ISO Update: TC265 - Geologic Storage of CO_2

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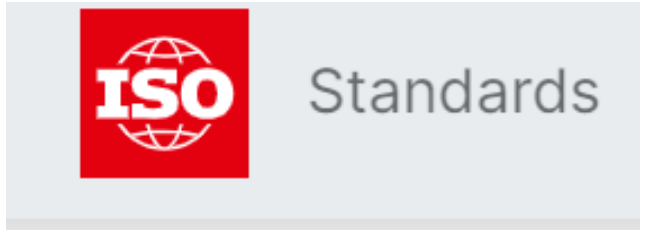
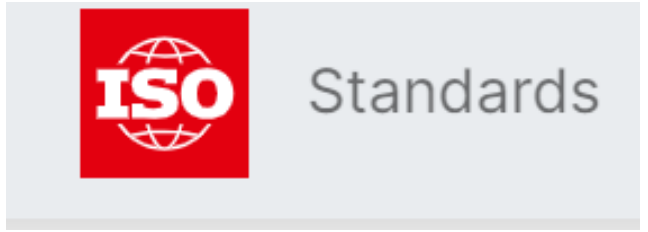
ISO Standards



- Standards
  - Developed based on a consensus of the members and revisable
  - Voluntary – not rules or laws; not mandated
  - If there is a regulation or law, the standard cannot be preferred. Standard may be incorporated or adopted into regulation, in whole or part
- Standard development
  - Technical Committees comprised of subject matter experts, write standards
  - Participating member countries approve standards
  - Standards reviewed to be revised/updated every 5 years
  - Standards are primarily taken into use by private stakeholders in project documentation
  - Countries may adopt the standards

Goals and Benefits of Standards

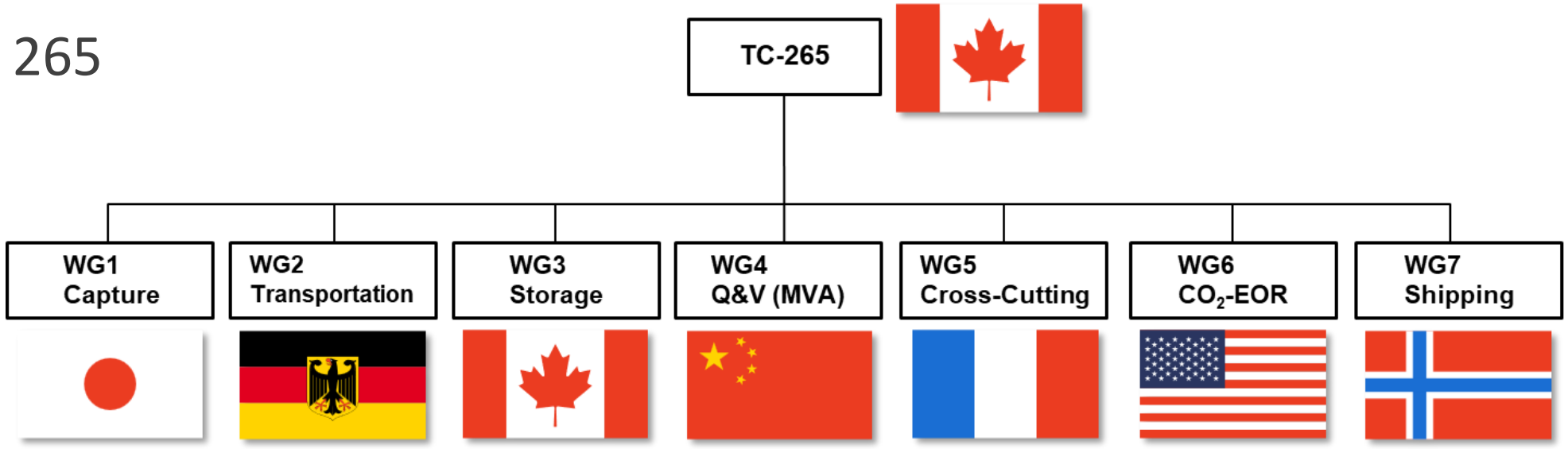


- Promote knowledge transfer and dissemination;
- Unlock legal challenges;
- Provide industry-driven guidelines;
- Enable incentives;
- Support viable public-private partnerships and allocation of risk and liability;
- Enable cost reductions and economic growth; and
- Support public acceptance and trust

ISO/TC 265 – Carbon Capture, Transportation, and Geological Storage

- In 2012, CSA successfully led the establishment and leadership of an ISO International Technical Committee for standardization in Carbon Capture and Storage (ISO/TC265 – Carbon Capture, Transportation, and Geological Storage).
- This was due, in large part, to the development of CSA Z741 on Geological Storage.
- Z741 – Geological Storage of Carbon Dioxide: establishes requirements and recommendations for the geological storage of carbon dioxide.
  - The purpose of these requirements is to promote environmentally safe and long-term containment of carbon dioxide in a way that minimizes risks to the environment and human health.
  - Developed by American and Canadian technical committee members over a period of 2 years, Z741 went on to become the seed document for ISO 27914

ISO/TC 265



25 Participating “P” Members

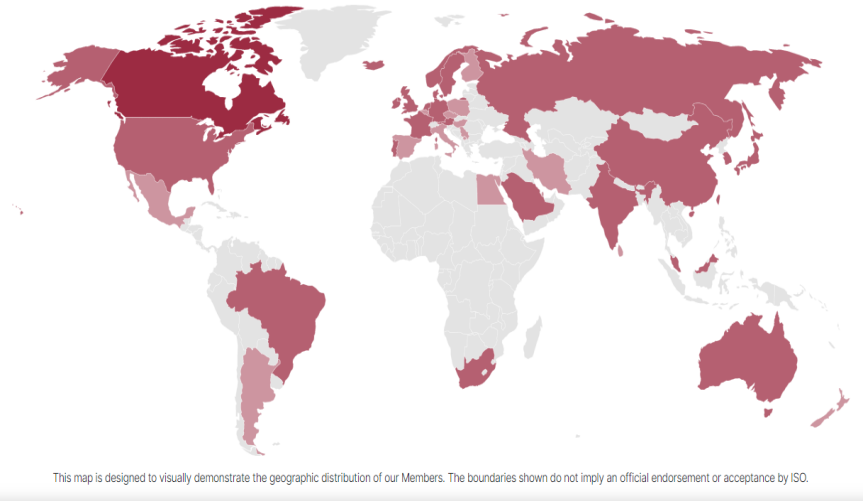
- Obligated to vote on all questions formally submitted for voting
- Standards organization of a country is the POC for the country

17 Observing “O” Members

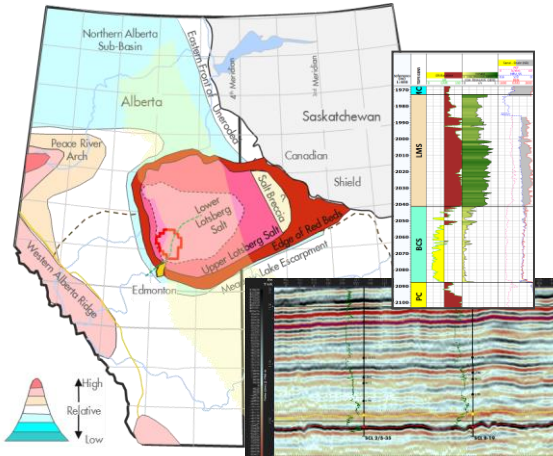
- Receive committee documents
- Right to submit comments & attend meetings

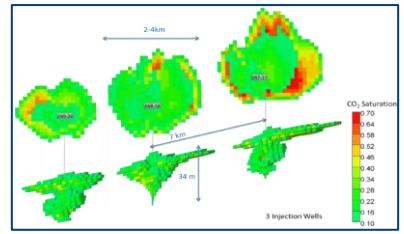
Liaisons

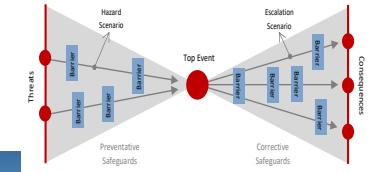
- Similar rights/duties to O members

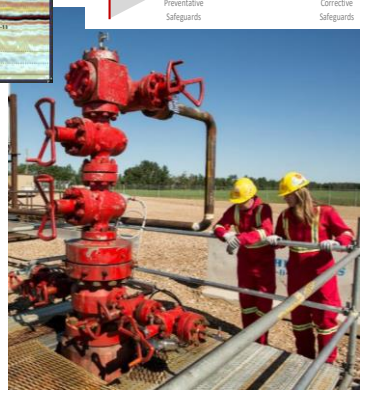


ISO/TC 265









Intent of TC 265:

- International Standards for the
  - design,
  - construction,
  - operation,
  - environmental planning and management,
  - risk management,
  - quantification,
  - monitoring and verification,
  - and related activities

  in the field of carbon dioxide capture, transportation, and geological storage.

- The focus is on CO_2 being emitted from large stationary point sources.

General Principles of ISO/TC 265 Standards

- Technology neutrality
  - No patented rights
  - No explicit descriptions of technology or product
  - Fits both onshore and offshore
- Regulatory neutrality
  - Performance-based rather than descriptive
  - No time periods specified
  - No criteria for reporting
  - No criteria for decommissioning
  - No explicit references to e.g., transfer of liability
- Complements other standards
  - TC 265 standards
  - Other ISO standards
  - Specific technical standards from other standardization bodies

FINAL DRAFT

INTERNATIONAL STANDARD

ISO/FDIS 27914

ISO/TC 265
Secretariat: SCC
Voting begins on: 2017-07-12
Voting terminates on: 2017-09-06

Carbon dioxide capture, transportation and geological storage — Geological storage

Capture, transport et stockage géologique du dioxyde de carbone — Stockage géologique

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

ISO

Reference number
ISO/FDIS 27914:2017(E)

TC265 – Published Standards

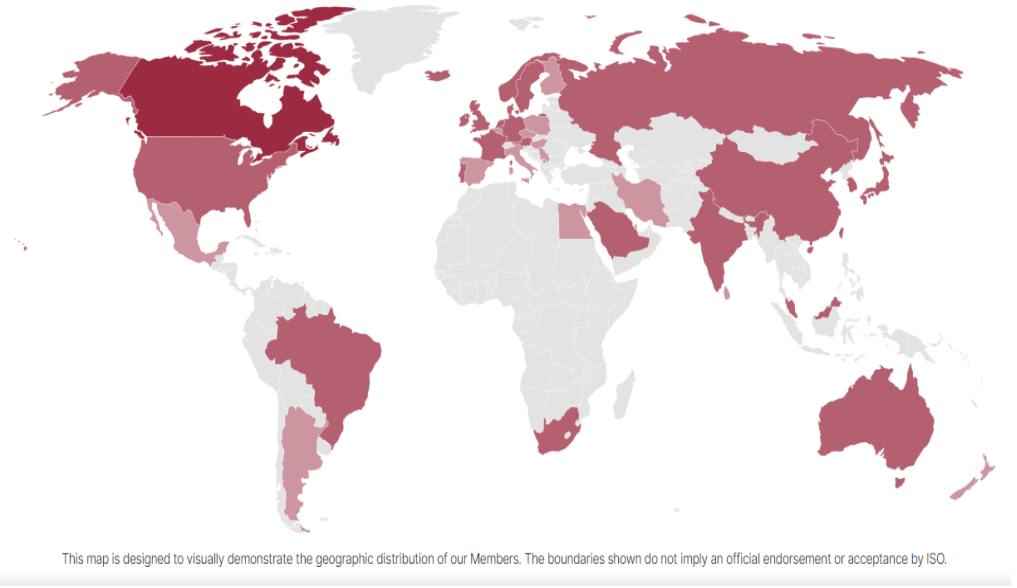
WG 1	Capture
WG 2	Transportation
WG 3	Storage
WG 5	Cross Cutting Issues
WG 6	EOR Issues
WG 7	Transportation of CO_2 by Ship

- ISO 27913 – Pipeline transport of CO2
  - Developed in 2016. Under revision
- ISO 27914 – Geological storage of CO2
  - Developed in 2017. Under revision, added scope: quantification and verification
- ISO 27916 – the storage of carbon dioxide using enhanced oil recovery
  - Developed in 2019
- ISO 27917 – Vocabulary for cross cutting terms
  - Developed in 2017
- ISO 27919-1 – Performance evaluation methods for post-combustion capture integrated with power plant
  - Developed in 2018
- ISO 27919-2 – Evaluation procedure to assure and maintain stable performance of post-combustion capture plant integrated with a power plant
  - Developed in 2021

How Standards are Used by Regulators

Many countries have a long tradition of referring to technical standards for performance-based framework

- Usually referred to as optional
- Offshore petroleum operations rely on a large number of standards for technical operations and HSE
- A number of existing standards and best practices for petroleum operations may be reused for offshore CCS
- CCS specific standards are already being referred to and taken into use



Some Examples

- USA – references standards and best practices in guidelines and frameworks

  - ISO 27916 standard referenced by the Internal Revenue Service as an available (non-mandatory) tool to obtain tax credits under the 45Q regime

- Norway – references standards and best practices in guidelines and not directly in the act or regulation
  - Regulations relating to safety and working environment for transport and injection of CO_2 on the continental shelf: guideline for assessing the well barriers to existing wells when storing CO_2 indicates that ISO 27914 should be used

- Canada – references standards and best practices in regulatory guidance and protocols
  - CCS Summary Report of the Regulatory Framework Assessment relied heavily on the experience provided by CSA 741, the seed document for ISO 27914

- European Union – the EU Taxonomy establishes a list of environmentally sustainable economic activities
  - For the exploration and operation of CCS storage sites in third countries, the activities must comply with ISO 27914

Revising the 27914 Standard for CO_2 Geological Storage

- ISO 27914 originally published in 2017
  - Purpose: to promote commercial, safe, long-term containment of carbon dioxide in a way that minimizes risk to the environment, natural resources, and human health
  - Covers:
    - Management Systems
    - Site screening, Selection and Characterization
    - Risk Management
    - Well Infrastructure
    - Injection Operations
    - Monitoring and Verification
    - Quantification and Verification (new scope added in 2022)
    - Site Closure
- Reopened for revision in 2022
  - Will be updated to incorporate experience and learnings since original publication in 2017
  - The planned timeline is 24 months for the revision
  - Expect to have draft ready in October, vote later in the fall