

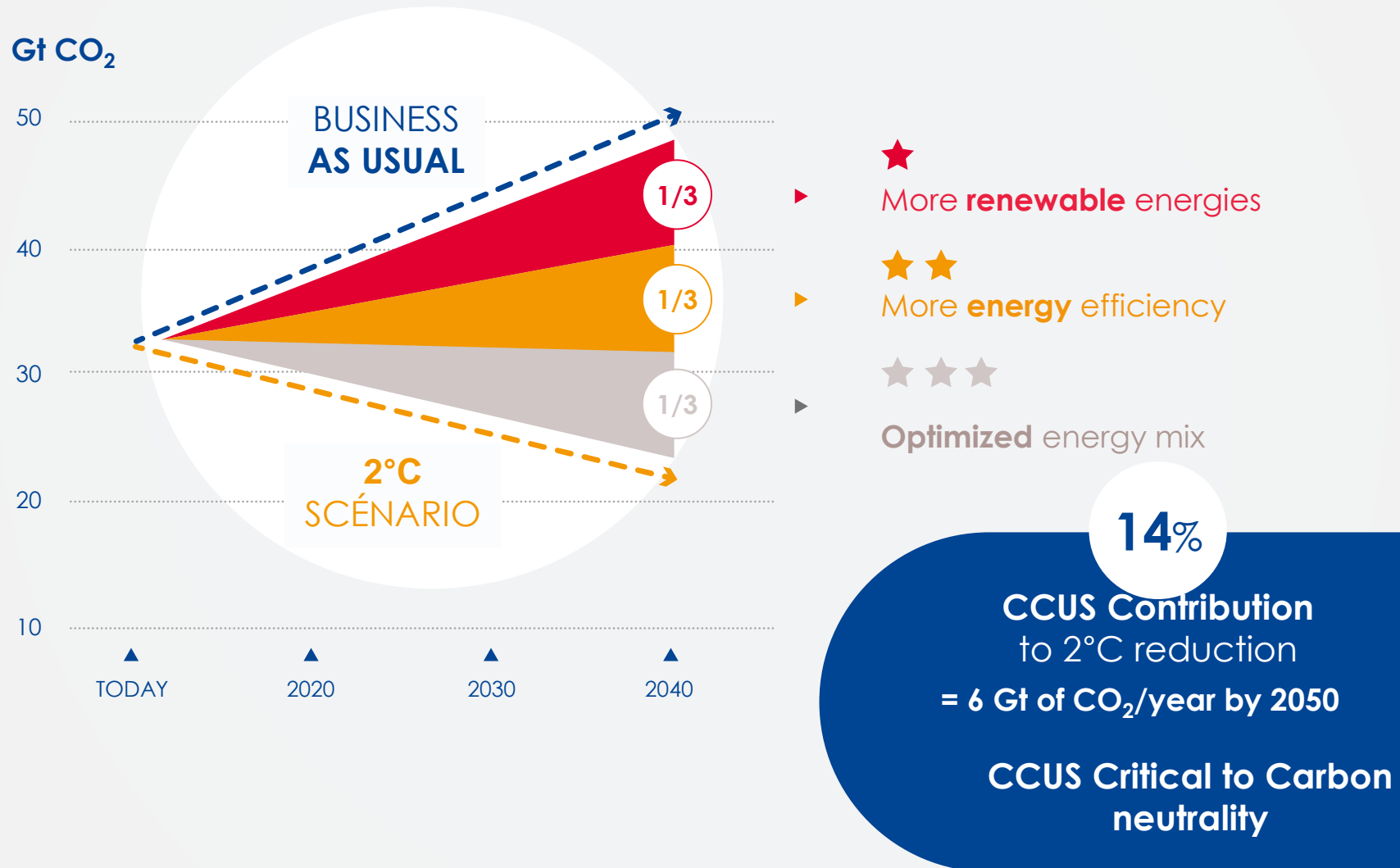


CCUS development  
within our

# CLIMATE STRATEGY

[HTTP://WWW.TOTAL.COM/SITES/DEFAULT/FILES/ATOMS/FILES/INT  
TEGRATING\\_CLIMATE\\_INTO\\_OUR\\_STRATEGY\\_VA.PDF](http://www.total.com/sites/default/files/atoms/files/integrating_climate_into_our_strategy_va.pdf)

# 3 AREAS OF FOCUS TO MEET THE 2°C TARGET



# TOTAL LEADER IN CCUS TECHNOLOGY BY 2035

1

CCUS is an **emerging Industry** representing a **business opportunity** on par with Exploration & Production

2

TOTAL is working for **environment more favorable** to the development of CCUS solutions

3

**Large scale CCUS deployment** may only be achieved via collaborative work and shared investment costs (Public/Private)

4

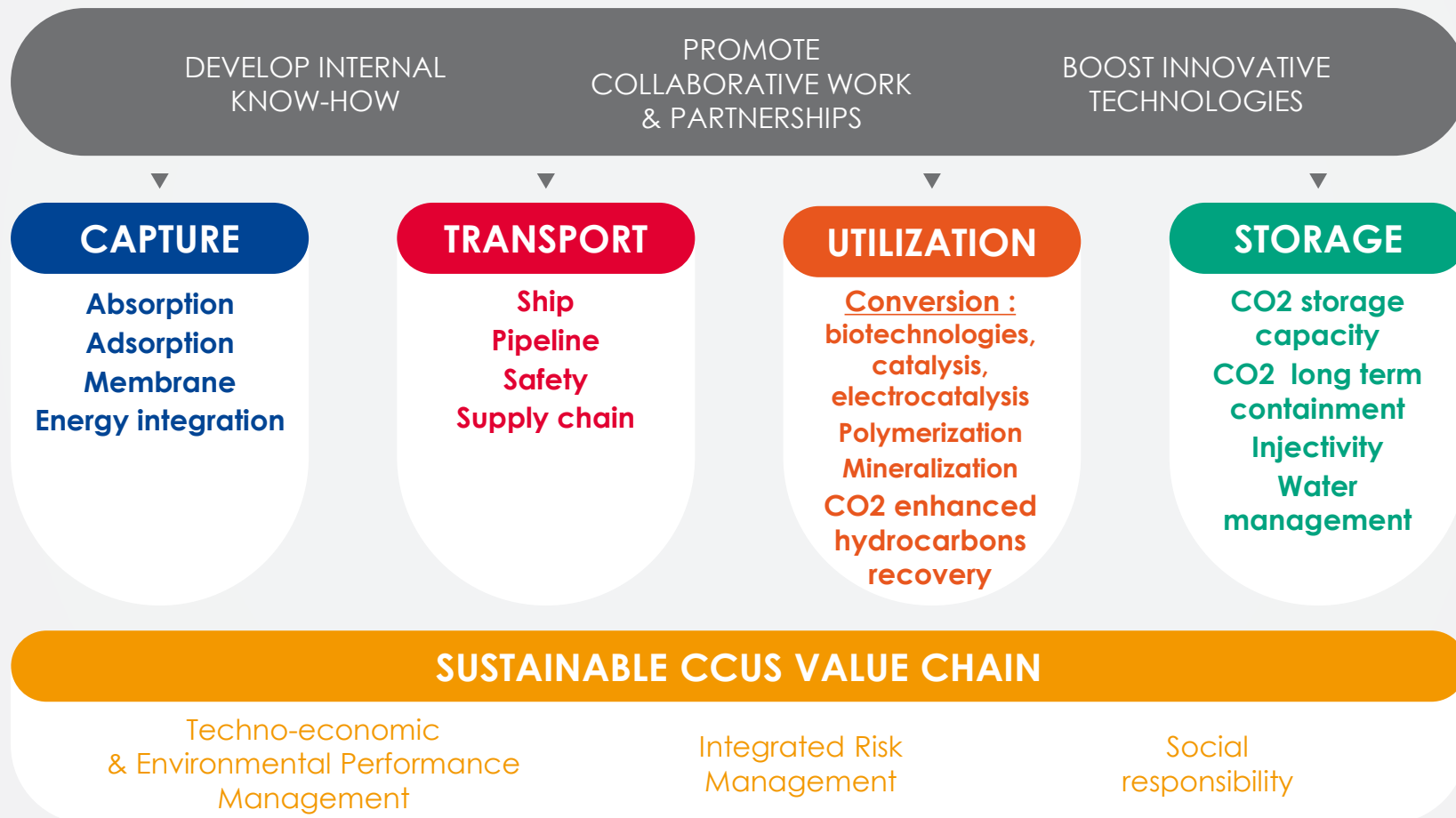
TOTAL will be positioned along the **full CCUS value chain** and will offer a suite of **highly competitive solutions**

5

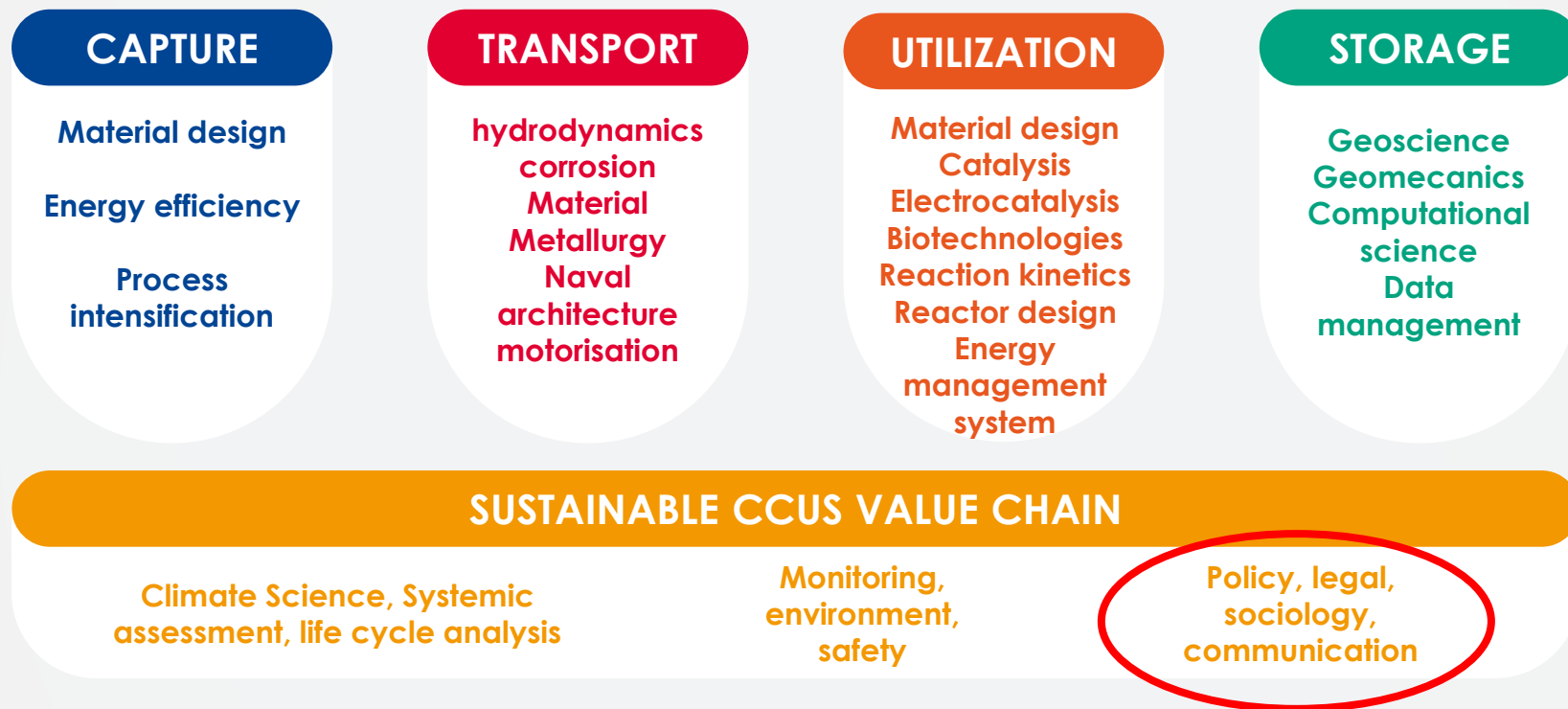
To contribute to developing CCUS as an efficient business, TOTAL will first focus on **commercial projects which could be scaled up**

# HOW TO BE A LEADER ALONG THE WHOLE VALUE CHAIN?

“ Be a major CCUS technology integrator along the value chain **to participate to climate change mitigation** and **prepare for new business opportunities** ”



# SOCIAL SCIENCES WITH SCIENCE TO BOOST TECHNOLOGIES



In addition with high level scientific skills : entrepreneurial, social, team work, project management, team management



# HOW **BOOST** CCUS **TECHNOLOGY** DEVELOPMENT ?

**TRL 1-4 : Computational science/data science/high throughput design and testing**

**TRL 4-6 : Collaborative demonstration platforms/fundings/capital venture/**

**Valorisation Carbon Quebec**  
CO2 capture  
+ CO2 utilisation demonstration plant  
Start up incubation  
with private&public fundings

CO2 capture demonstration plant



**Total Capital Development/  
Oil and Gas Climate Initiative**



**Solidia  
Technologies**



**sunfire**

**Europe/China : H2020/MOST**  
Chinese-European Emission-Reducing Solutions  
3MW Chemical looping combustion



中欧污染物减排技术研究

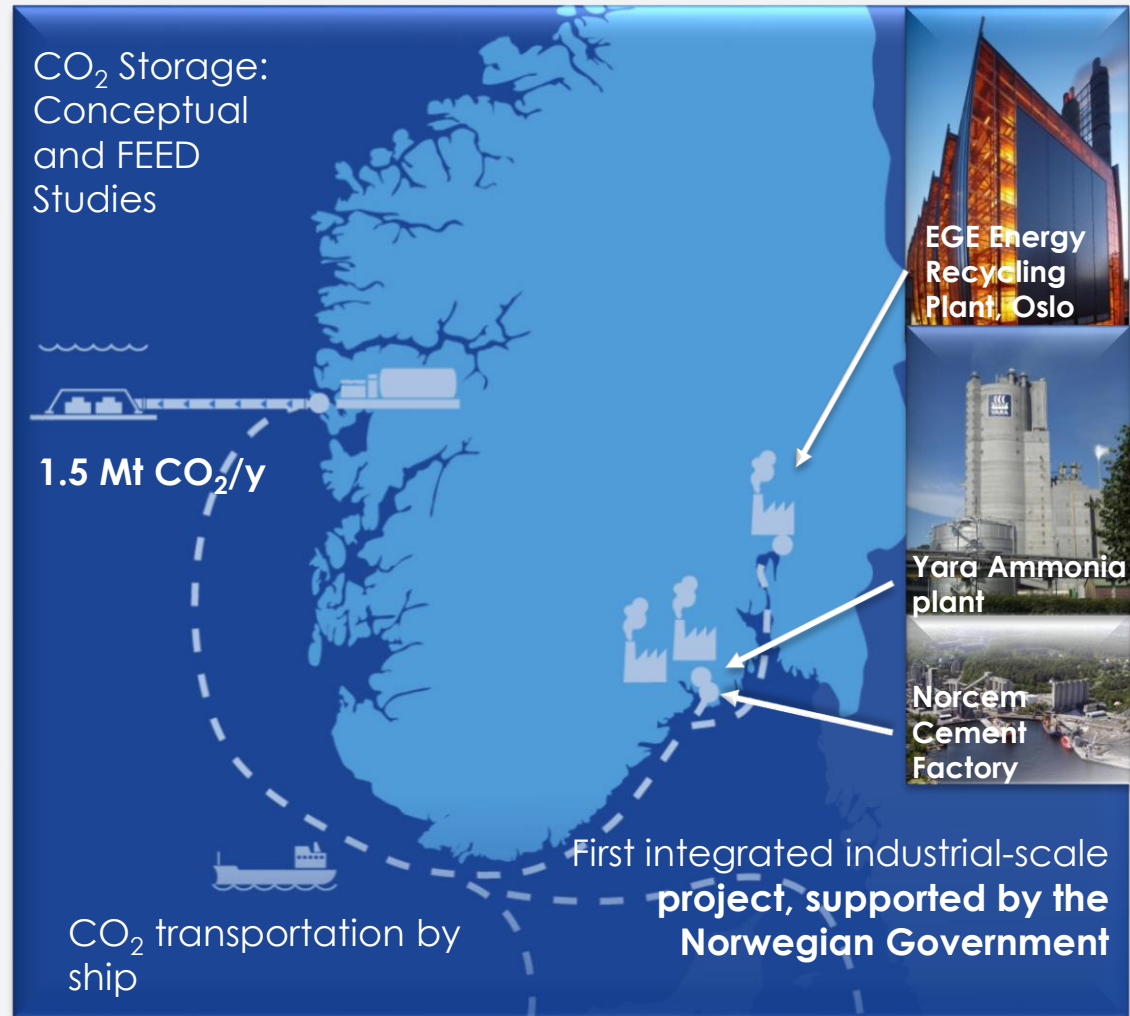
# CCUS PROJECTS = CO-CONSTRUCTION APPROACH

## Norwegian demonstration CCS project



Oslo city,  
Heidelberg Cement  
Yara fertilizer

+ global and local  
stakeholders,  
State, citizens,  
ONG, .....



# CCUS = HEAVY INDUSTRIES

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Heavy industries = long term investment = project management = plant operation = safety

Training/Education = high level technical skills+ mindset

Active pedagogy/blended learning = professionals, engineers, managers = HSE, operation, maintenance, project, technical assistance = qualification/certification

OLEUM training center offers the industrial facilities and knowledge sharing,



Hands-on exercise  
Augmented reality  
Simulators



# TOTAL LEADER IN CCUS TECHNOLOGY BY 2035

Decrease technologies **C**ost

Improve our **C**arbon footprint

Contrib **U**te to a more favorable development context

To **S**ubstain our activities in the future



DECREASE CCUS  
TECHNOLOGIES  
COST



DECREASE  
GLOBAL CARBON  
FOOTPRINT



INCREASE  
CCUS SOCIAL  
ACCEPTABILITY