Update from the working group on CO_2 standards, ICM Forum, European Commission

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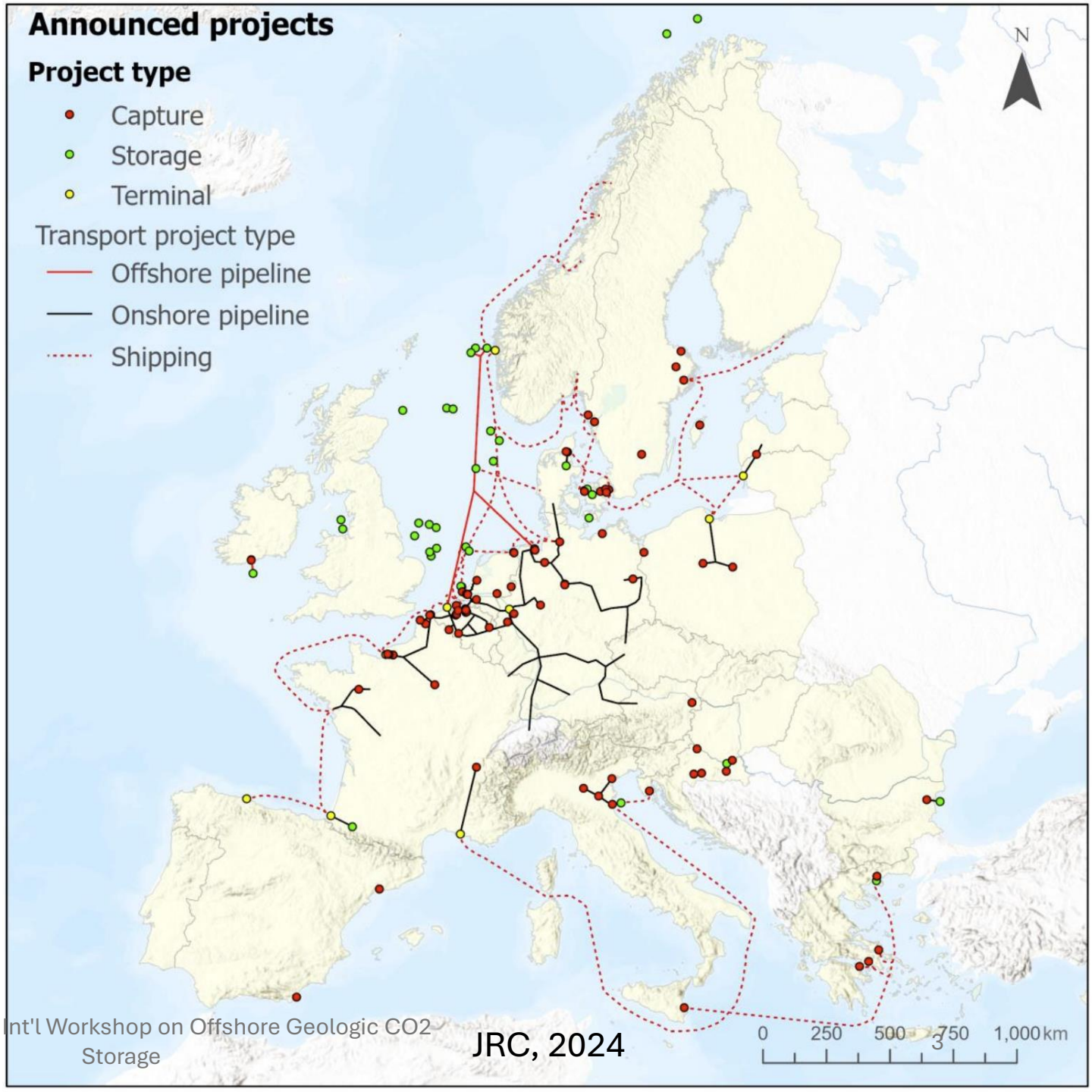
ICM Forum

- ICM Forum: industrial carbon management forum
  - Stakeholder consultation platform (previously ‘CCUS Forum’)
  - Created in 2021 by European Commission to support the Industrial Carbon Management Strategy (ICMS)
  - Four working groups (for previous reports see EC system)
    - CO_2 infrastructure
    - CO_2 standards
    - Public perception
    - Carbon capture and utilisation
  - Working groups guided by informal mandate from EC
    - Mandate and working groups renewed (typically) on yearly basis

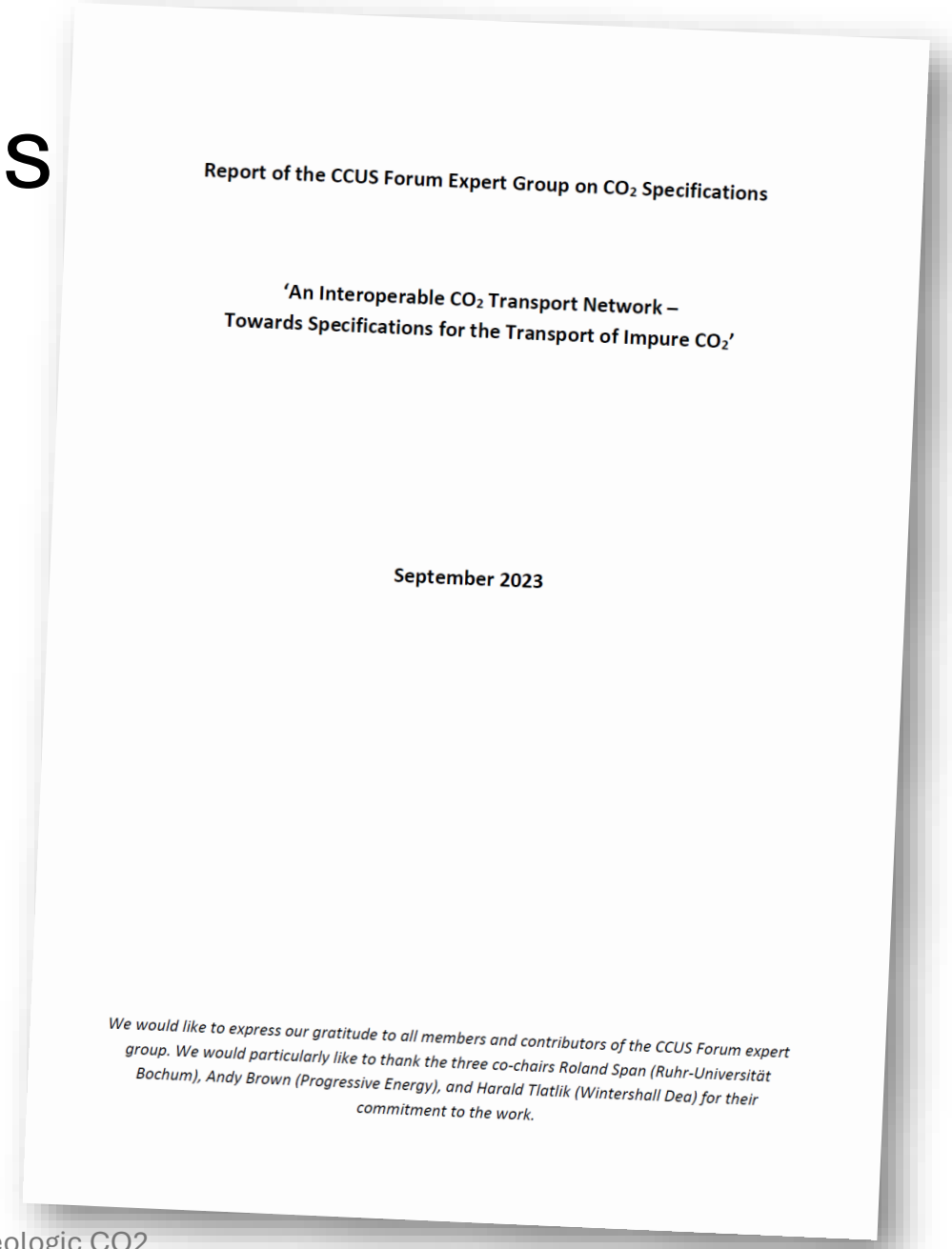
ICM Forum – WG on CO_2 standards

- Current developments show a good number of CCS projects developing across Europe
- Projects are likely to merge or link – CO_2 specifications from early projects may spread to later projects
- CO_2 specifications are an urgent issue
- The WG will ***not*** propose a standard for CO_2 stream composition



Working group CO_2 standards

- Previous WG report (September 2023)
  - An Interoperable CO2 Transport Network – Towards Specifications for the Transport of Impure CO2
    - State of knowledge of properties of CO_2 mixtures
    - Recommendations on further steps
      - Scenario building – which capture – transport – storage scenarios are likely?
      - Several issues and topics to be explored through R&D



Report of the CCUS Forum Expert Group on CO_2 Specifications

'An Interoperable CO_2 Transport Network –
Towards Specifications for the Transport of Impure CO_2'

September 2023

We would like to express our gratitude to all members and contributors of the CCUS Forum expert group. We would particularly like to thank the three co-chairs Roland Span (Ruhr-Universität Bochum), Andy Brown (Progressive Energy), and Harald Tlatlik (Wintershall Dea) for their commitment to the work.

Work stream 1

Current status

a. Existing and proposed specifications
- Europe, US, CA, other

b. Ongoing work on CO_2 standards
- ISO, CEN, DVGW C 260, ISO group on ship transport, etc.
- Current operational experience
- Current insight into chemical reactions, mixing streams
- Existing technologies for composition measurement

c. Discussion of differences
- Drivers of differences between existing / proposed specifications
- Emitters / capture systems involved
- Storage vs use

Result: overview of current specifications, drivers behind specifications, discussion / explanation of difference

Work stream 2

Future CO_2 networks in EEA

a. Transport networks in EEA (including growth scenarios)
   i. Example: Northern Lights
   ii. Example: Porthos
   iii. Example: CO_2 captured on-board ships

b. Expected modes of transport

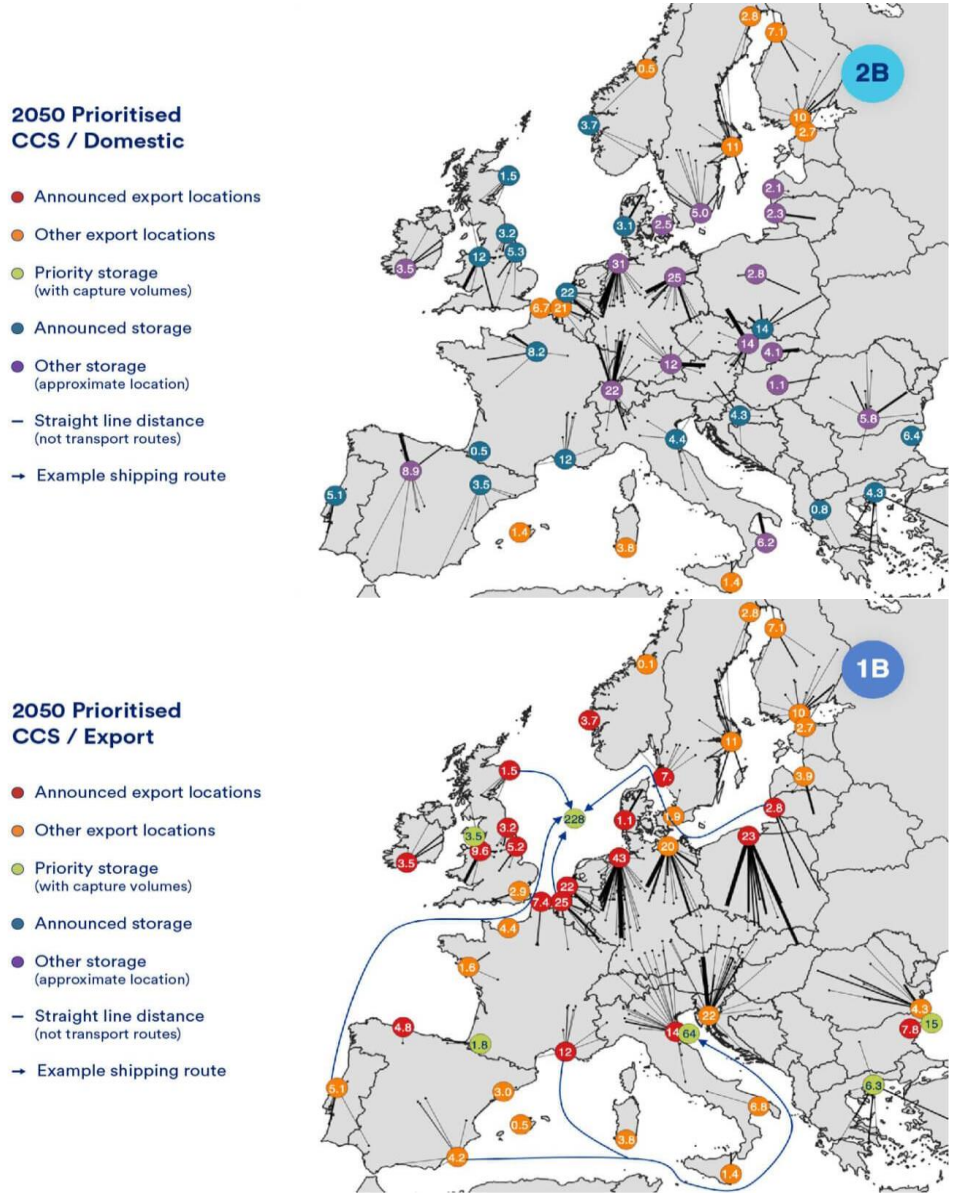
c. Coastal vs landlocked emitters or clusters of emitters

d. Expected forms of daisy chaining of transport modes

e. Choice of location of purification facilities

Result: insight into networks of the future, definition of (a set of) typical transport chains; need for and potential impact of EEA-wide standard

Close cooperation with WG on infrastructure



https://www.catf.us/resource/unlocking-europes-co2-storage-potential-analysis-optimal-co2-storage-europe/

Work stream 3

Future standardization needs

a. Long-term goals in Europe (building on workstream 2)
   - Interoperable networks and transport chains
   - Access to affordable transport and storage for emitters throughout EU
   - Drivers behind an EU-wide standard
   - Impact of standards (and of evolution of standards) in growing networks
   - Single vs multiple standards in the EEA
   - Timing of standardization

b. Challenges and opportunities in setting minimum quality standards (building on sections 2 and 3)
   - Required composition measurement
   - Multi-modal transport chains, cross-border networks
   - Cost effectiveness, integrity, interoperability
   - Discussion of cost impact and cost minimization
   - Purification costs (indication of cost of reducing concentration of hazardous impurities and chemically active impurities)

Result: insight in role of an EEA standard (network code) in the development of EEA infrastructure; insight in challenges and opportunities when defining an EEA standard

Work stream 4

Recommendations / conclusions

a. Summary of findings (building on workstreams 1-2-3)
b. Summary of challenges (plus recommendations how to overcome them)
c. Recommendations

Result: recommendations for EEA approach to CO2 standardisation / network code(s), a clearer view on future networks and the need for and impact of an EU-wide standard

Way forward

- Work is ongoing towards the ICM Forum event in Pau, France
  - October 10-11
  - Presentation of first results

- Present final report to EC by end of 2024

WG – CO2 standards: Schedule

18.07.
Ext. WG meeting
09:30

04.09.
Ext. WG meeting
14:00

16.09.
Ext. WG meeting
14:00

24.09.
Ext. WG meeting
13:00

10. + 11.10.
Meeting in Pau

End 2024

1. Introduction from the Commission
2. Presentation of the co-chairs
3. Presentation of the mandate
4. Ways of working in the WG
5. Next steps & calendar

Draft report

Final report

WG CO_2 standards

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