces and markets fuels, natural gas and low-carbon electricity. Our 100,000 employees are committed to better energy that is more affordable, more reliable, cleaner and accessible to as many people as possible. Active in more than 130 countries, our ambition is to become the responsible energy major.