Federal Ministry
of Education
and Research

FONA
Research for Sustainable Development
BMBF

The German R&D Program for CO_2 Utilization – innovations for a green economy

BMBF presentation

Technical expert meeting (TEM) on carbon capture, use and storage (CCUS) , Bonn, 21st of October 2014

Political Strategies

Nachhaltigkeits-
strategie
für Deutschland

- ***National Sustainability Strategy***
  - Reduction of GHG emissions up to 40 % (2020 vs 1990)

DIE NEUE
HIGHTECH
STRATEGIE
Innovationen für Deutschland

- ***New German High-Tech-Strategy***
  - Top priority for the future: Sustainable economy and energy

FONA
Research for Sustainable
Development
BMBF

- ***FONA framework programme***
  - Field of action: Sustainable management and resources

Federal Ministry of Education and Research

FONA Research for Sustainable Development
BMBF

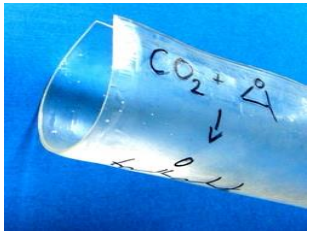
BMBF Funding Measures – Raw materials


Bildquelle: Stahl-Zentrum


Quelle: Dr. Mirtsch GmbH

1. **Boosting resource productivity**
   Key innovations, r²
2. **Securing raw material base**
   r³, GER-FRA, r⁴ (open call)
3. **Extending raw material base**
   CO_2-utilization
4. **Supporting SME**
   KMU innovative: resource efficiency
5. **Cooperating internationally**
   CLIENT, GER-FRA

6. **Acceleration of implementation:**
   ***r+Impuls** (open call)*



Federal Ministry of Education and Research

FONA Research for Sustainable Development BMBF

Technologies for Sustainability and Climate Protection – Chemical Processes and Use of CO_2

Funding measure

- Funding volume (2010-2016): ~ 100 Mio € (BMBF) + ~50 Mio € additional industry investment,
- 33 collaborative projects (>150 individual projects)

Goals

- **Extension of the raw material (carbon) base** of the chemical industry
- Chemical **energy storage**
- **Reduction of CO_2 emissions** in processes

Support and transfer project: DECHEMA e.V.
www.chemieundco2.de

Next Status-Conference: April 2015 in Berlin, Germany

Federal Ministry of Education and Research

FONA Research for Sustainable Development BMBF

r+Impuls – a novel innovation funding instrument

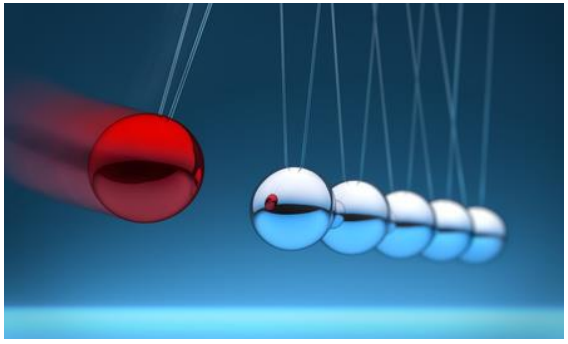
➢ Goals

- Transfer of R&D results with high potential to industrial application, e.g. r^2
- Cushioning of high risks of the transfer of R&D results
- Acceleration of implementation and market launch
- Strengthening of competitive strength and innovative capacity

➢ Realisation of the coalition contract: Securing of raw materials and raw material research

- Call for r+Impuls is open!

Submission deadline: 2nd of March 2015



Sample Project 1: Utilization of CO_2 for Products

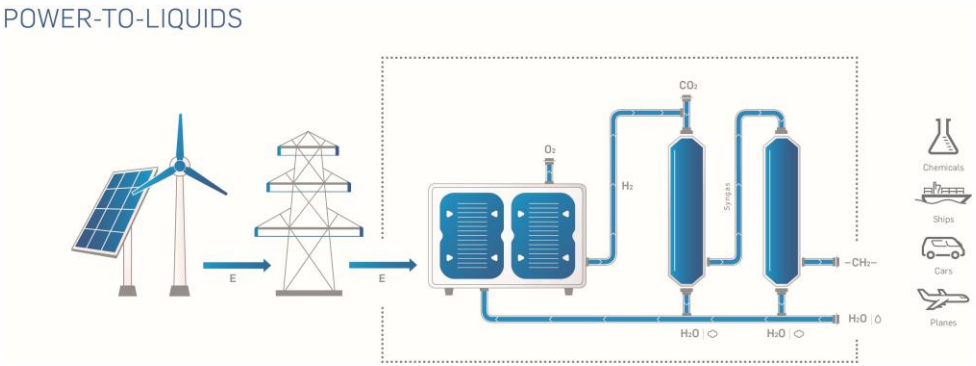
Dream Production

- Alliance of industry and academia
- Production of **high-quality polymers** using CO_2
- 2011: Pilot plant opened
- 2015: production plant (announced)
- LCA: - 20 % CO_2

Sample Project 2: Chemical Energy Storage

Sunfire

- Alliance of industry and academia
- **Production of liquid fuels from CO_2 and water using renewable energy – Power-to-Liquids**
- Core technologies: High Pressure Steam Electrolysis and Fischer-Tropsch-Process



Opening of worldwide first PtL Pilot plant on 14th of November in Dresden

Awards 2013 & 2014

- **2013**:
- **Science Award Electrochemistry –** Dr. Mayrhofer (junior research group)
- **Wöhler-Award** - Prof. Rieger (iC^4)
- **2014**:
- **Jochen-Block-Award (German Catalysis Society)** – Dr. Strunk (junior research group)
- **European Sustainable Chemistry Award (ESCA)** - Prof. Leitner and Prof. Klankermeyer (Dream Production)
- **Global Cleantech 100 Award** - Sunfire GmbH (sunfire)

Federal Ministry of Education and Research

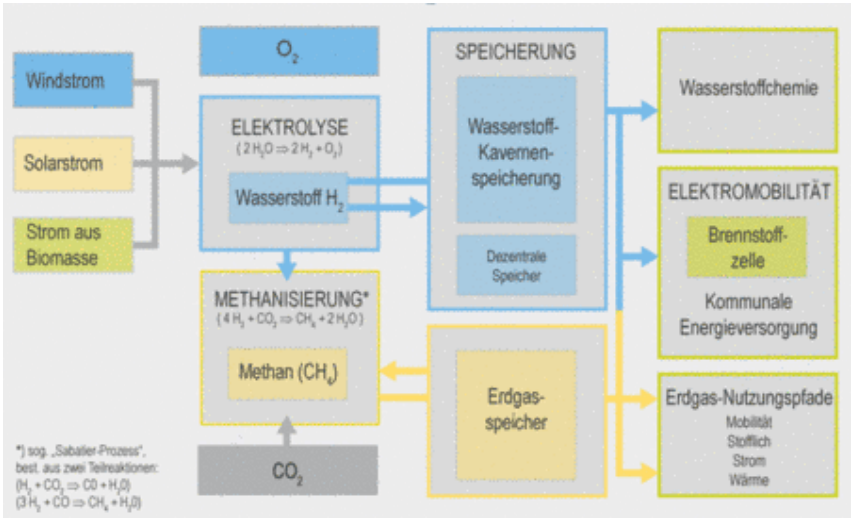
FONA Research for Sustainable Development BMBF

Twenty20 – Partnership for Innovation

zwanzig20 PARTNERSCHAFT FÜR INNOVATION

HYPOS

- Hydrogen Power Storage & Solutions East Germany
- Granted with a funding volume of app. 45 Mio €
- Optimization of green hydrogen production and supply
- **CCU theme field**: Methanation and storage of SNG in the natural gas grid and application driven utilization of SNG



Joint Funding Initiative “Energy Storage“

- joint initiative by BMWi, BMUB, BMBF (200 Mio. €)
- **BMBF budget** 88 Mio € (ca. 71 Mio € granted, 32 projects)
- **BMBF focus**: basic research
  - Hydrogen generation and storage
  - Electrochemical storage systems
  - Thermal storage systems

- **Chemical energy storage using CO_2** (10 projects in total)

➢ 3 projects will be funded by BMBF (e.g. Catalytic synthesis of methane)

Outlook

- R&D investment in CCU to be continued
- European/ global challenge

VISION GREEN ECONOMY:

- Green energy/green individual mobility
- Green hydrogen and carbon dioxide supply
- Green C-source for the chemical industry

Thank you for your kind attention!