Fossil-Free Combustion in Grate-kiln Pelletizing Plants Using Co-jet Burner

Project leader
Sofia Larsson, Luleå University of Technology

Partners
Luleå University of Technology, LKAB, Taoshi Energiteknik

Project duration
20220401 - 20250331

SWEDISH MINING INNOVATION

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VINNOVA Sveriges innovationsmyndighet
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Goals of the project

Reduce emissions from grate-kiln pelletizing plants

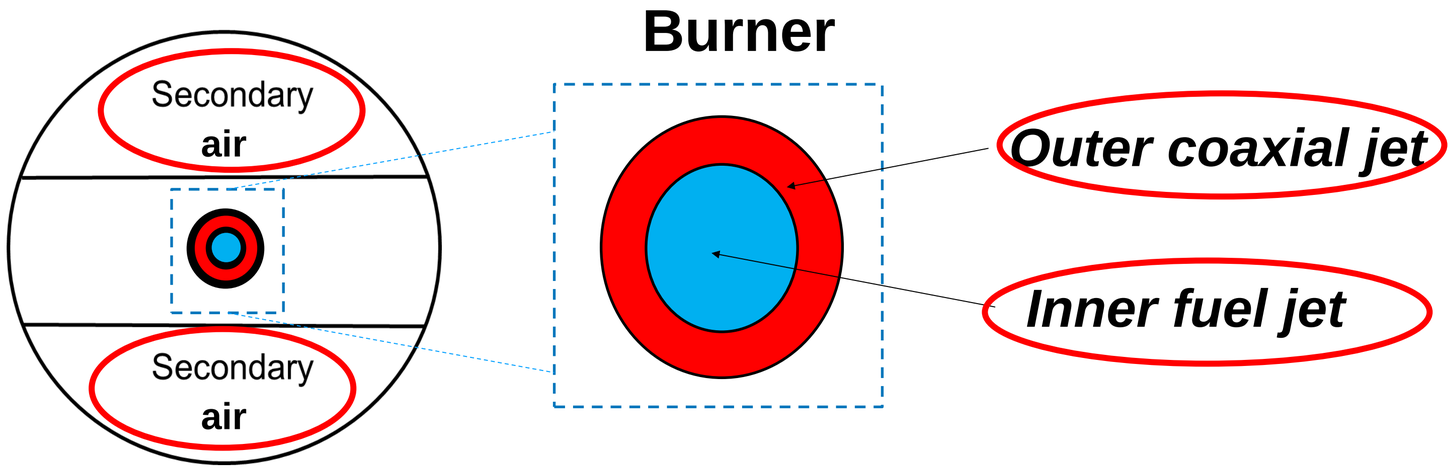
Aimed at rotary kiln

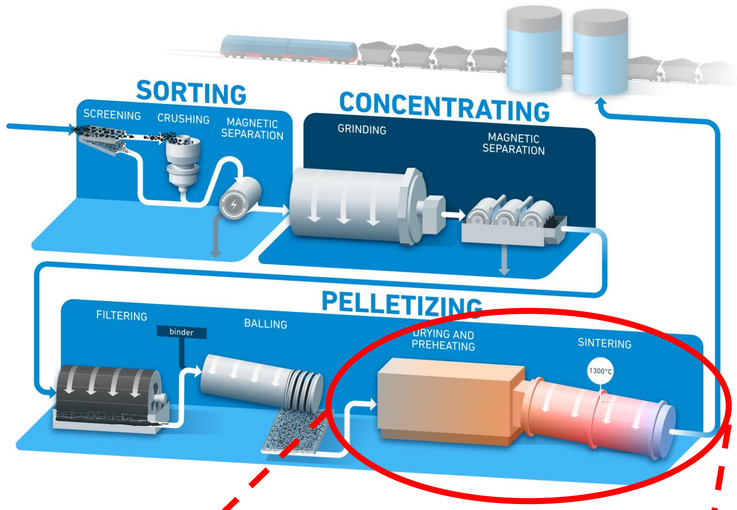
Find methods of replacing coal with hydrogen

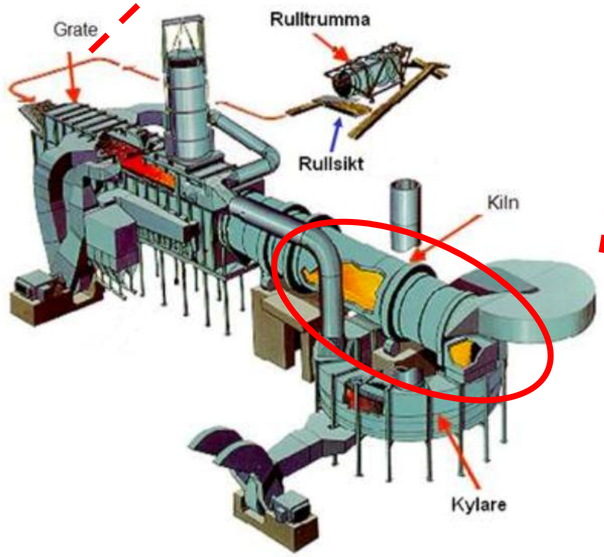
Not possible using existing equipment

Idea: coaxial jet

Control mixing of fuel and secondary (combustion) air







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Goals of the project – Deliverables

Simulation model for testing of flow parameters

Experimental model

Coaxial burner concept

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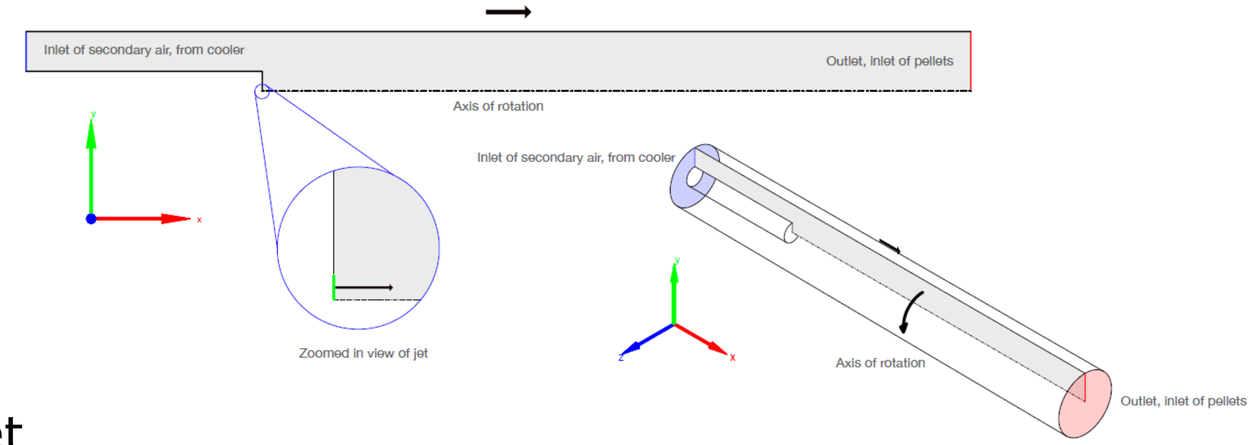
Results so far – Methods

Simulations of simplified geometry

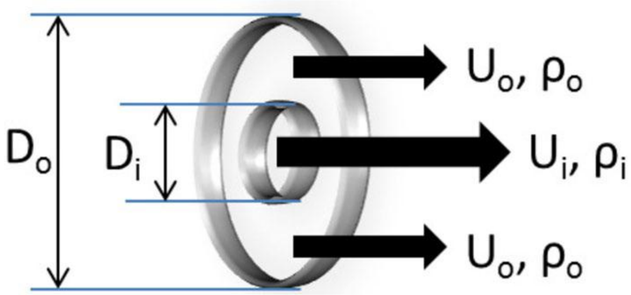
Compare single hydrogen jet and coaxial jet

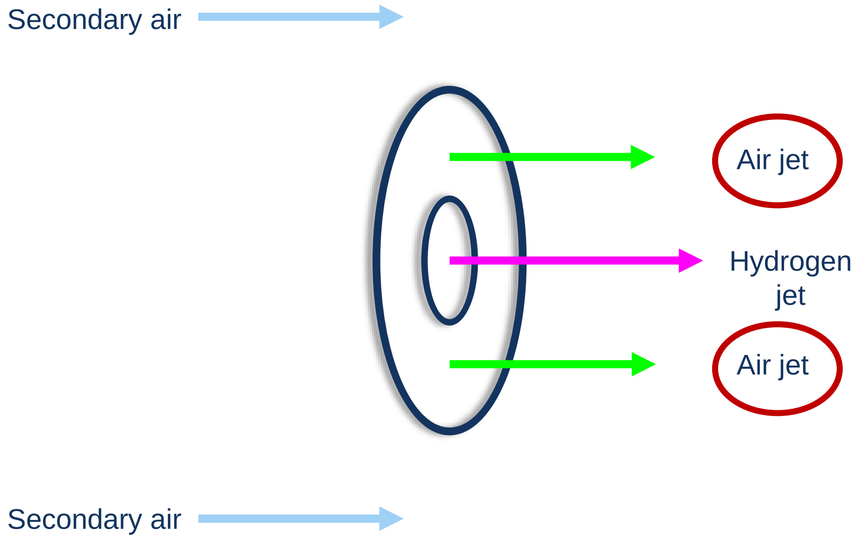
Air jet used to surround hydrogen jet



Parameters varied for inner and outer jet

- Mass flow
- Radius
- Velocity
- Fluid





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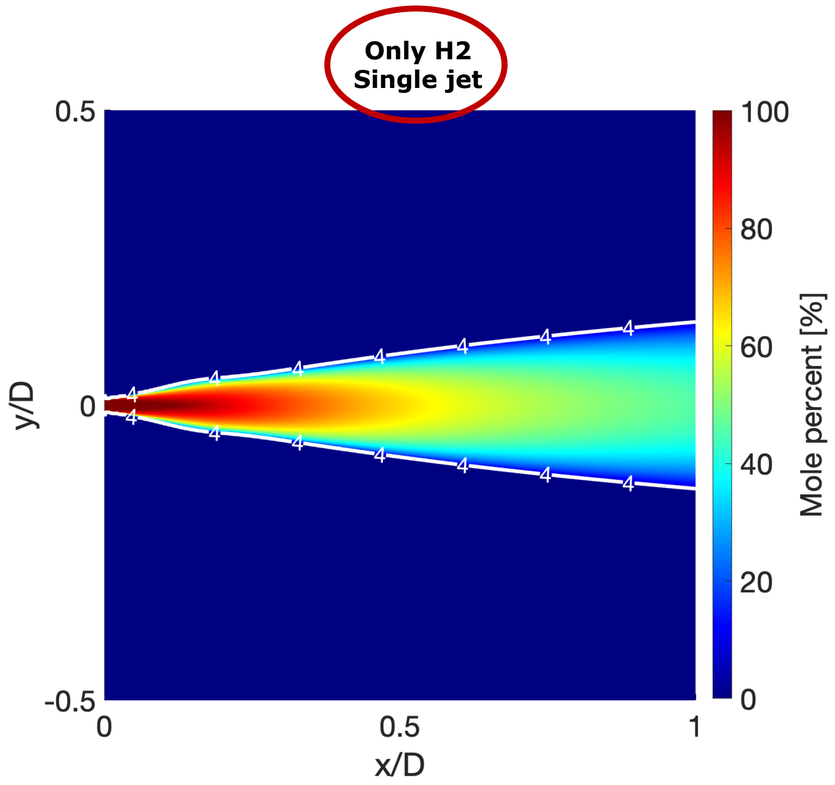
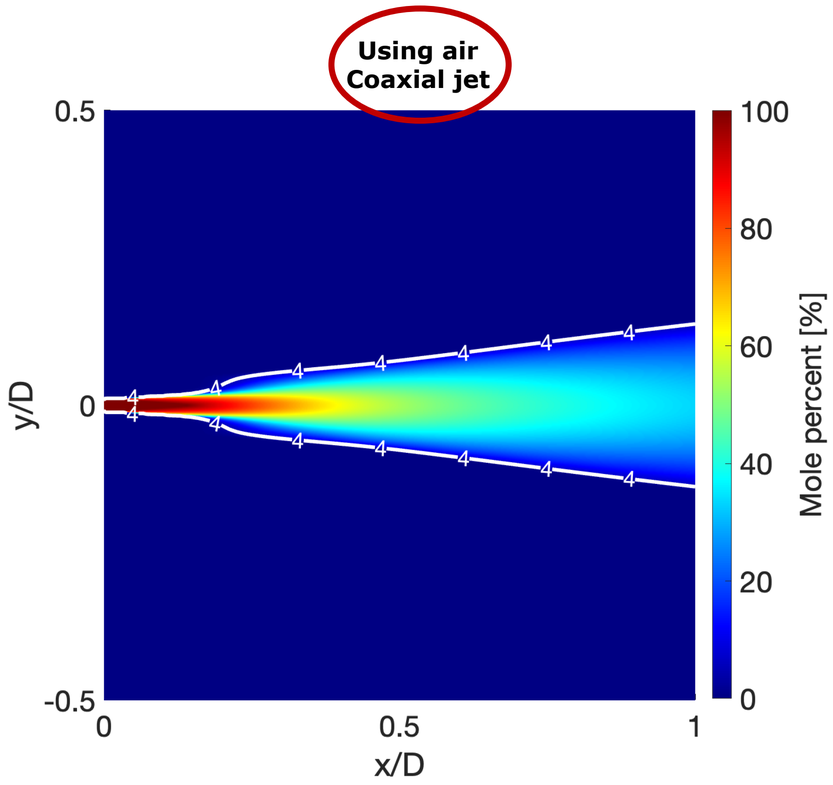
Results so far





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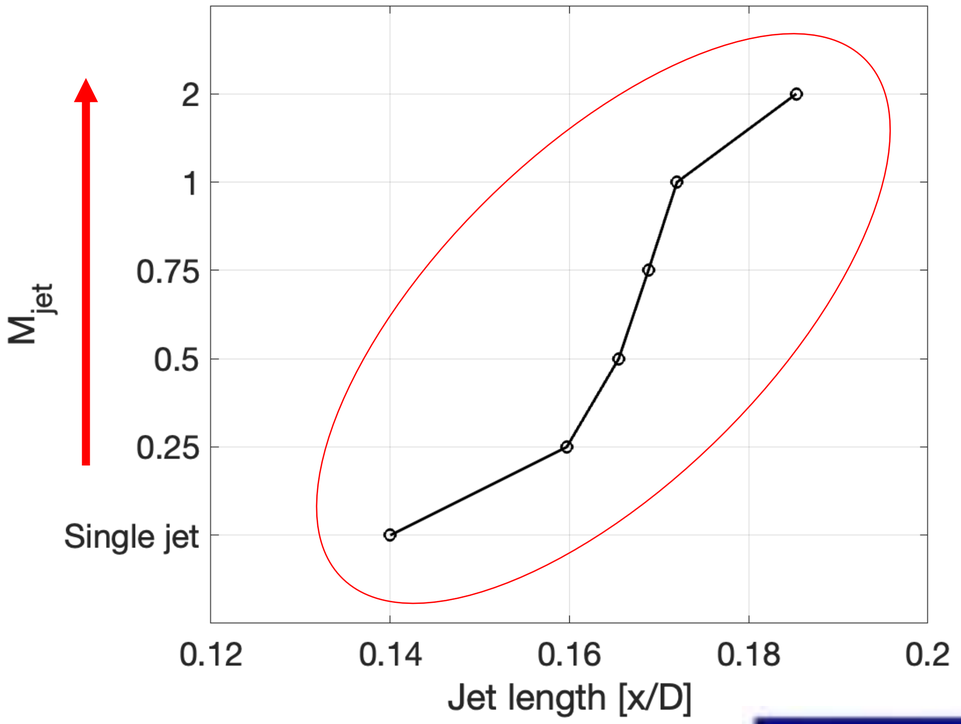
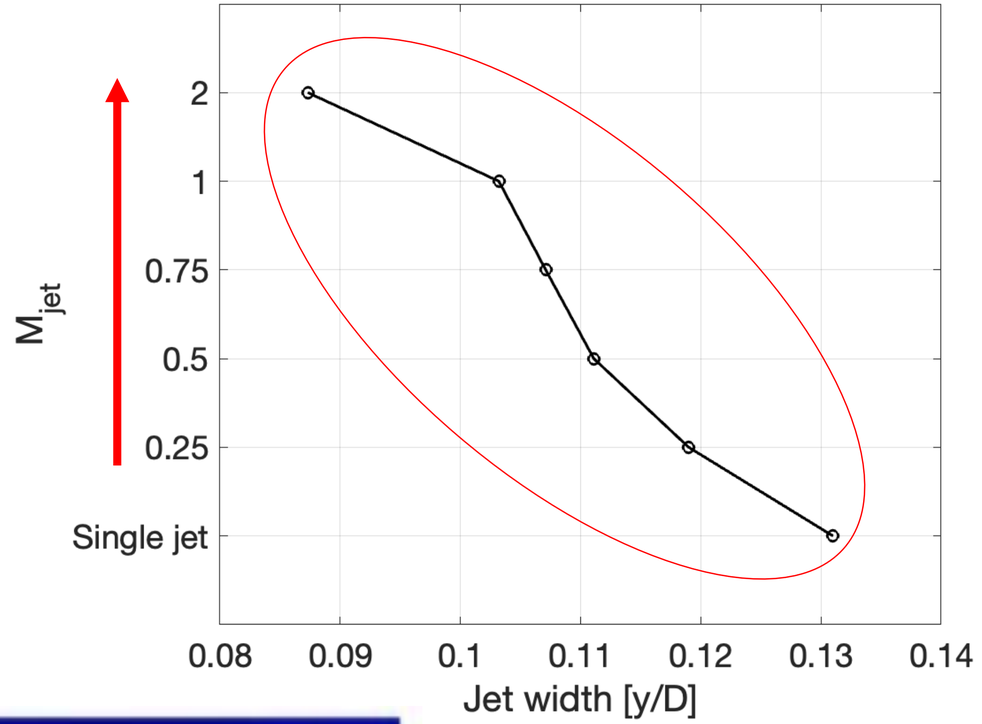
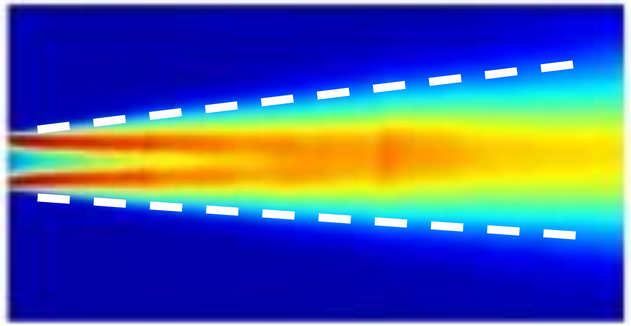
Results so far







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Upcoming activities and next step

Licentiate seminar for the PhD student in January 2025

Investigate a more realistic model of the kiln

Experiments during the spring

Discussions on how to continue the collaboration after the end of this project

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