

Injection Projects Group

Updated Specifications UNFC-2019



RESOURCE MANAGEMENT WEEK
2024



UNECE

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Updated UNFC-2019 Specifications applied to Injection Projects for the purpose of Geological Storage



United Nations ECE/ENERGY/GE.3/2024/9

 **Economic and Social Council** Distr.: General
27 March 2024
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Economic Commission for Europe
Committee on Sustainable Energy
Expert Group on Resource Management

Fifteenth session
Geneva, 22-26 April 2024
Item 7 (b) (v) of the provisional agenda
Decision support: Development and deployment of the United Nations Framework Classification for Resources: Applications: Injection projects

Supplementary Specifications for the application of the United Nations Framework Classification for Resources (Update 2019) to Injection Projects for the Purpose of Geological Storage

Prepared by the Injection Projects Working Group of the Expert Group on Resource Management

Summary

This document outlines the Supplementary Specifications for the Application of the United Nations Framework Classification for Resources (Update 2019) (UNFC (2019)) to Injection Projects for the Purpose of Geological Storage. The intended use of these Specifications is in conjunction with UNFC (2019). It supersedes and replaces the Specifications for the Application of the United Nations Classification for Fossil Energy and Mineral Reserves and Resources 2009 (UNFC-2009) to Injection Projects for the Purpose of Geological Storage, which were released on 30 September 2016.

These Specifications are submitted to the Expert Group on Resource Management at its fifteenth session for approval.

- Injection Projects Task Force started in 2010 (focus on injection and long-term geological storage of CO₂).
- Application of UNFC-2009 to Injection Projects published in 2016 (Focus on CCS / CO₂-Storage projects).
- Updated application of UNFC-2019 to Injection Projects pending approval of EGRM-15. Stronger emphasis on temporary storage projects for renewable energy carriers (e.g. underground hydrogen storage).
- UNFC Project maturity principles are generally applicable to Injection Projects, yet technical & social-economic-environmental challenges may differ from extractive activities.
- UNFC-2019 specifications can be bridged to SPE-SRMS (considered in a next UNFC-document).



Structure of the Specifications document



Preface

Acknowledgements

I. Introduction

II. Injection Projects Definitions

A. General Definitions

B. Project Definition

C. Geological Storage Resource Definition

D. Product Definition

E. Projects with Multiple Storage Products

F. Quantities Stored

1. Quantities for Long-term Storage Projects
2. Quantities for Temporary Storage Projects

G. Reference Points

H. Project Lifetime

1. Phases in the Project Lifetime
2. Project Lifetime Constraints

I. Access to Storage Resources

J. Access to Market

K. Corporate versus National Resource Reporting

L. E-Axis Categories

1. Treatment of Policy Support
2. Considerations for Market Conditions
3. Considerations for Category E3 – Non-Viable Projects
4. Considerations for suspended projects

M. F-Axis Categories

1. Distinctions between and considerations for F2 and F3
2. Considerations for Category F4 – New Technologies.
3. Remaining Storage Resources

N. G-Axis Categories

1. Classifying known versus prospective Storage Projects
2. Probability of discovery for Potential Storage Resources

O. Evaluator Qualifications

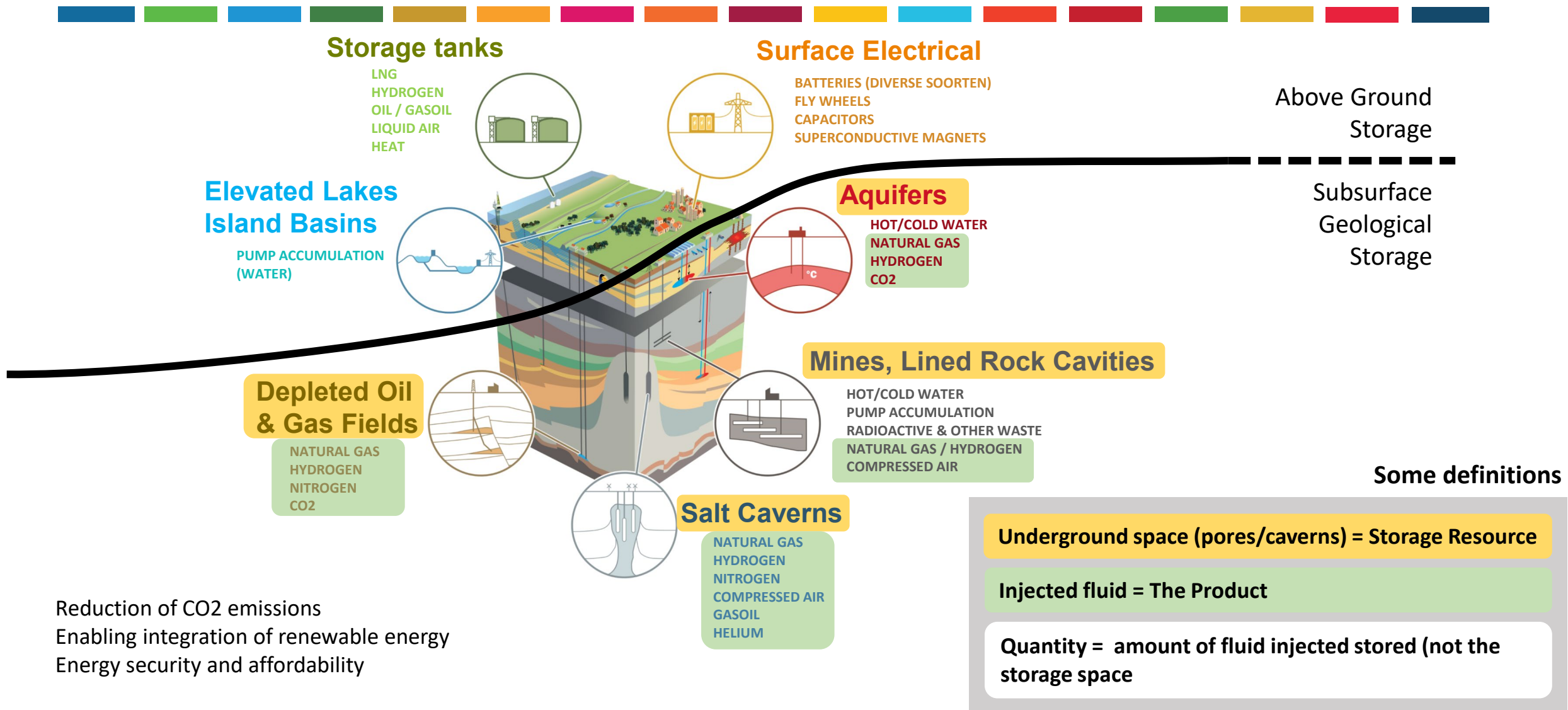
P. Units

Q. Reporting a Project Classification

Annex I E/F/G Table

Annex II Glossary of Terms in the Context of Injection Projects for Geological Storage

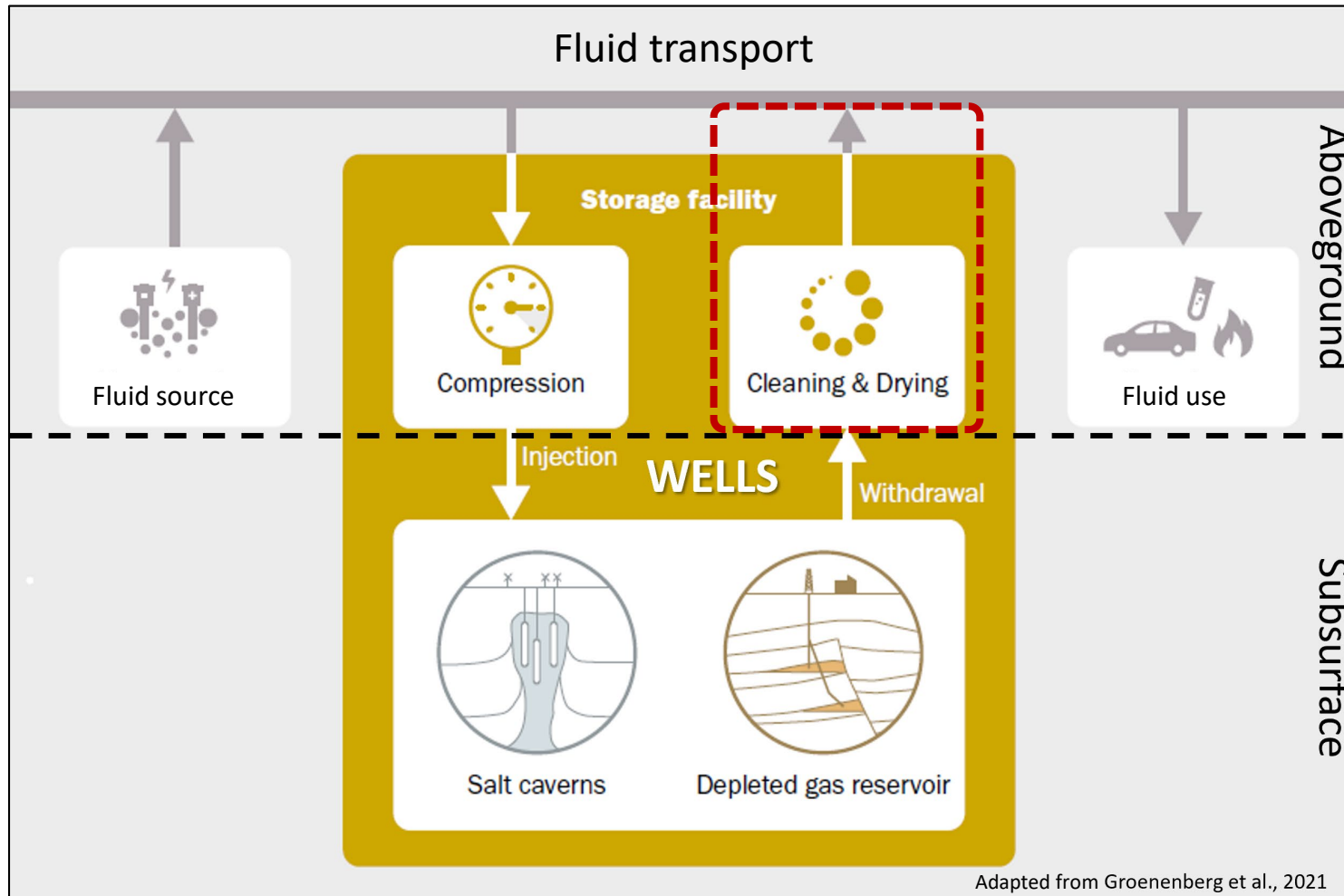
Geological Storage and Injection Scope



Reduction of CO2 emissions
 Enabling integration of renewable energy
 Energy security and affordability



Storage Project Definition and Boundaries



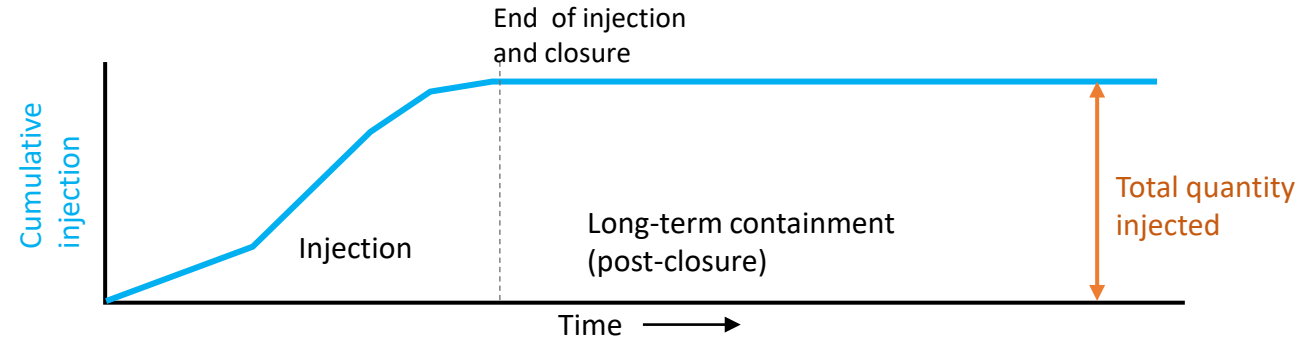
Adapted from Groenenberg et al., 2021



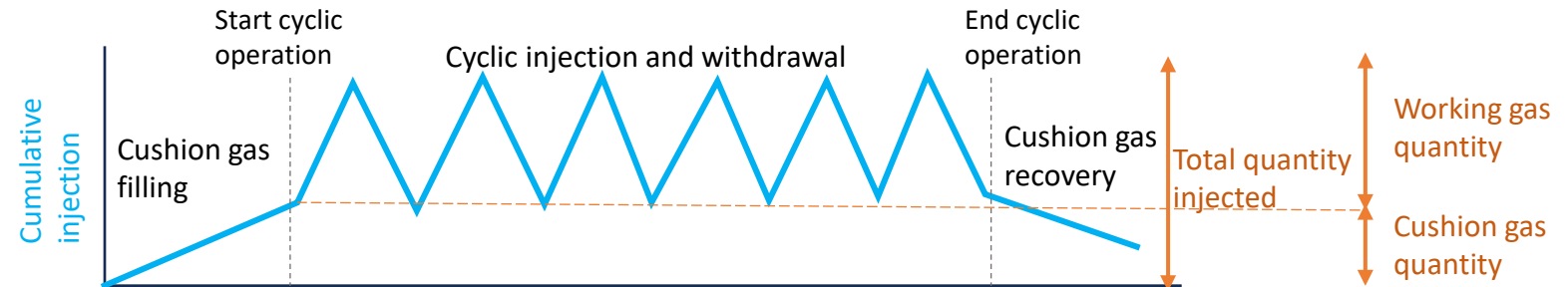
Storage Profiles Injection (and withdrawal)



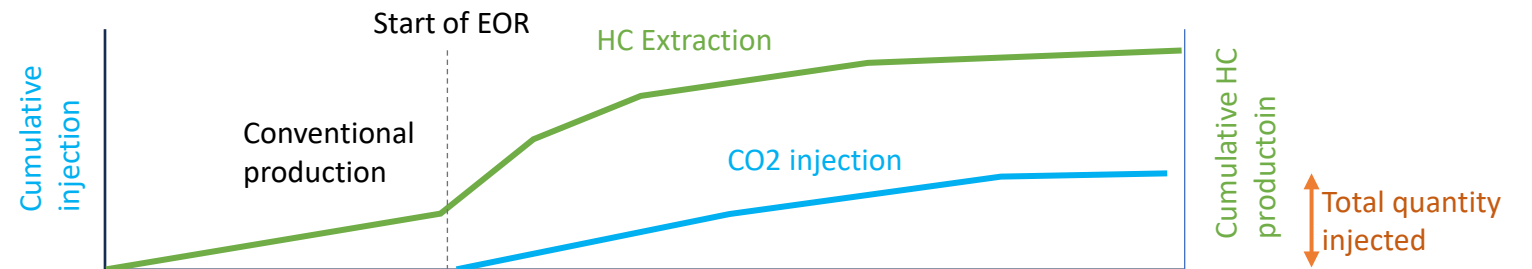
Permanent storage (e.g. CO₂)



Temporary storage (e.g. H₂, Nat.Gas)

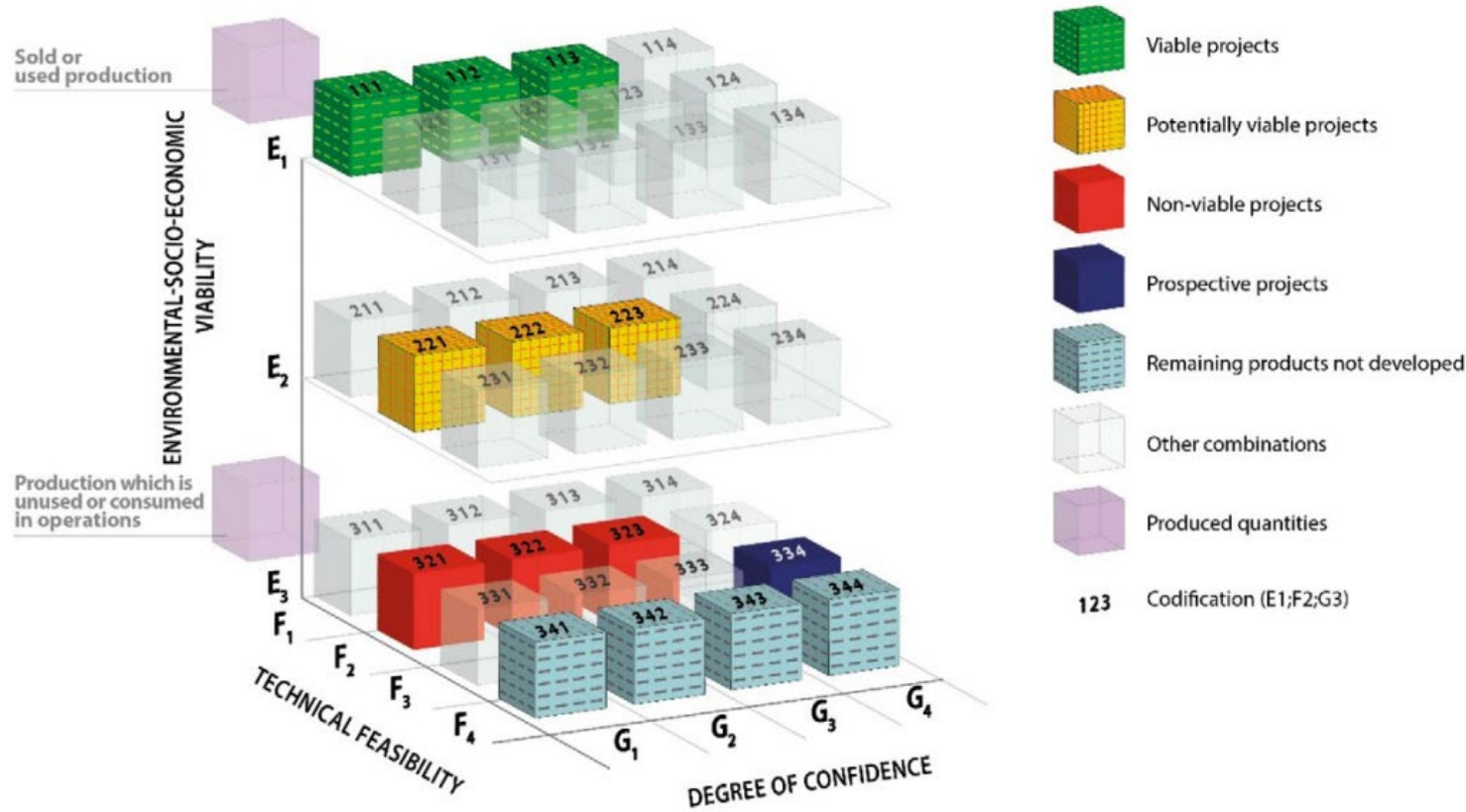


Enhanced hydrocarbon extraction (e.g. EOR)



Storage Project Classification

UNFC Categories and Examples of Classes



Storage space discovered and developed

Storage space discovered and awaiting further studies and appraisal to justify development

Storage space not yet discovered by wells and requiring further exploration activities

Conceptual storage projects based on technologies that are still under research



Next Steps



- Bridging document to the SPE-SRMS classification and linking with ALIGN-CCUS Storage Readiness Levels
- Guidelines document with examples on how to practically use UNFC-2019 with different types of storage projects, possibly supported by real case studies:
 - Existing and emerging CO2 Storage projects
 - Natural Gas Storage (mature)
 - Hydrogen Storage (demonstrators and first commercial) including repurposing of existing UGS
 - European screening studies (prospective storage potential)

THE VIEWS EXPRESSED ARE THOSE OF [AUTHOR NAME AND/OR ORG] AND DO NOT NECESSARILY REFLECT THE VIEWS OF THE UNITED NATIONS.

Thank you!

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Chair Injection Projects Working Group

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Date 25 | 04 | 2024, Geneva



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Discussion (comments received)



- **Preface:** Additional clarifications on storage of “Renewable Energy Carriers”, what is then stored, what is the origin of hydrogen and which forms are considered
- **Preface:** Evidence on trends indicating expected demand for new storage project types (e.g. hydrogen storage)
- **Project Definition:** Clarification on reasoning behind considering CO2 and N2 injection for EOR projects and not water and steam
- **Project Definition:** Clarification on monitoring / monitoring wells being optional or mandatory
- **Project Lifetime:** Adding Environmental Assessment and Risk Assessments to preparatory phase
- **Project Lifetime Constraints:** Including Pressure Constraints, Environmental Constraints (e.g. surface impacts) as Technical Constraints
- **Project Lifetime Constraints:** Addressing issue of potential interacting CO2 plumes as a challenging Regulatory Constraints
- **Project Lifetime Constraints:** Addressing issue of Financial Assurance of operator for entire lifetime (also post-injection) as Economic and Regulatory Constraints

