



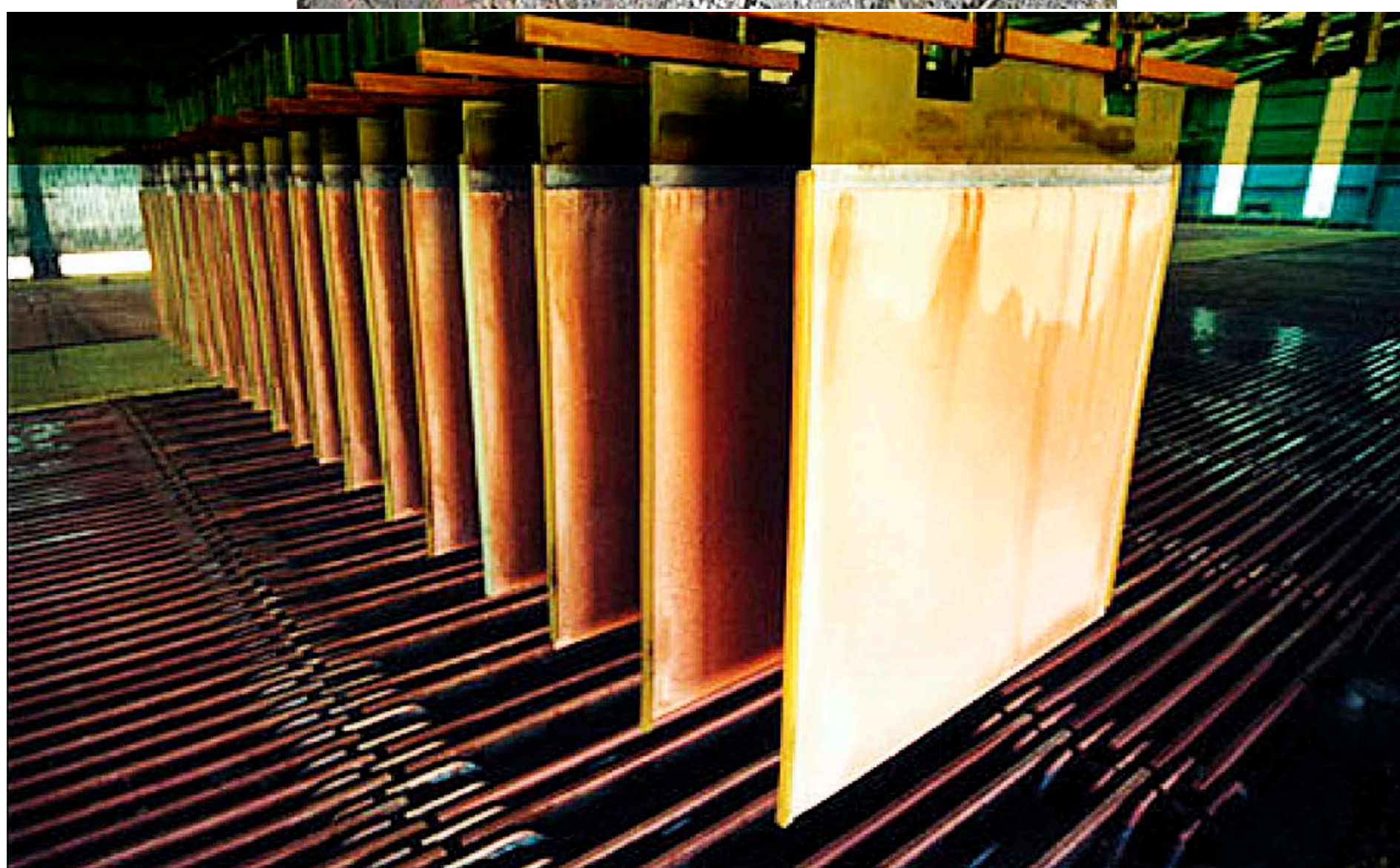
# Energy Efficient Electrowinning and Electrorefining Using Magnetically-Modified Electrodes

Novel electrowinning process that obtains metal from a liquid solution with an improved quality of metal produced and enables lower power consumption.

## Basic overview

Electrowinning and electrorefining are used at the last stage of processing of many base metals such copper, iron and zinc. With production rates of millions of tonnes per year, efficient power consumption is critical, particularly where the cell voltage is high. Electrowinning consumes 0.2 % of global electricity production.

Our technology, developed by CRANN researchers in Trinity College Dublin, shows **up to 30% reduction in voltage required**, by using magnetically modified cathodes.



*Mining and electrorefining.*

## Applications

Possible applications for this technology include:

- Electrowinning and electrorefining of base metals
- Precious metal recovery from dilute solutions
- Treating wastewaters containing toxic heavy metals such as cadmium or lead

## Technology and Patent Status

The core technology behind this technique uses magnetic fields to improve the mass transport in the electrochemical cell, influencing the relation between cell voltage and current density. In addition we have observed that the end product has improved deposit morphology, which will help reduce short circuits and cathode rejection.

This technology is currently in lab-scale prototype stage and we are looking to engage with an industry partner to test the scale up system and to test in a production environment.

Considerable know-how is employed to perfect this technique and this may be licenced to interested parties.



*Electrowinning for waste water treatment.*

## Advantages

This method provides a cheaper alternative to produce high purity metallic cathodes.

- Faster transport of species between liquid and metal.
- **Smoother deposits** with reduced dendrite growth.
- Reduction of secondary (side) reactions.
- **Improved recovery** from diluted solutions.
- Operation at room temperature.
- High rates achievable.
- **Reduced power consumption.**
- Provides option for faster production or reduced space yield.

## The opportunity

This technology is available for license. We are also interested in working with industrial partners to develop this technology further.

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