



Wood Pellet Milling Performance in a Suspension-Fired Power Plant

Masche, Marvin; Puig Arnavat, Maria; Wadenbäck, J. ; Jensen, Peter Arendt; Ahrenfeldt, Jesper; Clausen, Sønnik; Henriksen, Ulrik Birk

Publication date:
2018

Document Version
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):
Masche, M., Puig Arnavat, M., Wadenbäck, J., Jensen, P. A., Ahrenfeldt, J., Clausen, S., & Henriksen, U. B. (2018). Wood Pellet Milling Performance in a Suspension-Fired Power Plant . Poster session presented at 26th European Biomass Conference and Exhibition (EUBCE 2018), Copenhagen, Denmark.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Wood Pellet Milling Performance in a Suspension-Fired Power Plant

M. Masche¹, M. Puig-Arnavat¹, J. Wadenbäck², P. A. Jensen¹, J. Ahrenfeldt¹,
S. Clausen¹, U. B. Henriksen¹

¹ DTU Chemical Engineering, 2800 Kgs. Lyngby, Denmark

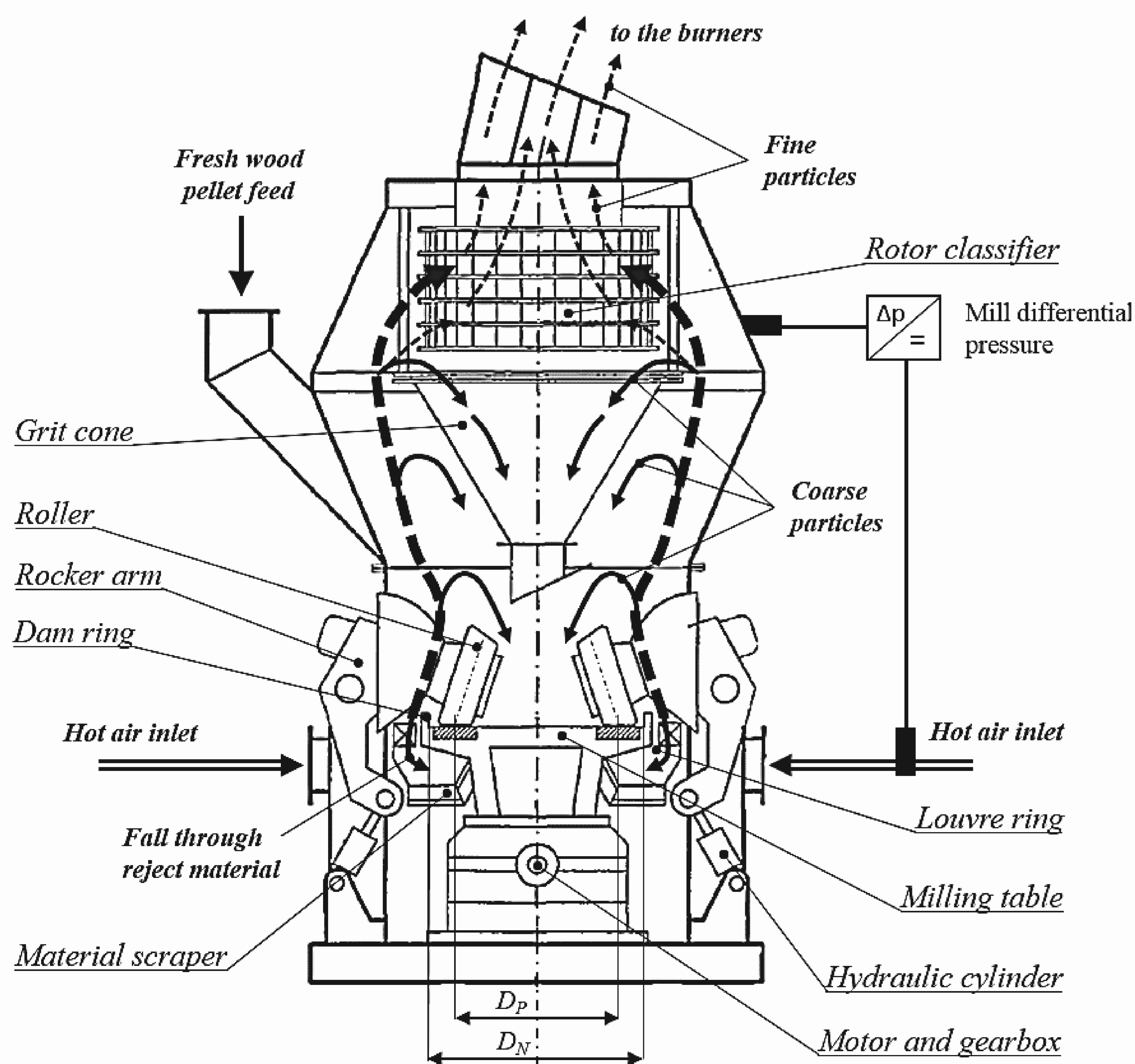
² Amagerværket, HOFOR A/S, 2300 Copenhagen S, Denmark

What were our motivation and research objectives?

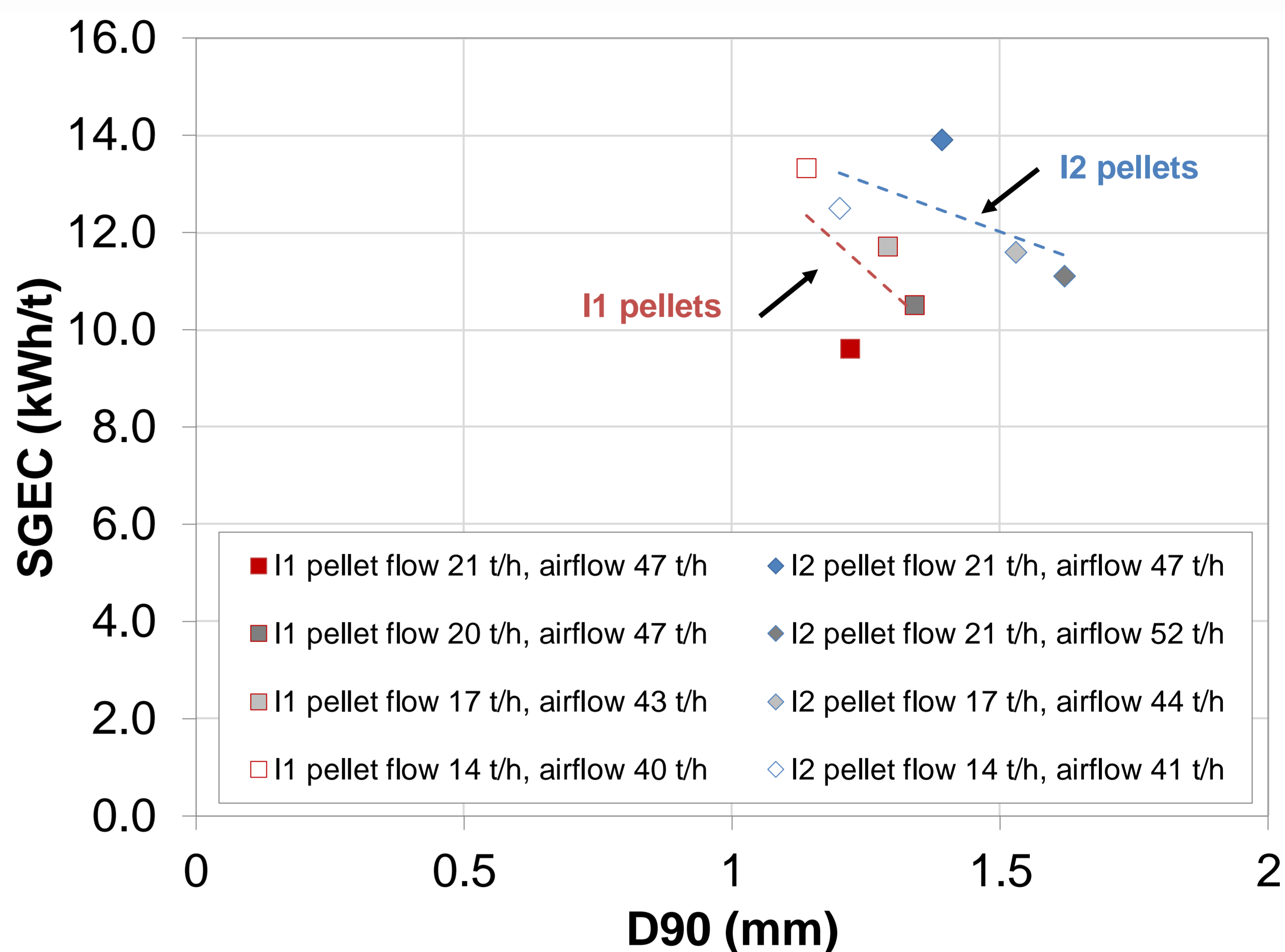
- There are limited experimental data on 100% wood pellet comminution in full-scale coal vertical roller mills.
- To study if the grindability in roller mills and particle separation in dynamic classifiers were affected by the particle size distribution (PSD) of material within pellets.
- Understanding pellet quality properties that affect the milling performance will ensure efficient pellet milling and hence optimize the combustion process.

How was the milling performance assessed?

- 1) Grinding **I1 pellets** (comprise finer particles) and **I2 pellets** (comprise coarser particles) in roller mills
- 2) Mill data collection
 - Specific grinding energy consumption, SGEC (kWh/t)
 - Mill pressure drop, Δp (kPa)
- 3) Isokinetic extraction of fine particles from burner pipes
 - Size/shape analysis using a dynamic image analyzer



Main findings



Conclusions

- The PSD of material within pellets affects the full-scale milling behavior and particle classification (i.e., cut size).
- I1 pellets yielded a smaller classifier cut size, required less grinding energy, and a lower mill pressure drop.
- The original elongated wood particle shape was not altered by vertical roller mills.
- Operating the mills at higher loads had unfavorable effects on mill pressure drop and classifier cut size. However, SGEC was reduced at higher loads.

