INTERNATIONAL MINERALS INNOVATION INSTITUTE

Exploring Clean-Tech Innovation: Radio Frequency Drying for Mineral Processing - Phase 2

At IMII, we're exploring innovative, sustainable technologies that could reshape the future of the minerals industry. This project investigated a novel approach to drying mineral products using radio frequency (RF) energy, powered by a clean tech inverter developed by <u>Acceleware</u>. If successful, this cutting-edge drying technology could reduce greenhouse gas emissions while offering a cost-effective, scalable alternative to conventional drying methods used in potash and uranium processing.

Advancing RF Drying Technology: Phase I & Phase II

Acceleware has been developing RF drying technology for years, demonstrating its effectiveness in commercial-scale applications outside the minerals industry.

- Phase I established proof-of-concept, confirming that RF energy can dry potash ore to required levels through advanced simulations and electromagnetic modeling.
- Phase II focused on scaling up the technology, designing and testing a 100 kg/hr prototype to evaluate its feasibility for industrial application.

The insights from this project could help guide the future of sustainable mineral processing while ensuring clean energy innovation moves closer to real-world industrial applications.

Key Outcomes from Phase II Research

Through a series of simulations, prototype testing, and iterative refinements, Acceleware successfully demonstrated that a RF dryer, powered by a 10 kW Clean Tech Inverter, can efficiently reduce potash moisture levels from 5.5% to below 0.2%.

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Key Achievements:

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- Optimized drying performance by determining the ideal dryer stages, frequency, and power settings.
- Addressed operational challenges, including electrical insulation risks, arcing, and electrostatic effects from dust accumulation.
- > Mitigated efficiency losses, ensuring the dryer operates effectively at scale.
- Validated scalability considerations, reinforcing that commercialization feasibility should be assessed alongside technical performance in early development stages.

Proponent: Acceleware Project Duration: April to June 2024

Project Cost:	\$327,319
Industry Contribution:	\$322,152
Acceleware:	\$ 5,167

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