



Characterisation of European CO₂ storage

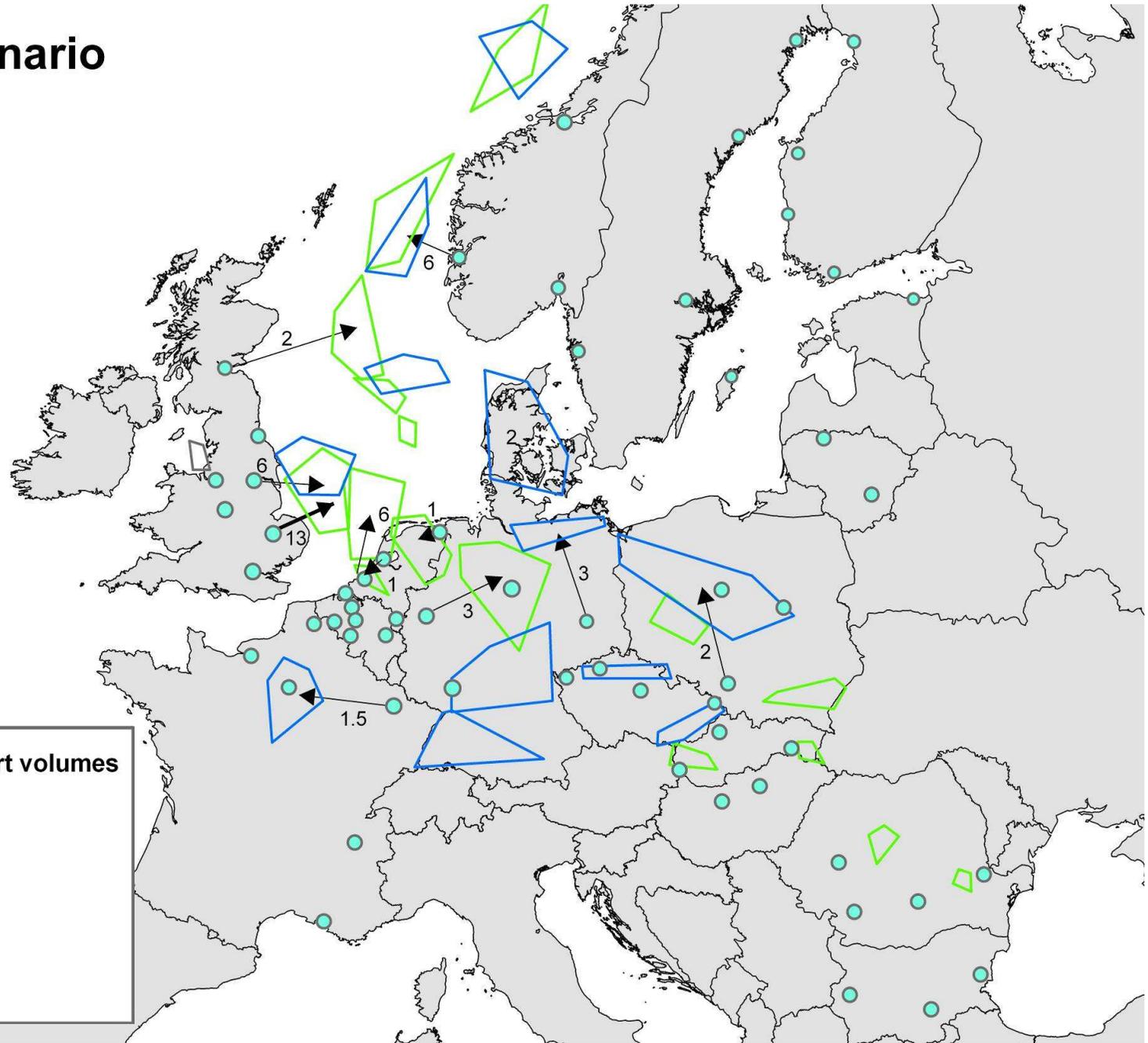
SiteChar First Workshop The SiteChar workflow

Reference scenario 2020

~ 40 Mt/yr


CO₂Europipe

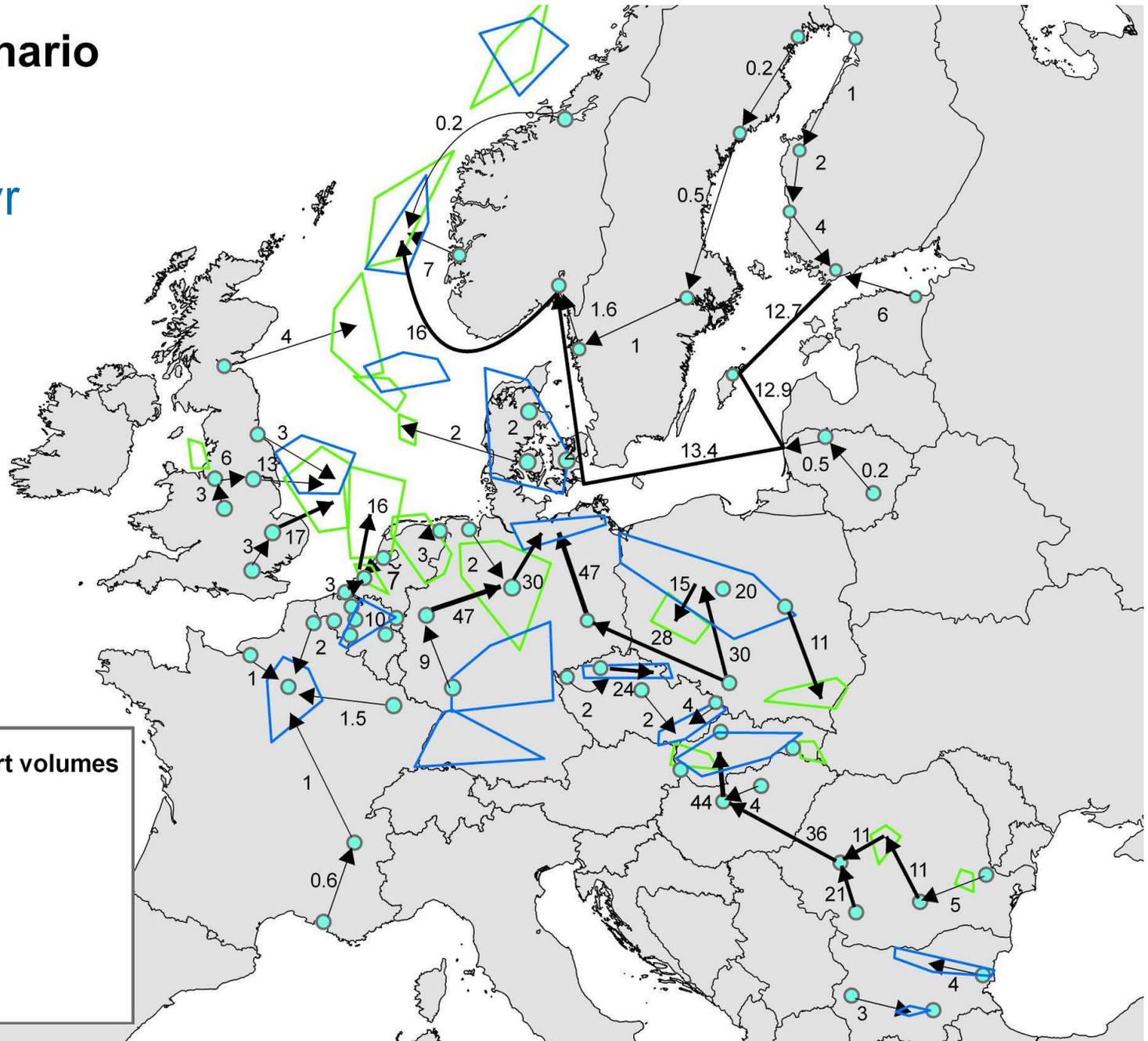
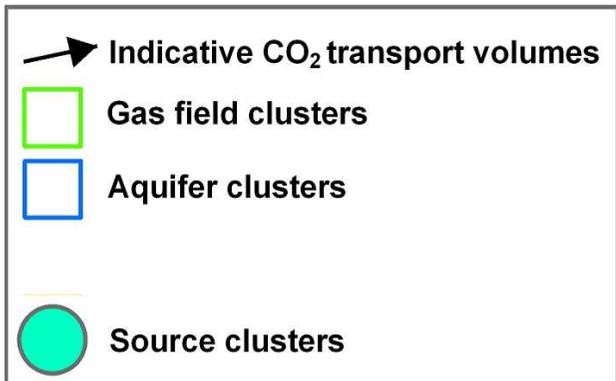
-  Indicative CO₂ transport volumes
-  Gas field clusters
-  Aquifer clusters
-  Source clusters



Reference scenario 2030

~ 400 Mt/yr


CO₂Europipe





Site Characterisation

- **Need portfolio of qualified sites...**
 - Planning (future-proofing) infrastructure
 - Improve business case for CCS projects

- **... across EU...**
 - Key players in capture, transport, storage

- **... and we need it now**
 - Timeline first assessment – first injection ~10 years
 - Must prepare for post-demo phase



SiteChar: site characterisation study

- **Aim: define workflow for feasibility studies**
 - Use experience from recent feasibility studies
 - Align with EU storage directive

EUROPEAN COMMISSION
DG RESEARCH

SEVENTH FRAMEWORK PROGRAMME
THEME 5 - Energy
ENERGY.2010.5.2-1: CCS - storage site characterisation

 Collaborative Project – GA No. 256705



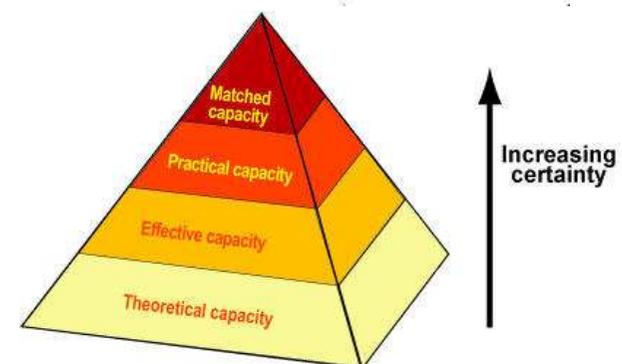
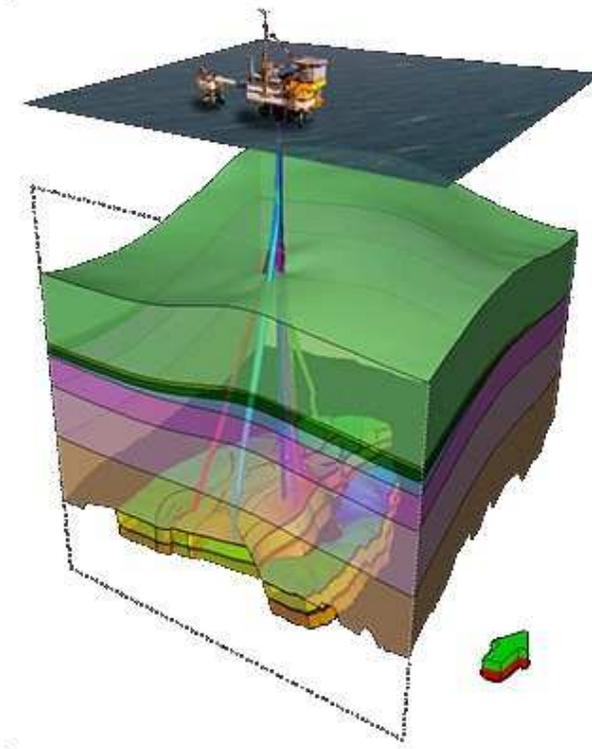
SiteChar
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Deliverable N° D1.2
Draft site characterisation workflow

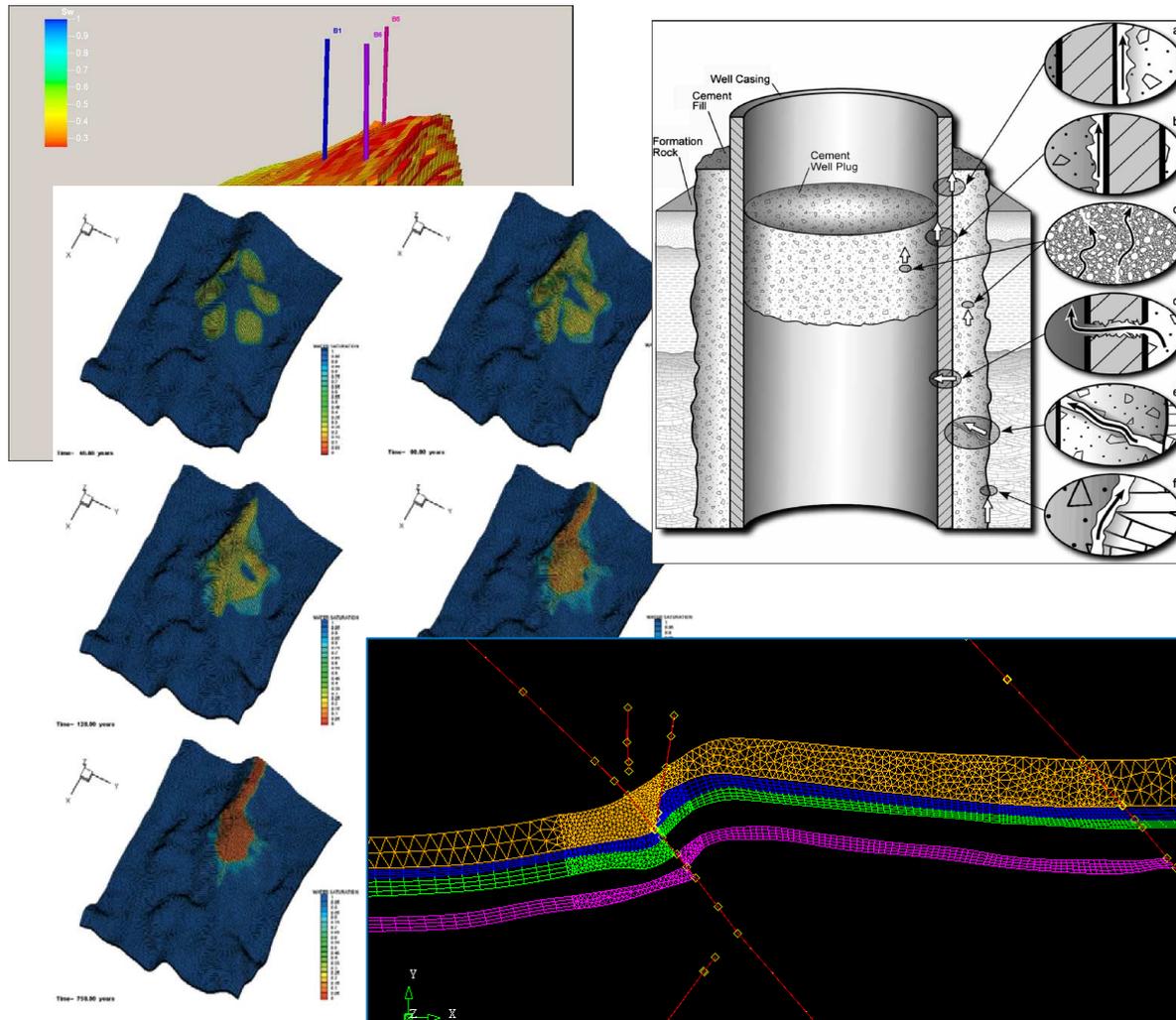
Deliverable No.	SiteChar D1.2
Deliverable Title	Draft site characterization workflow
Nature	Report
Dissemination level	Public
Lead Beneficiary	TNO
Written By	Filip Neele (TNO), Florence Delprat-Jannaud (IFPEN), Oliver Vincké (IFPEN), Valentina Volpi (OGS), Manuel Nepveu (TNO), Cor Hofstee (TNO), Jens Wollenweber (TNO), Ane Lothe (SINTEF), Susanne Brunsing (ECN), Jonathan Pearce (BGS), Anne Battani (IFPEN), Axelle Baroni (IFPEN), Bruno Garcia (IFPEN)
Due date	April 2011 delivered on 5 th October 2011

Purpose workflow

- To **discuss** the work
 - Discussions between operator and authority
- To **focus** the work
 - Focus on high-risk aspects
- To **speed up** the work
 - *Many* qualified sites required for development of CCS



Elements of a characterisation workflow



EU Storage Directive

L 140/114 EN Official Journal of the European Union 5.6.2009

DIRECTIVE 2009/31/EC OF THE EUROPEAN PARLIAM AND OF THE COUNCIL

of 23 April 2009

on the geological storage of carbon dioxide and amending Council Directive 89/103/EEC, European Parliament and Council Directives 2000/60/EC, 2001/180/EC, 2004/17/EC, 2006/119/EC and Regulation (EC) No 1013/2006

(Text with EEA relevance)

THE EUROPEAN PARLIAM AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 17(5) thereof,

Having regard to the proposal from the Commission,

Having regard to the opinion of the European Economic and Social Committee (1),

After consulting the Committee of the Regions,

Acting in accordance with the procedure laid down in Article 251 of the Treaty (2),

Whereas:

- (1) The ultimate objective of the United Nations Framework Convention on Climate Change, which was approved by Council Decision 94/9/EC of 13 December 1993 (3), is to stabilise greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.
- (2) The Sixth Community Environment Action Programme established by Decision No 1400/2002/EC of the European Parliament and of the Council of 21 July 2002 (4) identifies climate change as a priority for action. This programme recognises that the Community is committed to achieving an 8% reduction in emissions of greenhouse gases by 2005 to 2012 compared to 1990 levels, and that, in the longer term, global emissions of greenhouse gases will need to be reduced by approximately 70% compared to 1990 levels.
- (3) The Commission Communication of 10 January 2007 entitled 'Limiting global climate change to two degrees Celsius – The way ahead for 2020 and beyond' clarifies that

in the context of the envisaged global reduction of greenhouse gas emissions of 50% by 2050, a reduction in greenhouse gas emissions of 10% in the developed world by 2020 is required, rising to 40%-60% by 2050, that this reduction is technically feasible and the benefits far outweigh the costs, but that, to achieve it, all mitigation options must be harnessed.

(4) Carbon dioxide capture and geological storage (CCS) is a leading technology that will contribute to mitigating climate change. It consists of the capture of carbon dioxide (CO₂) from industrial installations, its transport to a storage site and its injection into a suitable underground geological formation for the purpose of permanent storage. This technology should now serve as an incentive to increase the share of fossil fuel power plants. Its development should not lead to a reduction of efforts to support energy saving policies, renewable energies and other safe and sustainable low carbon technologies, both in research and financial terms.

(5) Preliminary estimates, carried out with a view to assessing the impact of the Directive and referred to in the impact assessment of the Commission, indicate that seven million tonnes of CO₂ could be stored by 2020, and up to 160 million tonnes by 2050, assuming a 20% reduction in greenhouse gas emissions by 2020 and provided that CCS obtains private, national and Community support and proves to be an environmentally safe technology. The CO₂ emissions avoided in 2030 could account for some 15% of the reductions required in the Union.

(6) The Second European Climate Change Programme, which was established by the Commission Communication of 9 February 2005 entitled 'Winning the Battle Against Global Climate Change to prepare and execute future climate policy in the Community: the way ahead for 2020 and beyond' (5), identifies climate change as a priority for action. The Working Group published a detailed report on the topic of regulation, which was adopted in June 2006. It stressed the need for the development of both policy and regulatory frameworks for CCS and urged the Commission to undertake further research into the subject.

(1) OJ C 27, 3.2.2009, p. 75.

(2) Opinion of the European Parliament of 17 December 2006 (not yet published in the Official Journal) and Council Decision of 8 April 2006.

(3) OJ L 31, 7.2.1994, p. 11.

(4) OJ L 242, 10.9.2002, p. 1.

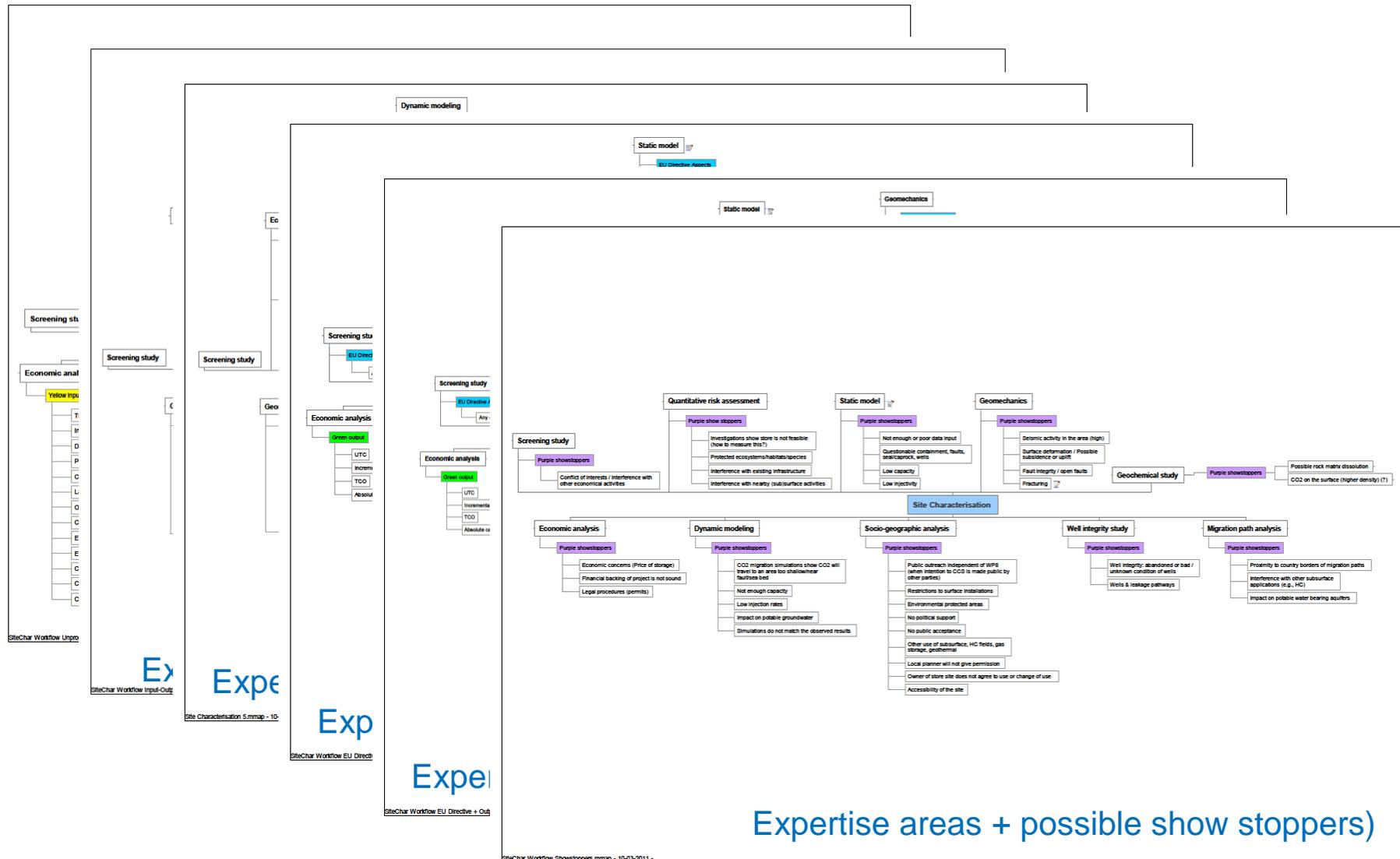


Site Characterisation Workflow

- **The EU Storage Directive...**
 - Requires many aspects to be considered / studied
 - Does not prescribe the level of detail
 - Does not prescribe method
- **The SiteChar workflow...**
 - Shows how elements of characterisation study contribute to EU SD list of aspects
 - Shows links between elements of characterisation study
 - Emphasises need for cooperation between areas of expertise (experts) in characterisation study



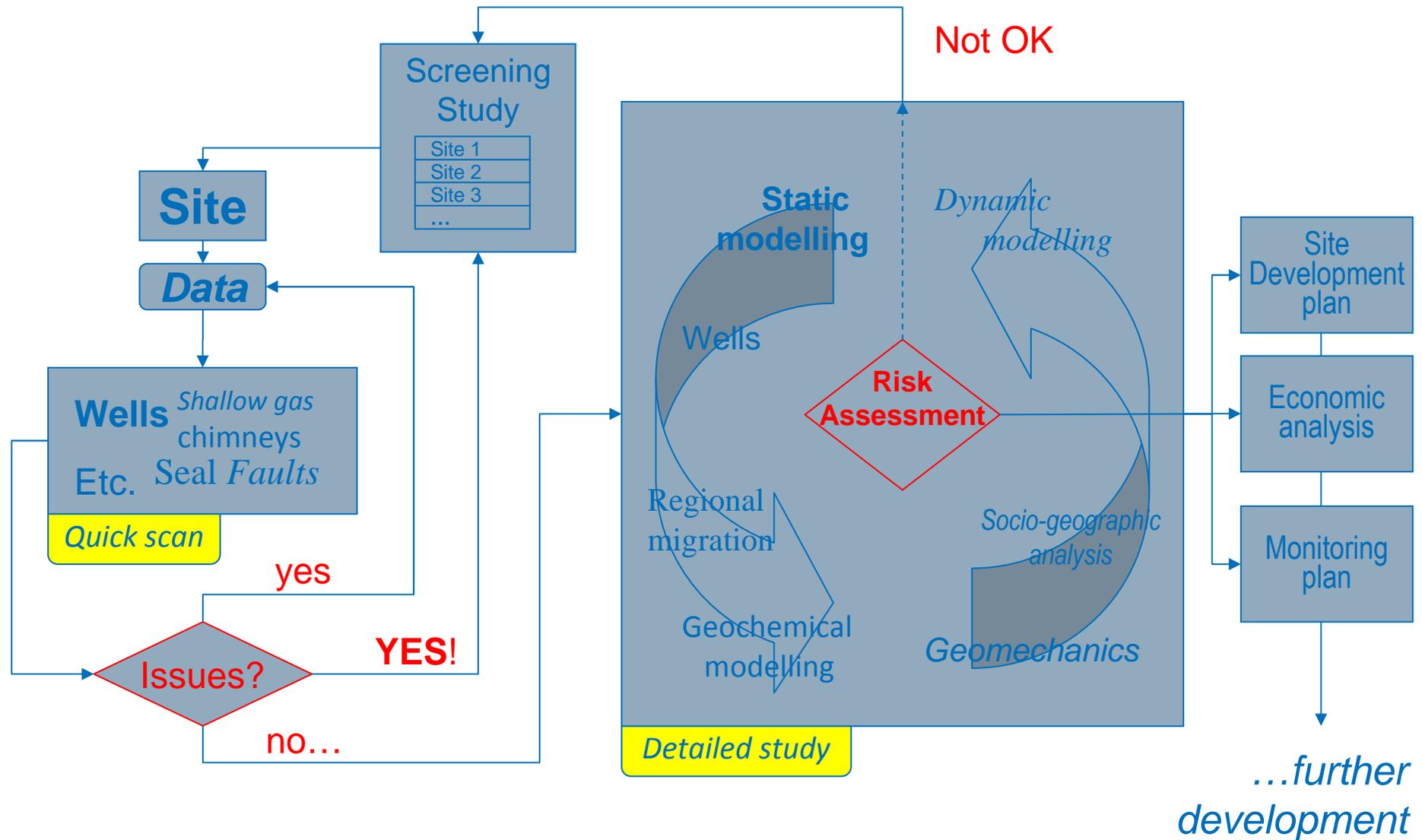
Elements of characterisation study



Expertise areas + possible show stoppers)



Workflow – graphical representation





Workflow – draft now available

- **Public report**
- **Updated during the project**
 - **With experience from SiteChar sites**
- **Final version at end of project**
 - **Q3 2013**

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