

We hereby provide information about our organisation with the intention to team up with other CCUS experts. We are interested in discussing new project proposals to upcoming ACT Calls related to subjects listed below.

## 1. Name of Institution

Institute for Energy Technology

## 2. Specialities field within CCS

**Storage:** Coupled geomechanical/reservoir modelling of CO<sub>2</sub> injection; geochemical characterization of rocks and fluids; batch and flow through experiments on fluid/rock interaction under reservoir conditions; development of monitoring methods from CO<sub>2</sub> on-shore and off-shore leakage, mineralogical characterization of reservoir rock (Material Characterization laboratory), characterization of storage reservoirs (Stable Isotope laboratory), modelling of seismic chimneys.

**Capture:** Development of novel energy and cost efficient processes and materials for CO<sub>2</sub> capture in both pre-/post-combustion power production and energy intensive industries; Energy use optimization in industrial processes and process integration.

**CO<sub>2</sub> quality and corrosion:** Through experiments and modelling determine the safe operation window (safe CO<sub>2</sub> specifications) for pipelines, ships and injection systems handling CO<sub>2</sub> with impurities. When do impurities react and form corrosive phases? What is the resulting corrosion rate? IFE has flow loop and autoclave systems that can operate at high CO<sub>2</sub> pressure (200 bar +) with accurate control (ppm level) of added impurities (H<sub>2</sub>S, O<sub>2</sub>, Sox, NO<sub>x</sub>, H<sub>2</sub>S....). See the Web-page for more information about experimental facilities and publications.

**Effect of impurities on corrosion:** Corrosion in CO<sub>2</sub> transport systems (pipelines, ships) made of carbon steel has been studied for a wide range of CO<sub>2</sub> compositions (CO<sub>2</sub> with ppm-levels of impurities). IFE have dedicated CO<sub>2</sub> flow loop and autoclaves that can handle high pressures (excess of 170 bar) and are equipped with high precision impurity injection- and analysing systems.

Impurities like H<sub>2</sub>O, H<sub>2</sub>S, NO<sub>2</sub>, SO<sub>2</sub> and O<sub>2</sub> can be injected continuously or intermittently. Through numerous experiments it has been possible to identify CO<sub>2</sub> mixtures that are practically inert (no reactions) and conditions when impurities react and create corrosive conditions. Corrosion rates in excess of 1 mm/y have been measured.

**Transport:** Accurate predictions of fluid dynamic behaviour of CO<sub>2</sub> w/impurities in long transport pipelines, with emphasis on situations where the CO<sub>2</sub> enters the multiphase flow region. This is, for example, used to estimate the need for pressure boosting, evaluate likeliness of hydrate formation and to study planned and accidental depressurisation scenarios.

**Utilization:** The use of CO<sub>2</sub> in leaching of minerals and other industrial processes.

### 3. Website

[www.ife.no](http://www.ife.no)

### 4. Contact person:

Storage:

Name: Viktoriya Yarushina

Position: Department Head

e-mail: viktoriya.yarushina@ife.no

Phone: (+47) 453 94 745

Capture and Utilisation:

Name: Julien Meyer

Position: Senior Scientist

e-mail: julien.meyer@ife.no

Phone: (+47) 994 60 895

Transport (CO<sub>2</sub> quality and corrosion):

Name: Gaute Svenningsen

Position: Senior Scientist

Address: P.O. Box 40, NO-2027 Kjeller, Norway

e-mail: gaute.svenningsen@ife.no

Phone: +47 95949891

Transport (CO2 quality and corrosion):

Name: Arne Dugstad

Position: Chief Scientist

e-mail: arne.dugstad@ife.no

Phone: (+47) 918 11 110

Transport (Flow assurance):

Name: Morten Langsholt

Position: Principal Scientist

e-mail: morten.langsholt@ife.no

Phone: (+47) 45286647

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