INTERNATIONAL NICKEL STUDY GROUP MEETING · LISBON · 14 OCTOBER 2026

Managing Water in Nickel Mining

Indonesia's Water Resilience, ESG Implementation and Global Market Readiness

Responsible nickel starts with water. Water keeps our plants running, protects the communities who live around our mines and industrial parks, and underpins the trust of global buyers. So APNI's approach is simple: measure first, be honest about what we find, and improve on the basis of verifiable data.

Meidy Katrin Lengkey
Secretary General, Indonesian Nickel Miners Association (APNI)

KEY MESSAGES

1. **Water now shapes supply**
   The 2026 El Niño has already cut output in Morowali.
2. **Data before claims**
   We still have no national baseline for water use per tonne of nickel.
3. **Different instruments**
   ESG, LCA, CBAM and the battery passport each ask different questions.
4. **A measurable roadmap**
   APNI proposes water KPIs for 2027–2030.

02 · INDONESIA'S NICKEL INDUSTRY LANDSCAPE

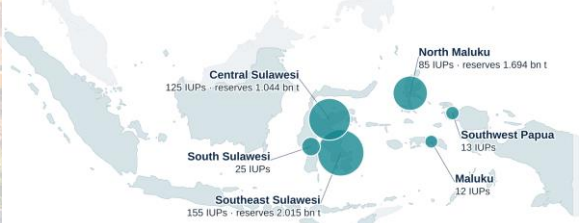
Global Position, Reserves, Permits and Processing Facilities

66.6%
Indonesia's share of world mined nickel, 2025
S&P Global

17.3 bn t
ore resources; 174.2 Mt Ni metal (2023)
Geological Agency/MEMR

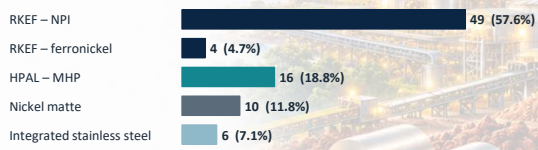
5.31 bn t
ore reserves; 52.472 Mt Ni metal (31 Dec 2025)
APNI annex; MEMR MOMI

415 permits (IUPs)
384 in production, 31 in exploration; MOMI records 414
APNI annex



Nickel mining permits (IUPs) by province (circle size = number) and reserves of the top three provinces

Recorded processing facilities by route and product (85 units)



Operating status is not broken down in the APNI annex. Separate reference (Investment Ministry/BKPM, Mar 2025, media-reported, smelter projects): 54 operating, 120 under construction, 16 planned; 60 in permitting reported separately. Different scope; not added to the 85 units.

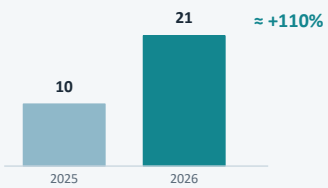
About two-thirds of the world's mined nickel now comes from Indonesia, and our permits and reserves are highly concentrated. Southeast and Central Sulawesi hold 280 of our 415 IUPs (67.5%), and three provinces hold 89.5% of ore reserves, so the pressure on water falls on the same few river basins. In January–August 2026, APNI's data recap puts total ore volume at 186.93 million wet tonnes: 163.61 million of domestic ore consumption, 14.05 million imported (mostly from the Philippines) and 9.27 million as FeNi/NPI and matte in ore equivalent. Resources and reserves use different reference years, so we keep them apart.

03 · NICKEL'S ECONOMIC CONTRIBUTION

State Revenue, Exports and Investment: 2026 versus 2025

Nickel non-tax state revenue (PNBP)

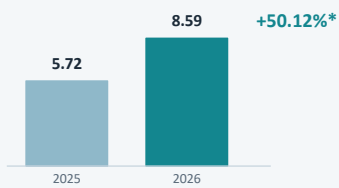
IDR trillion · Jan–Aug



Covers royalties and other PNBP levies, not royalties alone. Source figures rounded to the nearest trillion. ≈ USD 0.56 bn (2025) and 1.17 bn (2026).

Nickel exports, HS 75

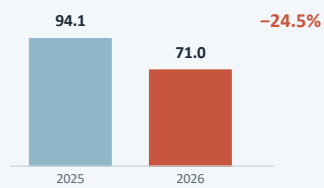
USD billion · Jan–Aug



Matte, MHP and refined nickel. Export value is not state revenue. Indicative ≈ IDR 153.9 trillion. USD and IDR conversions at JISDOR 6 Oct 2026: IDR 17,917/USD. *Official BPS percentage.

Realised nickel downstream investment

IDR trillion · first half



Realised processing investment, not commitments. Nickel mining investment is not yet published separately. ≈ USD 5.25 bn (2025) and 3.96 bn (2026).

Nickel matters to Indonesia's economy, so water risk is also economic risk. Nickel PNBP rose from IDR 10 trillion to IDR 21 trillion (≈ USD 0.56 bn to 1.17 bn), HS 75 exports grew 50.12%, and realised downstream investment fell 24.5%. Across all nickel products, including stainless steel, APNI's data recap puts January–August exports at USD 25.96 billion (+17.2%), even though nickel content fell 3.8%. These 2026 figures are partial and cover different periods.

04 · THE NICKEL–WATER NEXUS

Mine Wastewater under Ministerial Regulation 5/2022

WASTEWATER STREAMS (ART. 2)

- Runoff from stockpiles and disturbed ground
- Mine-pit water: rain and groundwater pumped out
- Processing and refining wastewater within mining operations
- Supporting: domestic, workshop and laboratory

1 TREAT FIRST Art. 2(1)

CONSTRUCTED WETLAND (ANNEX I)

- **Pre-treatment** equalisation and settling ponds for flow and TSS
- **Wetland cells** plants, microbes and saturated soil treat pH, metals and BOD
- **Indicator pond** checks compliance before release; lime if needed

2 A RECOGNISED TECHNOLOGY STANDARD
Optional for mining, including nickel ore (KBLI 0729). Sites that use it must include it in their application for a discharge technical approval (Art. 2(2)–(3), 19).

3 DISCHARGE Art. 7, 10–13

Receiving water body
River, lake or swamp, only at the compliance point and within Annex II limits

Single-site example: PT Vale Indonesia reports water use of 106.9 m³ per tonne of nickel in matte (2023). Not representative of the industry.

No national baseline for water use per tonne of nickel.

4 MONITORING AND REPORTING FOR WETLAND SITES (Art. 12–18): pH and flow daily, with online monitoring equipment (Art. 7); other parameters monthly by certified samplers and registered laboratories; river upstream, at discharge and downstream at least every 3 months; electronic reports to the permitting authority.

Indonesian law already sets the discipline for mine wastewater. Every mine must treat its wastewater before discharge, and sites using constructed wetlands must release only at compliance points, monitor daily and monthly, check the river every quarter and report electronically. What the law does not give us is a water balance. Indonesia still has no national baseline for water use per tonne of nickel, and closing that gap is the first step in APNI's roadmap.

05 · HOW MUCH WATER DOES NICKEL USE?

Water Intensity Depends on the Route and on What Is Counted

Reported water intensity, m³ per tonne of nickel (log scale)

Indonesia 2026E: who uses the processing water?

Processing only · Project Blue estimates · *Project Blue prints 121,000 and 138,000 m³; read as thousands of m³

Share of processed Ni

HPAL ≈410 kt · RKEF ≈1,972 kt

Share of processing water

HPAL ≈121 million m³* · RKEF ≈138 million m³*

Land use differs too: Skarn puts land use at 155 m² per tonne of nickel for laterite HPAL, against 8 m² for sulphide (change over 2018–2022). It attributes the water difference to rainfall, complex tailings and mine expansion, and suggests reforestation and water infrastructure could partly offset it.

Depending on the route and on what is counted, reported water figures for a tonne of nickel range from 60 to more than 10,000 m³. Process freshwater, site withdrawal including rainfall, and a company's own 'water use' are different measures. In 2026, HPAL is expected to produce about a sixth of our processed nickel but use almost half of the processing water. That is why we want one shared template before anyone compares numbers.

06 · EL NIÑO AND OPERATIONAL RESILIENCE

El Niño 2026: Separating Actual Impacts from Risk Scenarios

CLIMATE EVIDENCE · BMKG

+2.63

ENSO index, Jul–Sep 2026: very strong El Niño, expected to last into early 2027

529 zones

with a delayed rainy-season onset, covering 61.08% of Indonesia's land area

Nov 2026

rainy season begins in 185 zones (24.66%); peak Dec 2026–Feb 2027

Location	Actual impact (reported)	Risk scenario or unconfirmed report
Morowali (IMIP), Central Sulawesi	22 Sep: IMIP confirmed NPI cuts at several smelters, with no shutdowns or layoffs. Excelsior HPAL (newly commissioned): water shortage interrupted the ramp-up; could run at about 30% of capacity if it persists; Nickel Industries' RKEF lines normal (15 Sep).	IMIP warning (2 Sep): output could fall 30–40% without new water sources. The figure of about 100 kt of NPI cuts is from anonymous sources.
Luwu (PT Bumi Mineral Sulawesi/BMS), South Sulawesi	PLN: South Sulawesi hydropower capacity down about 650 MW (22 Sep). Output of BMS RKEF Line 1 reportedly reduced (Mysteel, 2 Sep).	Project Blue reports about 570 workers placed on standby; not confirmed by the company.
Sorowako (PT Vale), South Sulawesi	No impact yet on mine or smelter (company statement, 9 Sep).	Lower lake-fed hydropower if the drought persists; cloud seeding considered for early 2027 if needed.
Weda Bay and Obi (North Maluku); Southeast Sulawesi	No drought impact reported; none assumed.	HPAL process and cooling water; coal supply for captive power when Kalimantan rivers run low.
Ore mining (across sites)	Fewer rain disruptions; Hengjaya Mine posted record ore sales of 1.6 million wet tonnes in August.	Nov 2026–Feb 2027: floods, sediment surges and overflow from ponds and tailings facilities.

The 2026 El Niño is testing the water resilience of Indonesia's nickel downstream industry. It has hit us in two ways: river water for processing and cooling in Morowali, and river-fed hydropower in South Sulawesi. Sorowako, which draws on a lake system, has held up so far. We keep confirmed facts apart from unconfirmed figures. And when the rains return in November–February, the risk will flip to floods and sediment.

07 · UPSTREAM WATER MANAGEMENT

Mines: Keep Clean Water Clean, Treat Contact Water

1 Divert clean water

Diversion channels from upper slopes are built before land clearing, reducing the volume of water that must be treated.

2 Capture and settle

Contact water from pits, stockpiles and dumps is captured; settling ponds are sized for a design storm and dredged in the dry season.

3 Treat Cr(VI)

$FeSO_4$ reduces Cr(VI) to Cr(III); a clarifier or lamella settler then removes it with the solids.

4 Discharge and monitor

Release only at permitted compliance points; daily pH and flow, monthly laboratory tests, quarterly river sampling, electronic reporting (Regulation 5/2022 for wetland sites; good practice elsewhere).

Nickel ore effluent limits (Ministerial Regulation 9/2006; Regulation 5/2022 Annex II, wetland sites)

Parameter	Mining	Processing
pH	6–9	6–9
TSS	200 mg/L	100 mg/L
Cr(VI) / total Cr	0.1 / 0.5 mg/L	0.1 / 0.5 mg/L
Nickel (Ni)	0.5 mg/L	0.5 mg/L

Single-site evidence. PT Vale Indonesia's $FeSO_4$ and lamella settler system removes 99.31% of Cr(VI) and 88.62% of TSS (Hasanuddin University study, 2026).

Enforcement. Feb 2026: KLH froze about 80 environmental approvals after reviewing 250 of 1,358 coal and nickel businesses; watershed damage was one criterion.

> We know how to manage mine water in Indonesia. The hard part is getting hundreds of permit holders who share the same rivers to do it consistently. We therefore push for planning at the catchment level, and for sampling during heavy rain as a matter of routine. Since KLH froze environmental approvals in February, settling ponds have become a matter of licence continuity, not just a reporting item.

08 · ENFORCEMENT AND SANCTIONS

Regulation 6/2026: Non-Compliance Now Has a Clear Price

ENVIRONMENTAL APPROVAL

2.5–5%

of investment value

No environmental approval, but holds a business permit: fine = 2.5% × investment value.

No approval and no business permit: 5% × investment value.

The 5% rate also applies to **changes, land expansion or new activities** not covered by the permit.

WASTEWATER

IDR 700,000/kg

of nickel or chromium above the limit (≈ USD 39/kg)

Fine = excess load (kg) × rate × days. Load = (actual − limit concentration) × flow.

Rates per kg: TSS IDR 20,000 (≈ USD 1.1); Fe, Mn IDR 350,000 (≈ USD 20); Co, Cd, As IDR 1.4 million (≈ USD 78); Hg IDR 14 million (≈ USD 781). pH outside limits: IDR 10,000–40,000 per m^3 (≈ USD 0.56–2.23).

Permit obligations: IDR 1–25 million (≈ USD 56–1,395) per breach, e.g. IDR 25 million (≈ USD 1,395) for discharging outside the compliance point.

EMISSIONS

IDR 80–1,100/g

above the emission limit (≈ USD 4.5–61/kg)

Fine = excess load (g) × rate × time. Load = (actual − limit) × stack flow.

Rates per gram: SO_2 IDR 80 (≈ USD 4.5/kg); particulates, NOx IDR 150 (≈ USD 8.4/kg); Ni, Co, Cr IDR 250 (≈ USD 14/kg); Hg IDR 1,100 (≈ USD 61/kg).

Permit obligations: IDR 5–25 million (≈ USD 279–1,395) per breach, e.g. no continuous monitoring IDR 15 million (≈ USD 837).

1 Written warning — fix within 30 days

2 Government coercion — e.g. close a wastewater outlet, halt production

3 Administrative fine — up to IDR 3 billion (≈ USD 167,000) per violation

4 Permit freeze — if coercion or fines are not met

5 Permit revocation — also for damage that cannot be contained or restored

PROPER matters

A non-compliant PROPER rating brings regular field or virtual inspections; sites compliant in successive years can be supervised through report reviews.

Ministerial Regulation 6/2026 on environmental supervision and administrative sanctions (signed 25 May 2026, released 12 Oct 2026; replaces Regulation 14/2024). Steps can be combined or skipped for serious breaches. Sanctions are issued through OSS; fines are paid as non-tax state revenue; objections within 7 days. USD at JISDOR 6 Oct 2026 (IDR 17,917/USD).

> For nickel miners and smelters, a missing environmental approval can cost 2.5–5% of the investment, and every kilogram of nickel or chromium above the limit has a price. APNI's message to members: keep approvals current, treat and monitor wastewater and emissions, and keep a compliant PROPER rating.

09 · REGULATION 6/2026 IN DETAIL

Regulation 6/2026: Who Supervises, How, and What Follows

Ministerial Regulation 6/2026 on environmental supervision and sanctions · signed 25 May 2026 · released 12 Oct 2026 · in force on promulgation · replaces Regulation 14/2024

1 · SUPERVISION (ART. 2–23)

Who: the authority that issued the environmental approval or permit (minister, governor, regent or mayor). The minister can take over serious cases or step in when regions do not act (Art. 4–5).

Regular, field or virtual visit: e.g. sites operating for more than 2 years, national vital objects, repeat violators, a non-compliant PROPER rating, or public concern (Art. 19).

Regular, report review: pre-construction, construction, up to 2 years of operation, or compliant PROPER ratings in successive years (Art. 20).

Incidental: community complaints, reports from industrial park or SEZ managers, suspected non-compliance, or a ministerial order (Art. 21).

2 · INSPECTORS' POWERS (ART. 24–30)

On site, inspectors (PPLH) may **monitor, take samples, photograph, record, inspect equipment and installations, and stop certain violations** (Art. 24).

Immediate stop for medium or serious breaches: close or dismantle a wastewater outlet, halt an emission source, or close a waste dump, marked with a PPLH sign or line (Art. 26–27).

Outcome: a signed inspection record and a status of compliant or non-compliant. Non-compliance leads to a recommendation for administrative sanctions, criminal sanctions and/or environmental dispute settlement (Art. 29–30).

3 · SANCTIONS AND FINES (ART. 38–60)

Coercion without prior warning: the same minor breach more than twice, a serious threat to people or the environment, or wider damage if not stopped at once (Art. 40).

Coercion and fine together: no environmental approval; effluent or emission limits exceeded; permit obligations not met; AMDAL prepared without a certified preparer (Art. 43).

Fines: up to IDR 3 billion (≈ USD 167,000) per violation; 2.5–5% of investment value (fixed plus working capital); 10% of AMDAL preparation cost (Art. 44–48).

Late compliance: extra fine based on days of delay; exemptions for natural disasters, permit processing or limited domestic technology (Art. 52–54). Freeze or revocation does not remove civil or criminal liability (Art. 57, 59).

Process: identify violation → draft decision → decide → deliver via OSS (Art. 61–65) · **Objection:** within 7 days; the sanction still applies meanwhile (Art. 67, 69) · **Follow-up:** heavier sanctions if breaches continue (Art. 72–73)

> Under Regulation 6/2026, supervision of nickel operators is risk-based: PROPER status and compliance history decide whether a site gets field visits or report reviews. Inspectors can stop a breach on site, and coercion and fines can be imposed together.

10 · DOWNSTREAM WATER MANAGEMENT

RKEF and HPAL: Two Different Water-Risk Profiles

Aspect	RKEF (pyrometallurgy)	HPAL (hydrometallurgy)
Capacity and exports (Ni)	53 units (APNI annex). APNI data recap: 246 furnaces (242 operating, 4 under construction); about 2.64 Mt Ni a year at 90% utilisation. Jan–Aug 2026 exports: 1,262 kt Ni (NPI/FeNi 804, stainless steel 246, matte 212)	16 MHP-producing units (APNI annex). APNI data recap: 697 kt Ni of MHP capacity operating, 337 kt under construction. Jan–Aug 2026 exports: 241 kt Ni (MHP 214, nickel sulphate 27)
Main role of water	Furnace and electrode cooling; slag granulation	Process input: ore slurry, autoclave leaching, counter-current washing
Recirculation	Closed-loop cooling and cooling towers; make-up water replaces evaporation	Thickener overflow and filter-press water returned to the process
Residues and seepage	Slag; runoff and leachate from slag and ore stockpiles must be monitored	Tailings filtered and stored on land (dry-stack); contact water collected in lined channels and treated
Effluent focus	Thermal discharge, TSS, oil and grease	pH, dissolved metals (Ni, Mn, Cr(VI)), sulphate; neutralisation with limestone or quicklime
2026 drought signal	IMIP confirmed NPI cuts at several smelters (22 Sep), volume not disclosed; Nickel Industries' RKEF lines normal	Excelsior HPAL ramp-up interrupted; could run at about 30% of capacity if the shortage persists

> In 2026, Excelsior showed us how sensitive HPAL is to water, because water is part of its chemistry. For RKEF, the weak point is cooling water. Looking ahead, we see two priorities. The first is enough land and a sound design for dry-stack tailings as HPAL output grows. The second is making park operators, and not only their tenants, responsible for water supply, drainage and shared wastewater treatment.

11 · COMPANY CASE STUDIES

Vale, Harita and Nickel Industries: Site Evidence and Its Limits

	PT Vale Indonesia	Harita Nickel	Nickel Industries
Location and scope	Sorowako, South Sulawesi: open-pit mine and RKEF (nickel matte); power from three hydropower plants on the Larona River (about 365 MW)	Obi Island, North Maluku: mine, RKEF smelter, HPAL refinery, dry-stack tailings	Hengjaya Mine (Central Sulawesi); RKEF lines at IMIP and IWIP; Excelsior HPAL (46% interest) at IMIP
Key evidence	Water use (company term) 7.56 million m³; 106.9 m³ per tonne of Ni in matte (141.77 in 2022); >100 settling ponds; 99.31% Cr(VI) removal	Indonesia's first IRMA audit of an integrated mine and processing site; corrective actions under way	Green PROPER rating four years running (2025 assessment); drought impact disclosed promptly with site rainfall data
Year and source	2023 data (company website); Hasanuddin University study (published 2026)	Site audit Apr 2025; draft report Nov 2025; updates to Jan 2026 (IRMA)	ASX quarterly report (Jul 2026); company update (15 Sep 2026)
Data limits	Self-reported; 2024–2025 water data not yet reviewed by APNI; Pomalaa HPAL and Bahodopi RKEF projects not covered	Final IRMA score not yet published; media reports of Cr(VI) in Kawasi springs disputed by the company	Water withdrawal data not yet reviewed by APNI; IMIP water supply is shared and outside the company's control

These three companies show what good practice can look like. They do not represent national performance. Vale shows that investment in ponds and treatment can be measured and scientifically evaluated. Harita opened its site to a multi-stakeholder audit. Nickel Industries told the market about its drought impact quickly. But each reports water in its own way, and that is why we are proposing a common data template.

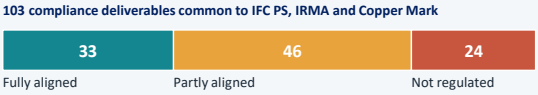
12 · PRACTICAL ESG IMPLEMENTATION

Indonesian ESG Standards: Separating What Is in Force from Drafts

Gap analysis of ESG regulation for critical minerals

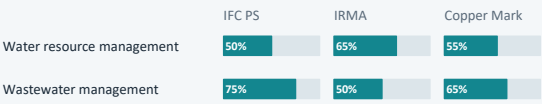
Coordinating Ministry for Economic Affairs, 2026 · study only

103 compliance deliverables common to IFC PS, IRMA and Copper Mark



23 of the 24 unregulated items (96%) are in the social pillar: Indigenous peoples and FPIC, land acquisition, resettlement, security.

Alignment of mandatory regulation with international standards, water parameters



IN FORCE

Environmental approval (based on AMDAL); Government Regulation 22/2021; Ministerial Regulations 9/2006 (nickel effluent standards), 5/2022 (constructed wetlands), 7/2025 (PROPER) and 6/2026 (supervision and sanctions)

VOLUNTARY OR MARKET-DRIVEN

IRMA Standard v1.0 (2018); Indonesia Taxonomy for Sustainable Finance (TKBI), OJK v3, 5 Feb 2026

DRAFT OR PROPOSED

IRMA v2.0 (under revision); APNI's proposed national ESG standard for critical minerals (target: Presidential Regulation; KLH meeting 20 Jul 2026). Not in force.

For us, credible water ESG comes down to four things: follow Indonesian law, align with recognised standards, protect communities and ecosystems, then verify and keep improving. The government's 2026 study shows that our water rules exist, but they still aim at minimum compliance. The national ESG standard APNI has proposed will not be in force until the regulation is issued.

13 · LCA, CARBON AND WATER FOOTPRINTS

Measure with the Same Method Before Making Claims

ISO 14040 and 14044:2006
Life-cycle assessment (LCA)
Published comparisons require an independent critical review.

ISO 14067:2018
Product carbon footprint
The reference standard for most buyer requests on product emissions.

ISO 14046:2014
Water footprint
Assesses impacts in a specific catchment, not just volume; distinct from a site water balance.

Four methodological choices that decide whether two nickel figures are comparable

1. **System boundary**
   State the stages covered: mining, ore transport, processing, captive power. Intermediates are usually cradle-to-gate.
2. **Declared unit**
   Per tonne of nickel contained in NPI, matte or MHP, not per tonne of product, because Ni grades vary widely.
3. **Data quality**
   Primary site data with a clear reference year; disclose secondary data and data gaps.
4. **Co-product allocation**
   Cobalt in MHP, and iron and chromium in NPI, share the burden; explain the method and test sensitivity.

You will not see a national carbon or water footprint figure here, because no verified baseline exists yet. Water, energy and emissions are tied together: a drought can cut hydropower and push emissions up, and recycling water takes electricity. We need both an ISO 14046 water footprint and a site water balance, backed by the effluent monitoring required by law, such as Regulation 5/2022 for wetland sites. Neither can stand in for the other.

14 · CBAM AND NICKEL VALUE CHAINS

CBAM Reaches Nickel through Iron and Steel Products

1 Jan 2026 Definitive period begins

1 Feb 2027 Certificate sales open for 2026 imports

30 Sep 2027 First annual CBAM declaration

Product	CN code	CBAM status
Ferronickel, including most NPI	7202 60	Covered
Pig iron, including some NPI	7201	Covered
Stainless steel: ingots, semi-finished, flat, bars, wire	7218–7223	Covered
Nickel matte, MHP, unwrought nickel	7501, 7502, 2825 40	Not covered
Nickel sulphate	2833 24	Not covered

Direct obligation
EU importers, through an authorised CBAM declarant, report embedded emissions and surrender certificates. Iron and steel: direct emissions only. Importers of ≤50 t a year are exempt.

Buyer data requests
Indonesian producers are asked for verified emissions data by installation, product and production route, plus any carbon price paid. Without data, importers use default values.

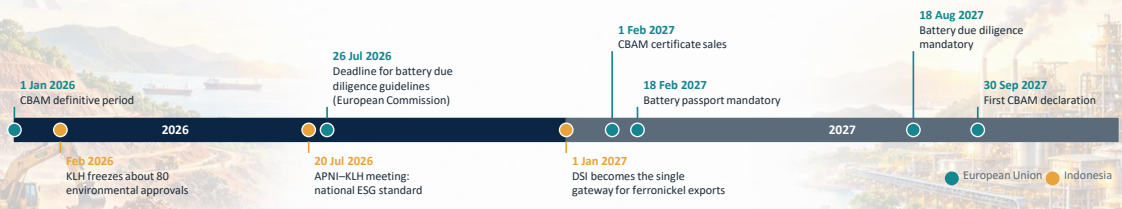
Methodology
Embedded emissions follow CBAM rules for the relevant installations and precursors.

CBAM is not an LCA. An ISO 14067 carbon footprint covers mine to factory gate, including indirect energy; CBAM figures answer a different question.

CBAM reaches Indonesian nickel through ferronickel, pig iron and stainless steel. MHP, matte and nickel sulphate are outside it. The legal obligation sits with EU importers, but the requests for verified, installation-level emissions data land on our producers' desks. Without that data, importers fall back on default values. So data readiness becomes a competitive advantage.

15 · EU BATTERY PASSPORT AND TRACEABILITY

Regulatory Timeline and Roles in the Supply Chain



Battery passport · Article 77

Electronic record with a QR code for EV batteries, light means of transport (LMT) batteries and industrial batteries above 2 kWh. Mandatory for economic operators placing batteries on the EU market.

Due diligence · Articles 48–52

Due diligence on cobalt, lithium, natural graphite and nickel, with third-party verification; risks include water, soil and air pollution. Small operators exempt (threshold may change).

Nickel supplier's role

No direct obligation. Data is requested through contracts: mine and refinery identity, chain of custody, water-risk data, audit results, grievance records.

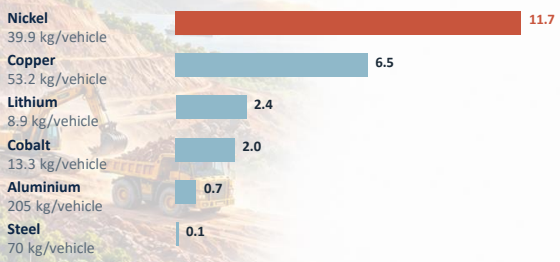
The battery passport, due diligence and the supplier's role are three separate things. Nickel miners carry no direct legal obligation, yet the data Europe needs starts at the mine. Buyers will ask for water monitoring data, grievance records and audit results in their contracts well before August 2027. So those data systems must be built now.

16 · WATER AS A FINANCIAL RISK

From ESG Water to Financial Water: What Markets Will Ask For

Mine-related water consumption per average EV, m³ per vehicle

Skarn estimate, 2024 · metals only (assembly adds about 3.0 m³)



Nickel: 11.7 of 23.4 m³ (50%) of the metals' water consumption in Skarn's average-EV estimate. Skarn's mine-level range can add up to about 104 m³ more per vehicle.

40% of major mining companies report exposure to water risks that could close operations, disrupt production or constrain growth.

CDP, 'High and Dry', 2022

No. 1 An NGFS paper ranks water as the dominant nature-related financial risk.

NGFS, 'The Green Scorpion', Dec 2023

Disclosure IFRS S2 requires disclosure of climate-related physical risks, such as water availability. EU sustainability reporting (CSRD/ESRS) also covers impacts across the value chain.

IFRS; European Commission

Water is moving from the ESG appendix into financial risk assessments and supply-chain reporting. In an electric vehicle, nickel is the largest single contributor to mine-related water consumption, so carmakers, investors and lenders will look closely at nickel sites, including ours. Verified, comparable water data is how Indonesian nickel keeps its access to markets and to capital.

17 · PROPOSED APNI ROADMAP 2027–2030

From Baseline to Independent Verification, with Measurable KPIs

2027 · Baseline
Water balances for all member operations; one template that builds on existing effluent monitoring

2028 · Plans and monitoring
Trigger-based drought plans; joint water monitoring with communities

2029 · Integration
ISO-based LCA for main products; shared data platform; recycling programmes

2030 · Verification
Third-party assurance of water data; verified public industry water report

KPI	Definition: numerator ÷ denominator	Milestone
Freshwater withdrawal intensity	Surface water, groundwater and third-party water (m^3, excluding seawater; harvested rainwater shown as a sub-item) ÷ t Ni contained in products sold	Baseline 2027; target set in 2028
Water recycling rate	Recycled or reused water ÷ (withdrawal + recycled or reused water), m^3	Reported from 2028
Effluent compliance	Samples meeting standards at compliance points ÷ all samples at those points	100%, every quarter
Drought plan coverage	Sites with an approved trigger-based plan ÷ member operating sites	100% by end-2028
Joint community monitoring	Community water points jointly sampled and published ÷ affected community water points	100% by 2030
LCA and verification coverage	Ni output with a critically reviewed LCA ÷ total Ni output; sites with assured water data ÷ all sites	LCA from 2029; assurance from 2030

This roadmap is a proposal, and we want to shape it together with our members, the government and buyers. Each KPI has a clear numerator and denominator, so results can be compared fairly across sites. We are deliberately holding back on reduction targets until the 2027 baseline is in. Targets without a baseline risk greenwashing.

18 · CLOSING AND RECOMMENDATIONS

Three Recommendations for Water-Resilient Nickel

1 Government · Industry

One shared water-data baseline

From 2027, every site reports its water balance and effluent data in one template built on monitoring already required by law, with an annual public industry summary linked to PROPER.

2 Government · Industry

Prepare for drought and the return of rain

Allocate water by catchment with community supply as the first priority, adopt trigger-based drought plans, and design ponds and tailings for extreme wet seasons.

3 Buyers · Financiers

Reward verified performance

Accept harmonised data and recognised assurance instead of multiple overlapping questionnaires, and tie sustainability-linked finance to water KPIs.

An invitation to INSG members: join APNI in building a common water-data template for the nickel supply chain, so that producers, consumers and governments read the same numbers in the same way.

These three steps work together. A shared baseline makes drought plans measurable, and verified data gives buyers and financiers something solid to reward. Responsible nickel starts with responsible water management.

More info please visit
www.apni.or.id

APNI
INDONESIA NICKEL MINERS ASSOCIATION

Thank you.
Meidy Katrin Lengkey
Secretary General

ANNEX · ABBREVIATIONS

Abbreviations Used in This Presentation

AMDAL Analisis Mengenai Dampak Lingkungan (environmental impact assessment)
APNI Asosiasi Penambang Nikel Indonesia (Indonesian Nickel Miners Association)
ASX Australian Securities Exchange
BKPM Badan Koordinasi Penanaman Modal (Investment Coordinating Board)
BMKG Badan Meteorologi, Klimatologi, dan Geofisika (Meteorology, Climatology and Geophysics Agency)
BMS PT Bumi Mineral Sulawesi
BOD Biochemical oxygen demand
BPS Badan Pusat Statistik (Statistics Indonesia)
CBAM Carbon Border Adjustment Mechanism (EU)
CDP Global disclosure system, formerly the Carbon Disclosure Project
CN Combined Nomenclature (EU customs codes)
CSRD Corporate Sustainability Reporting Directive (EU)
DSI Danantara Sumberdaya Indonesia
ENSO El Niño–Southern Oscillation
ESG Environmental, social and governance
ESRS European Sustainability Reporting Standards
EU European Union
EV Electric vehicle
FeNi Ferronickel
FPIC Free, prior and informed consent
HPAL High-pressure acid leaching
HS Harmonized System (customs tariff codes)
IDR Indonesian rupiah
IFC PS International Finance Corporation Performance Standards
IFRS International Financial Reporting Standards (S2: climate-related disclosures)
IMIP Indonesia Morowali Industrial Park
INSG International Nickel Study Group
IRMA Initiative for Responsible Mining Assurance
ISO International Organization for Standardization
IUP Izin Usaha Pertambangan (mining business permit)
IWIP Indonesia Weda Bay Industrial Park
JISDOR Jakarta Interbank Spot Dollar Rate (Bank Indonesia reference rate)
KBLI Klasifikasi Baku Lapangan Usaha Indonesia (standard industrial classification)
KLH Kementerian Lingkungan Hidup (Ministry of Environment)
KPI Key performance indicator
LCA Life-cycle assessment
LMT Light means of transport
MEMR Ministry of Energy and Mineral Resources (ESDM)
MHP Mixed hydroxide precipitate
MOMI Minerba One Map Indonesia (MEMR permit map)
NGFS Network for Greening the Financial System
NPI Nickel pig iron
OJK Otoritas Jasa Keuangan (Financial Services Authority)
OSS Online Single Submission (business licensing system)
PLN PT Perusahaan Listrik Negara (state electricity company)
PNBP Penerimaan Negara Bukan Pajak (non-tax state revenue)
PPLH Pejabat Pengawas Lingkungan Hidup (environmental inspector)
PROPER Program Penilaian Peringkat Kinerja Perusahaan dalam Pengelolaan Lingkungan Hidup (company environmental performance rating)
PT Perseroan Terbatas (limited liability company)
QR Quick Response (code)
RKEF Rotary kiln–electric furnace
SEZ Special economic zone (KEK)
TKBI Taksonomi untuk Keuangan Berkelanjutan Indonesia (Indonesia Taxonomy for Sustainable Finance)
TSS Total suspended solids
USD United States dollar

Chemical symbols: Ni nickel · Co cobalt · Cr chromium · Cr(VI) hexavalent chromium · Cr(III) trivalent chromium · Fe iron · Mn manganese · Cd cadmium · As arsenic · Hg mercury · SO_2 sulphur dioxide · NOx nitrogen oxides · $FeSO_4$ ferrous sulphate · pH acidity scale
Units: kt thousand tonnes · Mt million tonnes · bn billion · m^3 cubic metre · mg/L milligrams per litre · MW megawatt · kWh kilowatt-hour