MEASURES FOR CO_2-NEUTRAL BRICK PRODUCTION AT **LINGL SOLEAD** – HANDOUT FOR PRACTITIONERS

Holger Rottmann - September 2025

5. AACHENER OFENBAU- UND THERMOPROZESSKOLLOQUIUM

LINGL SOLEAD GmbH

- Company founded in 1938
- Headquarters in Krumbach (Swabia)
- Leading international manufacturer of machines and systems
- Global specialist for customised solutions along the entire ceramic production value chain
- Employees: 220
- Foreign branches in various locations
- Strong partner for process engineering, automation, robotics and Industry 4.0.
- Construction and successful implementation of 400 tunnel kilns worldwide

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1. ENERGY OPTIMISATION MEASURES

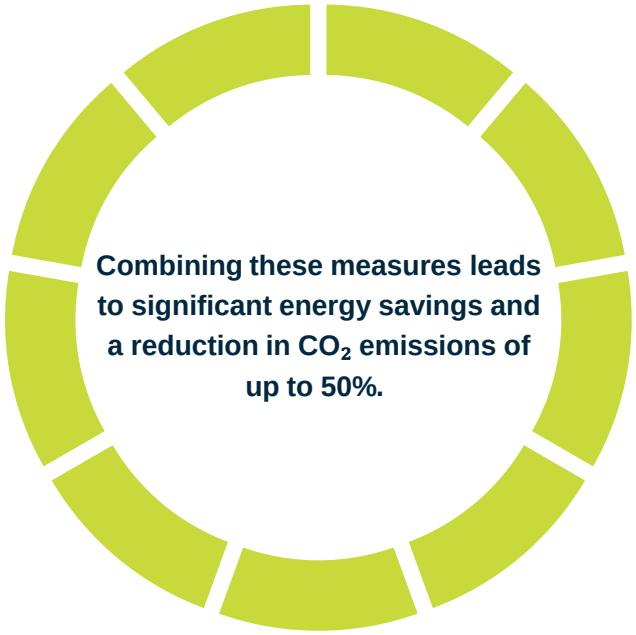
Decoupling of kiln and dryer – minimization of hot air extraction

Longer heating and cooling times – extended heating and cooling zones

Circulation systems to improve heat transfer

Preheating of combustion air up to 450°C-Better combustion efficiency and reduced fuel consumption through preheating of the air.

Minimization of the storage heat of the kiln cars



Improved sealing on doors and passageways-Prevention of heat loss through high-quality seals at critical points.

Reduction of heat loss through reinforced insulation on walls and ceilings.

Exhaust gas heat exchangers for utilizing exhaust heat-Utilizing exhaust heat to preheat combustion air or for other processes.

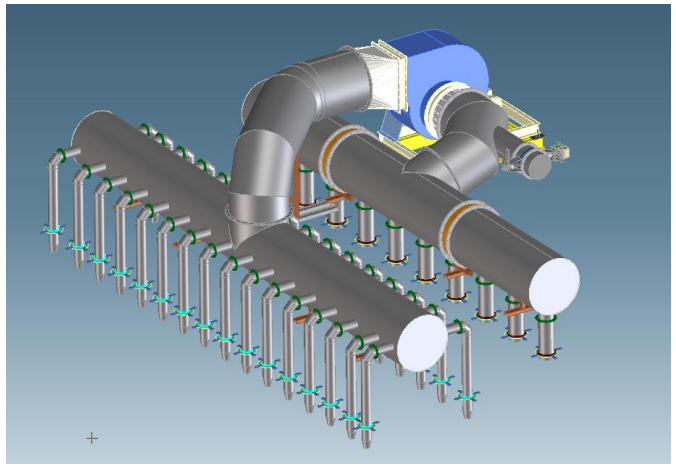
Alternative heating methods-Using renewable energies or alternative fuels to reduce CO_2 emissions.

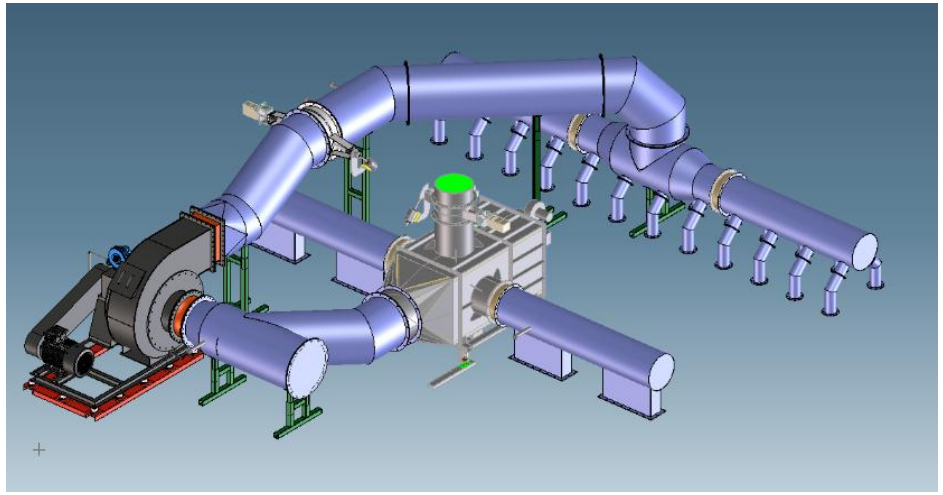
Conclusion: By implementing these measures, Lingl Solead can significantly reduce its CO_2 emissions while increasing energy efficiency in brick production.

ENERGY OPTIMISATION MEASURES

Flue gas recirculation + cooling zone recirculation

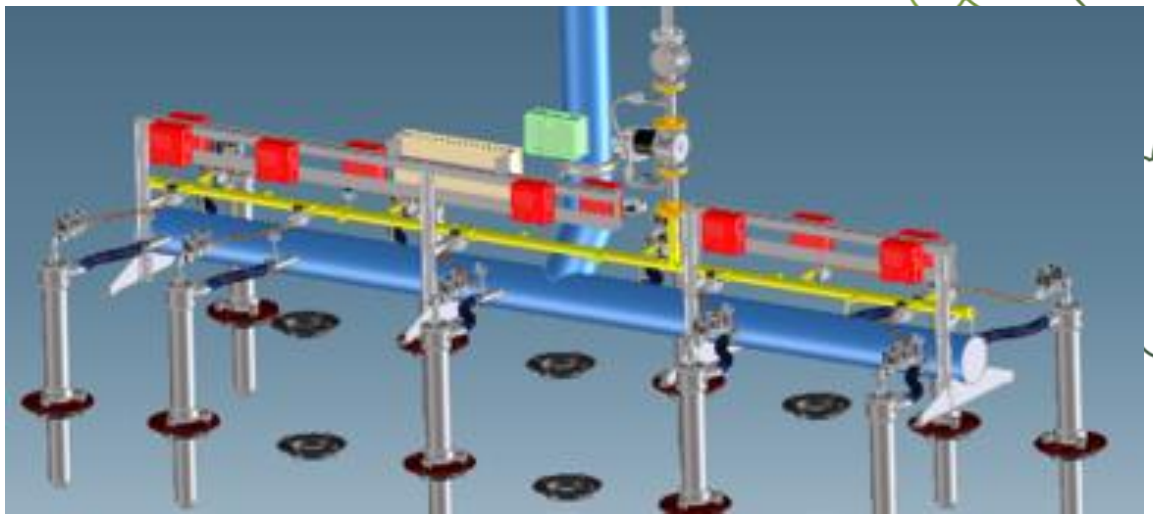
- Homogenization of the temperature inside the kiln
- Increase of convective heat transfer

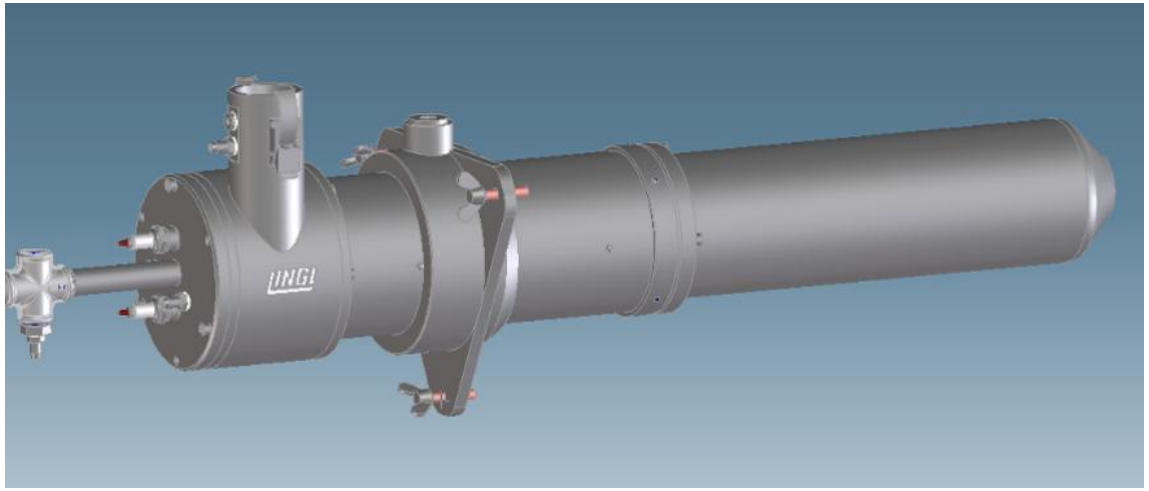




BURNERS AND BURNER GROUPS USED

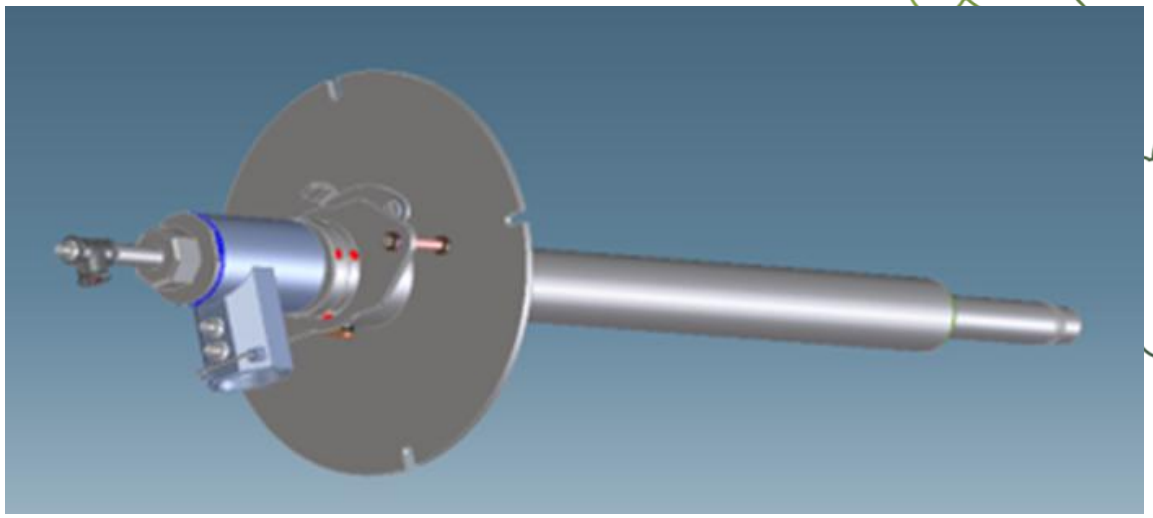
High Velocity Burner

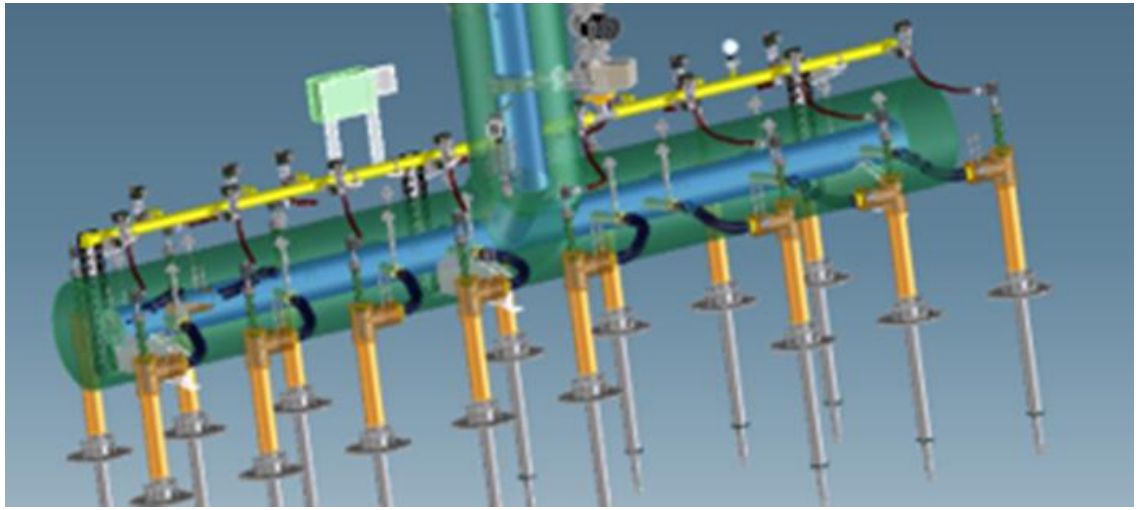


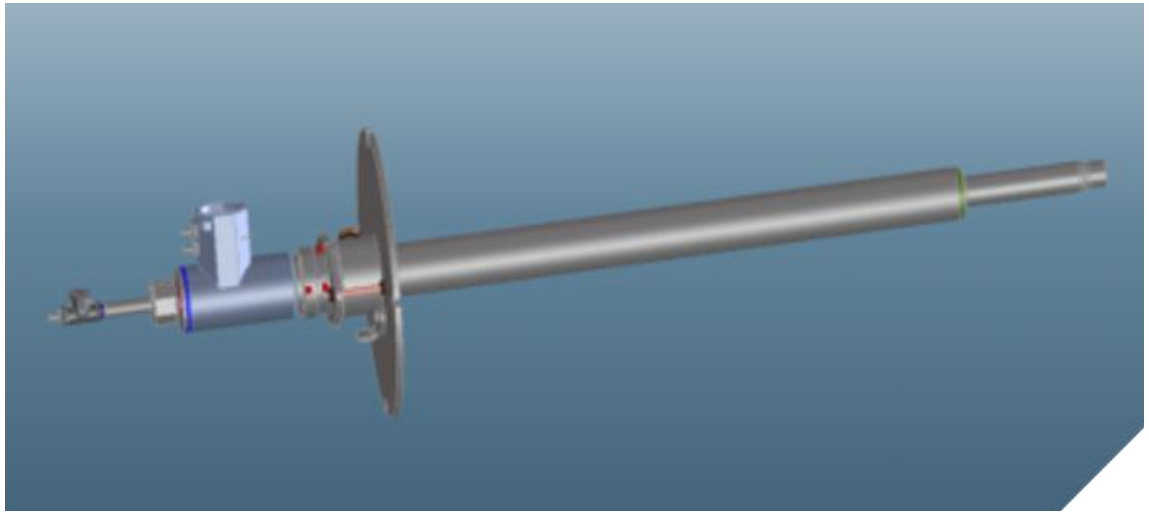


BURNERS AND BURNER GROUPS USED

Main Gas Burner

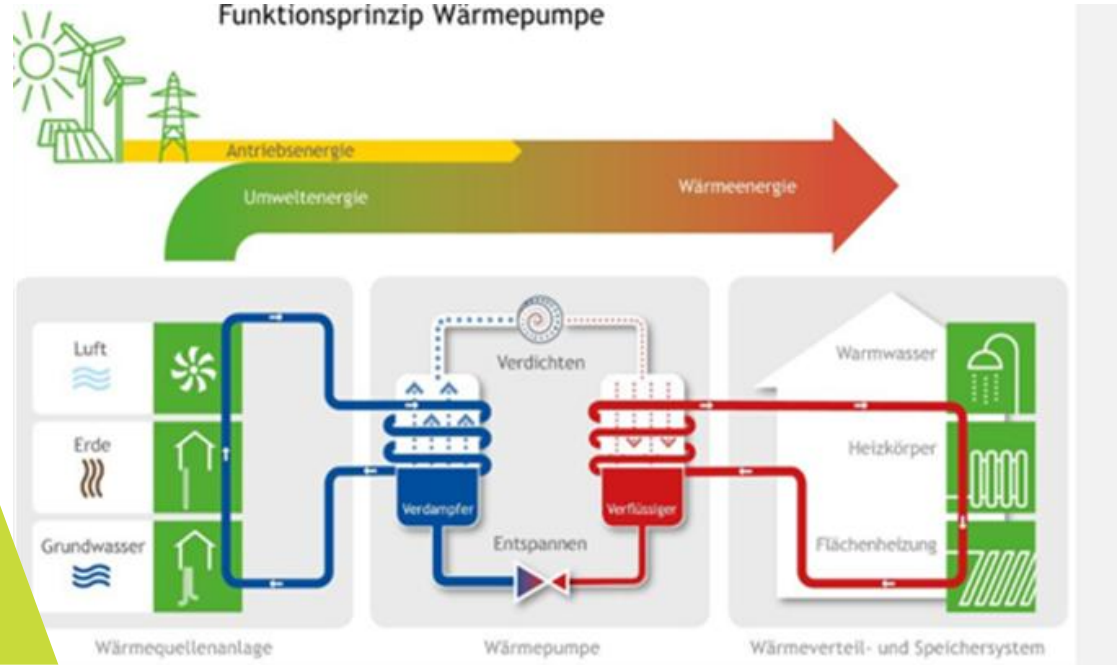






BURNER INSULATION

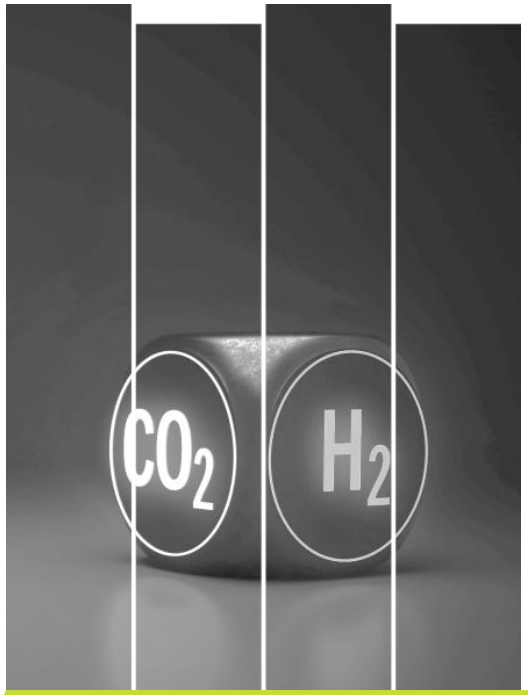
USE OF HEAT PUMPS FOR EFFECTIVE UTILISATION OF DRYER EXHAUST AIR



3. Alternative Energy Sources

Hydrogen from renewable sources

- ✓ Production efficiency at 60 - 85%
- ✓ Existing infrastructure can only be partially used
- ✓ Adjustments to burner and safety technology
- ✓ Hydrogen can be added to natural gas
- ✓ Analysis of the influence of hydrogen on the product properties



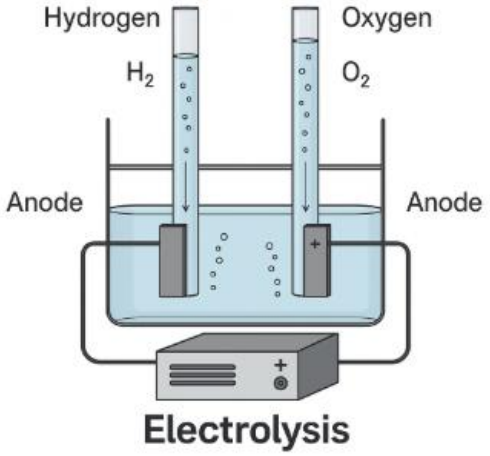
LINGL already offers firing technology for the use of hydrogen and mixed operation in the ceramic industry

HYDROGEN PRODUCTION USING AN ELECTROLYSER

R&D@ LINDE pioneering engineering

Hydrogen is now. H-TEC SYSTEMS

QUEST ONE



4. FUTURE TUNNEL KILN

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Electric kiln

THANK YOU!

& Welcome to the world of LINGL.COM

KONTAKT:

h.rottmann@lingl.com

+49 160 90997350