VINCA Technologies Limited

3rd Force in Metallurgy: delivering responsible sustainable metals
Innovative patented high-recovery non-toxic metal extraction

Award winning technology startup:
IMARC; Unearthed-Aspermont FOM; Mines&Money / Mining Magazine shortlists

May 2023

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KEY INDUSTRY PAIN POINTS

CRITICAL MINERAL SUPPLIES FACE MULTIPLE CHALLENGES

- Declining head grades + deeper, more complex ore bodies
- "Trapped value": isolated mineral resources & poor transport links to global markets
- Growing social license requirements to safeguard scarce water, lands & energy
- Processing constraints & high capex for greenfield Smelters
- Stricter environmental regulations for production & transport emissions (CO_2, gases, dusts, water)

KEY MACRO GROWTH THEMES

CRITICAL MINERAL SUPPLIES SUPPORT COUNTLESS RESOURCING OPPORTUNITIES

VINCA MISSION

Deliver a patented, cutting-edge, clean & sustainable metals processing technology which changes the way the metals are delivered, for the benefit of all communities and stakeholders

Cleaner Metals

- Higher Recoveries
- Lower Emissions
- Cleaner Outcomes
- Cheaper Economics
- Better Livelihoods

HIGH GLOBAL IMPACT

1. Unlocks “trapped value” from increasingly scarce and complex critical precious & base polymetallic orebodies, using a cheaper, faster, cleaner, (non-toxic), modular, more flexible lower-footprint process, which repurposes wastes (solids/gases/liquids) back into the Circular Economy, while improving Scope 1, 2 and 3 emissions; water-use & logistics.
2. Displaces high energy polluting smelters; roasters; high-pressure oxidation autoclaves and toxic leaching chemicals with a zero-harm, high-recovery metal extraction method
3. Re-shores critical transition metals supply chain control, value & skills back to mineral hosting economies, in a responsible “Future Fit” manner
4. Safeguards scarce water, air, soil and energy natural resources
5. Alleviates poverty and improve community livelihoods via more effective and environmentally-friendly lower-impact mineral recovery processes; enabling additional skills; employment; education & downstream business developments

HEDGE against the RISING COSTS of Industry’s social Harm

ALIGNMENT WITH SOCIETAL GOALS

Sustainable Materials
Responsible Sourcing
Circular Economy
Advanced Materials Innovations

VINCA TECHNOLOGIES

GOAL 1

Clean Water and Sanitation

Ensure availability and sustainable management of water and sanitation for all

GOAL 2

Industry, Innovation and Infrastructure

Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation

GOAL 3

Sustainable Consumption & Production

Achieve sustainable management & efficient use of natural resources

GOAL 4

Climate Action

Take urgent action to avert climate change and negative impacts to local environments

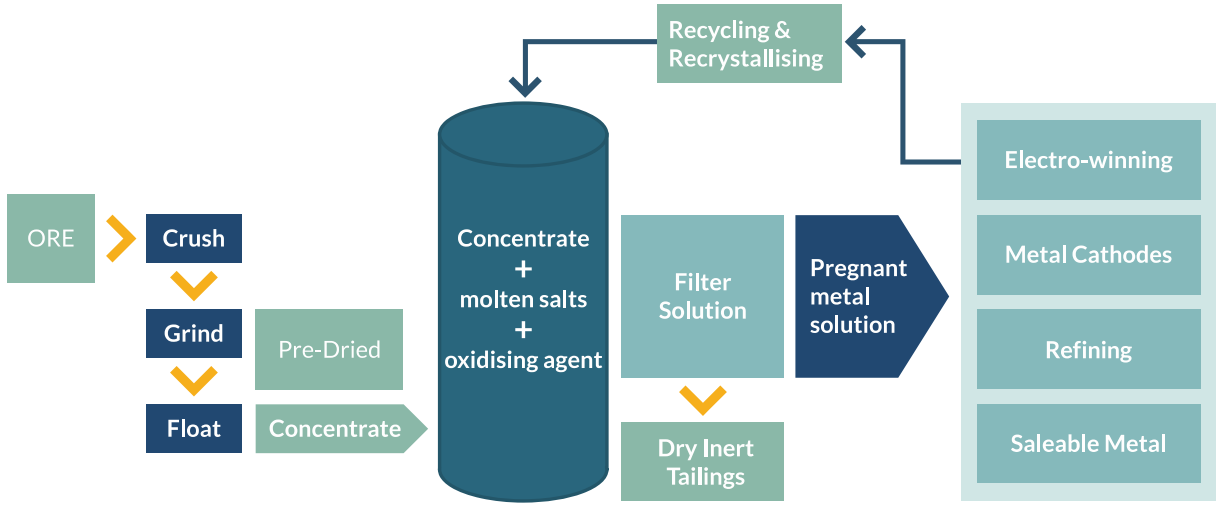
VINCA
Process Advantages

Breakthrough Technology
3 US granted patents, recognising novelty & protecting IP's commercialising future

VINCA Advantages

- Novel molten salt chemistry; simple flow sheet design
- High recoveries & fast kinetics: delivering better economics
- No toxic chemical use;
- No high-pressure, high-energy pre-treatments
- Dry, inert, solid resaleable circular economy tailings
- Non-aqueous metal extraction process
- Easier permitting & improved community engagements
- Safe, stable & modular; with standardised parameters
- Reduces smelting / roasting / pox reliance

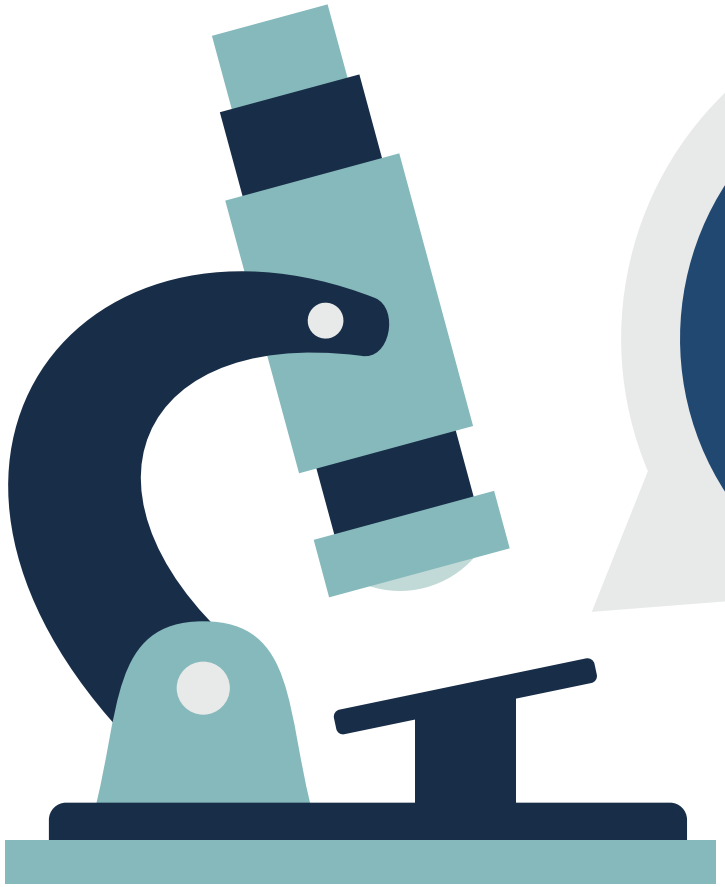
SIMPLE FLOW SHEET CONFIGURATION



Multi-metal recoveries:
Au, Ag, Pd, Pt, Rh, Ru, Co, Cu, Ni, Zn, Pb, Sn

HIGH METAL RECOVERIES
success breeds success

Fast kinetics & no passivation interference



- **99%** Au: 99%
- **99%** Pt: 99%; Pd: 97%; Ru: 97%
- **99%** Ag: 99%
- **99%** Co: 99%
- **99%** Cu: 99%, Ni 99%, Pb 99%

Note: Recoveries based on best results across sample leach tests for each metal

Benefits at a glance

Generating higher productivity, cleaner minerals

Breakthrough Metallurgy

- Eutectic molten salts as soluble complexing metal leach & electrolytic “carriers”
- High & wide ranging precious/base metal recoveries
- Fast Kinetics (3/day semi-continuous cycles)
- Simple flowsheet
- Standard parameters

Compelling Economics

- 20-25%+ potential capex reduction benefits
- Transport infrastructure capex, freight & Scope 2 emission opex savings
- Broader base of potential revenue streams
- Smaller Footprint
- Upstream & downstream mining & reclamation

Multiple Use Case Advantages

- Multi-deposit regional consolidations
- Trapped Value unlocked for complex Tier2 / Tier3 remote inland deposits
- Early-entry high value Refinery residues, tailings, black mass capture
- Avert dependence on future Smelter capacity shortages

Safe & Environmentally Friendly

- No CO2 emissions / carbon neutral/negative
- Circular Economy “Waste-Free” (solids; liquids; gases)
- Non toxic reagents
- Atmospheric pressures
- Less Transport infrastructure / Scope 2 emissions

Auto-Thermal Energy

- Zero Net Energy balance (beyond first melt) (& not mineralogy dependent)
- Carbon negative potential for high Sulphur feedstocks

Self-Generating Steam Waters

- No H2O tailings
- Salt washing via steam capture

Modular Scalability

- Flow sheet ability to both shrink and expand to suit large and small projects alike

Industrially Proven Plant/Equipment

- Readily available long life robust standard Industrial equipment
- Smelter re-lining requirements removed

Feedstock Flexibility

- Ability to process a diverse range of complex & “dirty” Precious / Base metal feedstocks (primary, secondary residues, black mass), with few technical constraints (Uranium; Asbestos)
- Readily able to process both single and double refractory ores
- Solution for declining head grades

Multiple use cases

Creating critical mineral value where others cannot

Regional Multi-deposit consolidations

- Flexible multi-metal feedstock options (precious/base)
- Pooling of mining costs
- Reduced logistics costs / scope 2 emissions
- Resource nationalism gains (skills/taxes)
- Improved Community engagement (skills; value; environmental safety)
- Aggregate “aging assets” to extend life

Complex Tier2/Tier3 value unlocking

- Multi-metal remote inland “elephant-country” (fragmented/artisanal) deposits with poor transportation links to global markets
- Modular processing matching to deposit size
- Upstream & downstream mining savings
- Smaller Footprint; sustainable processing
- Potential tax credits (sustainable innovations) & resource nationalism gains (skills; value capture etc)

Future Smelter capacity offsets

- Avert dependency on future Smelter capacity shortages (capex; community & regulatory constraints)
- Modular capacity options (bolt-on expansions / commercial offtakes)
- Smaller footprint
- Improved Community engagement (skills; value capture; environmental safety)

Complex Metal Refinery residues

- Improved payables for high value complex metal content (eg PGMs from Ni Refinery materials)
- Circular economy (waste free) gains
- Lower Transport infrastructure / Scope 2 emissions
- Less waste / reclamation costs

CN/Hg-banned jurisdictions

- Banned jurisdictions include: Germany, Czech Republic; Hungary; Turkey; Costa Rica; US (Montana/Wisconsin/Colorado parts); Argentina (several provinces)
- Environmentally (ESG) friendly processing

Resource nationalism (onshore processing)

- Indonesia; Zimbabwe – others likely to follow suit
- Community value benefits (safety; skills; taxes)

Black Mass recycling

- Circular Economy waste-value-metal capture
- Pre-existing feedstock availability (early de-risk cashflows)

Satellite ore deposit processing

- Improved satellite orebody economics
- Pooling of small satellite deposits (previously sub-economic)

Slag stockpile blending

- High value slag stockpile blending
- Pre-existing feedstock availability (early de-risk cashflows)
- Ability to process a diverse range of complex metal feedstocks, with few constraints (U_3O_8; Asbestos)

NEAR TERM STRATEGY

Optimise Recoveries

Expand Global Database

De-risk Lab scale Flowsheet

Evolve Comparative Economics

KEY PARTNERSHIPS

"best of breed"

University Arizona (*DoE grant funding*)
Patent JVs (x2)

Kingston Process Metallurgy (KPM)
Process Validations (Economic & Technical)

GKN Germany / Nanomag India
Commercial Filter manufacture

GEA / Novopro
Recrystallisation equipment design and manufacture

Haynes International / University Pittsburgh *Construction materials*

EPC Contractor(s) & Fabricator(s) (TBA)
Process Design Engineering

University of Oxford (Earth Sciences)
Geothermal brines metal recovery collaboration

MEET THE TEAM

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Technical Specialist Partnerships (Global Best of Breed)

- Kingston Process Metallurgy
- GKN Powder Metallurgy
- Nanonmag
- GEA / Novopro
- Haynes International
- University of Pittsburgh
- University of Arizona
- Oxford University (geothermal brines)

Advisory Board Backgrounds

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