INNO-CCUS goals

This is a summary of the INNO-CCUS partnership goals from the Investment Agreement between INNO-CCUS and Innovation Fund Denmark. The full version is written in the Investment Agreement – 115000002B, p. 32-38.

The INNO-CCUS Partnership is established as a mean to secure a significant contribution to achieve the Danish government's climate goals on CO2 reduction, through CCUS solutions.
The Partnership has the ambition to achieve a fundamental change in the way we view, value, and use carbon resources to enable a complete shift of the current system from fossil-based to biogenic carbon sources.

This calls for dedicated research and development, prototype building, pilot testing and demonstration projects across the various technologies and focus areas of chemical capture, biological capture and storage, geological storage as well as utilisation. In addition, significant efforts are needed beyond technology development to support creation of the social, financial and legal frameworks required for successful CCUS rollout.

The Partnership will do this by:
• Engage national and international partners from the entire CCUS value chain
• Within the Partnership define high impact research and innovation needs in parallel with developing technology/solutions
• Secure a dynamic partnership towards 2050 to include the strongest and most active partners continuously
• Ensure the best pathway for demonstration realisation and implementation as technologies mature
• Ensure dissemination of knowledge gained in the Partnership to the benefit of the global CCUS community

The CCUS Partnership will generate the proper knowledge, networks, development, regulation, and support mechanisms required for realising the CO2-reduction, job creation, export, and environmental improvement opportunities represented in the CCUS roadmap. During the IFD funding period, the partnership will work towards the following high-level qualitative goals:

1) Build a value adding partnership where national and international partners from the entire CCUS value chain are engaged in the partnership.
2) Contribute significantly towards the 2030 and 2050 CO2 reduction goals, through CCUS solutions with technological, economical and societal considerations in place.
3) Strengthening green transition competencies within CCUS solutions.

Extending this, the following quantitative goals are defined for INNO-CCUS:

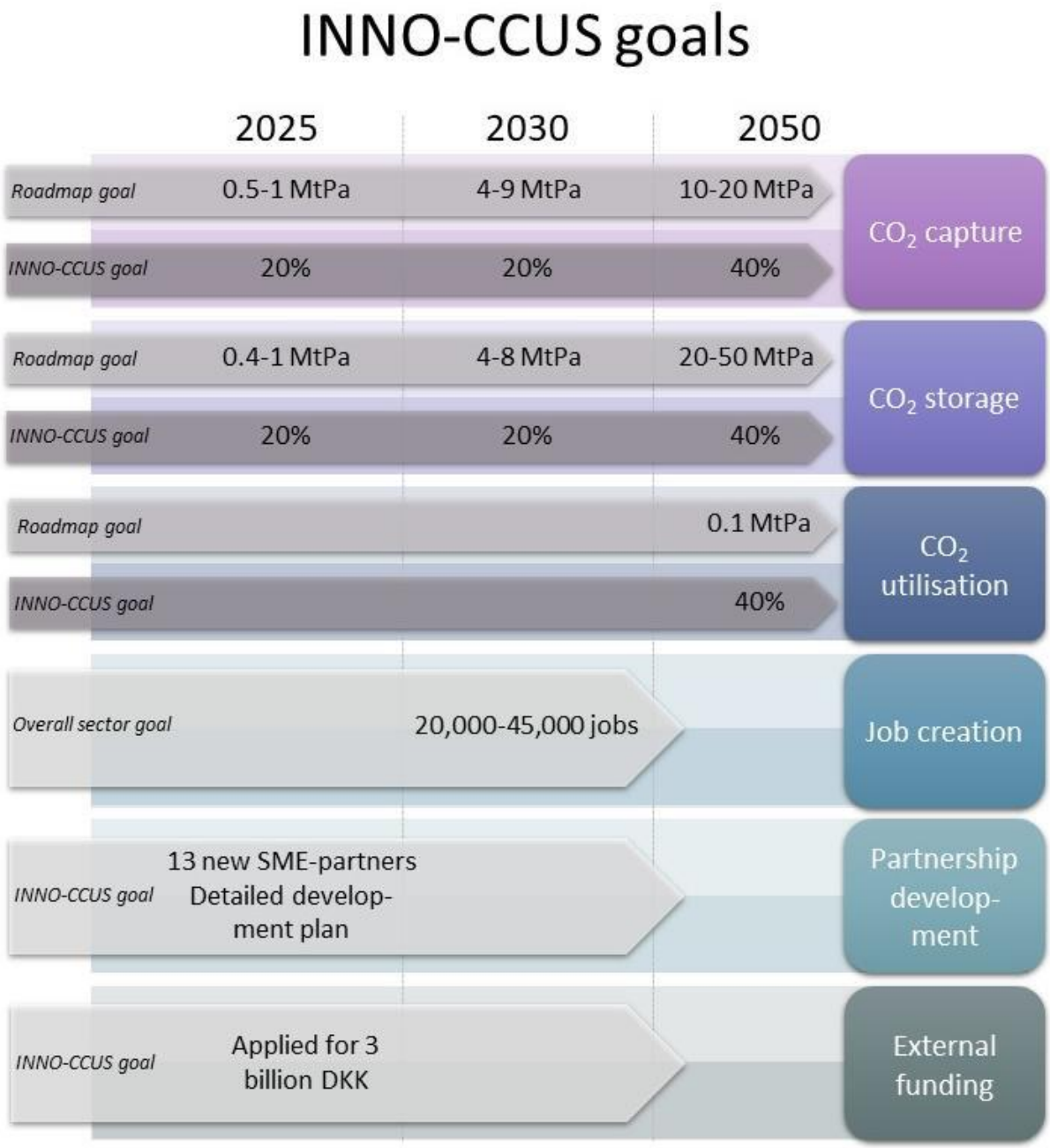

Figure 2 An overview of the technical and developmental goals for INNO-CCUS in 2025, 2030 and 2050.

CO2-capture

Existing technologies will be optimized regarding cost, efficiency, and environmental impact. Less mature technologies will be explored, developed, and compared to state-of-the-art solutions. If the activities in pool 1 and 2 is successful, we expect:

- a 10% increase in cost efficiency for chemical CO2 capture
- improved monitoring and validation methods for biological CO2 capture
- 20 % contribution (equal to 0.1-0.2 MtPa.) to CO2 capture in 2025
- 20% contribution (equal to 0.8-1.8 MtPa.) to CO2 capture in 2030
- 40 % contribution (equal to 4-8 MtPa.) to CO2 capture in 2050

CO2-storage
Different geological storage options will be explored and important tools for storage site validation will be developed. The goal is to:

- lower the operational cost of geological storage by 5% by securing more efficient injection processes and fewer shutdowns due to well impairment.
- improve the monitoring and validation methods to secure safe and sustainable long term biological storage
- 20% contribution (equal to 0.08-0.2 MtPa.) to CO2 storage in 2025
- 20% contribution (equal to 0.8-1.6 MtPa.) to CO2 storage in 2030
- 40% contribution (equal to 8-20 MtPa.) to CO2 storage in 2050

CO2-utilisation
The biggest potential for utilisation of large quantities of CO2 is related to Power-to-X applications. This is addressed in Innomission 2. Non-fuel applications are being addressed in INNO-CCUS. The goals are to:

- improve biogas upgrading and explore the potential for production of sustainable chemicals or materials from medium size sources at locations where neither storage nor transport infrastructure of CO2 is feasible.
- 40% contribution (equal to 0.04 MtPa.) to CO2 utilisation in 2050

Job creation
The overall sector goal is a job creation of between 20,000 to 45,000. That can be expected with the Danish ambition of capturing 4-9 Mtpa by 2030. The generated jobs will cover a wide variety of professions such as

- engineers researching and developing the necessary state-of-art technology
- geologists identifying suitable subsurface structures for permanent storage
- financial and legislative professionals creating and maintaining the necessary framework
- labourers putting words into action.

Biodiversity
All INNO-CCUS projects are designed to protect our climate and nature, and will do no harm to nature. An increase in biodiversity is expected especially from the projects in workstream 2, biological CO2 capture and storage. We will not focus specifically on biodiversity, but remain very conscious about ecosystems and sustainable land/sea use.