We Are Becoming a Multi-Energy Company

The energy transition depends, first on electrifying energy use, which will require a massive increase in green electricity. TotalEnergies is expanding across the entire electricity value chain (intermittent renewable production, flexible gas-fired power production, storage, trading, customer sales) in a profitable way.

Our goal is to build an Integrated Power business with a return on average capital employed higher than 10% and to rank among the world's top five providers of solar and wind energy by 2030, with gross capacity of 100 GW and an interim target of 35 GW by 2025 (17 GW reached as of year-end 2022).

Second, the energy transition depends on the development of new, low-carbon energies (biofuels and biogas, clean hydrogen and synthetic fuels combining hydrogen and carbon) that TotalEnergies has the core skills to produce. We are expanding into these new markets by focusing on circular resource management and deploying less mature technologies at our own sites to test their business viability.

For natural gas, a transition energy, TotalEnergies continues to expand across the liquefied natural gas (LNG) value chain to consolidate its position as the world's third-largest player. LNG plays a key role in the net-zero roadmaps of many coal-consuming countries. It's also a perfect partner for intermittent renewable energies given that flexible and dispatchable CCGT plants provide a secure electricity supply in the context of weather events and fluctuations in demand.

Regarding oil, the Company is highly selective and focuses its investments on projects with a low breakeven point and low emissions. This strategy enables us to take full advantage of global oil demand, which continues to grow but should begin to decline in the medium term, due to the electrification of transport; it ensures that our businesses will remain profitable and resilient over the long term.

As they evolve, the energy markets are becoming increasingly interconnected and interdependent, particularly since electricity – the energy at the center of the transition – is a secondary energy, meaning that it depends on other energies and markets.

Our integrated multi-energy strategy and our solid financial base are strengths that allow us to be a major player in the sustainable energy the world needs and make the most of current developments including the potential price volatility they may cause. ■

ENERGY TRANSITION

HOW IS NATURAL GAS KEY TO THE ENERGY TRANSITION?

Natural gas can replace coal for numerous applications (power generation, manufacturing, etc.), so it has an immediate positive impact, since its carbon emissions are half those of coal. That should be a global priority.

Flexible and easily dispatchable, natural gas is also an ideal partner for renewable energies, which are intermittent and seasonal by nature, for power generation.

In order for gas to live up to its potential for the energy transition, methane leaks need to be eliminated from the gas value chain. TotalEnergies has already reduced its emissions and is committed to zero methane emissions.

In addition, LNG has demonstrated its key role in connecting gas consuming countries with large natural gas resources available on a global scale.

For these reasons, gas is a core component of roadmaps for getting to net zero in many coal-consuming countries, including the UK, the US, Germany, Japan, South Korea, China and elsewhere.

Conversely, the crisis in the natural gas markets in 2022 has unfortunately triggered a boost in global demand for coal, which reached historic highs in 2022. The IEA reported in December 2022[1] that Europe's demand for coal, primarily for power generation, rose 6% against a backdrop of serious disruption in the European electricity markets.

1. IEA Oil Market Report, February 2023.

NEW ENERGIES

ACCELERATING THE MOVE TO RENEWABLES AND STRENGTHENING POWER GRIDS

Electrification of end-user demand thanks to clean power is one of the biggest drivers of the energy transition. Renewables, already the primary factor in decarbonizing the power mix, are experiencing accelerated growth. According to the International Energy Agency (IEA), solar and wind capacity increased threefold between 2015 and 2021 (by 85 GW and 246 GW respectively). But this is not enough. TotalEnergies shares that view.

As the penetration of intermittent renewable energies increases, massive investments to upgrade power transmission and distribution networks are also required, as well as storage solutions and flexible power plants. Global investments in renewables and power grids are already outpacing investment in oil and gas production by nearly 100%. Here too, we need to go further: we also share the IEA's belief that annual investment in low-carbon power must, at a minimum, double by 2030 to reach between $1.5 and $2 trillion, with half devoted to grids.

TotalEnergies aims to reach 100 GW in gross installed wind and solar capacity by 2030, and is among the ten major companies worldwide (including six Chinese firms) that are targeting triple-digit renewable energy generation over the course of the decade.

Electrification is gaining pace, which is in turn taking carbon out of a growing number of applications – especially transportation, the most oil-intensive industry.

A Net Zero Company by 2050, Together With Society

With regard to greenhouse-gas emissions, TotalEnergies is committed to lowering its carbon footprint from energy production, processing and delivery to our customers.

First of all, the Company is executing an ambitious action plan to reduce the greenhouse gas emissions for which we are directly responsible (Scope 1+2 emissions at our operated assets) to the strict minimum. We are further investing in carbon storage and sequestration projects so as to "neutralize" our residual emissions and be able to offer those CCS solutions to our major industrial customers.

Although the speed of the transition will depend on the pace of change in government policies, consumer behaviors and corresponding demand, TotalEnergies has embraced the need to offer our customers affordable, less carbon-intensive energy products, and to lend support to our partners and suppliers with their own low-carbon strategies.

Drawing on the actions already taken to evolve our energy offerings and reduce carbon emissions from our operations, in 2022 TotalEnergies published an outline of what our businesses might look like as we become a carbon-neutral energy company by 2050, together with society.

By 2050, TotalEnergies would produce:

• about 50% of our energy in the form of low-carbon electricity, with corresponding storage capacity, totaling about 500 TWh/year, on the premise that we develop about 400 GW of renewable capacity.

• about 25% of our energy, equivalent to 50 Mt/year of decarbonized fuels in the form of biogas, hydrogen, or synthetic liquid fuels from the circular reaction $H_2 + CO_2$ = e-fuels.

• about 1 Mb/day of oil and gas (about a quarter of the total in 2030, consistent with the decline envisaged in the IEA's 2021 Net Zero scenario), primarily liquefied natural gas (roughly 0.7 Mboe/day, or 25-30 Mt/year) with very low-cost oil accounting for the rest. Most of that oil would be used in the petrochemicals industry to produce about 10 Mt/year of polymers, of which two thirds would come from the circular economy.

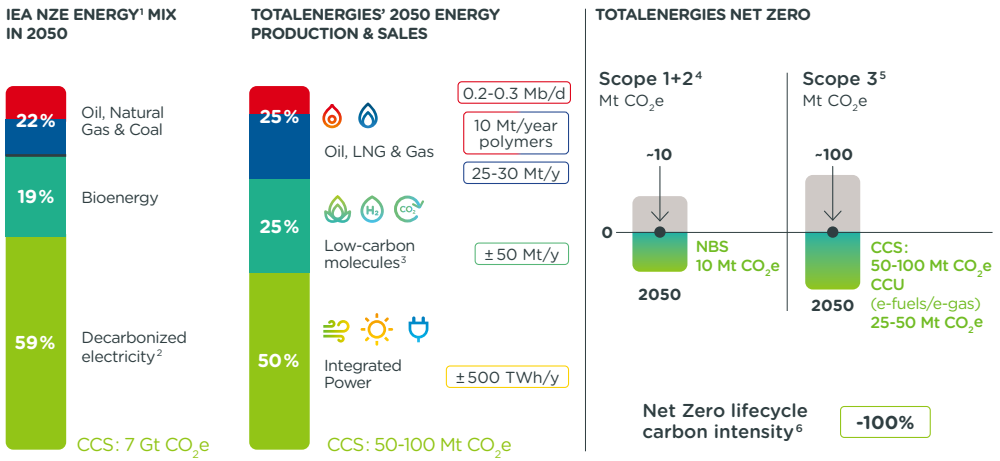
That oil and gas would represent:

• about 10 Mt of residual emissions annually, with methane emissions almost eliminated (below 0.1 Mt CO_2e/year); those emissions would be offset in full by projects using nature-based solutions (natural carbon sinks).

• Scope 3 emissions totaling about 100 Mt annually. To get to net zero together with society, TotalEnergies would help "eliminate" the equivalent of 100 Mt/year of CO_2 generated by our customers by developing:

- a carbon storage service for customers that would store 50 to 100 Mt/year of CO_2;
- an industrial e-fuels business that would prevent 25 to 50 million tons of CO_2 for our customers through production with 100% green hydrogen, while offsetting the intermittent nature of renewable energies to make them a viable replacement for fossil fuels. ■

TOTALENERGIES IN 2050: A VISION FOR A NET ZERO COMPANY



1. IEA WEO 2021 - NZE scenario. **2.** Hydro, solar, wind and nuclear. **3.** Biofuels, biogas, hydrogen and e-fuels/e-gas. **4.** From operated facilities. **5.** From energy products used by our customers (GHG Protocol Category 11). **6.** Average carbon intensity of energy products used by our customers worldwide (Scope 1+2+3).

Why Continue to Invest in Oil?

In May 2021, the International Energy Agency (IEA) published its Net Zero Emissions (NZE) scenario outlining changes in world energy demand that would be compatible with a 1.5°C scenario "without overshooting the related carbon budget." The strict assumptions used for the evolution in energy demand between now and 2030 prompted the IEA to assert that the world had no need for new oil and gas projects. Indeed, under that "normative" scenario, demand for oil between 2020 and 2030 declines at the same rate as the natural depletion of fields, i.e about 4% a year.

This scenario does not claim to forecast actual changes in energy demand, and since its publication the IEA has released several demand forecasts that reveal the extent to which the world is deviating from that normative outlook. Demand for oil is by no means declining in line with the depletion of existing fields; in fact, demand is rising. In February of this year, the IEA projected that demand in 2023 would exceed 2019 levels, rising to 102 Mb/d – (whereas the NZE scenario published in 2021 projected falling demand from 2019, to 93.5 Mb/d in 2023).

Tungsten Explorer, Moho North project (The Republic of the Congo).

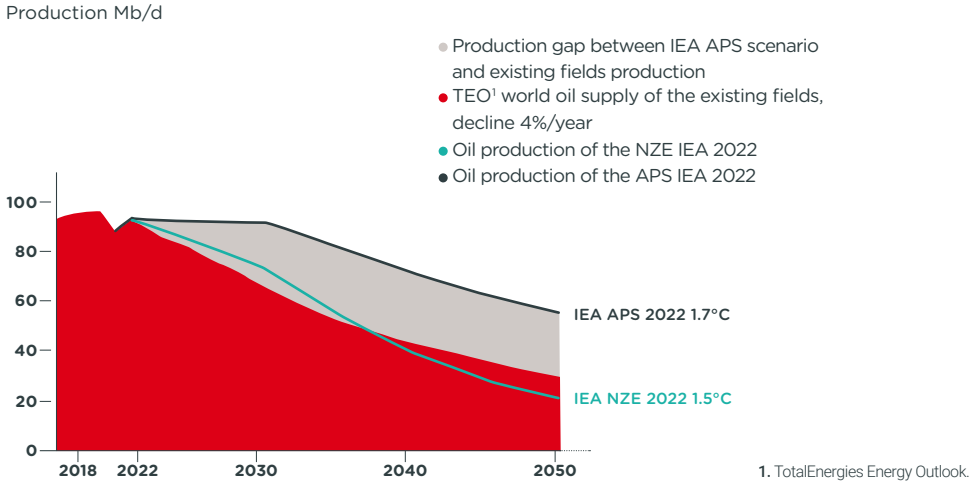
The IEA's forecasts for short-term oil demand are in line with TotalEnergies' analyses: although we concur with the NZE scenario regarding oil demand in 2050, the demand curve for 2020-2030 put forward to achieve it is clearly very far from observed market trends.

The IEA updated its scenarios in the World Energy Outlook published in October 2022. In the wake of the 2022 energy crisis, it acknowledged the importance of balancing supply and demand for the energies currently used throughout the world. Under its Announced Pledges Scenario (APS), which is compatible with the Paris Agreement, global oil demand would peak in 2030 and then subside, but at a slower pace than the natural rate of oil field decline. So new oil projects will be necessary. The chart below compares oil production in the APS scenario to the production capacity of existing fields (TotalEnergies' assessment shown in red in the chart). The gray area indicates the shortfall in available production, meaning new projects that will need to be launched, even under the 1.7°C scenario.

That is why TotalEnergies believes new oil projects are needed to meet continued strong demand, maintain prices at an acceptable level and create the conditions for a "just" transition that gives people time to change their energy practices. ■

1. IEA Oil Market Report of February 2023.

WORLD OIL PRODUCTION FORECAST COMPARED TO IEA NZE AND APS SCENARIOS



1. TotalEnergies Energy Outlook.

2020-2030, A Decade of Transformation for Now and the Future

The vision of our potential transformation by 2050 is backed by an investment policy designed to accelerate low-carbon solutions (electricity and renewable energies, biogas and biofuels, low-carbon fuels, CCS) while we continue to meet the world's current energy demand.

The world's population continues to grow and the inhabitants of emerging nations have legitimate aspirations to higher living standards, comparable to those of Western countries. The years 2020 to 2030 will mark TotalEnergies' transformation into a true multi-energy company.

In practical terms, over the current decade 2030, TotalEnergies plans to:

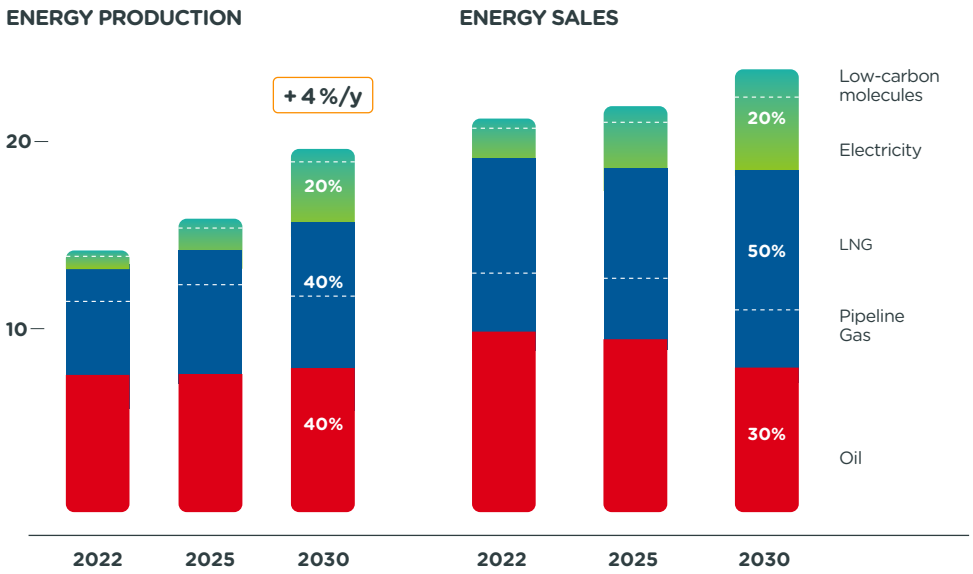
• Increase our energy production from 14 PJ/day to 20 PJ/day to meet growing demand. Electricity (primarily renewable power) would account for half that increase, with target power generation of about 130 TWh, and liquefied natural gas would make up the balance, while oil production by 2030 will remain stable;

• Pursue efforts to decarbonize the energy products offered to end customers, by decreasing our sales of petroleum products by more than 30% to align those sales with a production of about 1.4 Mb/day. That reduction is consistent with our strategy of integration across value chains, and reflects the anticipated decline in fuel demand in Europe, where the shift to electric road transportation is well underway. As a result, oil will account for no more than approximately 30% of our total sales, compared to 55% in 2019.

This expected evolution in our activities in 2030 underpins TotalEnergies' carbon emissions commitments over that same period, which are described in the section on Climate and sustainable energy. ■

ENERGY PRODUCTION AND SALES

PJ/d (excluding Russia)



Oil
- Maintaining the cash flow engine
- Aligning sales to demand and production

Gas
- Growing LNG production
- Integration along the LNG value chain

Integrated Power
- Creating value from integration in electricity
- Renewables: 100 GW by 2030, ROE > 10%

Low-carbon molecules
- Growing biofuels (SAF), biogas, CCS business
- Developing low-carbon H_2 for our refineries

Investments Aligned With Our Multi-Energy Strategy

Seagreen (Scotland) offshore wind farm under construction.

The challenge posed by the energy transition is to move as quickly as possible from the current energy system (which is more than 80% based on fossil fuels) to a decarbonized system. For a company like TotalEnergies, that means continuing to supply our customers with the energy they need now, while accelerating our investment in the low-carbon energies that will dominate in the future: **we must invest in both systems simultaneously and strike the right balance to ensure a just transition** *(see p. 9)*.

In 2022 our investments totaled $16.3 billion, including $4 billion in low-carbon energies. In 2023, we expect that figure to increase to $5 billion. That sum exceeds our projected capital expenditure for new oil & gas projects ($4.5 billion). In the coming years, investments in low-carbon energies will represent 1/3 of our investments, more than new oil&gas projects (30%).

Consistent with our commitment to build a multi-energy company, we have decided to publish financial indicators for the Integrated Power segment as of the first quarter of 2023 to demonstrate our ability to combine profitable growth and sustainable development while generating value for our shareholders.

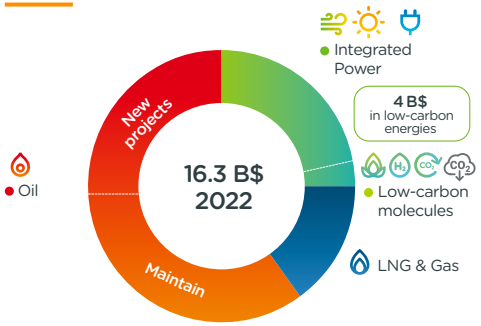
Continuing to invest with discipline: our decision criteria

In a global economic context marked by inflation, it is essential to maintain our investment criteria to ensure the profitability and resilience of our portfolio.

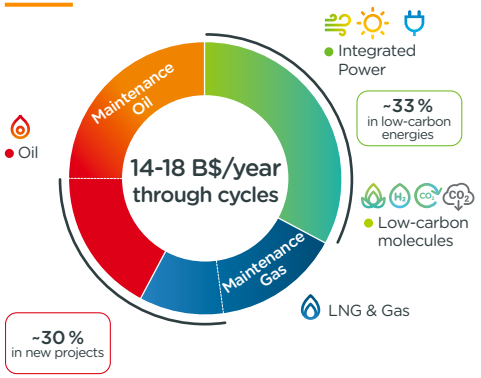
Each material investment project is evaluated in relation to the Paris Agreement's objectives and on the basis of the following criteria:

- **Project profitability** is analyzed in a hydrocarbon price scenario compatible with the Paris Agreement (Brent at $50 per barrel according to the IEA APS scenario limiting global warming to 1.7°C, and Henry Hub at $3 per MMBtu) and with a carbon price of $100 per ton (or the current price if higher in a given country). ››

2022 CAPITAL EXPENDITURE



OUTLOOK 2030



- **For new oil and gas projects** (greenfield and acquisitions), the intensity of Scope 1+2 greenhouse gas emissions is compared, depending on their nature, to the intensity of the average greenhouse gas emissions of upstream production assets or that of various downstream units (LNG plants, refineries) of the Company. As of 2023, the threshold has been lowered for Upstream projects to 19 kilograms of CO_2e/boe, versus 20 kilograms of CO_2e/boe previously – evidence of the effectiveness of our criteria. For additional investments in existing assets (brownfield projects), the investment will have to lower the Scope 1+2 emissions intensity of the asset in question. The goal is for each new investment to contribute to lowering the average intensity of the Company's Scope 1+2 greenhouse gas emissions in its category.

- **For projects involving other energies and technologies** (biofuels, biogas, CCS, etc.), GHG emissions reductions are assessed based on the amount by which they will reduce the Company's emissions.

Our investment decisions in 2022

In 2022, after an evaluation based on these criteria, 43 investments were approved. The most significant by category are as follows:

- **Upstream Oil & Gas:** expansion of the CLOV field and development of the Begonia oil field and Quiluma and Maboqueiro gas fields in Angola; the Snøhvit compression project and development of Eldfisk North in Norway; the launch of Ballymore in the United States; the Fenix gas project in Argentina; Lapa South-West in Brazil.
- **Liquefied Natural Gas:** Acquisition of an interest in NorthField East LNG and NorthField South LNG in Qatar for Upstream and two FSRUs in France and Germany.
- **Petrochemicals:** the Amiral project in Saudi Arabia.
- **Integrated Power:** a variety of solar, wind and BESS projects gained from the acquisition of Clearway Energy in the United States; acquisition of CoreSolar; the ACC gigafactory in France.
- **Low carbon molecules:** Hydrogen: a network of hydrogen stations for trucks in Europe; biogas: South Fork in the United States, acquisition of PGB in Poland; SAF: new unit at Grandpuits, France (Galaxie project).
- **Natural Carbon Sinks:** Maya in Guatemala and Tambopata in Peru.
- **CCS:** acquisition of a storage licenses in Denmark and for Ichthys in Australia.

For projects greenlighted in 2022:

- Profitability exceeds the internally defined threshold, in a scenario compatible with the **Paris Agreement's objectives,** with the exception of natural carbon sink projects, which are evaluated on the basis of the actual cost of a ton of CO_2 .
- **The Scope 1+2 greenhouse gas** intensity is below the average intensity of their category for new oil and gas projects and reduced for brownfield projects, additional measures to control emissions will be needed since the emissions intensity of certain upstream projects increases over time as production declines.

Upstream gives precedence to value creation and cash generation over volume and puts a priority on developing low-cost (typically below $20/boe for operating and investment costs) or low-breakeven and low-emissions projects (typically below $20/b for operating and investment costs) or low-breakeven (typically less than $30/b including tax) and low-emissions (typically less than 19 kg CO_2/b) projects.

In accordance with the Company's new biodiversity ambition *(see p. 75)*, all new investment projects must also meet the **zero net deforestation** criterion.

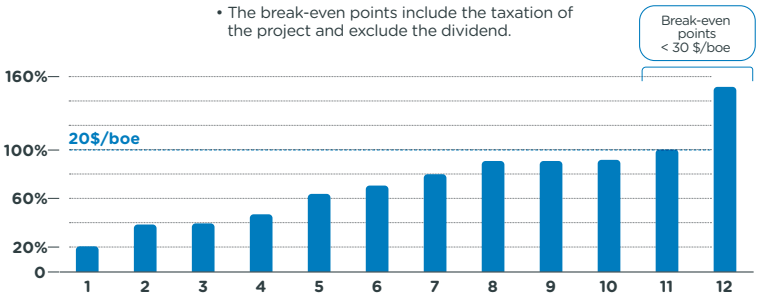
Our divestments in 2022

Divestments in 2022 totaled $1.4 billion, and most were connected with our policy of partial disposal of renewable assets once they have been commissioned, the sale of our interest in Block 14 in Angola, the sale of shares by SunPower, the partial sale of the Landivisiau CCGT plant and the sale of the Sarsang field in Iraq. ■

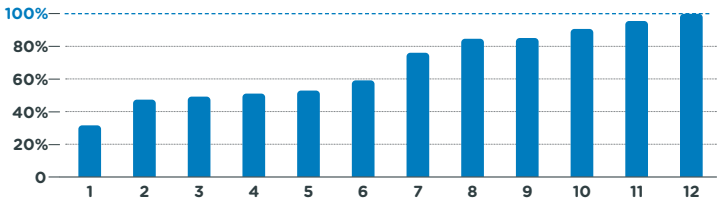
2022 APPROVED OIL & GAS PROJECTS

Technical costs

- Technical costs include operating costs and investment costs.
- The break-even points include the taxation of the project and exclude the dividend.



GHG emission intensity
% vs. portfolio average



Just Transition: A Prerequisite for a Successful Energy Transition

How can we move to a sustainable development model that meets the vital needs of the planet's 8 billion current inhabitants today, and over 8.5 billion by 2030[1], without compromising the ability of future generations to meet their own needs? As the effects of global warming become more visible, nations are now faced with the essential task of a large-scale transformation, particularly of their energy systems.

Beyond the technological and financial challenges it will pose, this transition process must be just if it is to succeed. It must provide the least developed countries with the clean, reliable and affordable energy they need for their growing populations aspiring to a higher standard of living. The most developed nations, in turn, will need to assist those who could be adversely affected by that transition, should for example their job disappear or the cost of this transition put them in energy poverty.

TotalEnergies is a major player in the energy transition. We are mindful of the issues related to a just transition raised by our activities and our own transformation to achieve net-zero emissions by 2050, together with society, and we are providing concrete answers *(see table)*.

We are particularly sensitive to the need to enhance our employees' skills, guarantee decent wages and maintain social dialogue, in the spirit of the International Labour Organization's guiding principles on just transition and the Paris Agreement. ■

(1) Source un.org

A JUST TRANSITION FOR ALL OUR STAKEHOLDERS

THE EXPECTATIONS — Our answers

Our employees

ENSURE EMPLOYABILITY, EQUAL OPPORTUNITY, SOCIAL PROTECTION AND ATTRACTIVE JOBS

- Guarantee decent jobs around the world
- Anticipate changes in disciplines by adapting and developing skills
- Our Care Program (health, social protection, ways of working, family sphere)
- Diversity and inclusion
- Social dialogue

See p. 68 to 72

Our suppliers

PROMOTE DECARBONIZATION AND SUPPORT THE VALUE CHAIN'S TRANSITION

- Train our buyers in sustainability
- Raise awareness and train our suppliers
- Strengthen sustainability requirements in our procurement and audit processes
- Share and promote best practices
- Collaborate with players in the value chain

See p. 92

Our customers

SUPPORT THE TRANSITION TOWARDS LOW CARBON, AFFORDABLE ENERGY CONSUMPTION

- Provide access to affordable energy
- Contribute to decarbonization of mobility
- Support B2B customers in decarbonizing their industrial and commercial operations
- Promote responsible energy use

See p. 41 to 60 and 89

Our communities

CONTRIBUTE TO THEIR RESILIENCE AND TO SUSTAINABLE SOCIO-ECONOMIC DEVELOPMENT

- Protect natural resources and biodiversity
- Respect the rights of affected communities
- Manage the negative impacts of our activities
- Contribute to sustainable local development by cooperating with communities and civil society

See p. 65 to 67 and 73 to 95

Our host countries

PARTICIPATE IN ENERGY PROJECTS THAT ADDRESS HOST COUNTRIES' CHALLENGES

- Deploy a multi-energy offering
- Promote transparent, responsible taxation and the fight against corruption
- Advocate and collaborate internationally and with other companies on the transition's challenges in host countries

See p. 21 and 83 to 95

Our Climate-Related Risks

Effects of drought on a reservoir.

The risks posed by climate change are included among the risks analyzed by the TotalEnergies Risk Management Committee (TRMC). TotalEnergies ranks its risks by type and gravity.

In 2022, the TRMC updated its risk mapping and submitted the results to the Board of Directors in early 2023. In the opposite table, TotalEnergies' risks are positioned in relation to identified generic risks, in accordance with the recommendation of the Taskforce on Climate-related Financial Disclosure (TCFD). The TRMC also verifies the use of appropriate risk management systems. Additional action plans can be defined when necessary.

Audits are conducted to ensure that existing risk reduction and control measures are effective. Personnel from multiple disciplines, segments and businesses may collaborate in carrying out these action plans and audits. The Audit Committee of the Board of Directors monitors the effectiveness of the internal control and risk management systems established by senior management, in light of identified risks and with a view to fulfilling TotalEnergies' objectives. ■

EXTRACT FROM TOTALENERGIES' RISK MAPPING

Following the recommendation of the task force *on Climate-related Financial Disclosures*

	Transition risks				Physical risks	
	Policy and legal risks	Technology risk	Market risk	Reputation risk	Acute risk	Chronic risk
Pace of the energy transition deployment, evolution of the demand	✓	✓	✓			
Financing of oil and gas reserves	✓		✓			
Operational risks related to the effects of climate change and extreme events	✓	✓			✓	✓
Risk of legal action	✓					
Reputation risk				✓		
Risks related to skills management and changes in jobs		✓	✓			

A Resilient Portfolio

TotalEnergies has succeeded in creating a more resilient portfolio through very active portfolio management in recent years: the upstream portfolio has seen a 50% change since 2015, for an oil reserves replacement ratio above 100% over 2015-2021 (excluding Russia). Our portfolio has a low breakeven point, in line with the Company's objective of keeping below $30/b (in 2022 the pre-dividend organic cash breakeven point stood at $23.2/b), which ensures that its resources remain competitive. For its operated upstream oil and gas activities in 2022, TotalEnergies had the lowest production cost per barrel and the lowest greenhouse gas emissions intensity (Scope 1+2) among its peers, at around $5/boe and 17 kg CO_2e/boe respectively. The average life of the Company's proved and probable oil and gas reserves is 17 years and the discounted value of its upstream Oil and Gas assets beyond 2040 represents less than 15% of their total value.

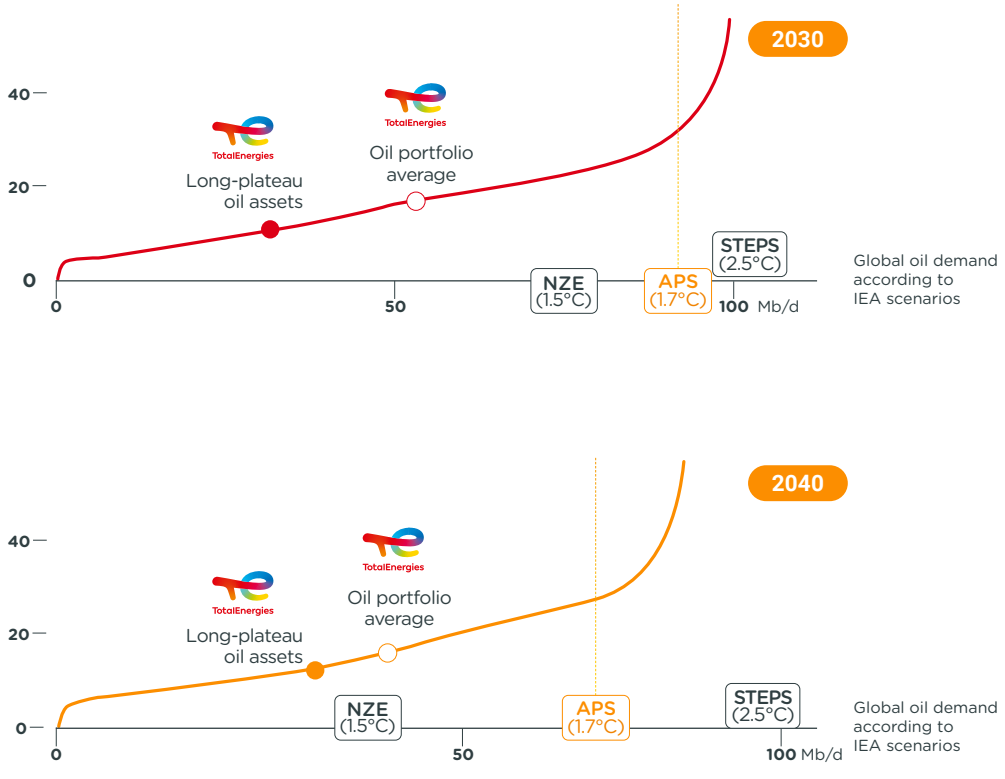
Risks of stranded assets

In June 2020, TotalEnergies determined that among its upstream assets, only the Fort Hills and Surmont oil sands projects in Canada could be classified as stranded assets, meaning assets with reserves beyond 20 years and high production costs, whose overall reserves might therefore not be produced by 2050.

TotalEnergies has decided to consider only proved reserves for the impairment tests on these two assets – contrary to the general practice which includes both proved and probable reserves – and not to approve any new capacity expansion project on these Canadian oil sands assets.
This portfolio management approach allows TotalEnergies to mitigate the risk of stranded assets in the future if the risks of a structural decline in demand for oil and gas materialize faster than estimated as a result of stricter global environmental regulations and constraints and the changes in consumer preferences that would follow. >>

MERIT CURVE OF GLOBAL OIL PRODUCTION COST[1]

Technical cost, $/b



→ **As shown in the attached merit order curve of production costs up to 2030 and 2040, compared to the demand expected under various IEA scenarios, TotalEnergies' portfolio presents an average technical cost among the cheapest 50 Mb/d in these timeframes, thanks largely to long plateau and low-costs oil assets.**

1. Source: Rystad, IEA WEO 2022 scenarios (rise in global average temperature in 2100).

Oil and gas sensitivity to carbon prices

TotalEnergies assesses its portfolio's resilience, including for new material investments, on the basis of relevant scenarios and sensitivity tests.

Each material investment – including in the exploration, acquisition or development of oil and gas resources, as well as in other energies and technologies – is reviewed in relation to the objectives set out in the Paris Agreement, so that every new investment enhances the resilience of the Company's portfolio *(see p.14)*.

Even if carbon pricing is not currently used in all of the Company's host countries, TotalEnergies includes, as a base case, a minimum carbon price of $100/t in its investment criteria (or the current price in a given country, if higher); beyond 2028, it applies an annual increase of 2%.

• **Assuming a carbon price of $200/ton** with an annual increase of 2% beyond 2028 (i.e. a $100/t increase from the base scenario beginning in 2023), TotalEnergies estimates a **negative impact of around 15%** on the discounted present value of its assets (Upstream and Downstream).

1. World Energy Outlook 2022, Table 2.2 Fossil fuel prices by scenario (p. 110).

• In relation to the scenario used to review investments (Brent at $50/b), **application of the IEA's NZE price**[1] scenario would lower the discounted present value of all of the Company's Upstream and Downstream **assets by around 15%.**

Impairment of upstream assets

In addition, to ensure robust accounting of its assets in the balance sheet, the Company uses an oil price trajectory to calculate impairment of its upstream assets. That trajectory is stable until 2030, then decreases linearly to 50_{2022}/b by 2040; from 2040 it decreases to the price retained for 2050 in the IEA's NZE scenario (25_{2022}/b). The prices retained for gas in Europe and Asia decrease before stabilizing as of 2027 and until 2040 at lower levels than today, with the Henry Hub remaining at 3_{2022}/MMBtu over that period. Thereafter, those prices all converge with the prices in the NZE scenario in 2050.

Adaptation to physical risks

We take climate risk into account in the design of our facilities and in the evaluation of our sites in operation. Climate change potentially has multiple consequences, including rising sea levels and increased extreme weather events, that can negatively impact our operations.

We have issued recommendations for addressing the anticipated changes in the climate system and its components in our facility design bases (metocean criteria).

Similarly, we evaluate the vulnerability of our sites in operation to weather events so that their consequences do not affect the installations' integrity or people's safety. Internal studies have not identified any existing facilities that are vulnerable to the consequences of climate change known to date. ■

ULTRA-DEEP OFFSHORE

ULTRA-DEEP OFFSHORE IS HELPING TO MEET TODAY'S DEMAND

Technological advances in subsea engineering have enabled oil and gas exploration and production from increasingly deep waters since the late 1990s. "Ultra-deep" offshore is defined as water depths over 1,500 meters, which in the early 2000s represented the technical limit for drilling rigs and production facilities, largely exceeded since.

Today, the evolution of these technologies no longer justifies distinguishing between, for example, developments at 1,200 m or 1,800 m of water. This water depth threshold does not make these reservoirs 'unconventional', because all fields are developed with facilities that use a continuum of conventional technologies.

In addition, ultra-deep offshore projects develop large-scale fields, benefiting from the latest technologies that allow them to achieve very competive CO_2 emission intensities (~13 kg CO_2e/boe on average). Also, the design of the necessary floating installations guarantees minimal impact on biodiversity. These greater water depths alone are not inevitably synonymous with higher safety risks. Ultra-deep offshore wells generally target reservoirs buried at shallow depths; the pressure and temperature within those reservoirs are well within the capacity of proven drilling technology.

It is the combination of high-pressure reservoirs and significant water depths that can heighten the level of risk. TotalEnergies is no longer seeking to develop assets of that kind.

Ultra-deep offshore projects call for technology that only a limited number of major multinationals have mastered. All of those companies share a very high standard of performance, as TotalEnergies does with Petrobras in Brazil on the recent Mero, Lapa, Sepia and Atapu developments. Those projects also help to diversify – and thereby secure – the world's oil supply.