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From Wood Chips to Pellets to Milled Pellets: the Mechanical Processing Pathway of Wood

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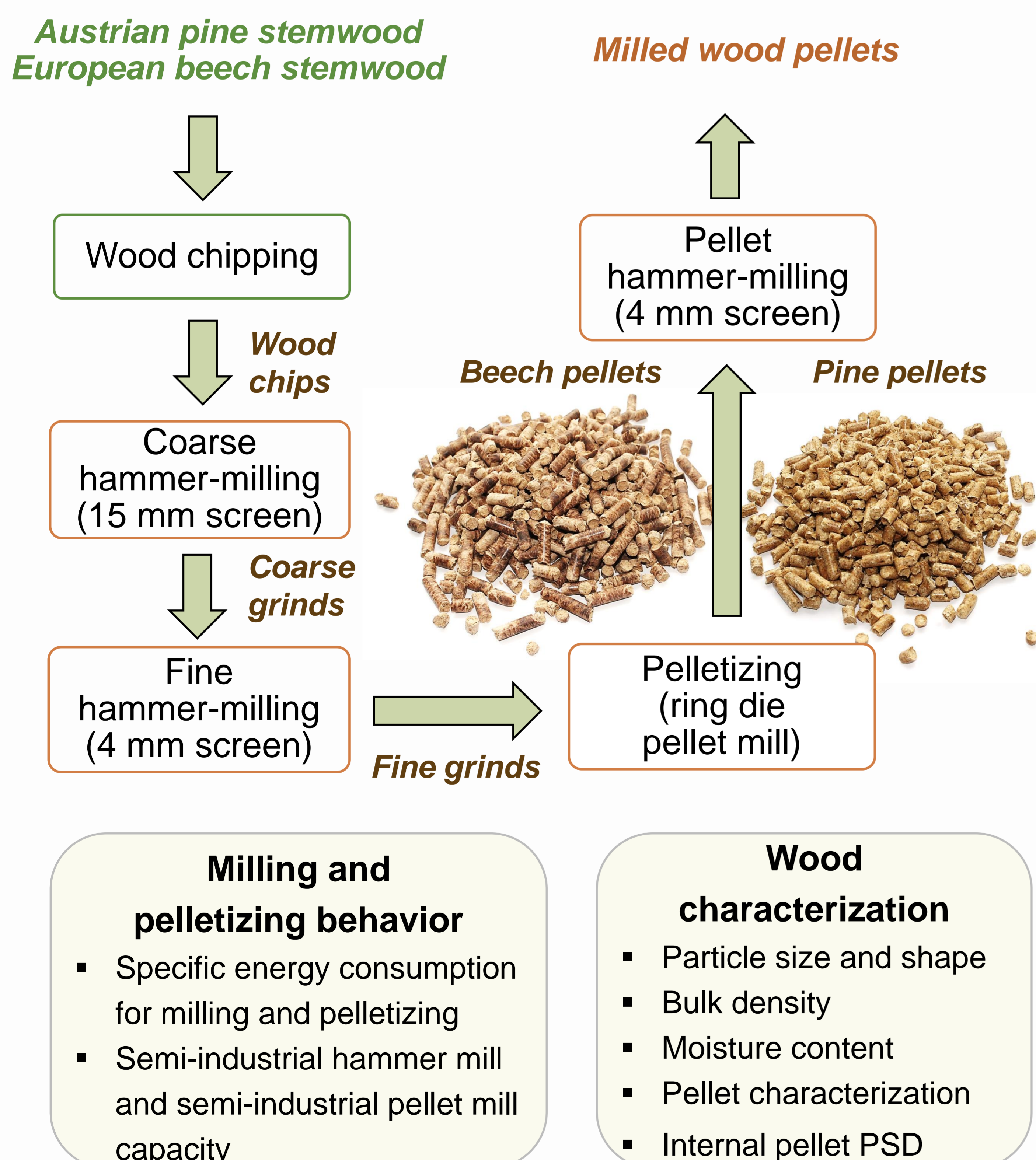
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Motivation and research objectives

We present a study focusing on the mechanical processing pathway of wood, including pellet feedstock size reduction, pelletization, and pellet comminution, because:

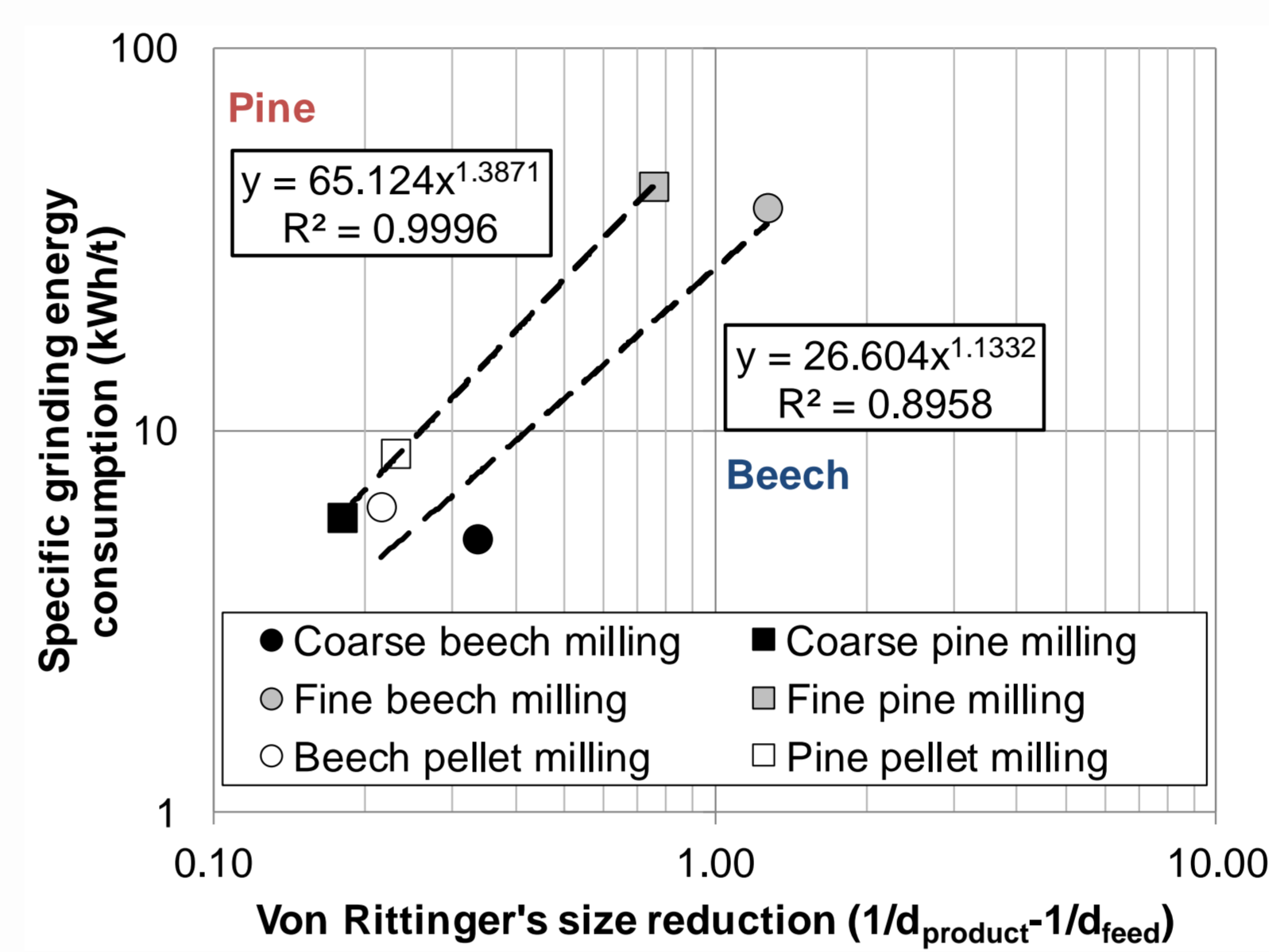
- Operators of wood suspension-fired power plants need information about the physical properties (i.e., size, shape, density) of milled pellet particles for optimizing particle burnout.
- An understanding of how pelletization and comminution alter the physical properties of wood is valuable for pellet producers, who want to produce pellets of desirable quality for power plants.
- Pellets after milling in coal mills are believed to show the original particle size distribution (PSD) before pelletizing.
- The effect of the size and shape of milled wood particles on the pelletizing process and pellet quality has hardly been studied.

How was the wood processing study performed?

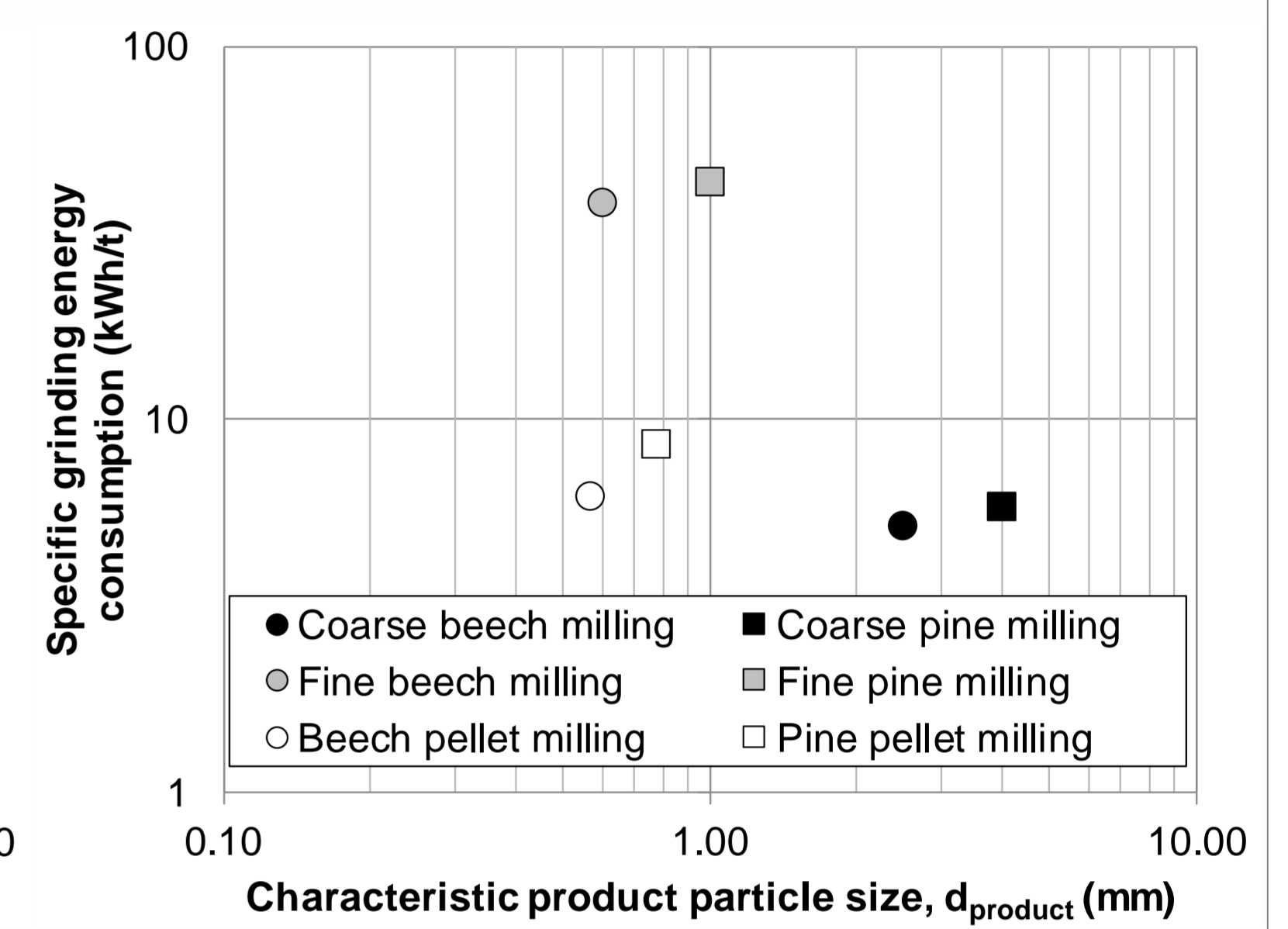


Main findings

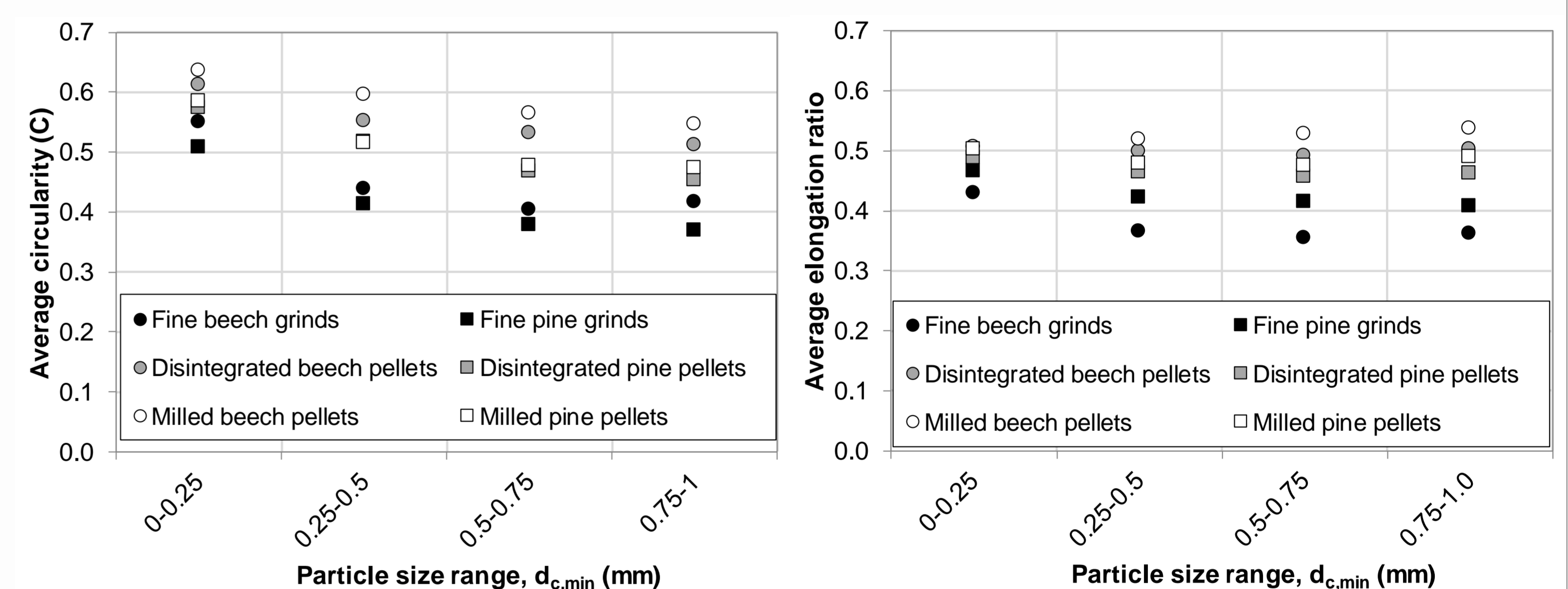
a) Size reduction effect



b) Particle fineness



c) Influence of pelletization and comminution operations on wood particle shape



Conclusions

- Milling beech requires less energy for milling, leads to higher size reduction, and produces finer particles.
- Milling pellets reduces the internal pellet particle size.
- Pelletizing beech requires more energy than pine due to lower amount of extractives.
- Pelletizing modifies the longest particle dimension and particle shape of wood.
- Pelletizing improves the grindability of wood compared to the pellet raw material.