

Enhancing Energy Efficiency in Sugar Manufacturing through the Jigger Tube Innovation

QUT research drives global improvements in sugar processing efficiency and sustainability

Improving energy efficiency is a key challenge in sugar manufacturing, where crystallisation and separation drive high production costs and emissions. Associate Professor Darryn Rackemann's research at QUT led to the invention and commercialisation of the Jigger Tube system, a breakthrough innovation that has transformed sugar processing worldwide.

Developed through a Queensland Sustainable Energy Innovation Fund (QSEIF) project (2003 - 2006), the research introduced a new jigger system design that enhanced vacuum pan performance by utilising waste heat with a precision injection system to improve circulation and heat transfer. Findings were shared through industry seminars and presentations to the Australian and International Societies of Sugar Cane Technologists, driving early awareness and adoption.

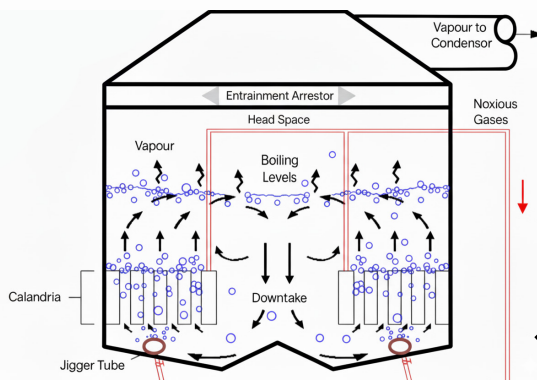
Since its introduction, the Jigger Tube has been installed in over 140 factories across 23 countries, including major sugar-producing regions such as Indonesia, Australia, India, the Philippines, and Thailand. The system delivers measurable operational benefits; improving product quality, reducing maintenance and downtime, and increasing overall energy efficiency.

The Jigger Tube exemplifies a successful Australian engineering innovation delivering sustained global impact through enhanced efficiency, productivity, and sustainability in the sugar sector.



Impact highlights

- Global adoption in 140+ factories across 23 countries, including major producers in Asia and Australia
- Improved product quality, reduced downtime, and enhanced energy efficiency
- Contributed to sustainable and energy-efficient sugar manufacturing worldwide



The jigger system design enhances vacuum pan performance by utilising waste heat in a precision injection system to improve circulation and heat transfer.

