

Transition Technologies

Accelerating our Path to Net-Zero

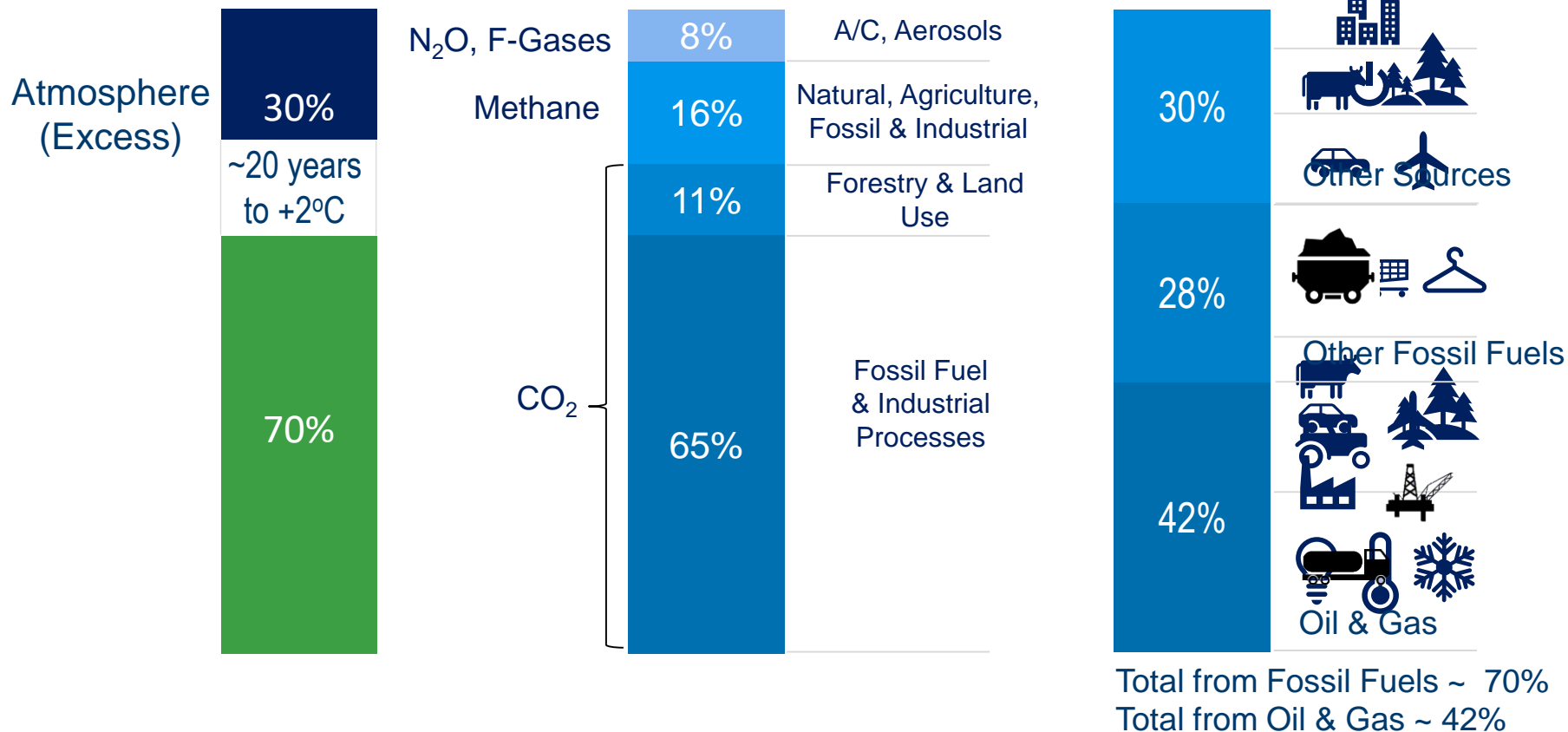
SPE London Net Zero

14 Sept 2021



The Climate Challenge

Green House Gas Emissions – Total 55 GtCO₂e in 2019



Source: IPCC (2014), CDIAC, UNFCC, BP, USGS, IEA WEO (2020), McKinsey 2020

Dual challenge

↑ **40% Growth in World Economy by 2030**

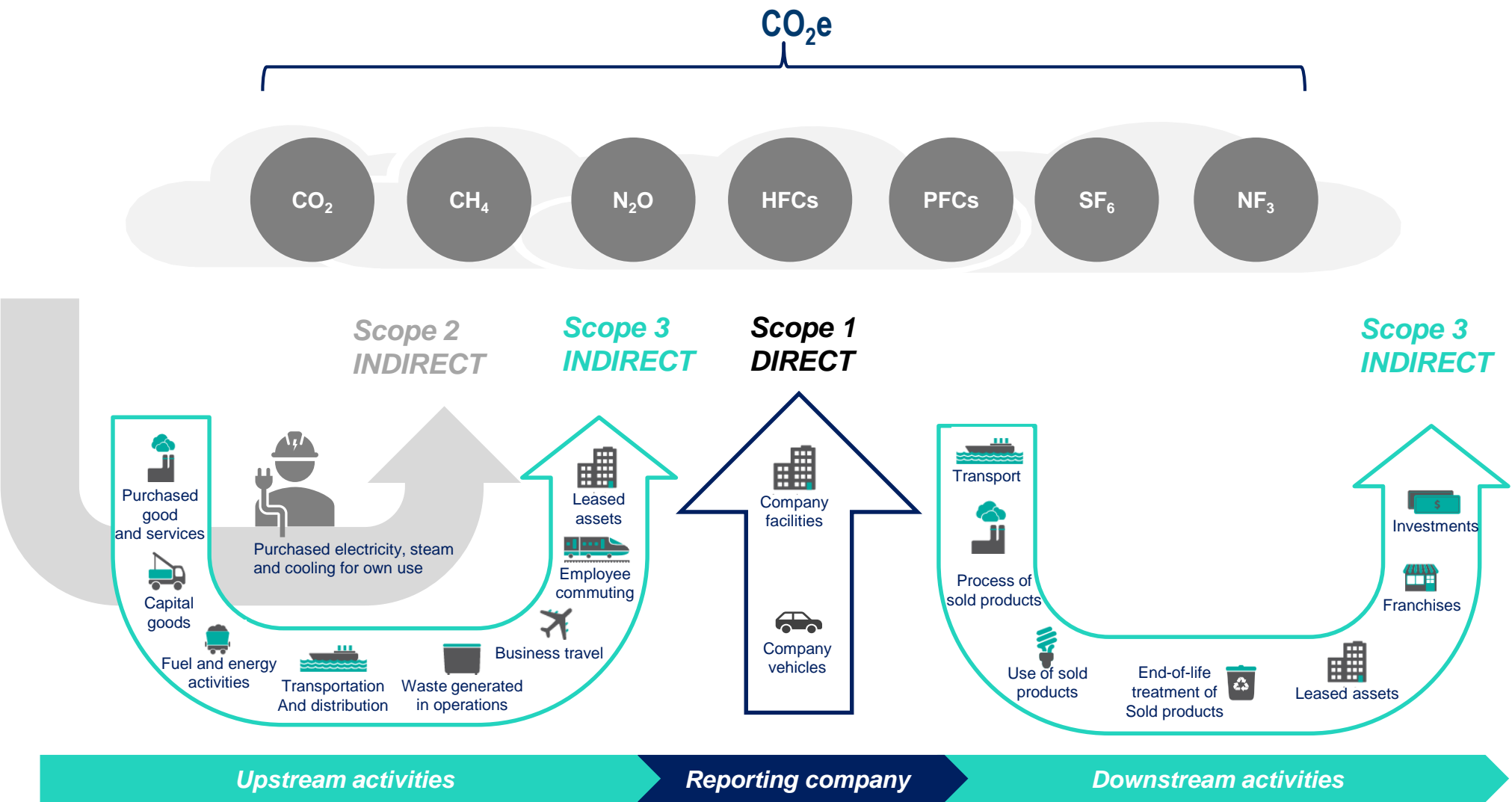
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↓ **40% in greenhouse gas emissions by 2030 for 1.5 degC**

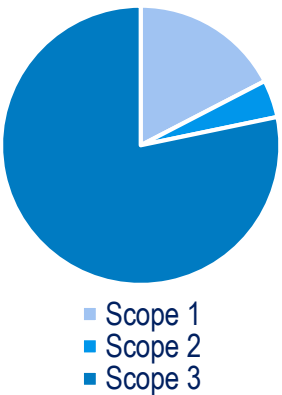


Source: IEA WEO (2020), IPCC (2019)

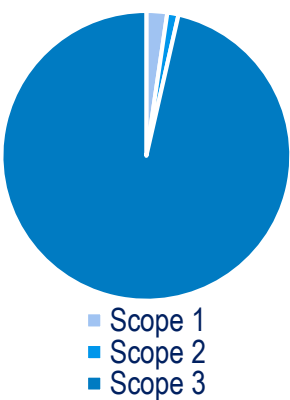
Greenhouse Gas Emission Scopes



Oil and Gas 2019 Emissions
23 GT CO_2e



Schlumberger 2019 Emissions
55 MT CO_2e



Oil & Gas Emissions

2019 Estimates

23GT CO₂E – O&G related

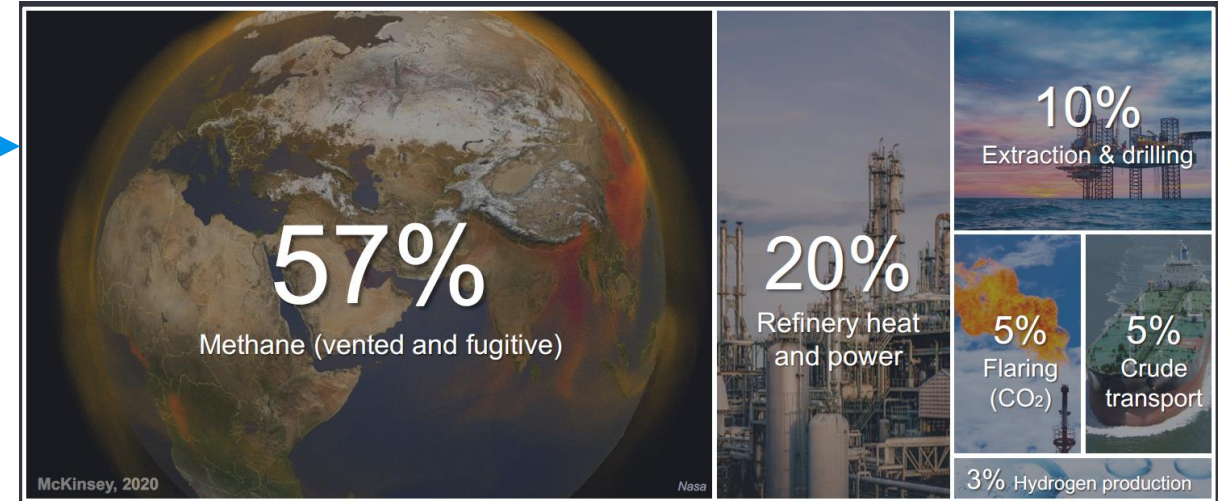
Scope 1 + Scope 2 = 5 GT



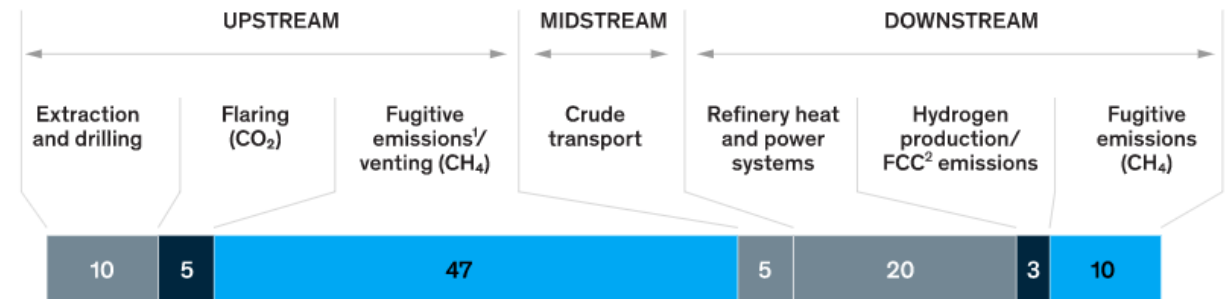
Scope 3 = 18 GT



32GT CO₂E – Non O&G



■ CO₂ (energy related) ■ CO₂ (not energy related) ■ Non-CO₂

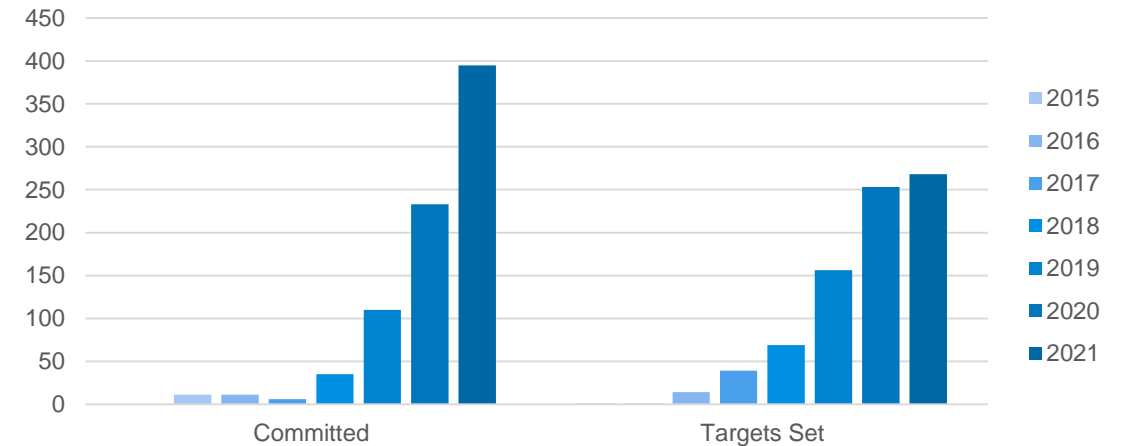


Source: IEA, McKinsey 2020

Science-Based Targets

- The SBTi is a partnership between Climate Disclosure Project (CDP), the United Nations Global Compact (UNGC), World Resources Institute (WRI) and the World Wide Fund for Nature (WWF).
- Provides guideline to companies on how quickly they need to reduce their greenhouse gas (GHG) emissions to prevent the worst effects of climate change
- Aligned with 2015 Paris Agreement
 - Committed to curbing global temperature rise to 1.5°C above pre-industrial levels
 - GHG emissions must halve by 2030, and drop to net-zero by 2050
- 1602 Companies taking action since June 2015
 - Specific O&G Sectorial Guidelines are under development, **and no O&G operators are committed yet**

Companies SBTi Commitments



Schlumberger



NABORS



Microsoft



Go Further

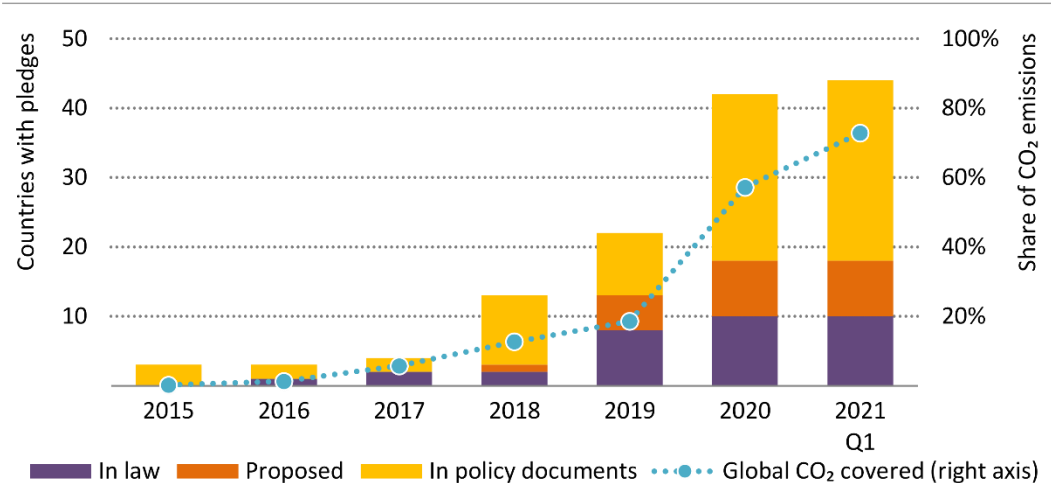
Walmart

Source: SBTi

Net Zero by 2050 Pledges

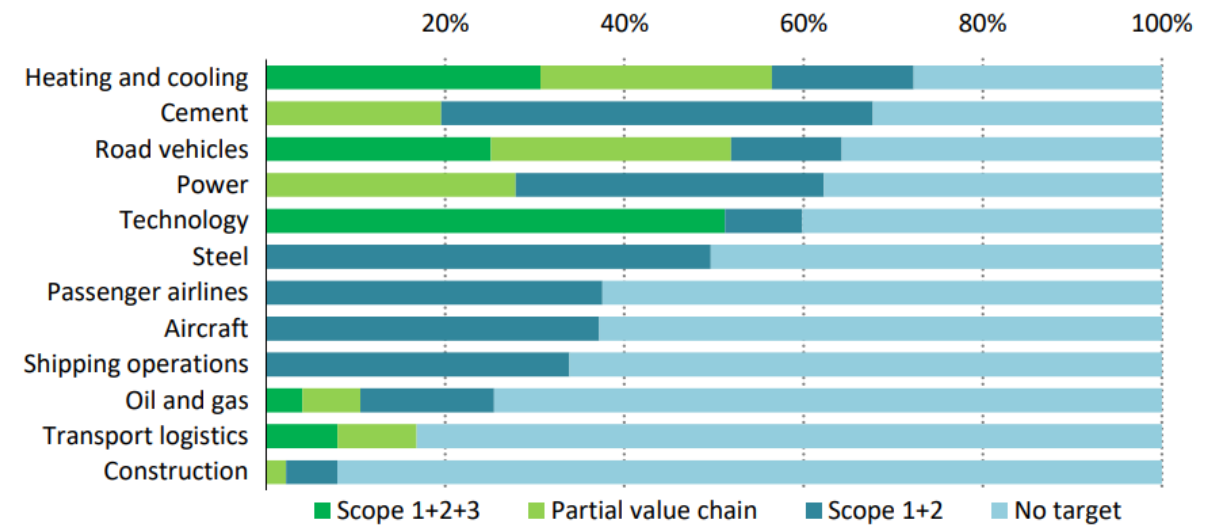
Countries

Figure 1.2 ▷ Number of national net zero pledges and share of global CO₂ emissions covered



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Companies



What are the Sustainable Development Goals?

17 global goals



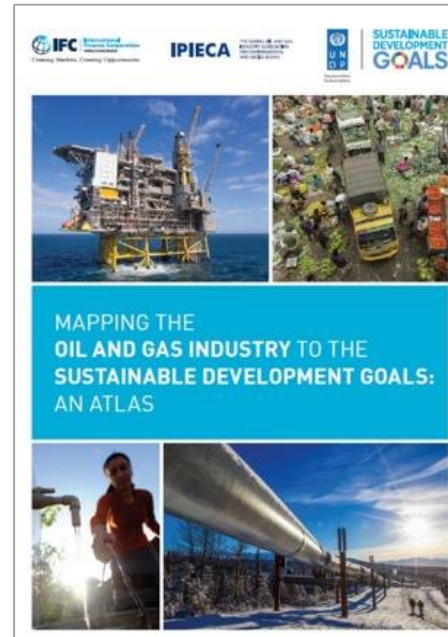
- The Sustainable Development Goals (SDGs) form part of ‘Transforming our world: the 2030 Agenda for Sustainable Development’
- Adopted in September 2015 by the 193 United Nations Member States
- Represent the world’s plan of action for social inclusion, environmental sustainability and economic development



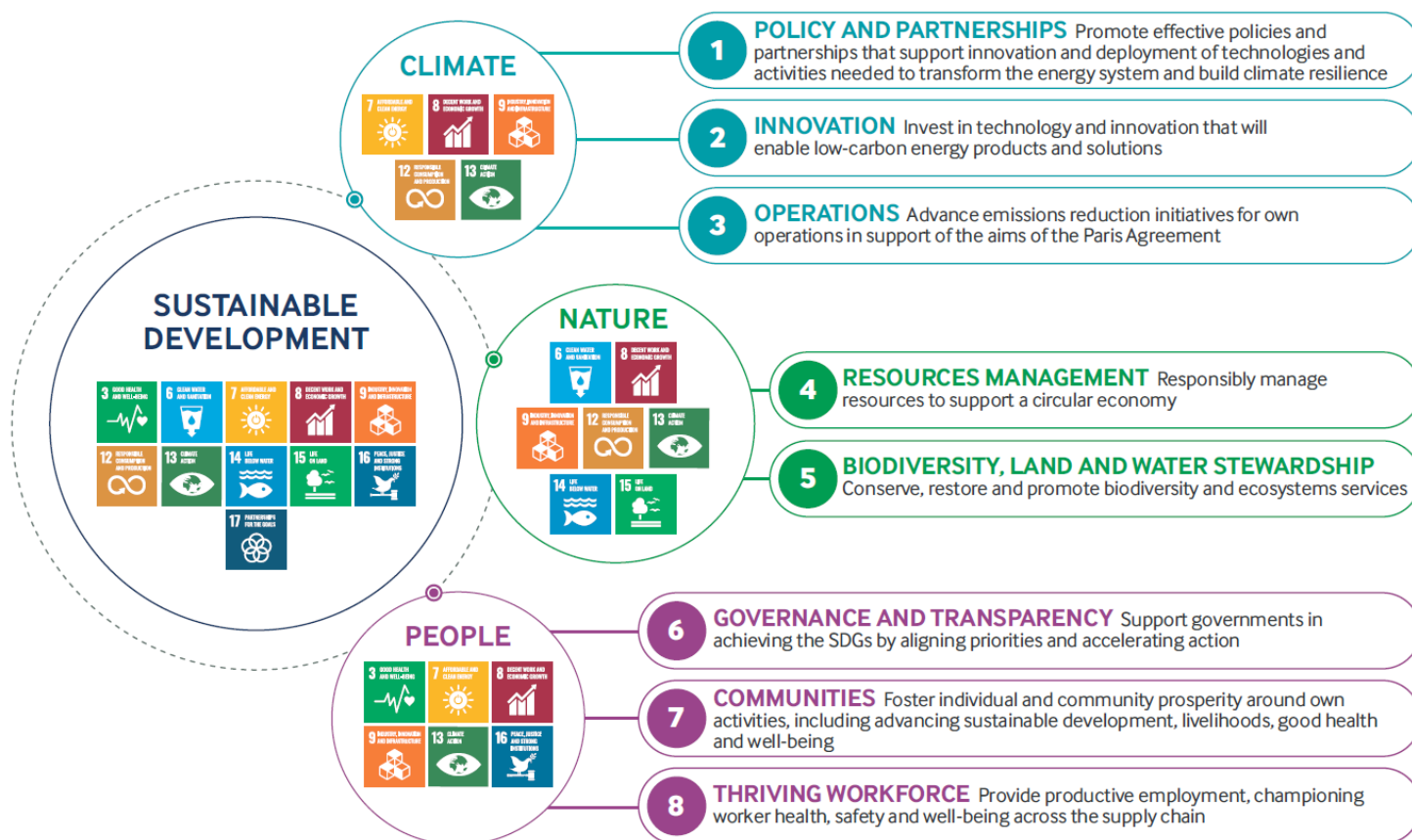
Mapping the industry to the SDGs

The oil and gas industry is committed to responsible and sustainable business, as well as serving as an essential partner to meet the challenge of the SDGs

The oil and gas industry has the potential to contribute to all 17 SDGs



Three themes | Eight impact opportunities



Our Commitment to Sustainability



Embedded in Vision & Purpose	<div></div> <p>We will define and drive high performance, sustainably. Together we create amazing technology that unlocks access to energy, for the benefit of all.</p>		
Ongoing Comprehensive ESG Program	Environmental Sustainability Climate Change, Energy Transition Emissions, Waste, Water, Nature	Social Sustainability Human Rights, Safety, Diversity & Inclusion, Local Content, Community Engagement	Corporate Governance Board Oversight, Ethics & Compliance, ESG Frameworks & Ratings, Reporting
Focus through 2030	Address Climate Change* <ul style="list-style-type: none">▪ Reduce emissions in operations▪ Deliver technology to lower customer emissions▪ Accelerate innovation in low carbon energy	Create opportunity <ul style="list-style-type: none">▪ Evolve a broader definition of diversity▪ Grow regional technology capability	Empower local teams to focus <ul style="list-style-type: none">▪ Country sustainability initiatives; priority SDGs▪ Sustainable technology portfolio mapped to SDGs

*Aligned to 1.5degC scenario of the Paris Agreement
Image source: UN.org, SBTi

Our Approach: Sustainability through Technology

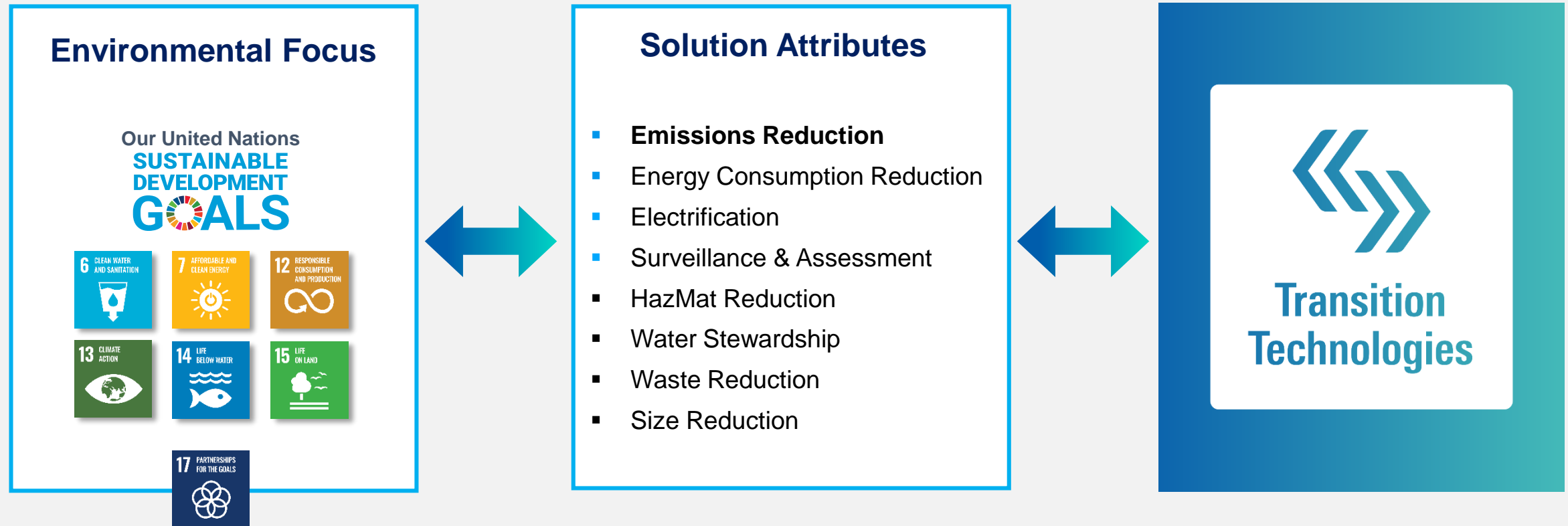
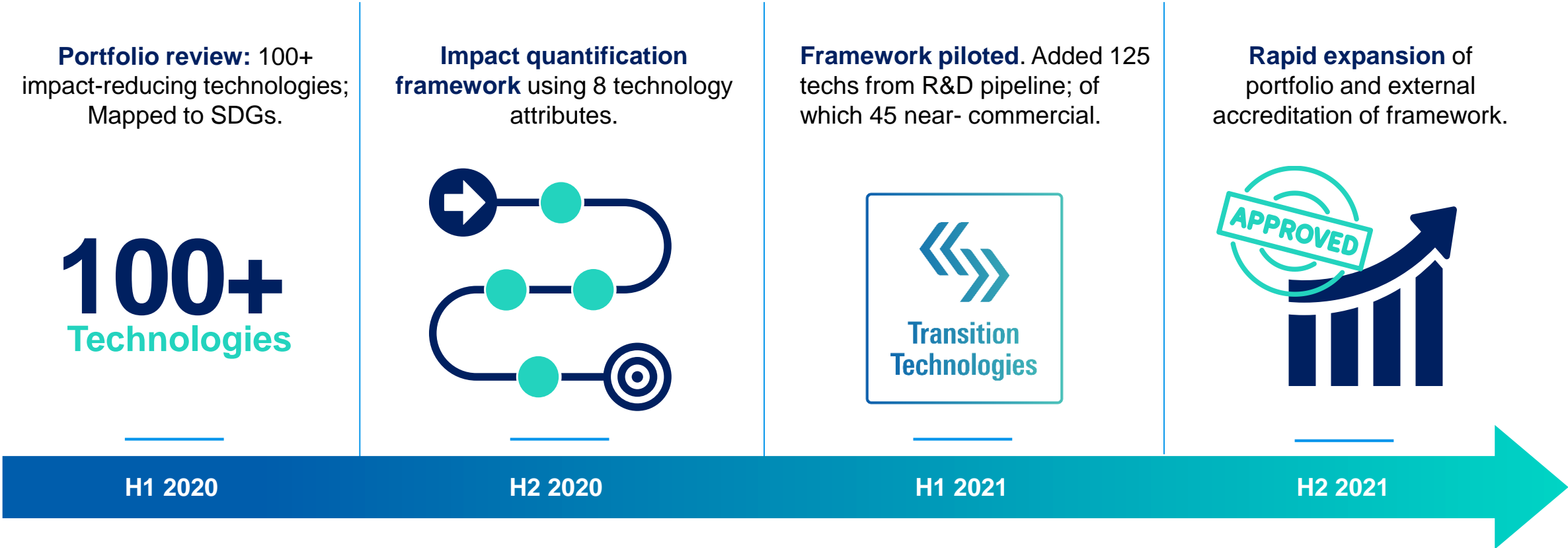


Image source: UN.org

Transition Technologies: Progress & Outlook



Structure of the framework

- ❑ GHG Protocol
- ❑ ISO 14+ series
- ❑ IPCC
- ❑ IEA
- ❑ Materials embodied carbon
- ❑ Energy emissions
- ❑ Transport (DEFRA, EPA, ..)
- ❑ ...

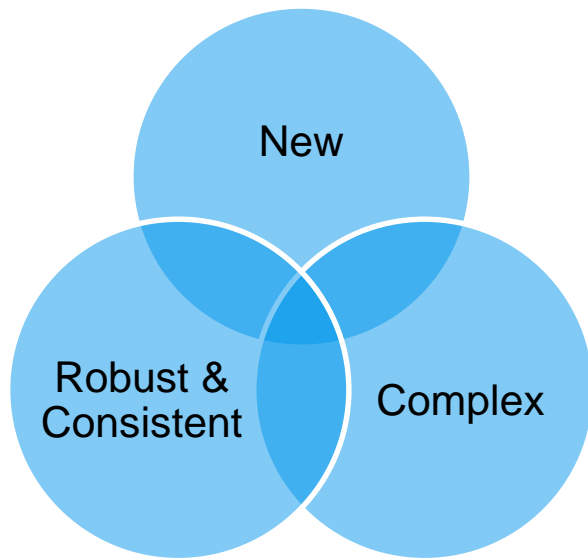
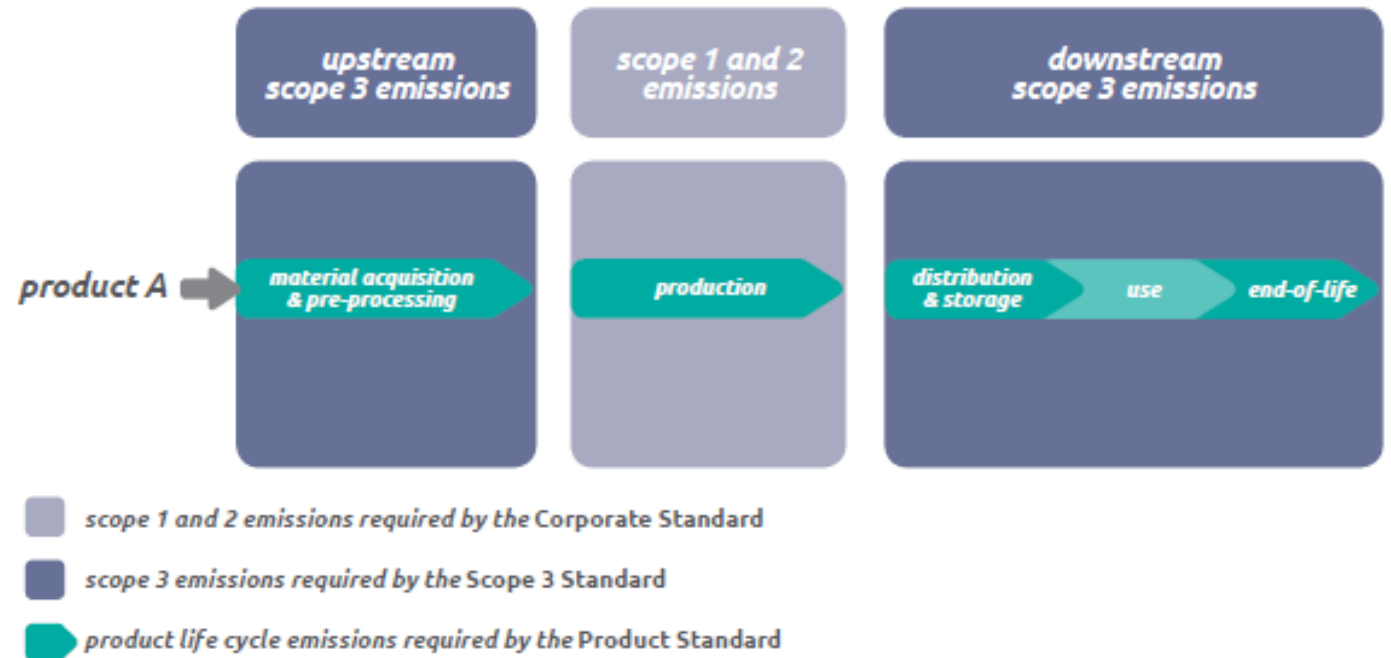
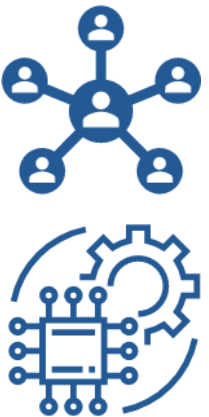
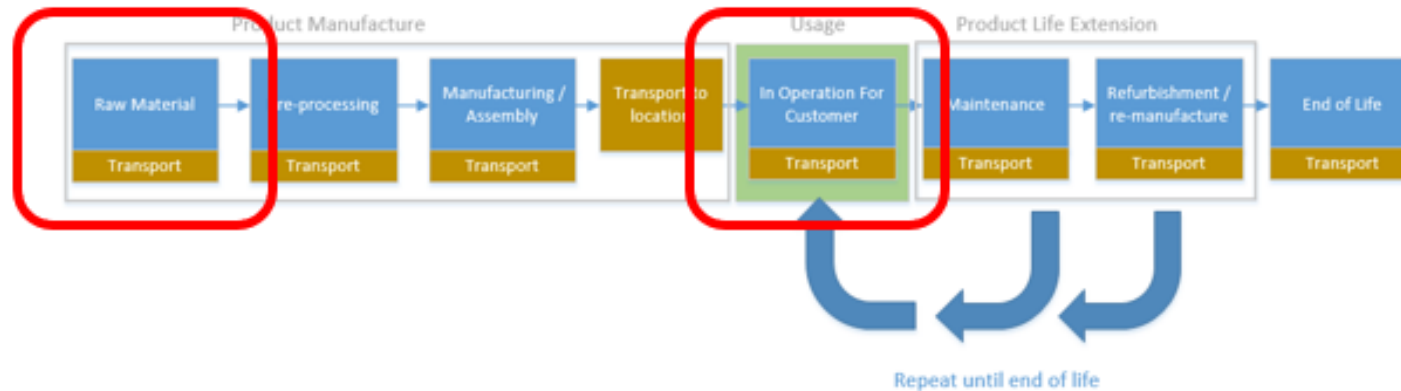
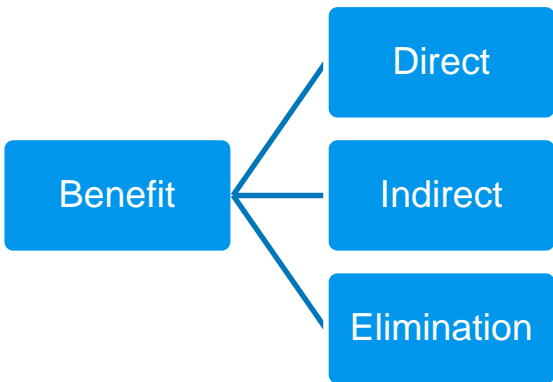
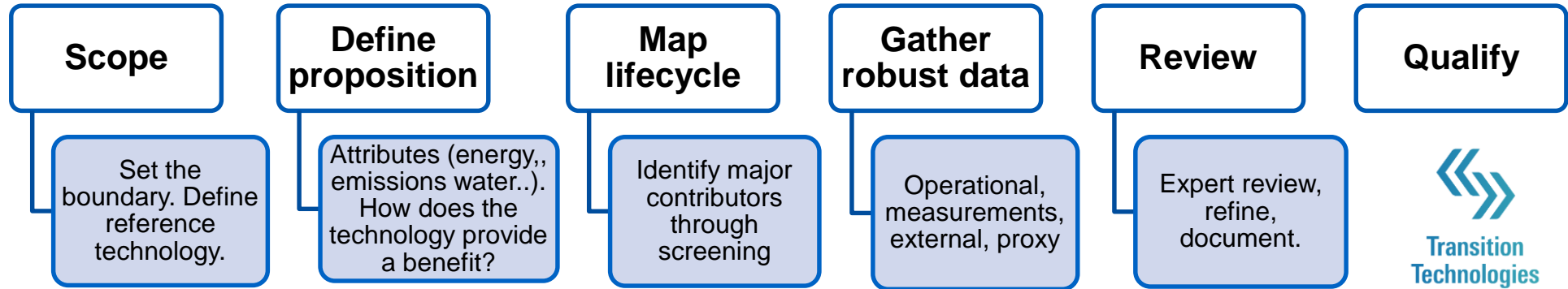


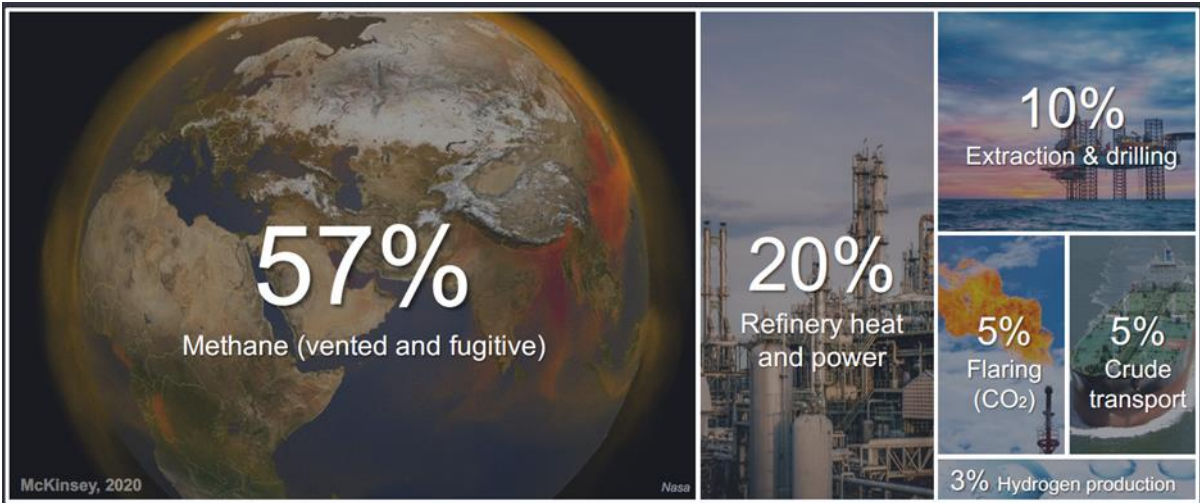
Figure [1.1] The relationship between the *Corporate*, *Scope 3*, and *Product Standards* for a company manufacturing product A



Key Steps to Quantification and Qualification



Transition Technology Portfolio

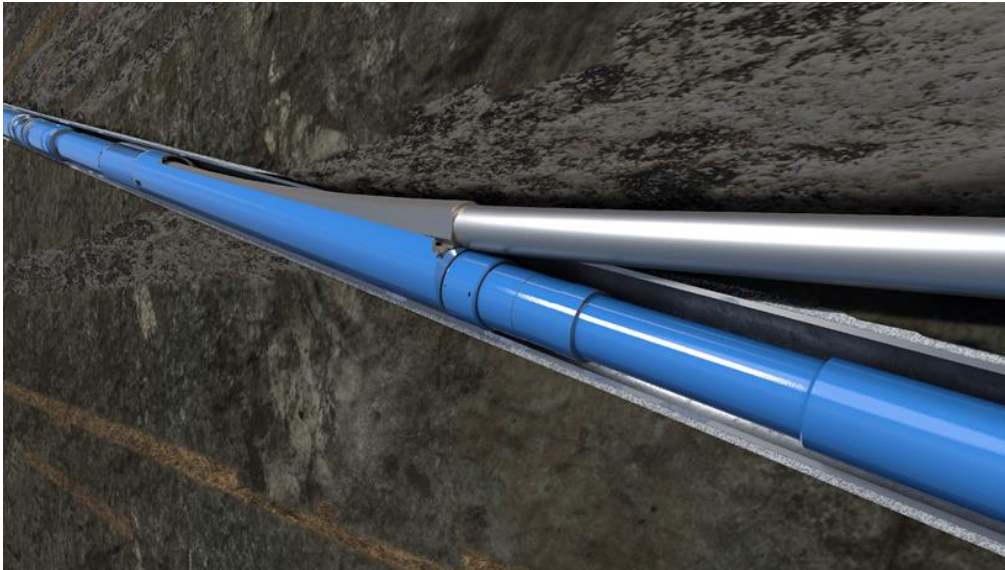


Address Fugitive Emissions	Reduce or Eliminate Flaring	Minimize your drilling CO2 footprint	Full Field Development Solutions	Electrification
<ul style="list-style-type: none"> Low Emission Valve Portfolio 	<ul style="list-style-type: none"> Ora Deep Transient Testing Evergreen Zero Flaring Flaring Emissions Prediction (Architest) 	<ul style="list-style-type: none"> Neosteer & Orbit G2 EverCrete & CemFIT Heal Intelligent Power Management Envirouniit / ATC Trulink 	<ul style="list-style-type: none"> Rapid Multilateral Systems Subsea boosting and compression HIWAY Maximum EON 	<ul style="list-style-type: none"> Electric Surface Actuator



Full Field Development Solution

Retrofit RapidX Multilaterals in Barents Sea



- Produce accretive reserves - faster
- Eliminate lead times and additional infrastructure
- World's first retrofit RapidX level 5 multilateral junction

† The estimated emissions total savings is based on assumptions as to what the alternative field expansion solution would potentially be.

Comparison: Two midwater development wells

RapidX Multilateral Systems

Performance and savings for Vår Energi

- Access to 7–8 million bbl of oil
- 5,000–10,000T CO₂E†



5000 to 1000 tons saved = 1000 to 2000 cars off the road annually

(conversion factor from epa.gov)

Zero-Flare Deepwater E&A Evaluation

With Ora Platform Deep Transient Testing (DTT)



- Zero-flare Testing option for sensitive DW projects
- Cost-effective Exploration & Appraisal Solution
- Reduces Emissions, saves Energy

Comparison: DW Single Zone Test

Ora DTT

Small vol gas vented

- 33T CO₂E

3 days rig time

- 585T CO₂E
- 7.6TJ*

Total Emissions

- 618T CO₂E

DST

6000bbl oil flared

- 3400T CO₂E

14 days rig time

- 2500T CO₂E
- 35. TJ*

Total Emissions

- 5900T CO₂E



5382 tons saved = 1000+ cars off the road annually

(conversion factor from epa.gov)

Zero-Flare Well Cleanup

With “Green” Completions for BP Oman



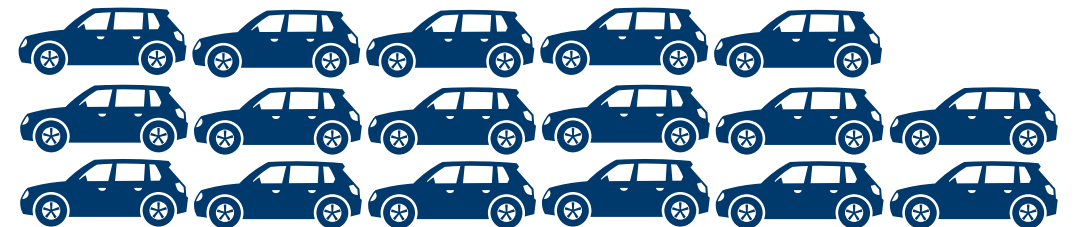
- Solids-free well cleanup solution in the Khazzan field
- Zero-flaring delivery of new wells
- Collaborative, fast-track product development

Comparison

Zero-Flaring Well Cleanup

10 wells

- 80,000T CO₂E avoided



80000 tons saved = 17000 cars off the road annually

(conversion factor from epa.gov)

Early Engagement Maximum Impact




Planning & Design

Operations Optimization

Technology Design & Choice



Kristin Fejerskov Kragseth • 1st
CEO hos Vår Energi
2mo • 

Goliat West multilateral retrofit. Two years from discovery to production. The Vår Team demonstrating technological excellence and leadership together with our suppliers 🤝 #oneteam #vårenergi



Vår Energi og Schlumberger med bore-nyvinning: – Har spart oss hundrevis av millioner
e24.no • 5 min read

   341 • 11 Comments

Early Engagement: 5–10k T CO₂E avoided

Thank You + Questions

An aerial photograph of an oil drilling rig in a tropical forest. The rig is a tall, yellow and white structure with a derrick. It is surrounded by a clearing with various pieces of equipment, including blue storage tanks, yellow cranes, and several trucks. The background is a dense, lush green forest. A blue semi-transparent overlay covers the left side of the image, featuring large white double arrows pointing left and right, and a series of white circles connected by lines, resembling a data or network diagram.

**Together, we create amazing technology that
unlocks access to energy, for the benefit of all.**