

Interview



Digitalization can make energy more affordable

How the fourth-largest international oil and gas major is approaching digital innovation

An interview with Patrick Pouyanné, Chairman and CEO, Total

Patrick Pouyanné has been chief executive officer of Total since 2014, after the death of his predecessor, Christophe de Margerie, in Moscow. A year after, he became chairman of the board of directors. During his career at Total, he has held several important executive positions in the Upstream segment, both in France and internationally; he also successfully managed the transformation of the Refining & Chemicals segment. In this interview with Arthur D. Little, Patrick Pouyanné examines the upheavals and challenges faced by energy companies, and how Total is embracing digital innovation as a way to drive sustainable and profitable growth.

Many observers have been pointing out the key energy challenges of the coming decades, such as rising energy demand and efforts to limit climate change. How does Total see these challenges?

Total, and energy companies more broadly, are facing a dual challenge. First, the world population is growing. It is forecast to rise from 7 billion today to 9 billion over the next few decades. Today, 1.5 billion people still do not have access to energy. It is fair to say that we must do everything we can to ensure that all these people do have access to energy, a prerequisite for economic development, in 30 or 40 years' time. And second, fighting climate change is a pressing issue. There is a broad consensus on the objective of limiting the global temperature rise to 2°C, and we fully endorse this aim in our business strategy. At first sight, these two challenges might seem impossible to reconcile. But, in fact, we aim to tackle them both, by being the responsible energy major and providing the world with affordable, reliable, clean energy.

“We will still be an oil and gas major in 35 years’ time.”

How is Total planning to align with the 2°C roadmap?

The roadmap underpins our strategy and is based on several cornerstones. The first is giving priority to natural gas. We see it as the fossil fuel of the future. It is the fossil fuel that generates the lowest emissions, typically only half as much coal when used for power generation, for example. Our portfolio is gradually shifting from a 50/50 split between oil and gas to a 60/40 split in favor of gas. Gas is also flexible and an ideal partner for renewable energy, which is intermittent, and will remain so until the industry finds a workable solution to store the energy produced by renewables. Promoting gas is a must, which is why, for instance, Total advocates carbon pricing.

Does that mean that you still see a long-term role for oil and gas?

Definitely! Have a look at the International Energy Agency's scenario limiting climate change to 2°C. It anticipates that the energy mix will become less carbon-intensive, but oil and gas will continue to play an important role, accounting for more than 40% of the mix, compared to 60% today. This directly impacts Total: we will still be an oil and gas major in 35 years' time. Without oil and gas, rising energy demand cannot be met. But as oil consumption will diminish, the most expensive oil will not be produced; therefore, it is important to focus on producing the "low breakeven" oil – in other words, the competitive oil. Strengthening the competitiveness of the oil we produce is what we have done, for example, by pairing Total's and Maersk Oil's businesses in the North Sea: we have driven down our breakeven to lower than 30 dollars per barrel, and created the North Sea's second operator.

But there are other cornerstones, as you said, to reach your objective of being aligned with the 2°C roadmap. You have diversified into renewables, for instance.

I like to see renewables as part of a broader category in our portfolio, which I call "low carbon." It includes the gas downstream, renewables, typically solar energy, biofuels and energy efficiency. Total has been a pioneer in the low-carbon sector. Acquiring SunPower in 2011 and becoming a major player in

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solar are part of the same movement as acquiring Lampiris, a green gas and power distributor, and Saft, a high-grade battery maker – as are teaming up with Eren RE, which develops solar, hydro and wind power projects, and investing in CCUS technology. It is aligned with our ambition of growing our low-carbon portfolio to 20% of our business in 20 years' time. Total is anticipating the changes in the energy mix, which we welcome as an opportunity to grow. But we only invest where we see a business case, and with exactly the same capital discipline as for the rest of our assets. We aim for profitable growth.

So buying Maersk Oil, the Danish oil and gas champion, and partnering with Eren RE, a renewables company, are part of the same strategy?

Absolutely. To invest in low-carbon businesses - some of which are not yet mature in terms of profitability - you need to make money. At Total, our strategy is to fund our diversification ventures through our core business, oil and gas. Diversification only works if you have a solid core business that generates a profit. By acquiring Maersk Oil, we capitalize on our strength, which, in turn, allows us to step up our efforts in renewable energy with Eren, for example. For the same reason,

“In my opinion, the energy company of the future should focus on delivering the energy the world needs through a diversified, balanced, profitable portfolio of assets.”

I strongly believe that Total must remain integrated along the oil and gas value chain, including the downstream. That's how I see the energy company of the future: focused on delivering the energy the world needs through a diversified, balanced, profitable portfolio of assets.

How has Total approached the changing nature of innovation, for example, the increasing importance of ecosystem development and working with partners, and the need for ever-greater speed and agility?

Innovation is the engine that drives the development of a company and creates its value added in the long term. It is critical for a company like ours to be innovative. Total's history goes back almost a century, and the fact that we are still here is testament to our ability to develop new concepts and reinvent ourselves. But in an open world, in evolving markets, you can never rest on your laurels. Encouraging a culture of innovation is key to our success. The company now has a culture and an organization that foster innovation,





starting with a new Strategy & Innovation Division at the corporate level, which includes R&D and a digital team led by a chief digital officer. But innovation is not just about products. It is also about the right frame of mind, having an open attitude towards the new challenges that come our way, new work methods and more. This is why I think innovation involves everyone, and everyone is a potential innovator.

How does Total work with start-ups?

We have various interactions with start-ups. Through Total Energy Ventures, our corporate venture fund, we acquire minority interests in those we find the most promising. We gain access to their ideas, agility and creativity, and in return, they have access to our commercial and financial clout. Another example of our open innovation methodology is

Key facts and figures

- **4th largest international oil company based on market capitalization**
- **\$149.7 billion in revenue in 2016**
- **\$8.3 billion adjusted net income in 2016**
- **2.45 million barrels of oil equivalent produced per day in 2016**
- **98,000 employees in 130 countries**



About Total

Total is a global integrated energy producer and provider, a leading international oil and gas company, and a major player in low-carbon energies. Its 98,000 employees are committed to better energy that is safer, cleaner, more efficient, more innovative and accessible to as many people as possible. As a responsible corporate citizen, it focuses on ensuring that its operations in more than 130 countries worldwide consistently deliver economic, social and environmental benefits.

our “Plant 4.0 project”: every year, we invite start-ups to join this incubator and demonstrate their concepts and how they might apply to what we do. I strongly believe that a company like Total needs to be challenged and to keep an open mind about innovation and technology. We cannot come up with all the answers ourselves.

How does Total approach digital innovation in particular?

I like to joke that you can’t digitize oil or gas. They are hard commodities. But what we see happening is that a lot of services related to this business can be digitalized. For instance, we are launching a gas and power distribution service in France that will be available through an online platform. It’s easy,

because customers now expect this type of service to be easy. Being digital-based, the service will be very competitive. It’s a great example of how digitalization can make energy more affordable. In the solar business, we are seeing more and more customers being drawn to distributed systems, where a solar panel on their roof is paired with intelligent software, helping them manage their consumption. Digitalization is spreading as our customers are getting more familiar with it. They are starting to expect us to be able to deliver in digital form. So it is really a topic that we are taking seriously. I don’t see it as a threat; I see it as a field offering opportunities.

How does Total see AI, and how does it intend to leverage this new capability and support innovation?

Artificial intelligence is a tool, a means to an end. At Total, we need to acquire and process all kinds of data – from seismic acquisition, or about our customers or the way our plants operate. Processing data is slow and complex, even for Total, which has the industry’s most powerful

computer, Pangea. So I believe artificial intelligence, big data management, machine learning, etc., have a role to play there. They are productivity enhancers, that’s for sure. Machines can replicate, accelerate processes. But at Total, a company of scientists and engineers through and through, we will always need the creativity and insight of the human mind.

“Artificial intelligence, big data management and machine learning will play a major role as productivity enhancers.”

Vincent Bamberger

is the Managing Partner in the Paris and Brussels offices of Arthur D. Little.



**About Patrick Pouyanné
Chairman and CEO of Total**

A graduate of École Polytechnique and a Chief Engineer of France’s Corps des Mines, Patrick Pouyanné held various positions in ministerial offices from 1989 to 1996, including Environment Technical Advisor to the Prime Minister (1993–1995) and Chief of Staff to the Information Technology Minister (1995–1996). He joined Total in 1997 in Angola, then in Qatar in 1999. In 2002, he was named SVP Finance, Economics and Information Systems Exploration & Production. In 2006, he became SVP Strategy, Business Development and R&D in Exploration & Production. In 2012, he was appointed President, Refining & Chemicals and a member of the Group’s Executive Committee. In 2014, Patrick Pouyanné was appointed Chief Executive Officer of Total, and a year after, Chairman of the Board of Directors.

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