



GaSTech

Euro Support Advanced Materials B.V.

Uden

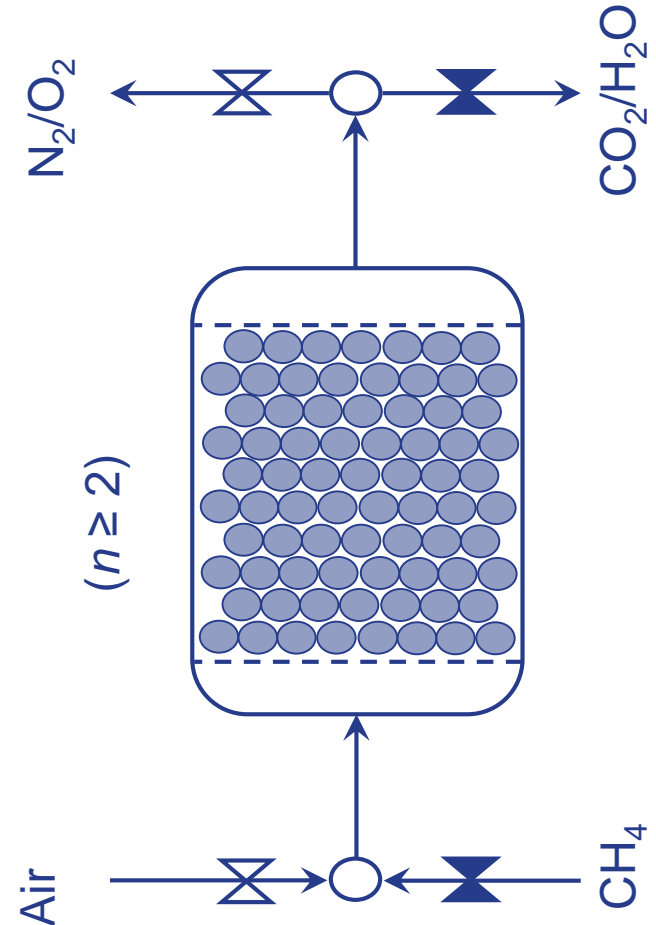
**ERA-Net project
K. Albertsen**

Partners

#	Participant legal name	Short name	Type	Country
1	Stiftelsen SINTEF	SINTEF	RTO	NO
2	Norwegian University of Science and Technology	NTNU	UNI	NO
3	Euro Support Advanced Materials B.V.	ESAM	SME	NL
4	Universitatea Babeş-Bolyai	UBB	UNI	RO
5	Hayat	HAYAT	IND	TR
6	ETH Zürich	ETH	UNI	CH
7	Universidad Politécnica de Madrid	UPM	UNI	ES

Project basis: Chemical Looping Combustion

- Single stationary reactor
- It utilizes simple standalone bubbling/turbulent fluidized beds that are alternatively fed with oxidizing and reducing gases.
- It can be scaled up and pressurized without facing unforeseen challenges.
- Heat is stored in reactor switching from high power to low power production possible



Project scope

To accelerate the development of gas switching technologies by further technology scale-up through

- Lab-scale demonstration (TRL 4) of gas switching reactor concepts
- Large-scale technology implementation studies to evaluate the techno-economic feasibility of process concepts incorporating gas switching reactors.
- Business case development

Investigate four chemical looping concepts

- **Combustion:** Indirect fuel gas combustion with inherent separation of N_2 and CO_2 for the production of high temperature gas
- **Reforming:** Redox reactions oxygen carrier to supply heat to the endothermic steam-methane reforming reaction with inherent CO_2 capture.
 - New oxygen carrier to be developed that can catalyse the reforming reaction.
- **Water splitting:** Steam is used to partially oxidize the oxygen carrier, producing hydrogen. Subsequently, the oxygen carrier is fully oxidized by air and reduced by carbon-rich fuel gases with inherent CO_2 capture.
- **Oxygen production:** An oxygen carrier with oxygen uncoupling properties is used to take up oxygen from air and then release it in a N_2 -free outlet stream. The resulting stream can then be used for oxyfuel CO_2 capture.

Partner roles

- Experimental demonstration of Gas Switching by SINTEF and NTNU
- Selection and pre-testing of the oxygen carrier materials by ETH to be manufactured by ESAM
- Modelling of large-scale gas switching reactor by SINTEF to provide input to process simulations done by NTNU and UPM
- Economic assessments for the different processes by UPM
- Evaluation of the business case based on the main project results by HAYAT

Acknowledgement

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