Part I: H2020 GATEWAY and the PCI application – so far, so good

H2020 project GATEWAY and the North Sea perspective

Dr. Marie Bysveen, Coordinator GATEWAY

SINTEF - Norway

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AGENDA

12.30 ***Networking lunch***

PART I – H2020 GATEWAY and the PCI application – so far, so good

13.20 **Welcome and safety announcements –** *(Tom Mikunda, TNO)*

13.30 **H2020 project GATEWAY and the North Sea perspective – (***Marie Bysveen, GATEWAY coordinator)*

13.45 **Stakeholder perspectives on CCS in the Rotterdam region**
Update on the ROAD CCS project (Andy Read, ROAD)
Near-term CO_2 storage in the Dutch North-Sea (Chris Gittins, TAQA)

14.10 **UK perspective and possible value creation -** (David Hanstock, Progressive Energy)

14.20 **PCI – Project of Common Interest – the Rotterdam Nucleus application**
(Tom Mikunda, TNO)

14.50 ***Coffee break***

PART II – The way forward realising CO_2 infrastructure

15.15 **Synchronised funding streams for CO_2 infrastructure** *(Elisabeth T. Vaagenes, SINTEF)*

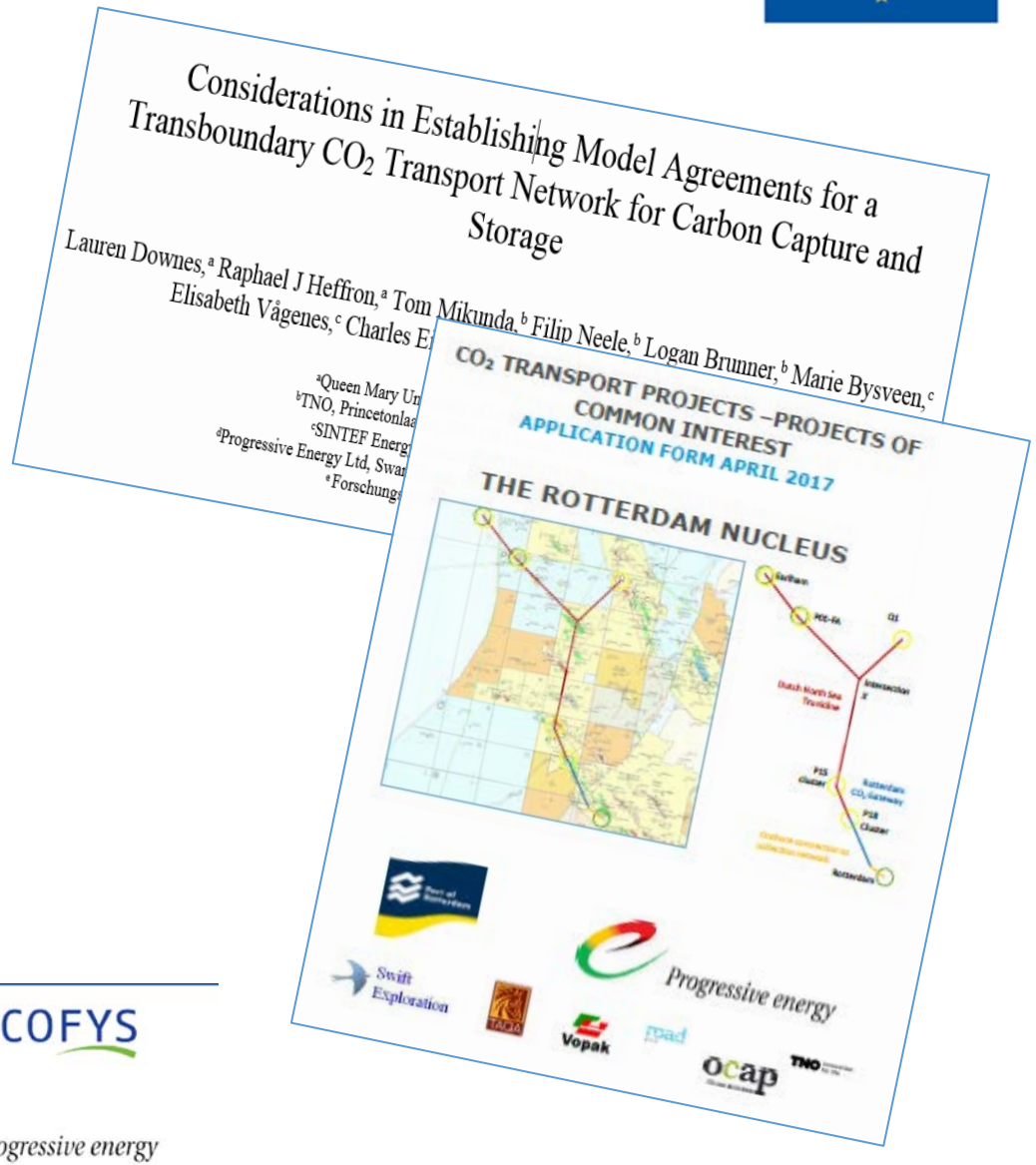
15.30 **Statues and viable ownership arrangements** *(Rahpael Heffron; Queen Mary Univiversity)*

15.45 **Discussion – What now after GATEWAY and the PCI submission ?**
Opportunities and barriers to CO_2 transport projects

16.30 – 17.00 ***Mingling reception with refreshments***

Outline

- GATEWAY background, objectives and plans
- Four possible North sea Pilot cases
- North Sea countries – situation
- TEN-E regulations
  - PCI, process, CEF funding
- Trans-European follow-up
  - List of PCI applications
  - SET Plan Implementation Plan
  - H2020 Work Porgramme



GATEWAY background, objectives and plans

GATEWAY background

-the North Sea situation

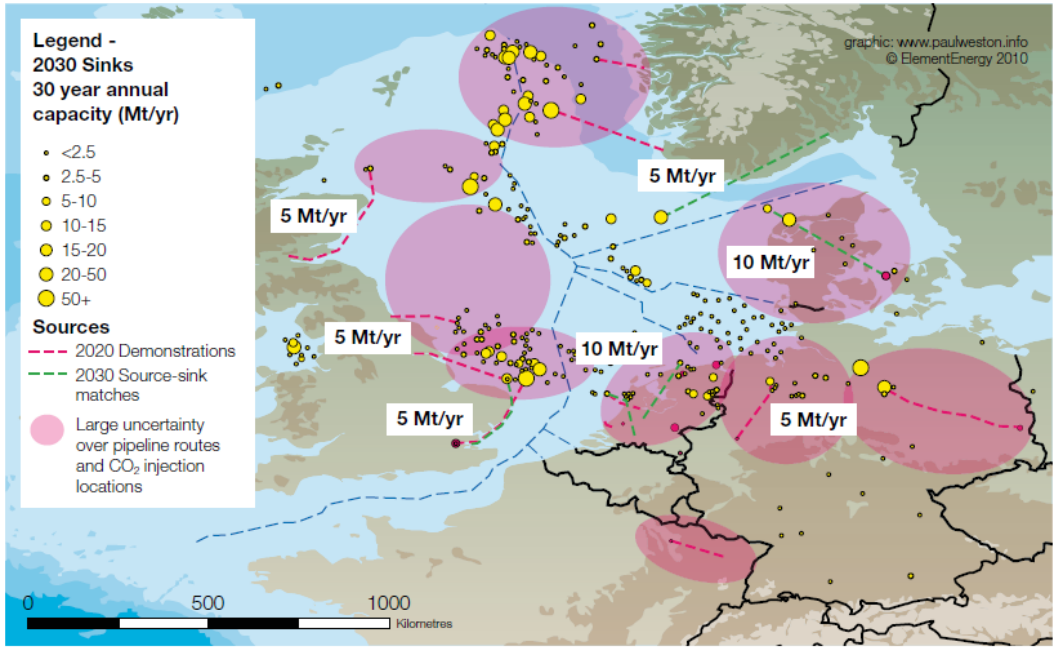


Figure 1: CCS activity in the 'Medium' scenario 2030

Element Energy, 2010 for NSBTF

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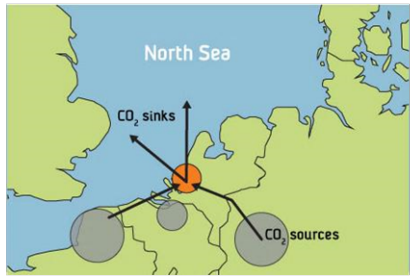
GATEWAY objectives

Provide a model for European CO_2 transport infra development

1. **Define a Pilot Case project –**targeting a cross-border gateway
2. **Define a EU CO2 Project of Common Interest (PCI) –**
   eligible for EU CEF support
3. **Align stakeholders interests and engage Member States**
4. **Develop Business Case for Pilot Case** –
   Addressing risks and proposing measures
   - Technology
   - Policy and regulatory aspects
   - Public Perception
   - Assess the funding needs

Horizon 2020
European Commission
The EU Framework Programme for Research and Innovation



Project facts
Started May 2015
Duration 2 years
Budget 787 k€
6 Partners

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GATEWAY implementation plan

Interaction with strategic initiatives, stakeholders, and decision makers

Pre-screening — DG1

Choice of Pilot case — DG2

Evaluation of Pilot case — DG3

Evaluation of business case — DG4

Evaluation of project plan — DG5

Pilot Case Development	Idea generation	Pilot Case definition	Pilot Case analysis	Business case development	Pilot Case project plan	Recommendations
Technology						
Market analysis						
Legal requirements						
Public perception						
Funding model						
Month (approx.)	1-6	6-10	10-20	20-23	20-23	23-24

Identifying alternatives Defining KPI's

Screening and definition

Detailed analysis

Business plan

Planning actions

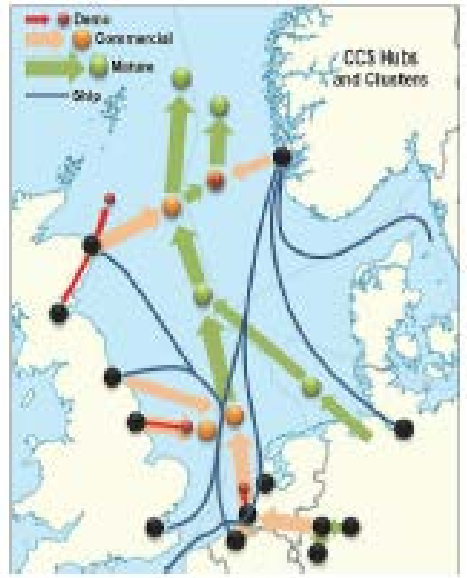
Pre-feasibiity

Four possible North Sea Pilot cases

GATEWAY's

4 initial pilot cases

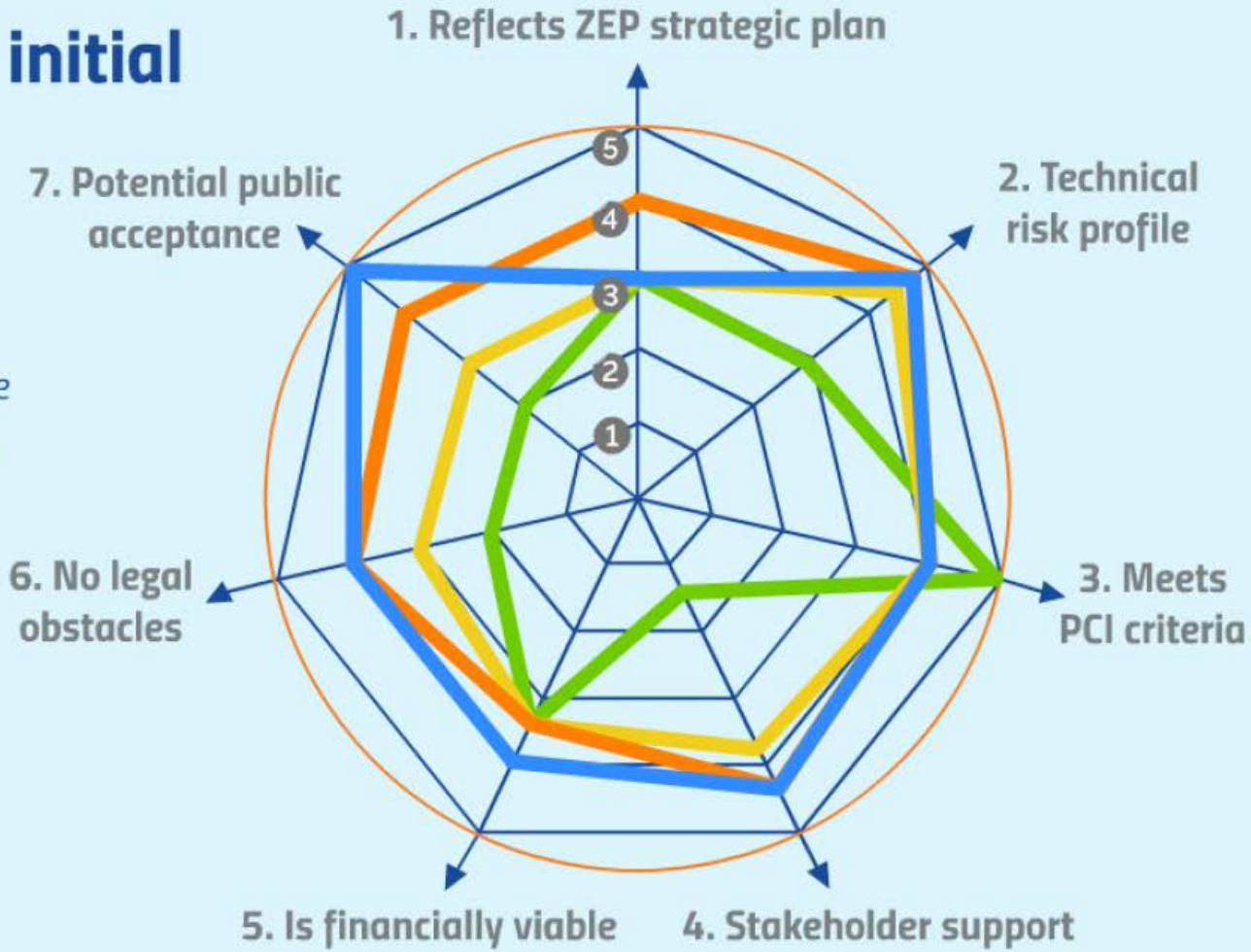
- Pilot case 1: CAR Pipeline
- Pilot case 2: UK-Norway
- Pilot case 3: German backbone
- Pilot case 4: ROAD Extensions



NSBTF - 2016/17

Pre-screening of initial pilot cases

- Pilot case 1: CAR Pipline
- Pilot case 2: UK-Norway
- Pilot case 3: German backbone
- Pilot case 4: ROAD Extensions





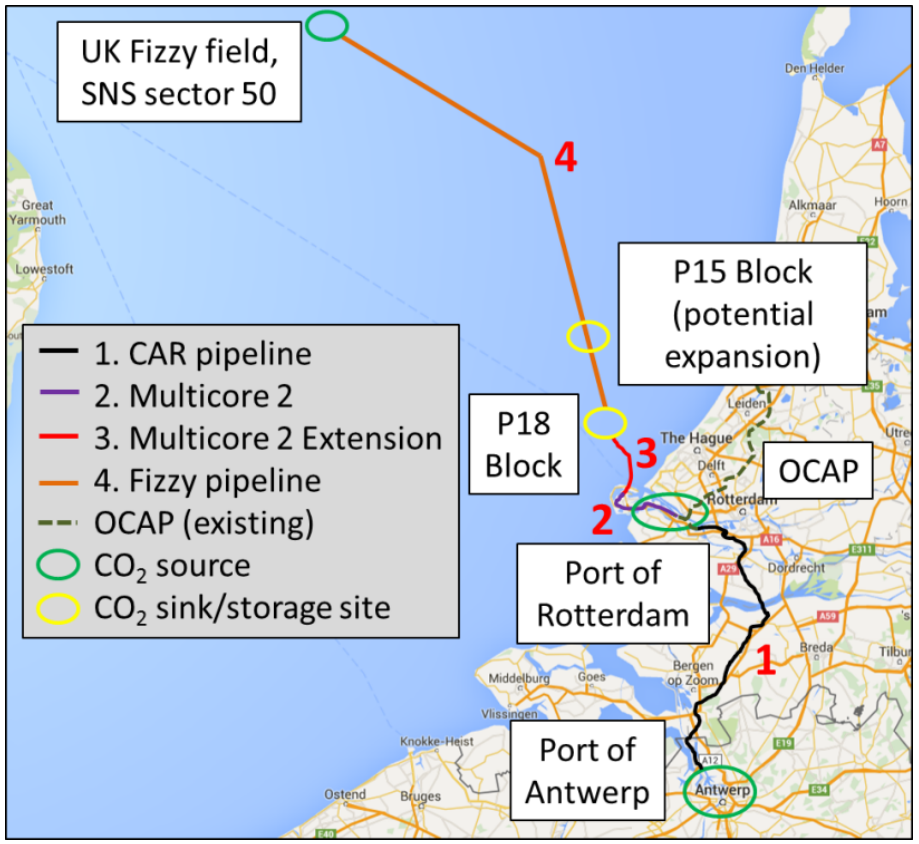






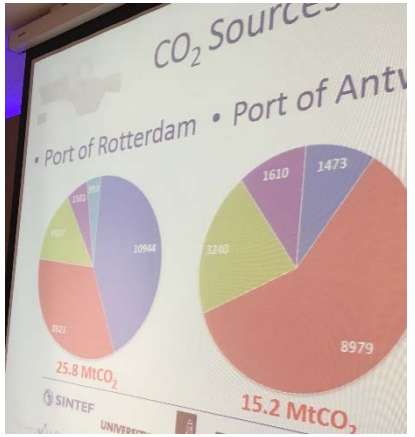
Brussels,
Nov2015

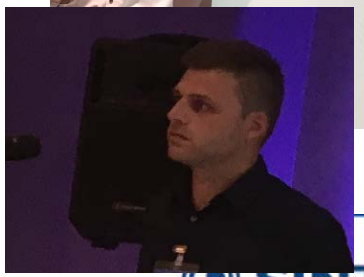
GATEWAY Pilot Case – Rotterdam Nucleus - Ver 1



Left: Pipeline routes for Pilot case Rotterdam Nucleus
Right: Possible future extensions added – including a shipping route to Germany (Ruhr) and a connection to France (Le Havre) from Antwerp

Brussels,
Autumn 2016

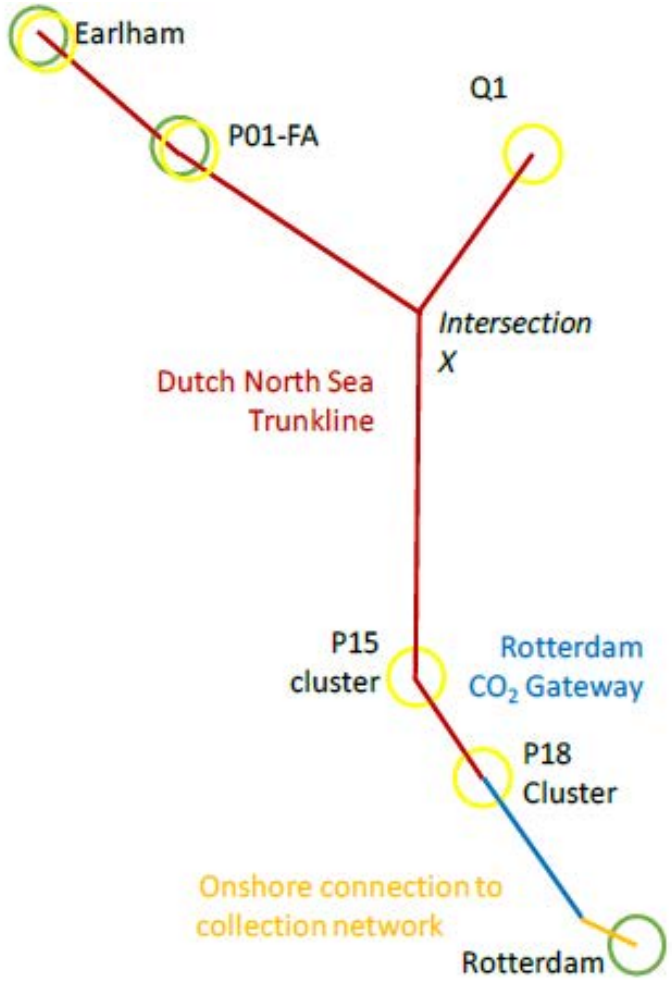




Marie

London,
Febr 2017

GATEWAY Pilot Case – Rotterdam Nucleus – Final version



Situation in North Sea Countries

Norwegian Ministry (No), Port of Rotterdam (N), Teeside Collective (UK)

Unlocking Clean Growth Through Carbon Capture and Storage

Save the date:

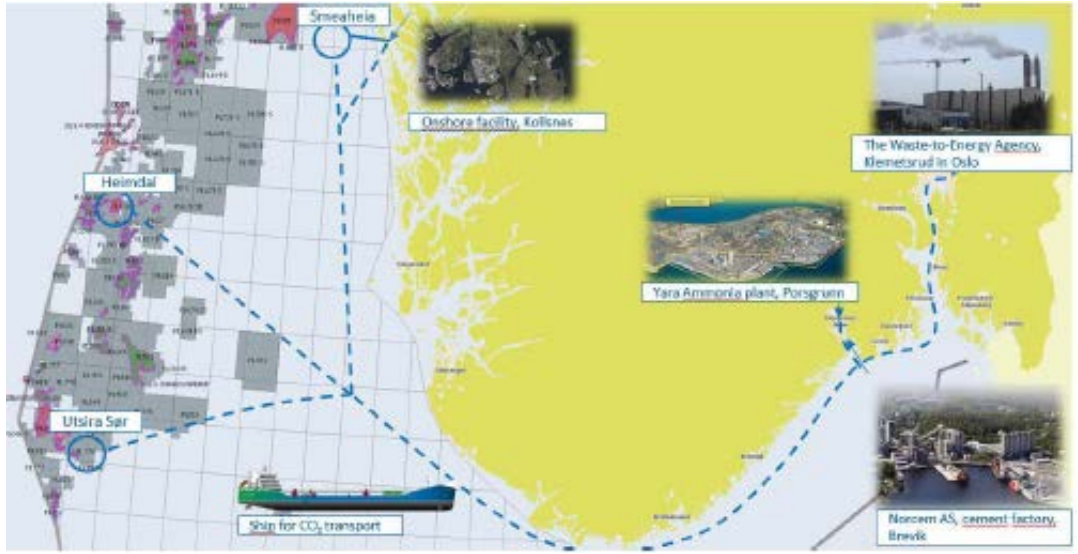
2017 European Parliament Hearing on CCS

Thursday 23rd March 10:00-12:00

Lambert van Nistelrooij (MEP) and the European Zero Emission Technology and Innovation Platform (ZEP) are pleased to invite you to a high level European Parliament Hearing on CCS.

In partnership with the Norwegian Ministry of Petroleum and Energy, Gassnova, and the International Energy Agency, the Hearing will provide an opportunity to hear about some of the most exciting CCS initiatives being progressed in Europe. Against that background, it will consider what role the EU and national governments can play in driving innovation and accelerating deployment.

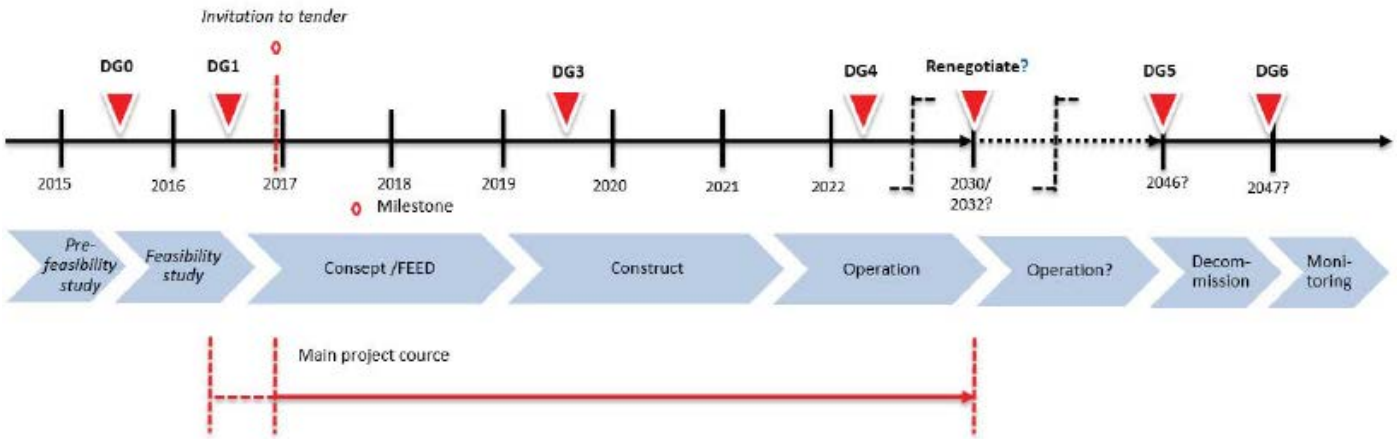
Norwegian situation



Last week: *'Today marks the award of contracts by Gassnova to Klemetsrudanlegget, Norcem and Yara. All three will receive support for further studies of full scale carbon capture at their respective facilities'*

Value chain

CO2 from one or more of these facilities will be transported by ship to intermediate storage. The carbon will subsequently be carried by pipeline to a store under the seabed in the North Sea. The Smeaheia area, to the east of the Troll gas field, and around 50 km offshore, has been chosen as the storage site. According to the schedule, a contract will be signed with an operator of the store before the summer. Statoil conducted the feasibility study that identified the Smeaheia area as an optimal storage site.



http://www.gassnova.no/en/norway-to-develop-industrial-full-scale-ccs-project

UK situation

Dutch situation

- Funding issue
- Political situation – new government – when ?
- H2020 ERA-NET 2019 (?)
- What if ?

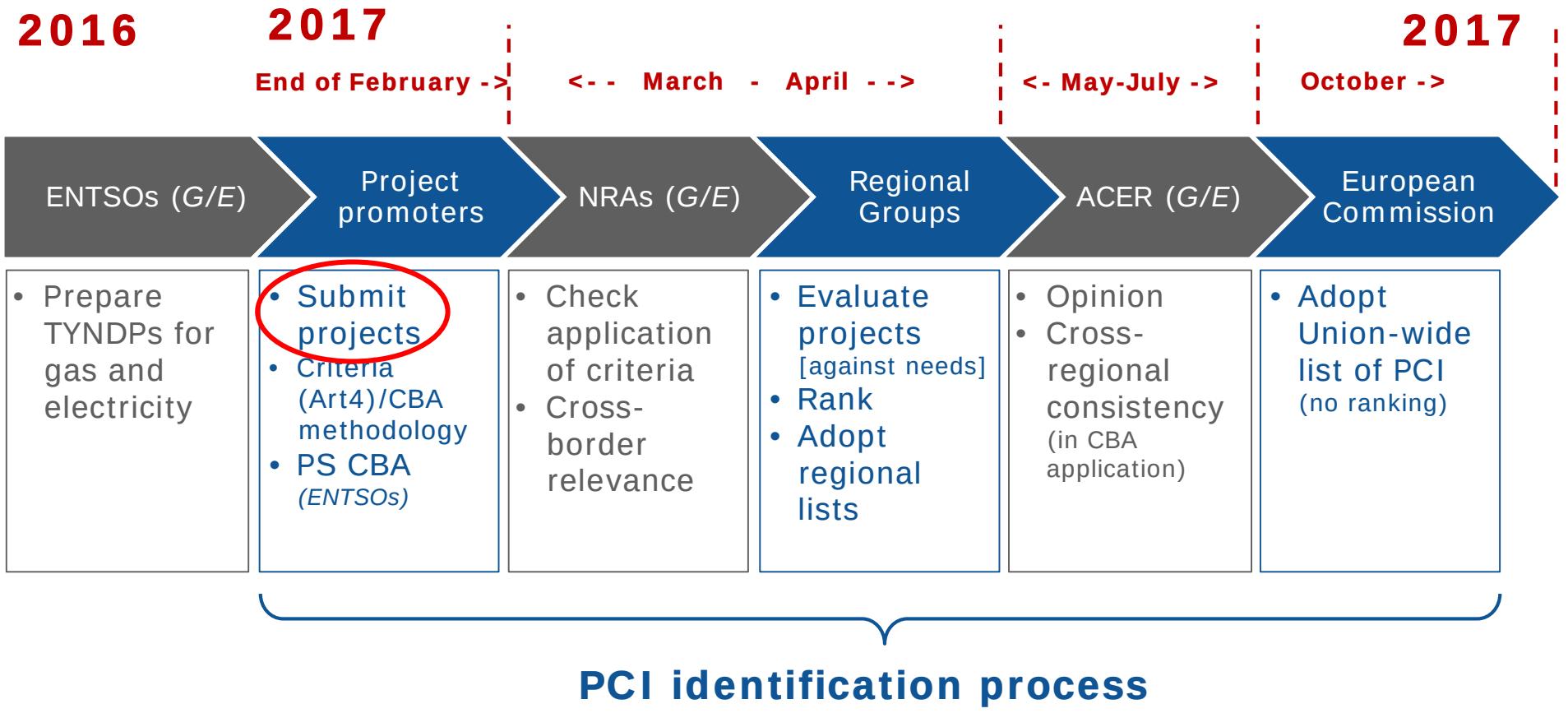
TEN – E regulations

PCI, process, CEF funding

Beatrice Coda
Policy Officer, DG Energy

European Commission

Process to identify projects of common interest



Trans-European follow-up

List of PCI applications

SET Plan implementation plan

H2020 Work Programme

Other funding mechanisms

DISCUSSION this afternoon

Acknowledgements

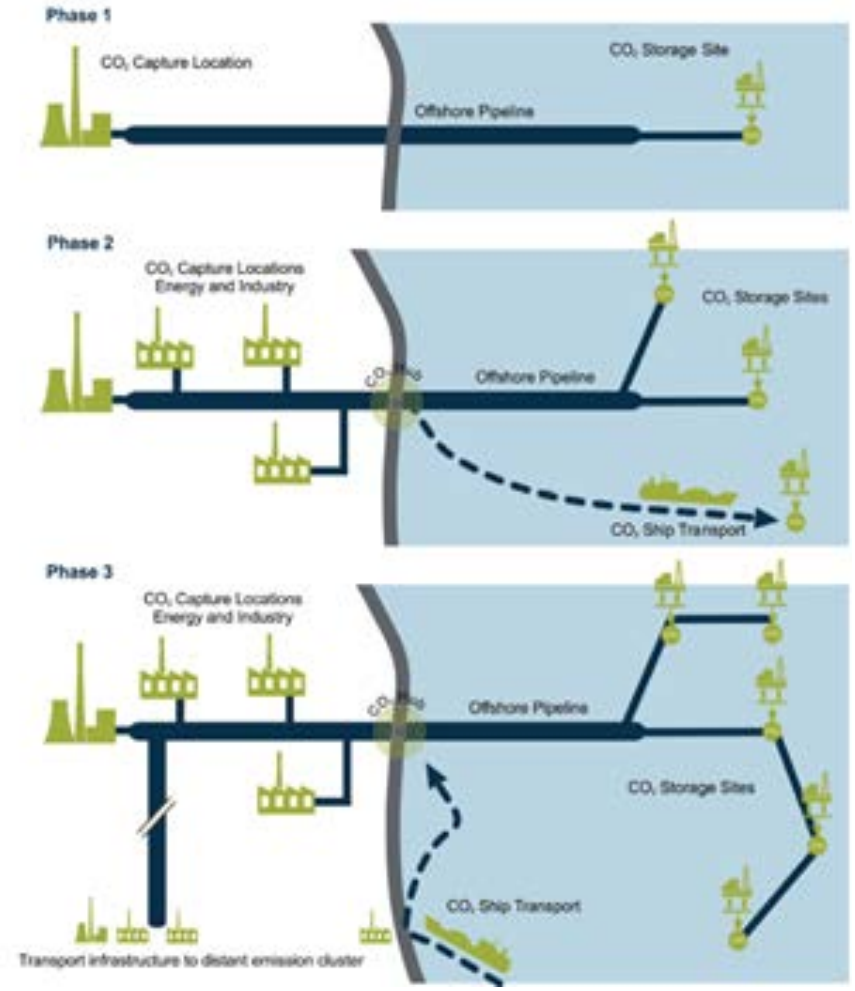
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no 657263.

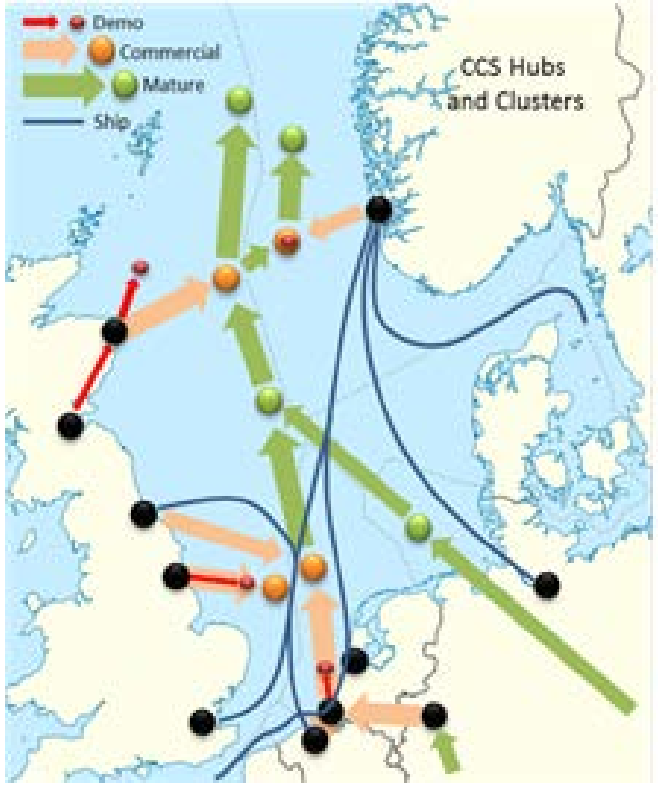
GATEWAY

https://www.sintef.no/projectweb/gateway/

Twitter: @GATEWAY_CCS

Sources-and-Sinks matching - in Phases





Left: ETIP ZEP; 3 phases for CO2 infra development in Europe
Right: North Sea Basin Task Force; Map of potential CCS hubs and clusters

Summing up

1. GATEWAY project responds to the need for facilitated CCS deployment in Europe
2. GATEWAY models the process on a Pilot Case – the Rotterdam Nucleus project
3. GATEWAY is kick-starting a business case for the project and a plan for a PCI application
4. GATEWAY project seeks cooperation with other CCS actors, initiatives, and stakeholders for a successful Business Case development

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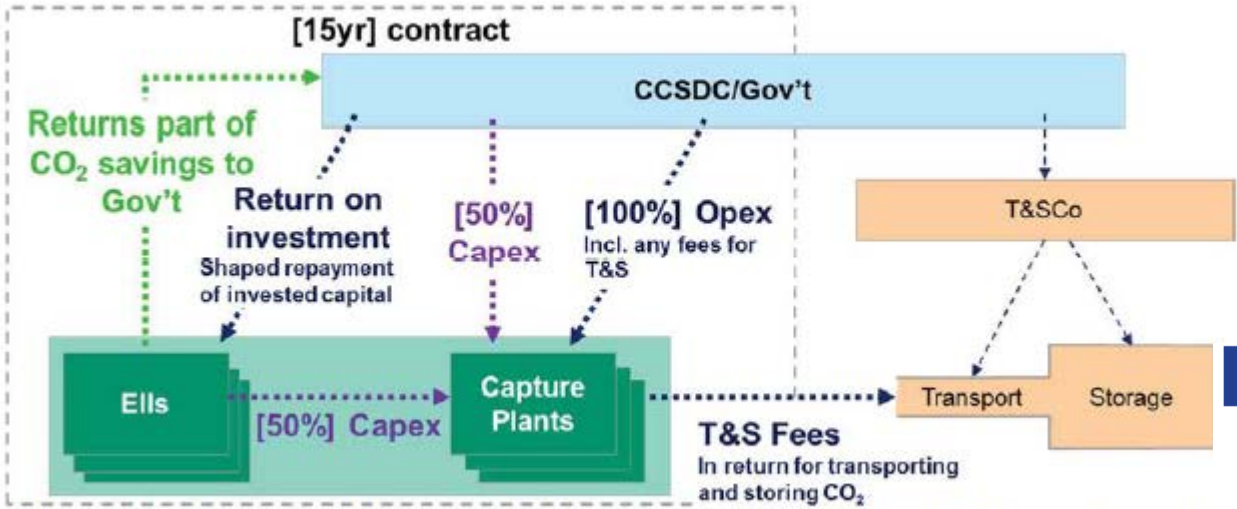
Figure 3 – Overview of proposed ICCS Business Model



Note: We assume here that CCSDC is the responsible body within Government for delivery of UK CCS including cont of Industrial CCS. Figures in brackets are parameters to be negotiated between parties and are subject to change.

PÖYRY TEESSIDECOLLECTIVE
A NEW INDUSTRIAL FUTURE FOR THE UK

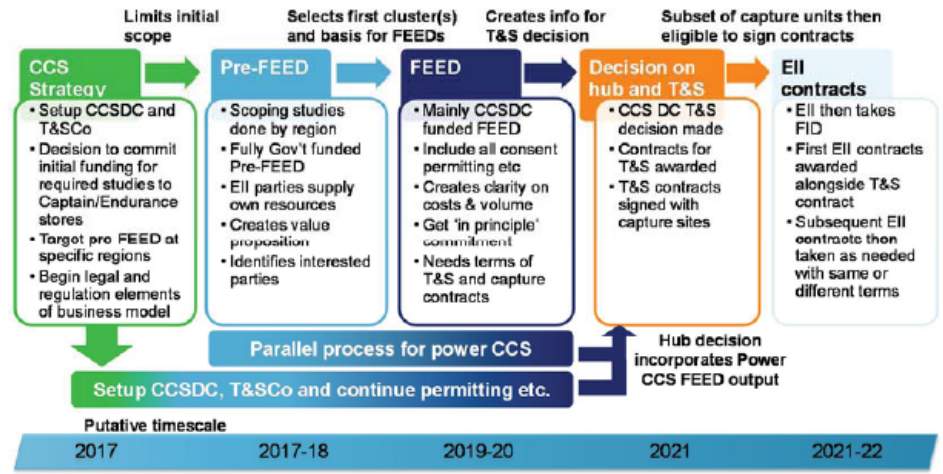
A BUSINESS CASE FOR A UK INDUSTRIAL CCS SUPPORT MECHANISM

A Pöyry report on behalf of and in partnership with Teesside Collective

Executive summary

February 2017

Figure 4 – Overview of capture contract allocation process



EXECUTIVE SUMMARY

- ***Carbon Capture and Storage (CCS) is a technically proven technology for application to industrial emissions currently operating at sites worldwide, and the only option for deep emissions cuts for many UK industries.***
- ***Total lifetime cost for capture, transport and storage for an industrial CCS hub is £60/tCO_2 – appears good value in comparison to cost of carbon used for policy development which stands at £78/tCO_2 by 2030, and other contracts aimed at decarbonising the energy system.***
- ***Building on Lord Oxburgh report recommendations, a commercially feasible industrial CCS business model has been identified and tested through broad stakeholder input that potentially meets needs of both industry and Government.***

The first step in the process is for Government: to define a clear strategy for CCS – this will include the decision to target support to particular storage sites and industrial and power CCS, as well as taking the necessary legal and regulatory steps to establish the CCS delivery bodies. A strong strategy is essential upfront to attract potential EII and regional participants to invest the significant resource required. The process steps are designed to allow for the decision on the T&S hub to be taken with key information in-hand from potential capture projects and vice-versa. We envisage that the final investment decisions (FID) on proceeding with construction of T&S and the signing of the initial capture contracts would be targeted to happen concurrently.

What is European 'Project of Common Interest - PCI' ?

- Part of Trans-European energy infrastructure regulation
- 12 strategic priority corridors and geographic areas defined
- Infrastructures for el, gas&oil, smart grids –

  - And now; CO2 transportation highways
- List of priority energy highways revised every 2nd year allowing new projects to apply for PCI status and associated funding – and more efficient permitting procedures

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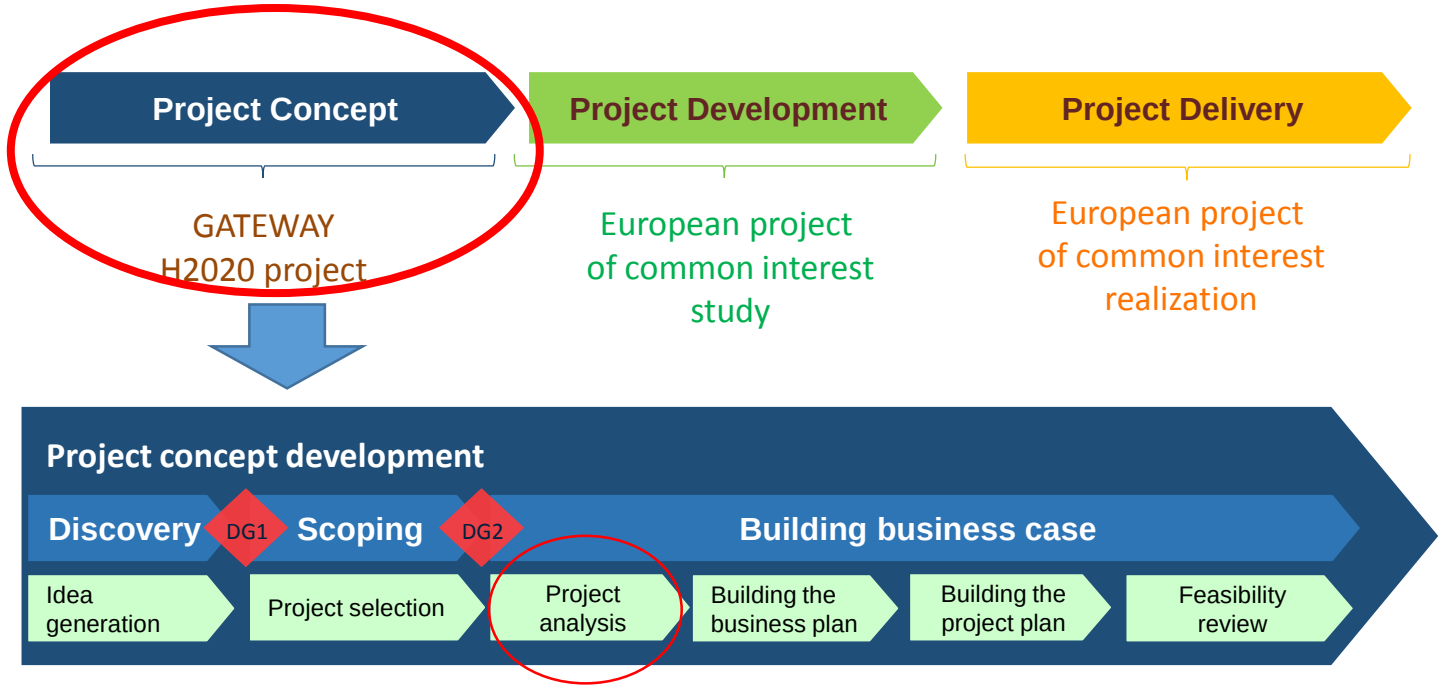
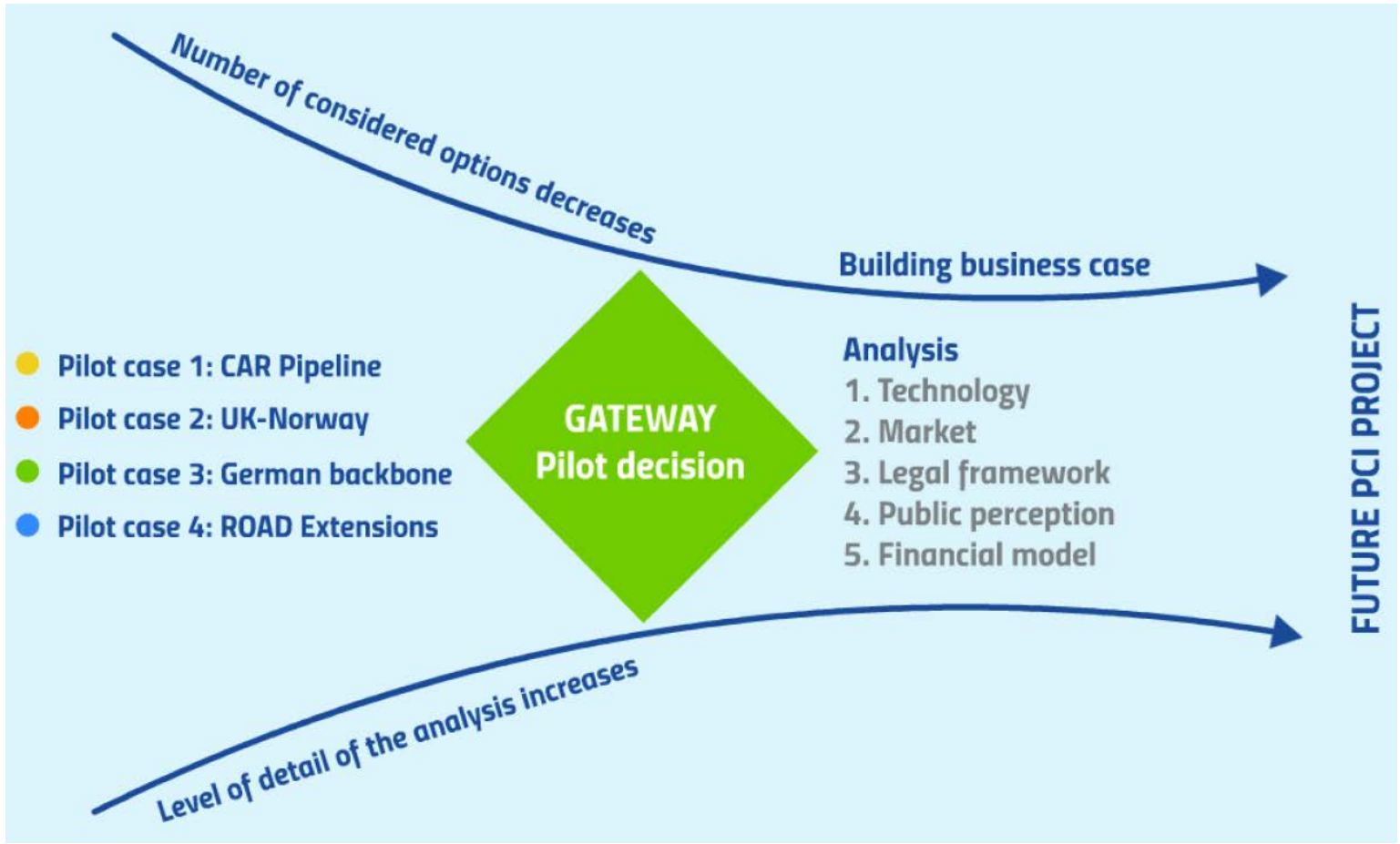
GATEWAY phases

Phase-gate process



PHASE 3: Building the Business Case



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GATEWAY working modus

Alignment of interest

Industry

NL: ROAD, Port of Rotterdam

Norway: Norwegian feasibility study

UK: CCS report

North Sea Basin Task Force (NSBTF)

European Commission

SET Plan process

ETIP ZEP

EERA

ETC