

H2020 GATEWAY project

By co-ordinator Marie Bysveen, SINTEF





Agenda



Looking back
Where are we now ?
Planning ahead



GATEWAY background

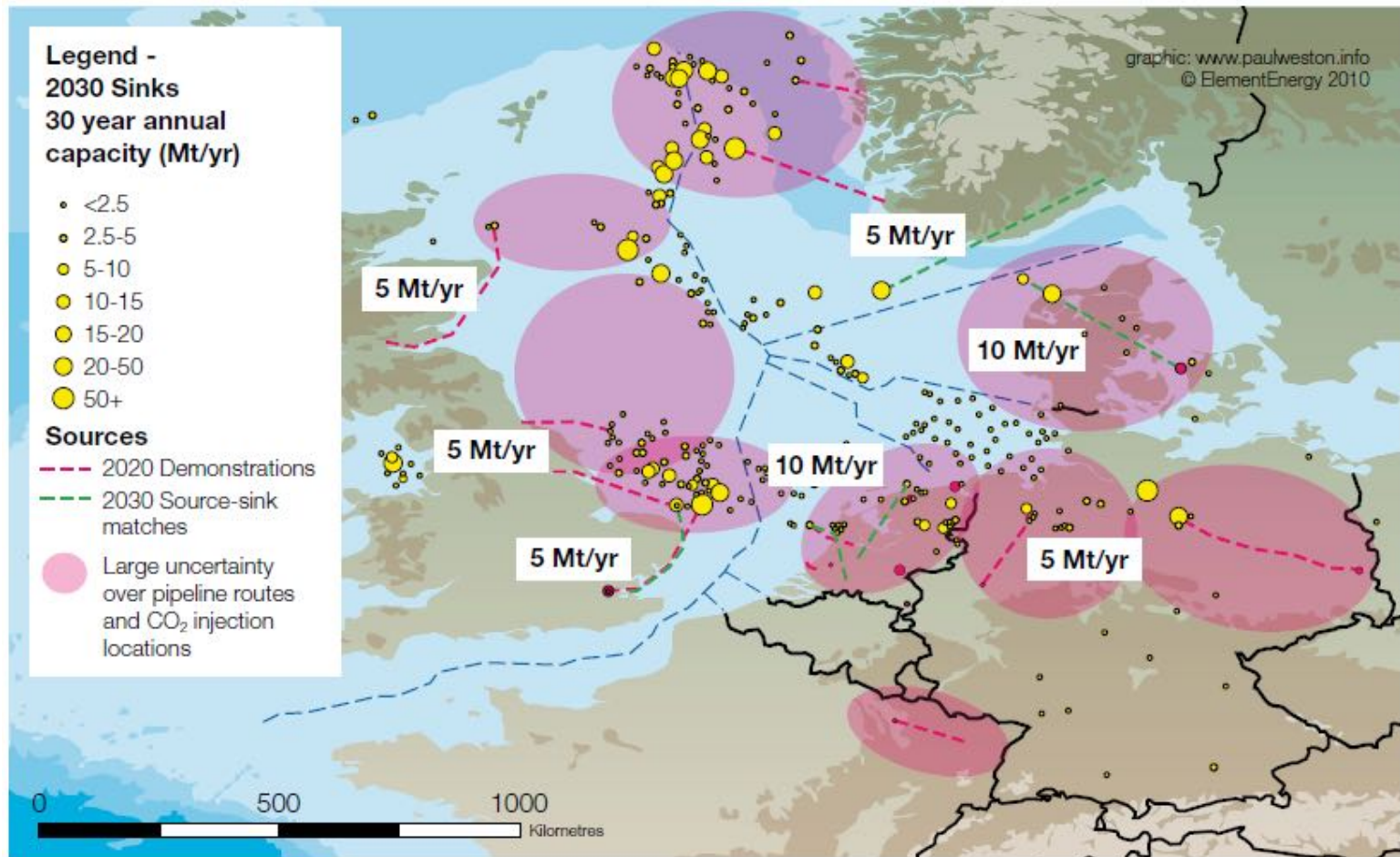
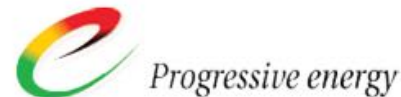


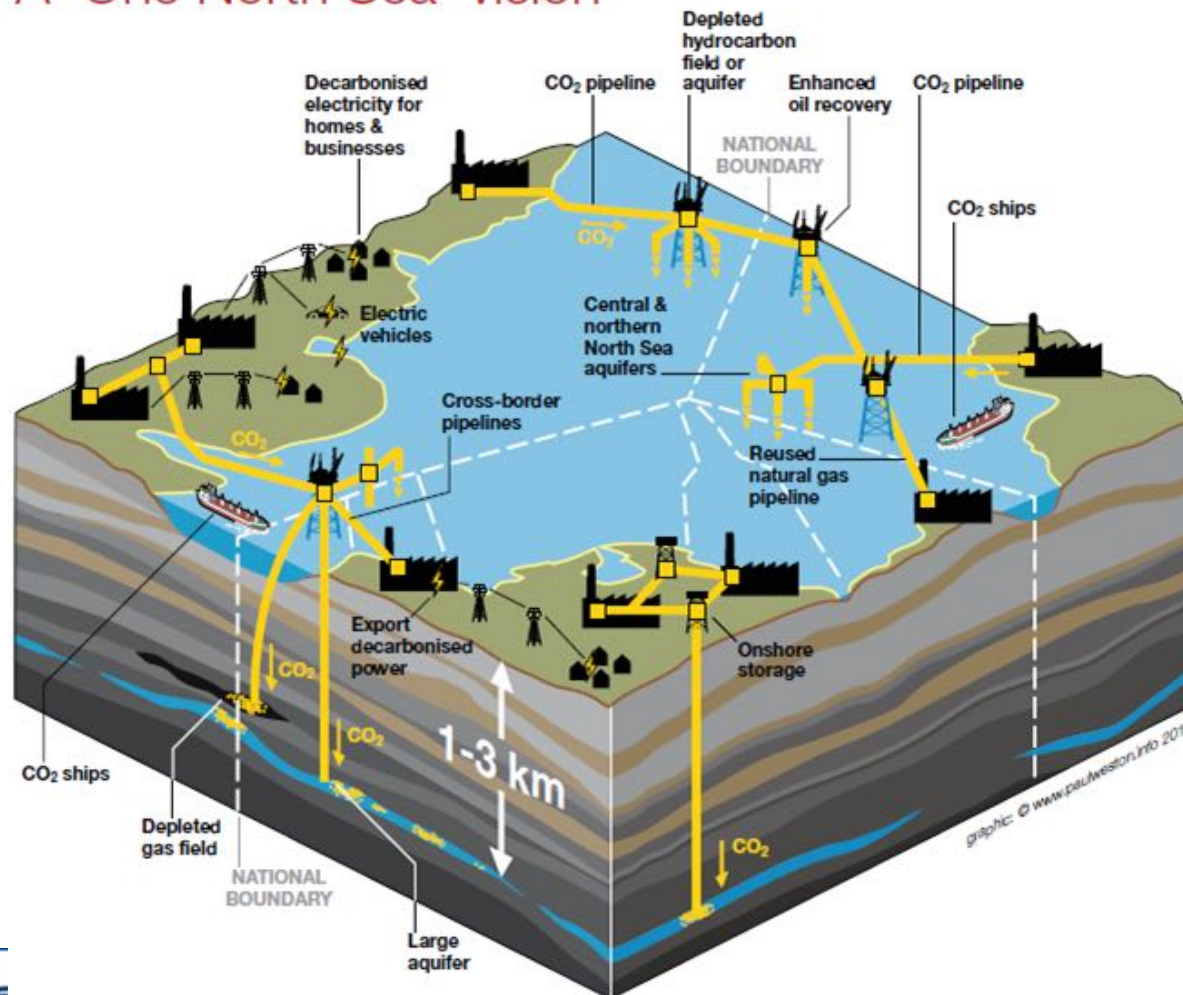
Figure 1: CCS activity in the 'Medium' scenario 2030

Element Energy, 2010
for NSBTF



GATEWAY background

A 'One North Sea' vision



*Element Energy, 2010
for NSBTF*



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TNO innovation for life



GATEWAY background

North Sea Basin Task Force Recommendations

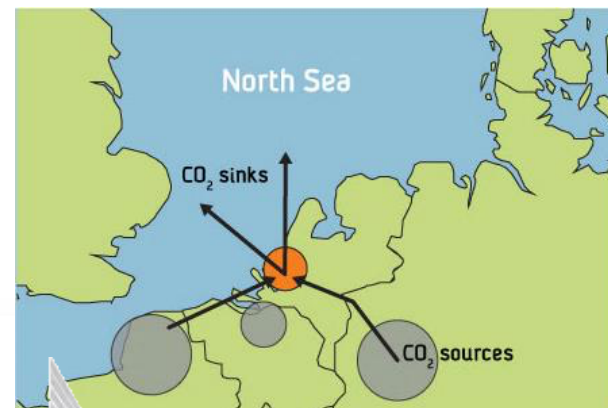


- Improve sink info
- Reduce uncertainties around the value chain
- Develop guidelines on how to develop stewardship between hydrocarbon extraction, Government and CO2 storage
- Governments to continue to show leadership and co-operation
- Governments to publish formal statements of intent to agree terms on cross-border issues



Developing a Pilot case for a European CO₂ transport infrastructure

GATEWAY



Horizon 2020

The EU Framework Programme
for Research and Innovation

Project facts

Started May 2015

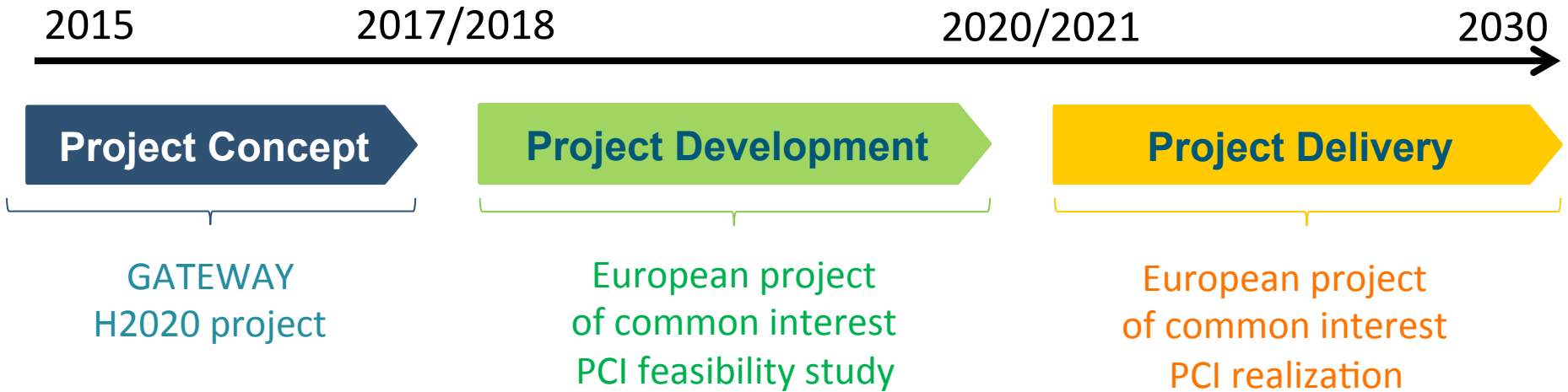
Duration 2 years

Budget 787 k€

6 Partners



GATEWAY implementation plan



Project concept

Discovery

Idea generation

Scoping

Project selection

Building business case

Product analysis

Building the business plan

Building the project plan

Feasibility review

GATEWAY
Communication plan

Interaction with strategic initiatives, stakeholders, and decision makers



Pre-screening

Choice of Pilot case

Evaluation of Pilot case

Evaluation of business case

Evaluation of project plan

GATEWAY
Implementation plan

DG1

DG2

DG3

DG4

DG5

Pilot Case Development

Scenario development

Pilot Case definition

Pilot Case analysis

Business case development

Pilot Case project plan

Recommendations

Technology

Market analysis

Legal requirements

Public perception

Funding model

Identifying alternatives
Defining KPI's

Screening
and definition

Detailed analysis

Business plan

Planning actions

Pre-feasibility

Month
(approx.)

1-6

6-10

10-20

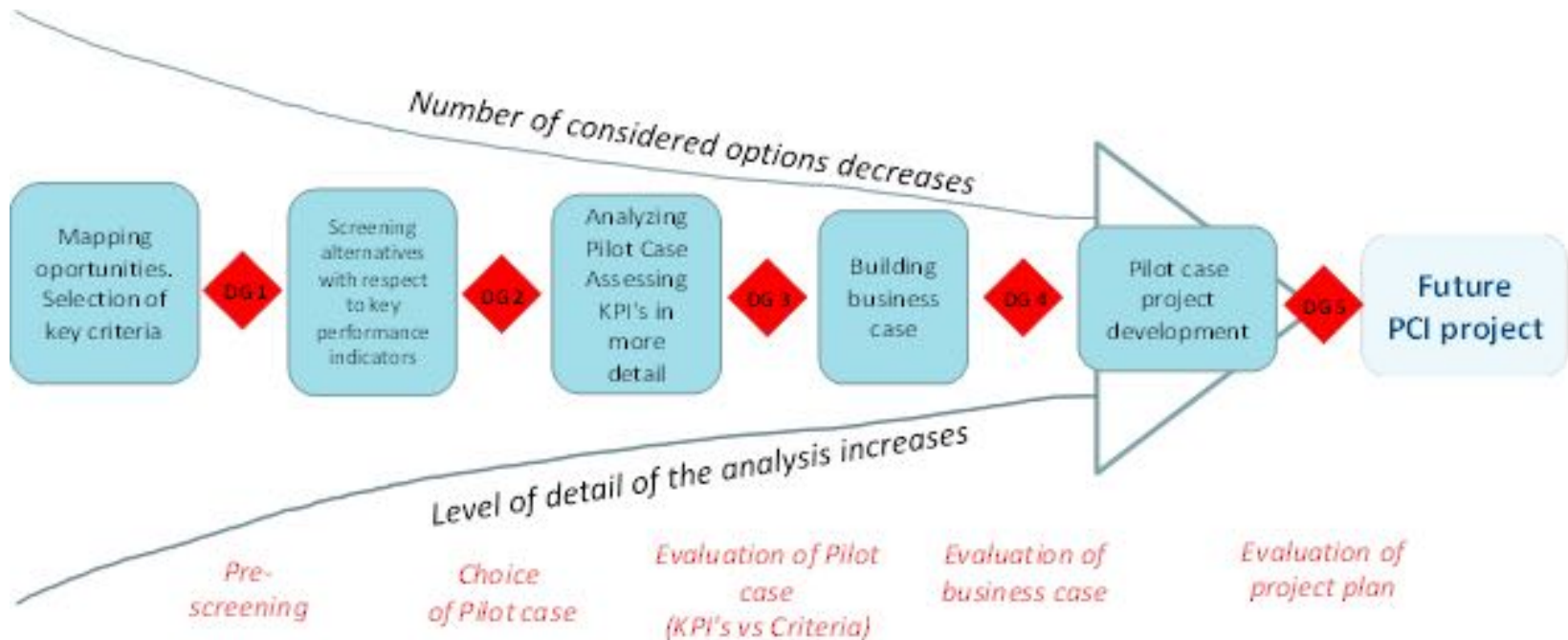
20-23

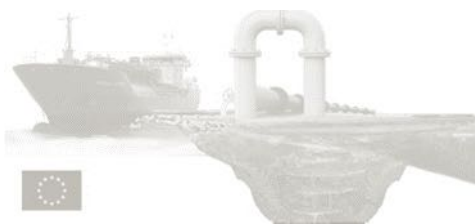
20-23

23-24



GATEWAY Process of Pilot case definition, evaluation, selection, and refined definition





Looking back



Timeline M1-M9

M1 June 2015 - Project kick off (Brussels)

M4 Sept 2015 - COM meeting on PCI (Mileu report)

M5 Oct 2015 - Decision gate1 WS (Amsterdam)

M6 Nov 2015 - Public kick off (Brussels)

M9 Febr 2016 - Decision Gate 2 WS (Amsterdam)

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Scenario development (Identifying alternatives, Defining KPIs)

Pilot case definition (Screening and definition)





Where are we now ?



Issues

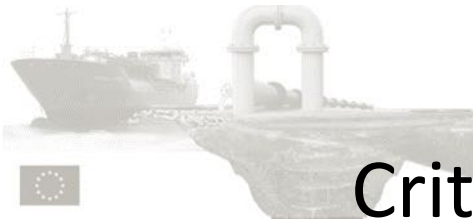
Criteria for selecting a Pilot Case

Scoring and selection of a Pilot Case

Dialogue with NSBTF, EUCOM, ZEP,
Stakeholders

Stakeholder dialogue





Where are we now ?



Criteria for selecting a Pilot Case

Some of the work done

Legal issues – by Rahpael Heffron, Queen Mary

PCI issues – by TNO

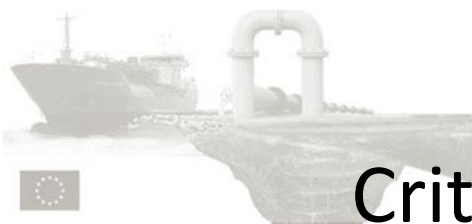
Public perception – by Diana Schumann, FZJülich

Pilot Case description- German Backbone

Pilot Case description – UK Norway

Pilot Case description – ROAD Extension to UK SNS





Where are we now ?

Criteria for selecting a Pilot Case



TNO report

H2020 Gateway: Pilot case definition

CO₂ Antwerp – Rotterdam (CAR) Pipeline

Date 12 January 2016

Author(s) Tom Mikunda, Joris Koorneef (TNO)

WP2 Derisking – Innovation and techno-economic validation
Action plan for Task 2.1: Public perception of CO₂ infrastructures

Subtask according to project proposal	Specific activity	Status	Termination date	Dependencies on other WPs
Part 1: Review of European public perception studies pertaining to CO ₂ transport	Systematic literature search in order to identify and select the studies relevant for the review	Completed		
	First evaluation of the selected studies	Completed	End of March 2016	
	Summary of the main results of the first evaluation of the selected studies	Under revision		
	Providing assumptions regarding the public perception of the alternative pilot cases based on the literature review	Completed		
	Providing criteria for the pilot case choice based on the literature review	Completed		
	Writing a review article to be submitted to a scientific journal – Part 1 of D2.1	In progress	End of May 2016	
Part 2: Design for assessing public perception of the pilot case	Defining the core elements needed for assessing the public perception of the pilot case	In planning	End of April 2016	Selection of the pilot case has to be
	More detailed description of the methods which should be applied in order to assess the public perception in the regions which would be affected by the pilot case – Part 2 of D2.1	In		

Legal Key Performance Indicators for CO₂ Transport

Raphael J Heffron – Energy and Natural Resources Law Institute, Queen Mary University of London

Overview of Legal Issues

The following tables consider the legal issues for carbon dioxide (CO₂) transportation in the European Union (EU) from a EU Member State (MS)

University of Leeds Contribution to GATEWAY
Overview and Status Update

Tim Cockerill

5 February 2016

Overview of modelling work

- The model allows us to generate realistic point to point pipeline routes, accounting for the cost/difficulty of crossing different types of terrain. In principle we could use this to develop more realistic portrayals of some of the pilot case routes currently presented as straight

Template – German Backbone

Key facts

Name of proposed PCI:	German Backbone Consortium
Name of possible PCI proponent:	D, Norway
MS/EEA involved (initial phase):	Power/industry sectors
Sources of CO ₂ :	30+ MtCO ₂
CO ₂ transported per year:	CNS oil fields
Proposed sink(s):	600 km
Distance between source/sink:	Pipeline
Form of transport:	1600 M€ (2015)
Estimated capital cost: M€ (2015)	*need to agree methodology
Estimated cost per tonne CO ₂ transported:	

Template – UK-Norway Pilot case

Key facts

Name of proposed PCI:	UK Cluster - Norway Consortium
Name of possible PCI proponent:	UK / Norway
MS/EEA involved (initial phase):	(power/industry sectors)
Sources of CO ₂ :	5 – 15 MtCO ₂
CO ₂ transported per year:	CNS oil fields
Proposed sink(s):	500 km
Distance between source/sink:	Pipeline
Form of transport:	800 M€ (2015)
Estimated capital cost: M€ (2015)	*
Estimated cost per tonne CO ₂ transported:	

Template – ROAD extension to UK SNS

Key facts

Name of proposed PCI:	Oil company consortium
Name of possible PCI proponent:	UK/NL
MS/EEA involved (initial phase):	Power/industry sectors and gas field
Sources of CO ₂ :	2.5 + 1.1 MtCO ₂
CO ₂ transported per year:	NL P15, P17
Proposed sink(s):	100 km
Distance between source/sink:	Pipeline
Form of transport:	160 M€ (2015)
Estimated capital cost: M€ (2015)	*need to agree methodology
Estimated cost per tonne CO ₂ transported:	



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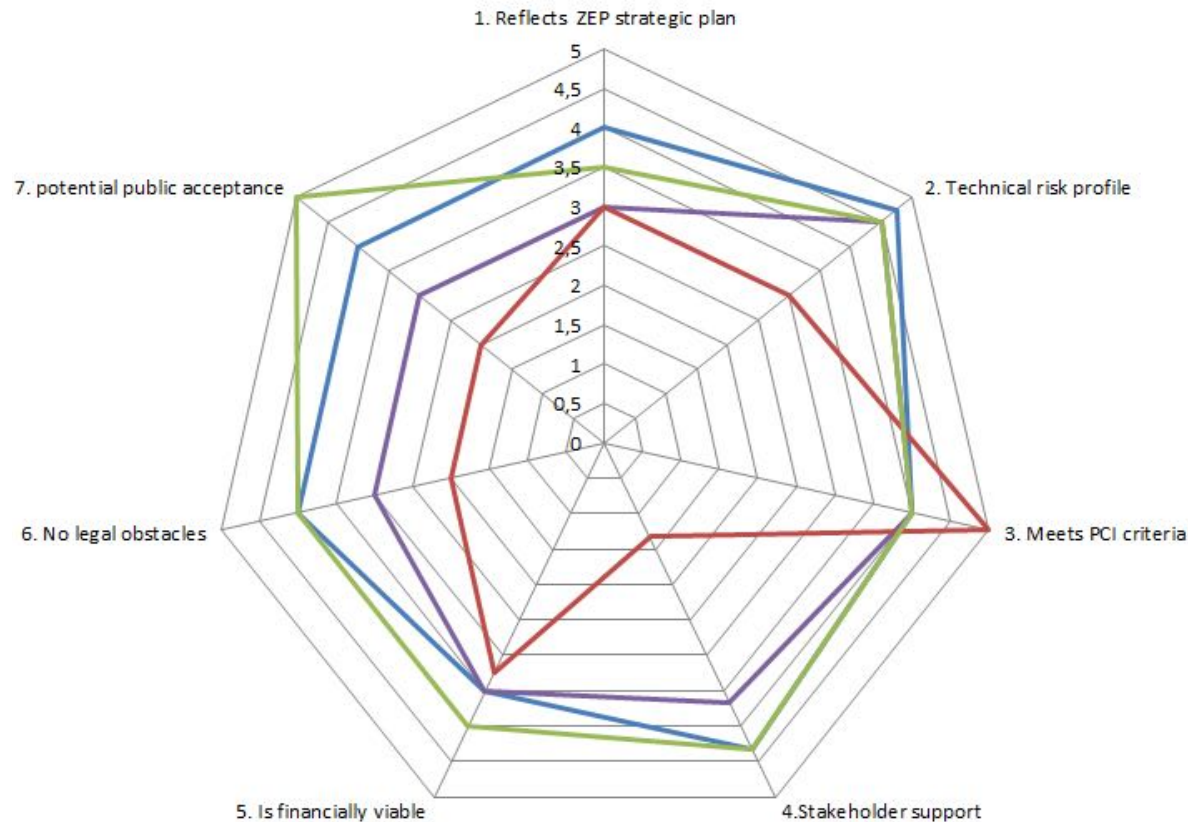




Where are we now ?



Scoring for selection of a Pilot Case





Where are we now ?



Dialogue with NSBTF, EU COM, ZEP, Stakeholders

NSBTF – Norway, Germany, Netherlands, UK (?)

EU COM – Meeting in March proposed

ZEP – Updating of strategy, ETIP

Other stakeholders – TAQA, Statoil, ROAD, CLIMIT, Others





EXTRA SLIDES



Where are we now ?



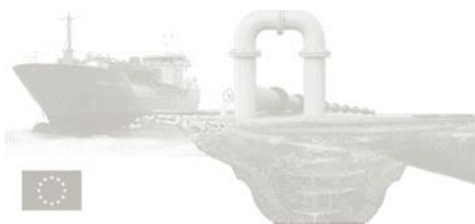
Stakeholder Advisory Group (SAG)

In DoW 'Policy Advisory Committee'

Members: External Stakeholders

Not separate SAG meetings – but Stakeholder Workshops – like Kick Off





Planning ahead



Timeline

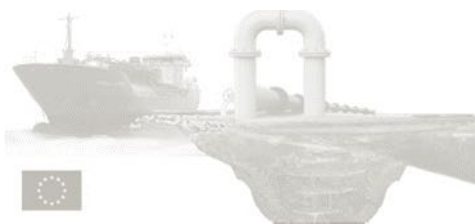
M10 March 2016 – EU COM/GATEWAY meeting (?)

M11 April 2016 – NSBTF meeting incl. GATEWAY

M13 June 2016 – External stakeholder WS

M13 June 2016 – Final Pilot Case Decision (?)





Planning ahead



Timeline

M10 March 2016 – EU COM/GATEWAY meeting (?)

M11 April 2016 – NSBTF meeting incl. GATEWAY

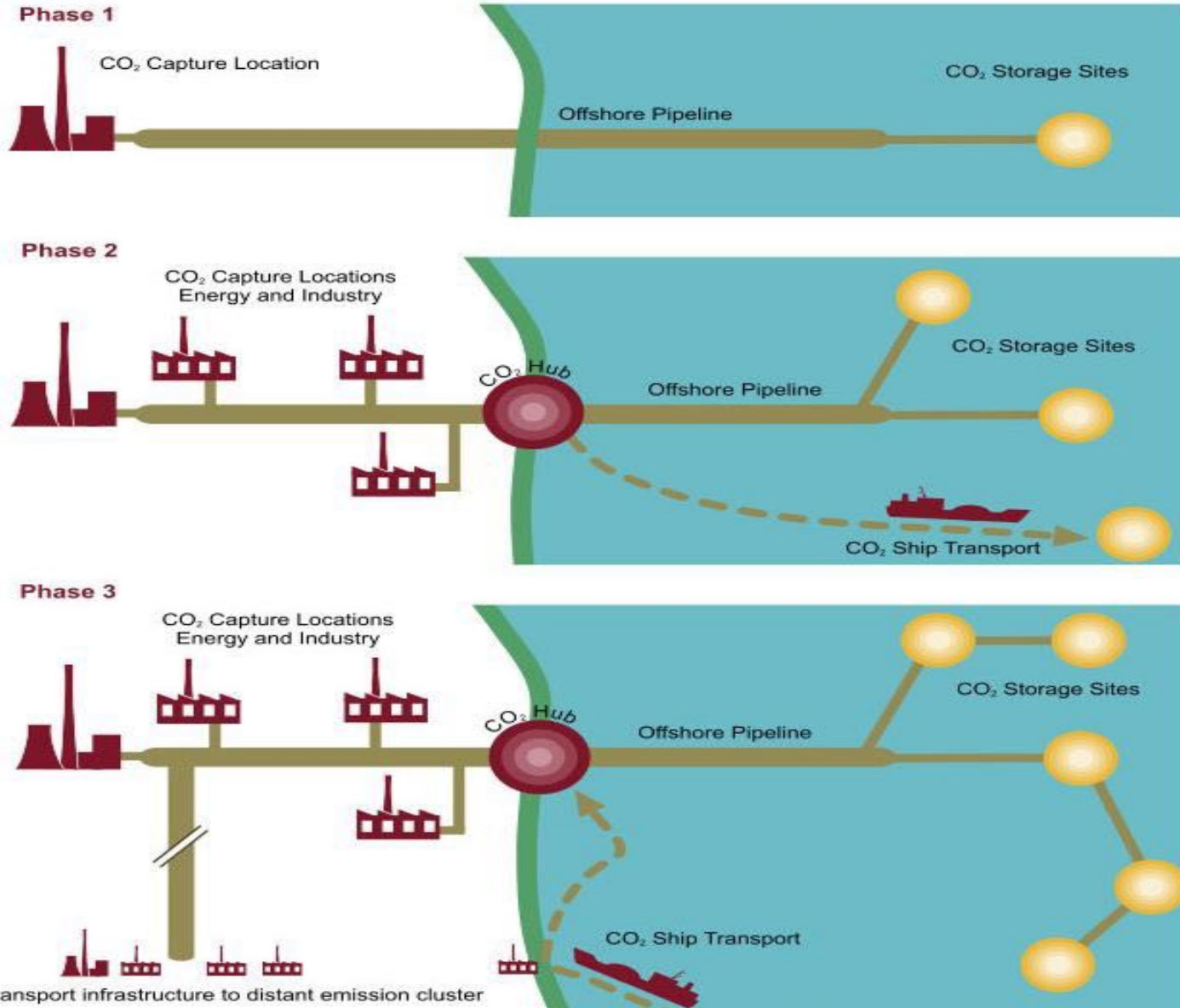
M13 June 2016 – External stakeholder WS

M13 June 2016 – Final Pilot Case Decision (?)



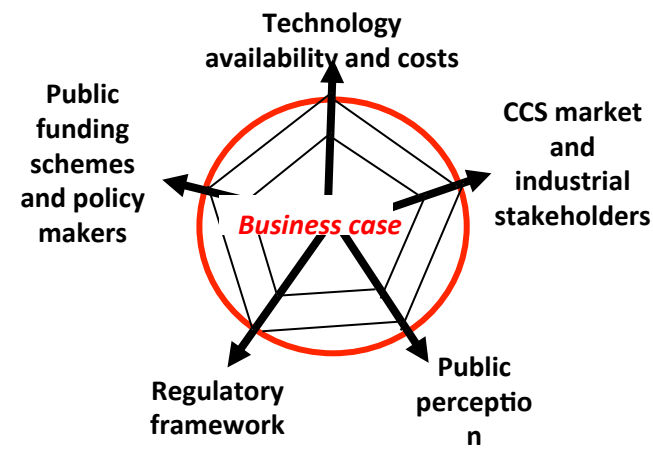
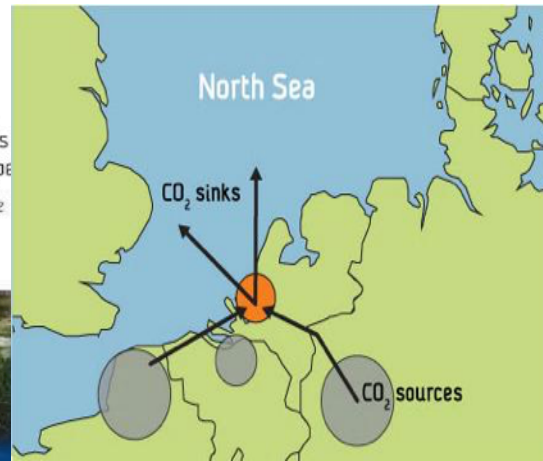
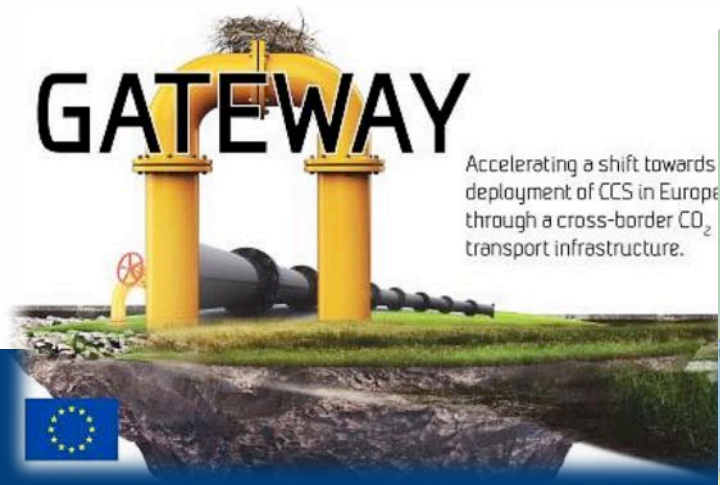
An Executable Plan for enabling CCS in Europe

ZEP report September 2015



GATEWAY objectives directly respond to the ZEP Executable plan

1. Provide a Pilot case for establishing European CO₂ transport infrastructure
2. Define a subsequent Project of Common Interest (PCI)
3. Align the stakeholders interests and engage member states strategies
4. Develop a business case for the Pilot Case project
 - address the risks and propose measures for de-risking
 - assess the funding needs and propose possible financing mechanisms



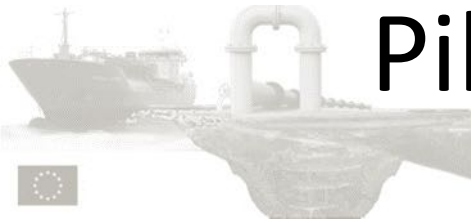


Pilot case suggestions - Criteria



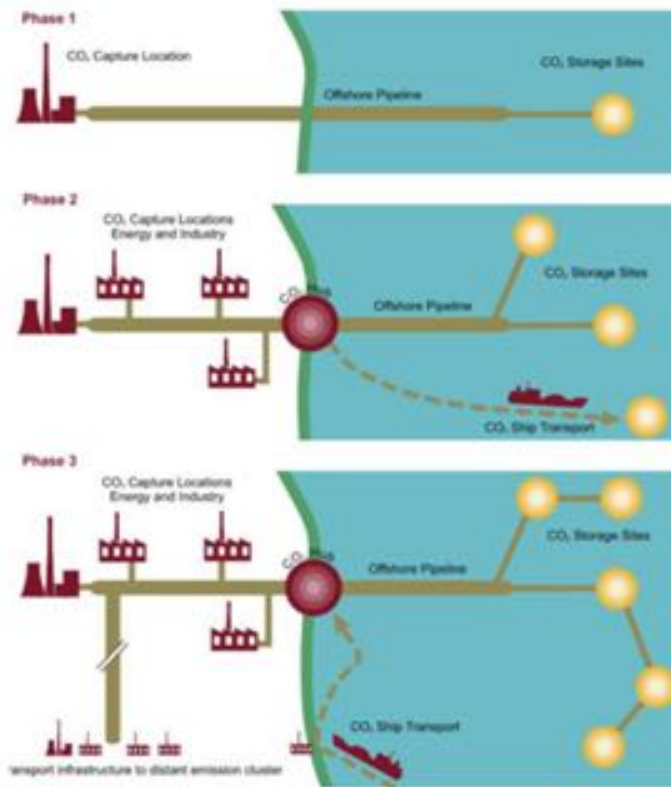
- Meet the PCI criteria
- Serve key CO₂ areas of Europe
- Provide the seed for further European CCS
- Have commercial and political support
- Absence of legal or public opinion “showstoppers”
- Key clusters of potential sources
- Routes to seed further CCS projects
- Supportive stakeholders
- Commercial drivers



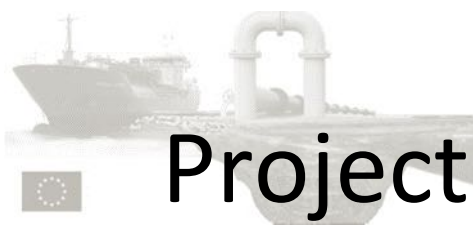


Pilot case suggestions

Some candidates

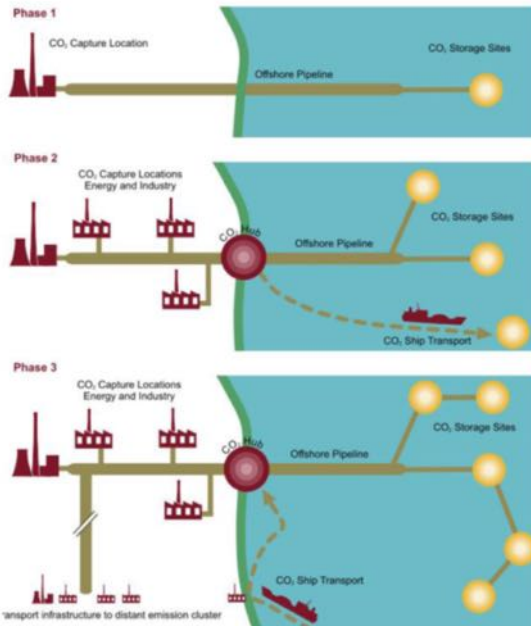


1. ROAD Extension
2. UK Cluster EOR - Norway
3. German Backbone



Project PCI / Development Potential

- *Supportive and cohesive regional cluster*
- *Medium sized project to seed the North Sea EOR opportunity, increased supply security, deferred decommissioning, increased tax revenues*
- *Benefits from new-build CCS framework*



Phase 1: *Cluster / one field and back-up store*
Oversized strategic pipeline

Phase 2: *Developing cluster and second field opportunity*

Phase 3: *Expansion opportunities from further clusters, including Norway, and extension pipelines. Shipping opportunity from western Europe*



Project contact details

Marie Bysveen, project coordinator

Marie.Bysveen@sintef.no

(+47) 92 28 61 13

Jana P. Jakobsen

JanaPoplsteinova.Jakobsen@sintef.no

(+47) 90 84 77 46

Elisabeth T. Vågenes

Elisabeth.t.vagenes@sintef.no

(+47) 41 43 28 84

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