Climate roadmap in action
February 2021
Reducing carbon emissions from operations
New commitment on Scope 1 & 2: -40% in 2030 vs 2015 while growing

Scope 1 & 2 emissions from operated oil and gas facilities (MtCO₂e)

- **2015**: 46
- **2020**: 36
- **2025**: <40
- **2030**: 25-30

**Net* emissions -40% vs 2015**

Acquisitions & start-ups since 2015

On the way to Net Zero across Total’s worldwide operations by 2050

* Net of carbon sinks

CO₂ emissions reduction levers

- Track CO₂ across all our operations
- Energy Efficiency
- Process electrification
- CCS
- Flaring reduction
- Methane control

Manage our portfolio

Develop carbon sinks

Developing strong internal low-carbon culture

Covid impact (3)

Acquisitions & start-ups since 2015

* Net of carbon sinks
2020: CO₂ fighting squad systematically reviewing all assets emissions
> 400 emission reduction projects already qualified

Carbon Footprint Reduction projects

- Overall:
  - 7 MtCO₂/y
  - 363 projects
  - 62 projects

- Cost ($/tCO₂):
  - Upstream
  - Downstream
  - < 10
  - 10-40
  - 40-80
  - ≥ 80
Scope 1&2 reduction initiatives in Upstream
-2.5 MtCO₂/y emissions reduced by 2025 through 160 projects

Reduce flaring and venting

Reduce non-routine flaring
- Stop routine flaring by 2030
- All new projects with closed flare

Congo / Gabon: venting rerouting and compression projects (-850 ktCO₂/y)
Nigeria: OML 100 Routine Flaring reduction (-240 ktCO₂/y)

-1.8 MtCO₂/y

Reduce fuel gas consumption through efficiency

Improve energy efficiency
- Change operating practices

Angola: operating practices & power optimization (-140 ktCO₂/y)
Nigeria, Angola: Digital initiatives (-60 ktCO₂/y)

-0.7 MtCO₂/y

Reduce fuel gas consumption through electrification

Renewables & Electrification

North Sea electrification: wind farm under study
Onshore sites solarization

-0.7 MtCO₂/y
Minimizing emissions from future Upstream projects

**Mozambique LNG**
Total 26.5% Op. - First LNG 2024

- **TANZANIA**
  - Gollinho / Atum
  - Offshore Area 1
  - Prosperidade
  - Orca
  - Tubarão
  - Tubarão Tigre

**Mero 3 – Brazil**
Total 20% - First oil 2024

- **Improving Mero 3 FPSO design**
  - CO₂ extraction from fuel gas + reinjection
  - Gas compression optimization
  - WHRU\(^1\) installation

- Carbon intensity reduced by 25% between Mero 1 and 3

**Lake Albert – Uganda**
Total 56.6% Op. - First oil 2024

- **Tilenga**
  - Fuel gas optimization
    - LPG extraction from production and local commercialization
  - EACOP pipeline power
    - Solarization of pumping stations in Tanzania

**Optimizing power generation & demand**
- Low-emission gas turbines
- WHRU\(^1\) installation
- Boil-off gas compressors

**On-site renewable electricity**
- Solar farm project to power LNG liquefaction site

**Carbon intensities**

- **25 kgCO₂/boe**
  - Average LNG: ~38 kgCO₂/boe

- **15 kgCO₂/boe**
  - Average oil&gas: ~20 kgCO₂/boe

- **13 kgCO₂/boe**
  - Average oil&gas: ~20 kgCO₂/boe

\(^1\) WHRU: Waste Heat Recovery Unit
Scope 1&2 reduction initiatives in Downstream
-4.5 MtCO₂/y emissions reduced by 2025 through 280 projects

Avoid

Processes electrification
La Mède biorefinery: green H₂ production
Go Green project: green power for all RC sites in Europe

Reduce

Energy efficiency in processes
Switch from fuel oil to natural gas for steam and electricity
Digital

Capture

Zeeland refinery: CO₂ capture from H₂ production (SMR)
Antwerp refinery: CO₂ capture, integration with Antwerp@C project (> 2025)

-2.3 MtCO₂/y
-1.4 MtCO₂/y
-0.8 MtCO₂/y (ZR)
Greening all power used by our European operations
Reducing Scope 2 emissions in Europe by 2 MtCO$_2$/y

Large contribution to RC emissions reduction in EU
Focus on methane
Focus on Methane
Dispersed, numerous sources, uncertain measurements

O&G worldwide methane emissions
(2020 - source IEA)

Upstream emissions sources

Most emissions from E&P and gas distribution

Dispersed sources but technically addressable

72 MtCH₄

Upstream Oil

Upstream Gas

Downstream Oil

Downstream Gas

Flaring

Cold vents

Fugitive Emissions

Combustion

Production

Process
TOTAL methane emissions

2020 methane emissions

- Flaring and venting to be addressed as a priority

- 98% from E&P
- Methane intensity*
  - < 0.20% for oil & gas assets
  - < 0.10% for gas assets

Upstream gas methane intensity

64 kt CH₄
1.6 MtCO₂e

* Methane emission volumes / commercial gas volumes produced
Relentlessly decreasing methane emissions
Walking the talk and maintaining near-zero emissions

Upstream methane emissions
kt CH₄

- Close to 50% decrease since 2010

Operational levers

- For new projects, install closed flare systems and exclude gas instrument as well as continuous cold venting
- Reduce gas instrumentation on all operated producing assets
- Increase frequency of Leak Detection & Repair campaigns
- Eliminate routine flaring by 2030

Intensity of operated O&G assets: <0.20%
Intensity of operated Gas assets: <0.10%
Examples of venting reduction
Over 25% reduction expected by 2025* – Some examples

**Cold vents**

Tyra redevelopment project (Denmark)
- Cold vent removal
- CH₄ reduction: 1.2 kt/y

Anguille cold vent rerouting project (Gabon)
- Reroute gas in between two platforms, installation of an electrical compressor
- CH₄ reduction: 7.4 kt/y

**Process vents**

Elgin vent rerouting project (UK)
- Reroute Glycol unit strip gas to LP Flare
- CH₄ reduction: 3.6 kt/y

* vs 2019
Dedicated R&D program on methane
Improving detection and quantification

A dedicated testing platform (TADI)

Open-air testing site near Lacq (south of France)
Simulation of methane leak scenarios (3 to 10 kt/y range)
Testing of GHG detection and measurement technologies

Over 30 technologies tested since 2018

An airborne GHG measurement technology (AUSEA)

Proprietary sensor technology mounted on drone (CO₂ and CH₄)
Source detection and quantification
Technology proved on TADI
Successful campaign on 6 Total sites (onshore and offshore)

Onsite deployment 2020-2023

A move towards continuous monitoring

Satellite detection
- Internal project (DEMETER)
- Partnerships (Kayrros, GHGSAT)

Fixed monitoring: camera, microsensors (tests ongoing)

Integrating top-down and bottom-up approaches

TADI: Transverse Anomaly Detection Infrastructure
AUSEA: Airborne Ultra-light Spectrometer for Environmental Application
Focus on Carbon Capture & Storage
**Climate roadmap in action**

**Key enablers: supporting policies + carbon pricing**

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**CO₂ emissions reduction needed via CCS¹**

MtCO₂

- 2020: 850
- 2030: 40
- 2050: > 5,000

**CCS identified projects per region²**

- Europe: 1450
- North America: > 5,000
- Other regions: > 5,000

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**Economies of scale to drive cost down**

**Europe to foster CCS projects by 2030**

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¹ Source: WEO 2020 (CO₂ captured and stored from process emissions in the energy and industrial sectors in the SDS < 2°C scenario), Global CCS Institute

² Source: Global CCS Institute + Total analysis
1996–2020: building up CCS competencies

- **CAPTURE**
  - EP & RC expertise
  - 1996: Sleipner, Norway

- **TRANSPORT**
  - EP & GRP expertise
  - 2007: Snøhvit, Norway

- **STORE**
  - EP expertise
  - 2010: Lacq, France

- **2014**
  - OGCI half of its investments earmarked for CCS technology

- **2017-2020**
  - Northern Lights project with Shell and Equinor in Norway

- **2017**
  - Participation in Norway’s Technology Centre Mongstad

Mobilizing expertise spread across the company
North Sea: the place to develop CCS

EU favorable regulatory policies

- North sea region: area of concentrated CO$_2$ emissions and large storage potential

Total’s approach

- Reducing Scope 1 emissions from operated assets through CO$_2$ capture and storage
- Scale enabling cost reduction in transportation and storage
- Targeting 3 to 5 MtCO$_2$/y storage capacity* by 2030

* Group share
Northern Lights
Norway & Total historic CCS partners since 1996

Northern Lights JV
Equinor (1/3, operator), Total (1/3), Shell (1/3)

- Norwegian government strong support, while announcing CO₂ tax (~220 $/tCO₂ by 2030)
- FID taken in May 2020
- Phase 1:
  - Transport, injection and storage up to 1.5 MtCO₂/y (0.8 MtCO₂/y already booked)
  - ~150 $/tCO₂
- Phase 2:
  - Potential capacity expansion for European emitters’ needs up to 5 MtCO₂/y or more
  - ~70 $/tCO₂

Capex Ph.1: 800 M$¹
for transport and sequestration

¹ State subsidies: ~80%

* Group share
Decarbonizing Zeeland refinery (Scope 1)
Producing clean hydrogen

- Dutch climate accord setting the pace for a decarbonized economy, targeting a CO₂ tax increase (~150 $/tCO₂ by 2030)
- Attractive national subsidy schemes for CCS (SDE++) in addition to European Union fundings
- Maximizing CO₂ emissions reduction by optimizing process synergies and heat recovery opportunities
- ~70 $/tCO₂ for 0.8 MtCO₂/y

Zeeland refinery
Total (55%), Lukoil (45%)

<table>
<thead>
<tr>
<th>CO₂ capture</th>
<th>CO₂ purification &amp; liquefaction</th>
<th>CO₂ intermediate storage</th>
<th>CO₂ export by ship</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO₂ &gt; 95% vol</td>
<td>CO₂ &gt; 99% vol</td>
<td></td>
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</tr>
<tr>
<td>Flue gas 900 kTCO₂/y emissions</td>
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</tr>
<tr>
<td>~0.8 MtCO₂/y* captured and avoided from 2025</td>
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</tbody>
</table>

Hydrogen production via SMR (90 kt/y) H₂
Zeeland Refinery
CO₂ export by ship CO₂ > 99% vol
CO₂ intermediate storage CO₂ > 95% vol
CO₂ capture CO₂ < 20% vol

Capex: ~300 M$¹ for capture and conditioning

¹ Capex at 100%
Aramis sequestration project
A new life for depleted gas fields

- Leveraging Total assets to develop > 4 MtCO₂/y CCS integrated project:
  - Build onshore multimodal terminal: reception by pipe, barges, ships
  - Build offshore sequestration network re-using existing infrastructure
  - Modular expansion based on customer demand (> 8 MtCO₂/y by 2030)
  - Targeting ~50 $/tCO₂ for 2-4 MtCO₂/y for transportation and storage

* Group share

~1.5 MtCO₂/y* storage capacity from 2026

>2.4 MtCO₂/y* storage capacity by 2030

Antwerp Refinery
Zeeland Refinery
Offshore pipeline ~150km
Offshore complexes CO₂ injection & sequestration
Liquid CO₂
Onshore facilities

Aramis project
Investing in R&D to lower CCS costs
Budget of 50 M$/y

Capture
- Optimizing interaction between CO₂ and the capture medium (new materials and processes)
- Optimizing CO₂ flow: in the process, in the material (Svante)
- Developing partnership for Direct Air Capture (Climework)

Transport
- Mastering hydrate avoidance during transport and injection
- Increasing shipping capacity (Northern Lights focus)

Storage
- Monitoring CO₂ behavior in reservoir:
  - Reservoir modelling
  - Reservoir monitoring

Ensuring safe permanent storage

Speeding up research results from lab to industrial projects through partnerships
Nature Based Solutions contributing to get to Net Zero emissions
Multiple ways to sink carbon in nature

**Conversion to carbon sink**
- Afforestation / Reforestation
- Agroforestry
- Farmland restoration
- Regenerative Agriculture
- Sylvo-pastoralism
- Grazing Management
- Perennial crops
- Productive trees

**Improved Management**
- Natural forest management
- Plantation management

**Protection & Conservation**
- Forest protection
- Conservation agriculture
- Grassland protection
- Peatlands & wetlands protection
Targeting high quality carbon units
Highest standards only, balancing various certification environments

- Professionalized measurements and certification process

Carbon credit standards

- Mostly under voluntary verification environment
- Existing standards and associated credits are based on:
  - Robust independent scientific framework
  - Principles of unicity, additionality, permanence and no leakage
  - Measured real carbon sink performance
Ensuring local inclusive & integrated value chains

Mandatory conditions for sustainability

- Improves livelihood of local populations
- Eliminates causes for deforestation and land degradation
- Avoided emissions from local productions on top of carbon sink
- Material co-benefits (jobs, water management, biodiversity, etc.)
**Australia: partnering to develop soil carbon sinks**

<table>
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<tr>
<th>tCO₂e</th>
<th>Investment</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 MtCO₂e* avoided over 25 years</td>
<td>9 M$* over 12 years</td>
<td>10 000 ha converted to regenerative agriculture</td>
</tr>
</tbody>
</table>

- Partnering with a **specialized carbon developer** with a track record of similar projects getting **Australian Carbon Credits Units** (ACCUs)
- Emission reductions verified and certified under the Australian **Emissions Reduction Fund**
- Carbon removal from **soil carbon sequestration through pastureland management** (3 MtCO₂e over 25 years)
- Large scale-up opportunities

*Group share*
Peru: partnering for large scale conservation and reforestation

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<tr>
<td>&gt; 25 MtCO₂e* Avoided + Removed over 20 years</td>
<td>~125 M$* over 20 years</td>
<td>&gt; 0.9 Mha under conservation</td>
</tr>
</tbody>
</table>

- Direct exclusive joint-development agreement with local NGO with +30 years of experience, with additional 25 MtCO₂e operations in pipeline
- Involves conservation of tropical dry-forest and amazon rainforest, impacting favourably biodiversity conservation
- Engagement of local communities through cocoa and carob agroforestry value chains
- Highest market certifications carbon & co-benefices: Verra’s VCS & CCBS Gold level

* 100% view
Central Africa: afforesting 40 000 ha and recreating a forest atmosphere in time

- Unprecedented operations to afforest a poor and barren ecosystem through a proven afforestation model
- Strategic location in the supply basin of 2 African megacities, allowing market access to produced commodities
- Potential to double the planted area from 2030 onwards

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<td>~13 MtCO₂e* removed over 20 years</td>
<td>230 M$* over 20 years</td>
<td>Afforestation: 40 kha including 2 kha of agroforestry</td>
</tr>
</tbody>
</table>

*Group share
Building Group’s carbon reserves

Invest in, scale-up, manage integrated and communities-inclusive nature-based value chains that capture carbon

- Quality of operations
- ESG approach
- Co-investor or business partner

- 100 M$/y
- < 20 $/tCO₂e targeted average credit cost
- > 40 MtCO₂e of approved multi-year projects*

- 5-10 MtCO₂e/y sequestration capacity by 2030
- Targeting 100 MtCO₂ carbon credits from operations by 2030
- Carbon credits to be used from 2030 while maintaining at least 10 years of reserves

*Investments already approved for operations to be spent over the next 20 years
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Financial information by business segment is reported in accordance with the internal reporting system and shows internal segment information that is used to manage and measure the performance of TOTAL. In addition to IFRS measures, certain alternative performance indicators are presented, such as performance indicators excluding the adjustment items described below (adjusted operating income, adjusted net operating income, adjusted net income), return on equity (ROE), return on average capital employed (ROACE), gearing ratio and operating cash flow before working capital changes. These indicators are meant to facilitate the analysis of the financial performance of TOTAL and the comparison of income between periods. They allow investors to track the measures used internally to manage and measure the performance of the Group.

These adjustment items include:

(i) Special items
Due to their unusual nature or particular significance, certain transactions qualified as “special items” are excluded from the business segment figures. In general, special items relate to transactions that are significant, infrequent or unusual.

However, in certain instances, transactions such as restructuring costs or asset disposals, which are not considered to be representative of the normal course of business, may be qualified as special items although they may have occurred within prior years or are likely to occur again within the coming years.

(ii) Inventory valuation effect
The adjusted results of the Refining & Chemicals and Marketing & Services segments are presented according to the replacement cost method. This method is used to assess the segments’ performance and facilitate the comparability of the segments’ performance with those of its competitors.

In the replacement cost method, which approximates the LIFO (Last-In, First-Out) method, the variation of inventory values in the statement of income is, depending on the nature of the inventory, determined using either the month-end price differentials between one period and another or the average prices of the period rather than the historical value. The inventory valuation effect is the difference between the results according to the FIFO (First-In, First-Out) and the replacement cost.

(iii) Effect of changes in fair value
The effect of changes in fair value presented as an adjustment item reflects for some transactions the differences between internal measures of performance used by TOTAL’s management and the accounting for these transactions under IFRS.

IFRS requires that trading inventories be recorded at their fair value using period-end spot prices. In order to best reflect the management of economic exposure through derivative transactions, internal indicators used to measure performance include valuations of trading inventories based on forward prices.

TOTAL, in its trading activities, enters into storage contracts, whose future effects are recorded at fair value in Group’s internal economic performance. IFRS precludes recognition of this fair value effect.

Furthermore, TOTAL enters into derivative instruments to risk manage certain operational contracts or assets. Under IFRS, these derivatives are recorded at fair value while the underlying operational transactions are recorded as they occur. Internal indicators defer the fair value on derivatives to match with the transaction occurrence.

The adjusted results (adjusted operating income, adjusted net operating income, adjusted net income) are defined as replacement cost results, adjusted for special items, excluding the effect of changes in fair value.

Euro amounts presented herein represent dollar amounts converted at the average euro-dollar (€-$) exchange rate for the applicable period and are not the result of financial statements prepared in euros.

This document also contains extra-financial performance indicators, including a carbon intensity indicator for energy products used by Total customers, that measures the average greenhouse gas emissions of those products, from their production to their end use, per unit of energy. This indicator covers the direct GHG emissions of production and processing facilities (Scope 1) and their indirect emissions associated with the use of products by the customers of the Group (Scope 3) which TOTAL does not control (for the definitions of scopes 1, 2 and 3, refer to TOTAL’s Universal Registration Document).

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