

**acatech –
NATIONAL ACADEMY OF SCIENCE AND ENGINEERING**

Hans-Joachim Kümpel

**Reigniting the debate on industrial
decarbonisation through CC(U)S in Germany**

October 13, 2016 – BRUSSELS

about

acatech



Objectives



Members



Financing



Topics



Outcomes

Objectives

Providing knowledge, guidance and support



> **Scientific recommendations**

acatech advises policymakers and the public on future technology issues



> **Knowledge transfer**

acatech offers a platform for exchange fostering cooperation between science and business



> **Promotion of young scientists and engineers**

acatech is committed to supporting young scientists and engineers



> **Innovative capacity**

acatech promotes sustainable growth through innovation

Members

The motor behind acatech's core work

- > 465 scientists from universities, research institutes and other organisations
- > New members are admitted on the basis of their outstanding scientific achievements
- > As a working academy, acatech is built on the commitment and dedication of its members, senators, supporters and experts



Financing

Ensuring stability and independence

**Project
sponsorship**
(public and private)

Core work
> Projects
> Events



**Institutional
sponsorship**
(by federal government
and federal states)

Academy
(Running
operations)



Topics

The topic networks and working groups



Biotechnology & Bioeconomy



Energy & Resources



Healthcare Technologies



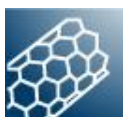
Information &
Communication Technology



Materials Science &
Engineering



Mobility, Logistics,
Aerospace Engineering



Nanotechnology



Product Development &
Production



Safety and Security



Society & Technology

- Working Group Education
- Working Group Communication in Technology
- Working Group Basic questions of Science & Engineering
- Working Group Economics & Innovation Research

Outcomes

Project results: positions, recommendations, forums

- > Result reports and policy recommendations
- > Dissemination of information
- > Presentation/discussion



acatech POSITION PAPER
Statement



acatech IMPULSE
Principles

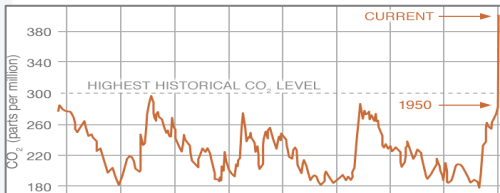


acatech STUDY
Project report



about

acatech's iCCUS project



Project



Know-how



Lack of acceptance

Situation in
Germany



1st Workshop

Project: Pathways for Decarbonization in Industry

- > Funded by **European Climate Foundation (ECF), Phase 1**
- > Leadership: Hans-Joachim Kümpel
- > CCS/CCU for **industrial processes** (excluding energy sector)
- > “What are the challenges for Germany and how can they be met?”

Status

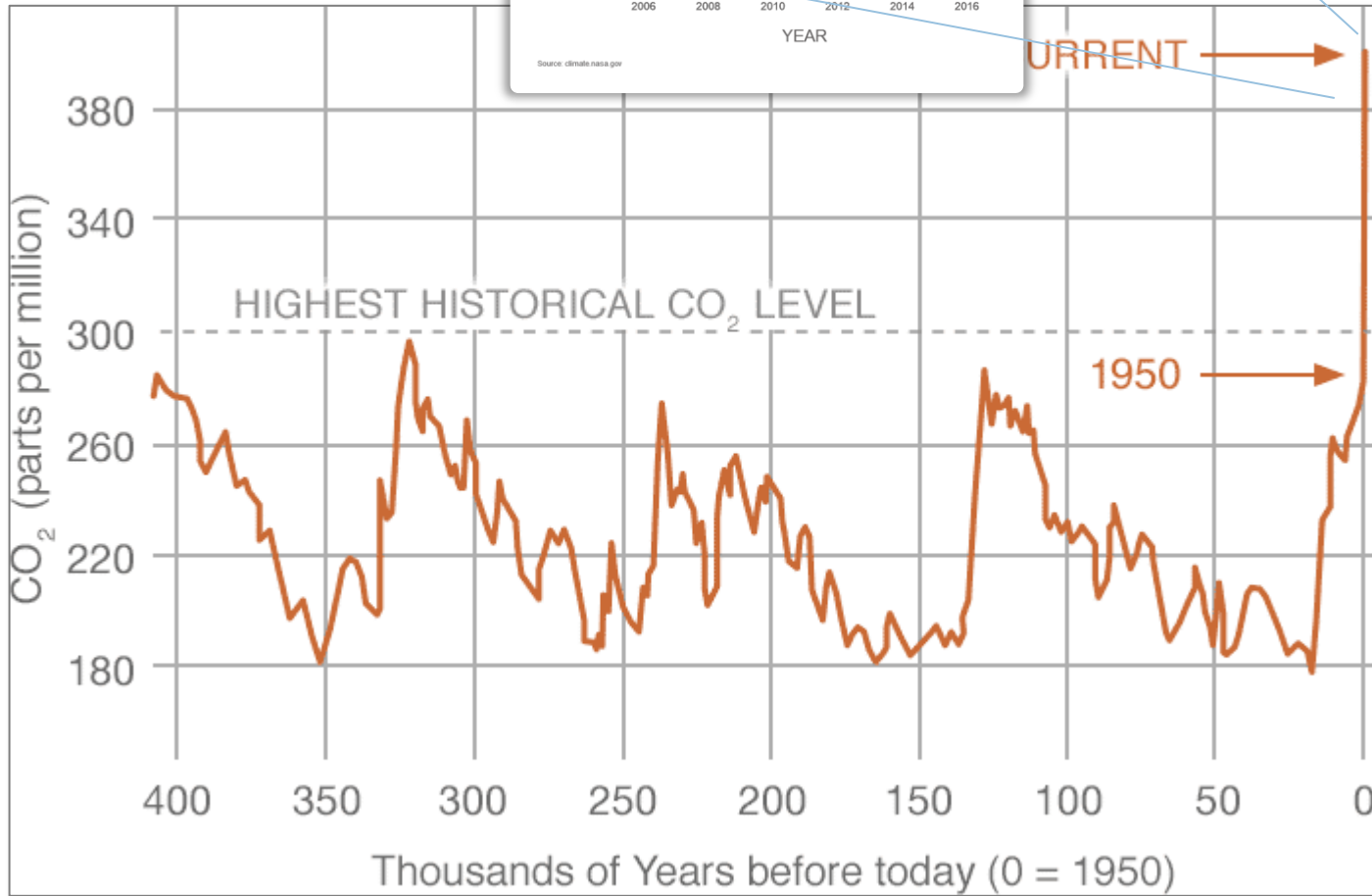
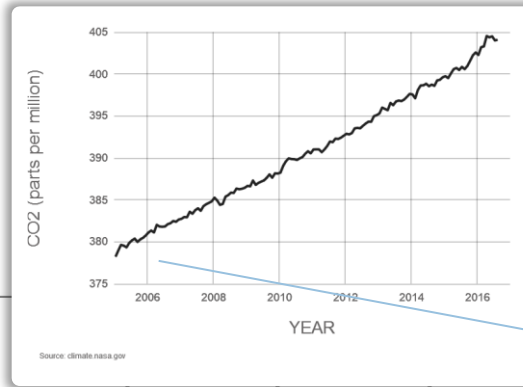
- > **1st Workshop on 22/23 June 2016 in Berlin**
 - Some 20 attendees from companies, science, politics and society (e.g. DECHEMA, VDZ, IG BCE, MunichRe, BGR, WI, GFZ,...)
 - 16 presentations with lengthy discussions to find out style of and main topics for document to be prepared
- > **2nd Workshop in prep.**



Why at all?

Project

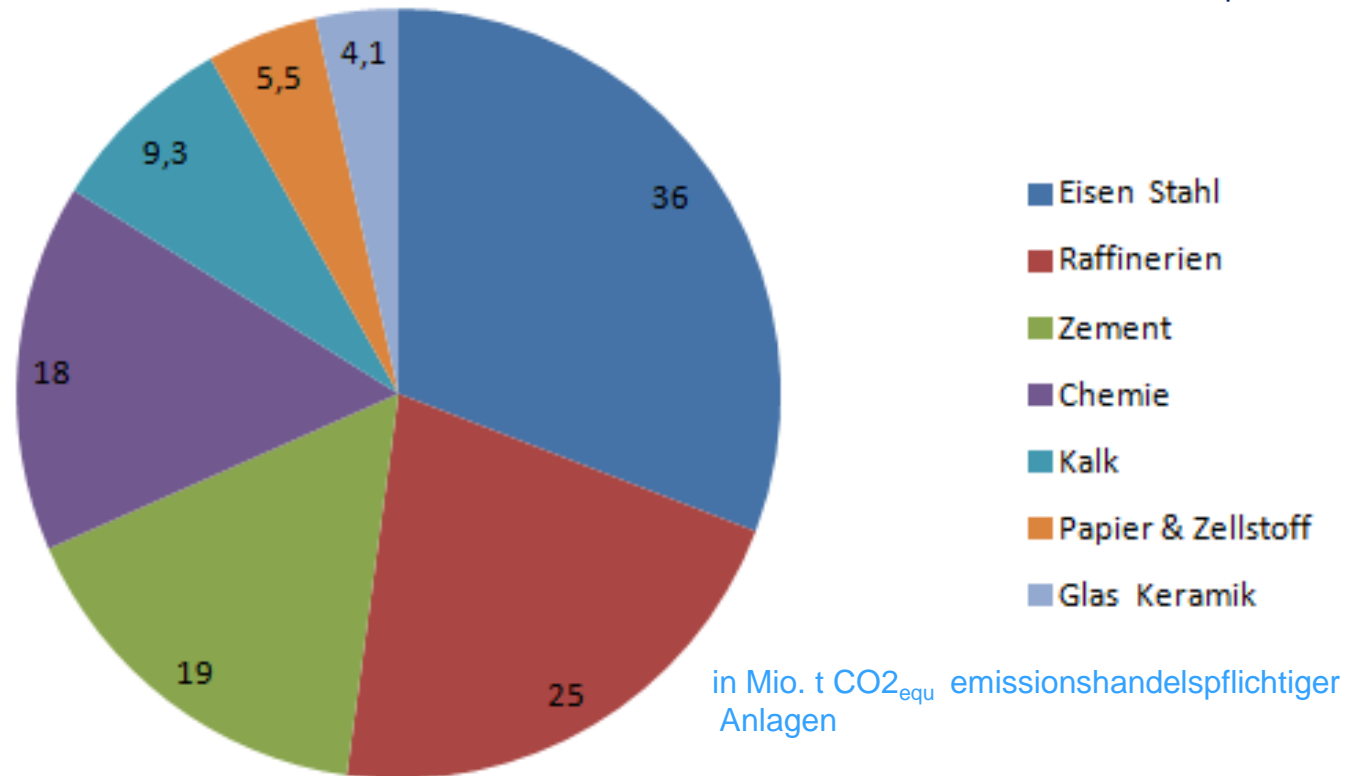
24 ppm in 10 years



<http://climate.nasa.gov/vital-signs/carbon-dioxide/>

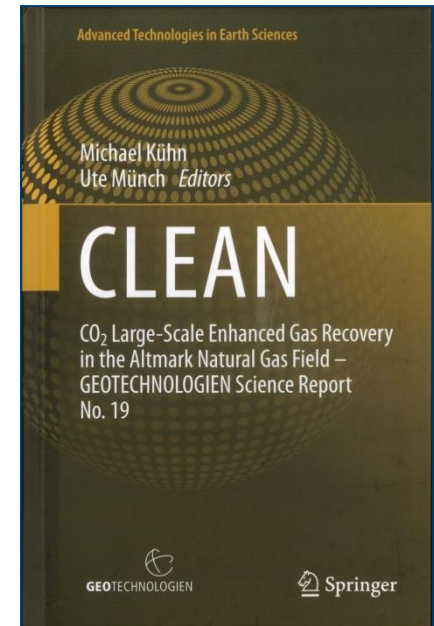
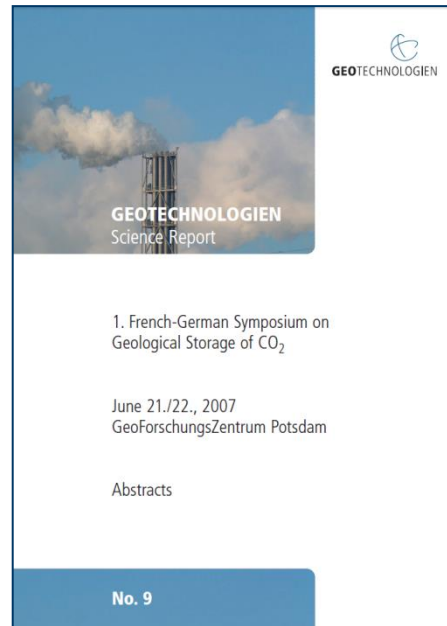
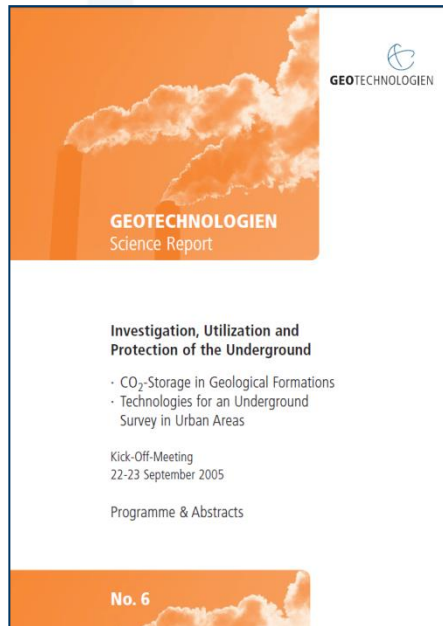
Situation in Germany

Emissions of energy intensive industry in 2014 → 123 Mio. t CO₂equ



Quite limited options to further reduce CO₂ emissions

Situation in Germany



Research: multi tens of million € Geotechnologien Programme, since 2005

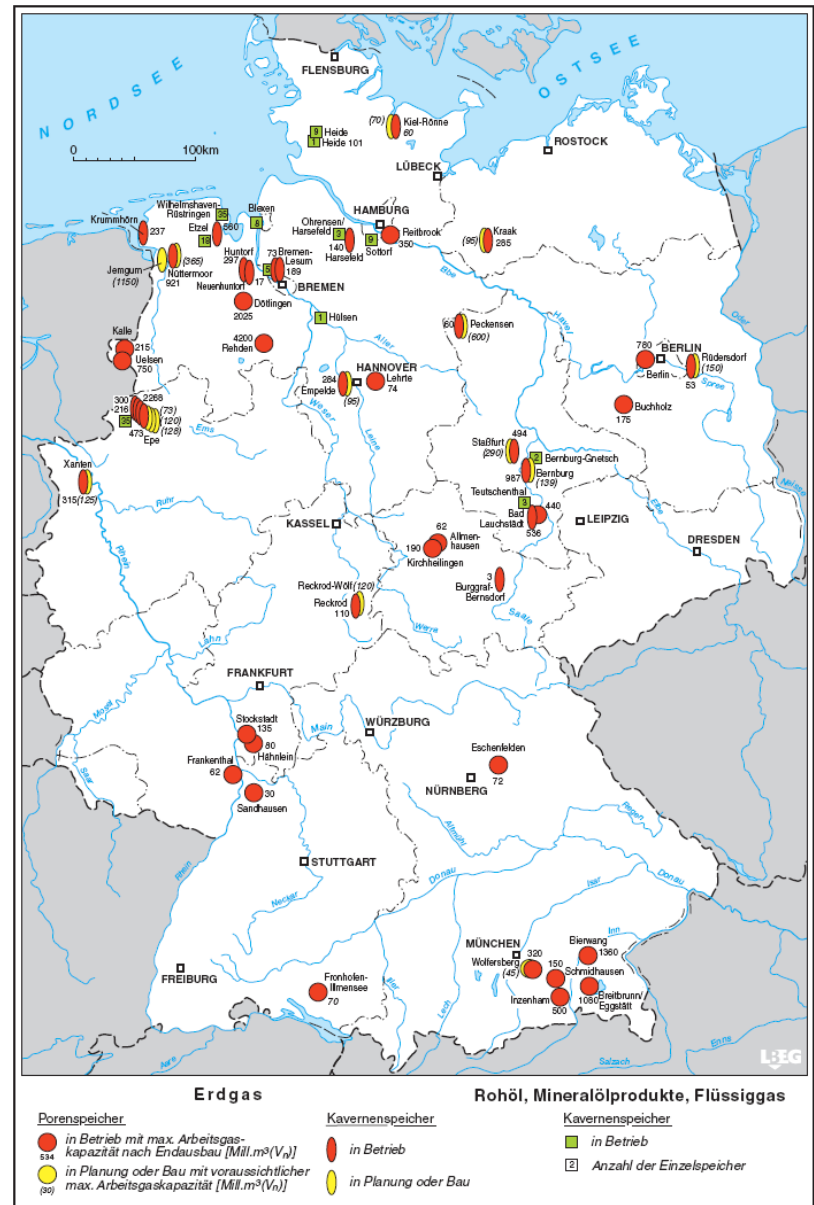
→ 33 CCS Research Consortia Projects, in particular w.r.t. storage of CO₂

Situation in Germany

Know-how available

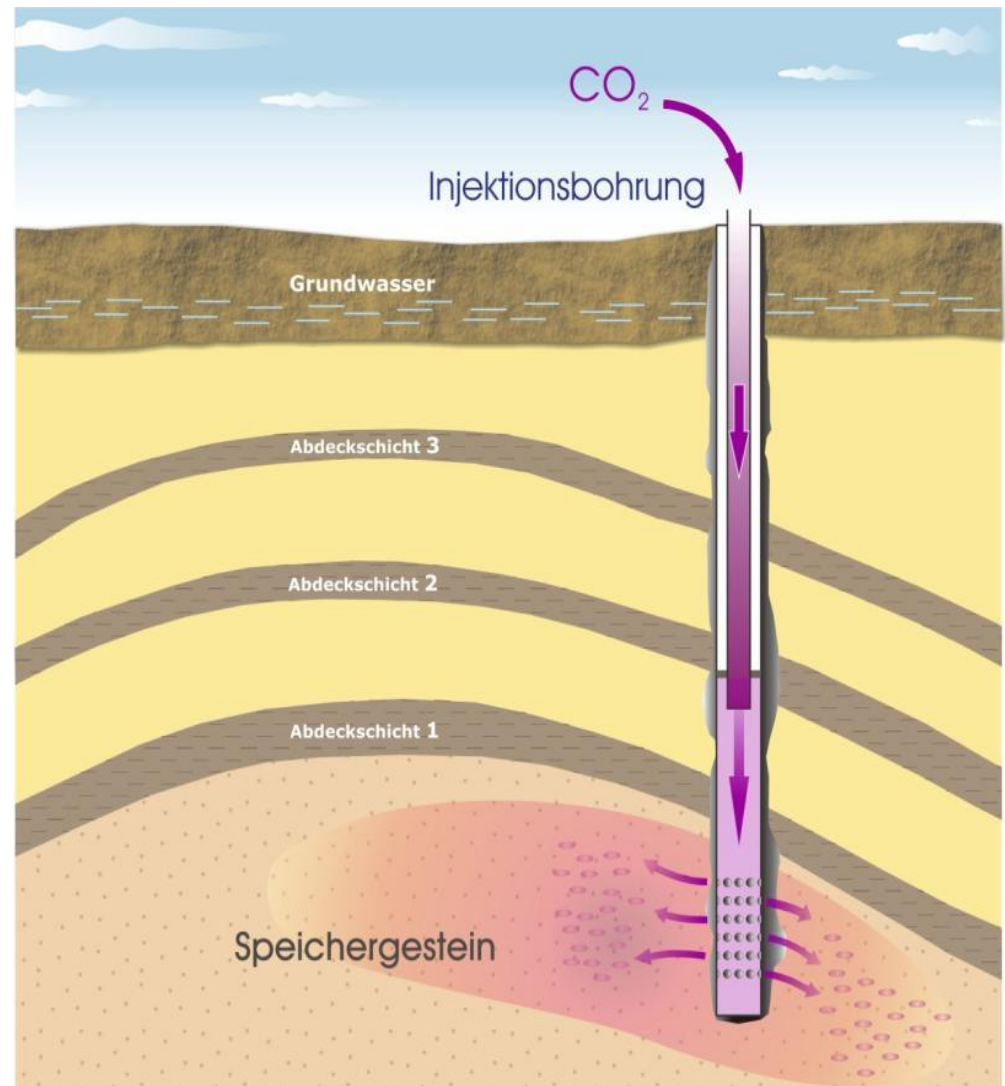
Experience with Storage of Natural Gas

- Germany: 20 pore storages (since 1955), volume: ~ 10 bn m³
- Worldwide: ~ 600 pore storages



Situation in Germany

Long-term Safety:
 Multi-Barrier Concept



Situation in Germany

Lacking Acceptance

Stopped industrial pilot storage projects
(power plants):

- ❖ RWE in Nordfriesland (Aquifer)
- ❖ Vattenfall in Beeskow (Aquifer)
- ❖ Gas de France in the Altmark
(Natural Gas Field)



Situation in Germany



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Protest gegen CO₂ Verpressung



© Karsten Smid / Greenpeace

Greenpeace-Aktivisten demonstrieren vor dem Bundeskanzleramt gegen unterirdische CO₂-Deponien.



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Widerstand in Brandenburg

Situation in Germany



Kommentar CCS-Technik

Pyrrhussieg der Umweltschützer

Kohlendioxid soll in Deutschland nicht unterirdisch gelagert werden. Was die Umweltbewegung freut, kann gefährlich für das Weltklima werden.



Öko / Ökologie

13.9.2013

KOMMENTAR VON

BERNHARD PÖTTER

Redakteur für Wirtschaft und Umwelt

“Tja, wohin mit dem Kohlendioxid? Kraftwerk Neurath bei Rommerskirchen.“



1st Workshop

June 2016 / Berlin

- Topics presented/discussed (1/2)
 - *Sequestration and possible risks for cement factories*
 - *Availability/necessity of appropriate transport infrastructure*
 - *Usage of CO₂ for chemical industry*
 - *Legal framework in Germany*
 - *Status of CCS-option as element of national climate protection strategy*



1st Workshop

June 2016 / Berlin

- Topics presented/discussed (2/2)
 - *Economic aspects of CCS*
 - *Bioenergy with carbon capture and storage (BECCS)*
 - *Geological storage potential in Germany (on-shore, off-shore)*
 - *Pilot project Ketzin*
 - *Public debate (emotional barriers, acceptability, transparency, communication)*

Thank you for your interest !