

A large wind turbine is the central focus, with several smaller ones in the background. The scene is set against a sunset sky with warm orange and yellow tones near the horizon, transitioning to a clear blue sky above. The turbines are silhouetted against the bright sky.

ESG effects on the valuation and financing of mineral industry transactions

Presenter:

Sabine Anderson

Conference:

IMVAL Conference 2025, 2-3 October 2025

- SRK
 - International and independent group
 - 1500 staff, with 45 offices located on six continents
 - Providing consulting services to the mining industry
 - Undertaking technical studies and due diligence work
 - In geology, geotechnics, mining, processing, metallurgy, tailings, water, mine infrastructure, ESG and economic evaluation

- Sabine Anderson
 - Mining engineer, 25 years of experience
 - Specialising in technical and economic evaluation
 - Working with multi-disciplinary teams
 - Mining projects at advanced stages of development, in numerous commodities
 - Competent Person (Mineral Reserves), Qualified Valuator

- How does ESG affect a Mineral Asset's NPV
(for operating assets, where the Valuation Income Based Approach is key)
 - How does ESG's impact on NPV get considered during a transaction
-

- ESG intertwined in the technical disciplines.
- All disciplines have a component of ESG in them or are driven by ESG
- Mining companies embed ESG in Technical Studies > Life of mine Plans > Economic Assessments, to various degrees



GOVERNANCE – THE BASICS

- Top level commitment
- Human rights – respect and due diligence
- Stakeholder engagement, including a grievance mechanism
- Compliance with law and permit conditions
- Indigenous title and consent agreements
- Alignment with ESG principles/ standards
- Ongoing risk assessment, ESIA for new projects
- Apply the impact mitigation hierarchy
- Functional management systems
- Validation of conformance with standards
- ESG disclosures
- Inflation and volatility

ENVIRONMENTAL

- Pollution prevention
- Sustainable resource use
- Biodiversity and ecosystems protection
- Avoiding deforestation
- Decarbonisation and energy efficiency
- Climate adaptation
- Water stewardship
- Responsible tailings and waste management
- Responsible mine closure
- Renewable energy stewardship
- Hazardous material stewardship
- Extreme event management plans



GOVERNANCE – SPECIAL TOPICS

- Payment of taxes
- Disclosure of payments to government (and support EITI)
- Fair transfer pricing
- Responsible political involvement
- Anti-bribery and corruption controls
- Anti-competitive action controls
- Responsible sourcing
- Market access for artisanal miners
- Independence of external auditors and oversight of geopolitical stability

SOCIAL

- Fundamental human rights at work
- Safe & healthy workplace
- Diversity and inclusion
- Human development and training in the workplace
- Community engagement
- Avoid impacts on community health, emergency plan
- Community development
- Cultural heritage protection
- Avoiding displacement and responsible resettlement
- Respecting indigenous peoples' rights
- Manage in-migration
- Social transition at closure
- Impact and risk of artisanal small scale mining

Policy and Law

- National commitments
- Introduction of carbon budgets
- Mandatory disclosures and associated corporate targets
- Carbon pricing
 - Taxes
 - Cross border levies
- Government incentives (eg Inflation Reduction Act)

Market

- Increase in capital availability
- Exclusion: product carbon footprint thresholds
- New or growing markets for low emissions products
- Future premiums for low carbon metals?
- Competitive advantages with shifting consumer preferences
- Stranded assets

Technological

- Greening of grids and security of supply
- Reduced operational costs
- Realistic proposals?
- Increased value of decarbonised assets

Reputational

- Stigmatization of sectors and regions

EXAMPLE

FINANCIAL MODEL ADJUSTMENTS IN DUE DILIGENCE

Tailings Storage Facility	Paste Backfill Plant Permitting	Water Treatment & Storage	Haul Road
Risk: - Complexity and time needed to remedy the embankment. Consequence: - Safety to personnel and equipment. - Relationships with communities and authorities. - Reputation Adjustments: - Additional USD 5 million in capital costs	Risk: - Permit not granted for the desired location (construction has commenced) Consequence: - Change of location, impacting reticulation logistics, extended time delay, increase in operating costs, impact on NPV (low to moderate) Adjustments: - Production delays due to increased permitting delays added	Risk: - Delay in increasing capacity of water treatment plant and water lagoon Consequence: - Reduced mining rate due to constrained mine dewatering. - Reduced mining rate resulting from delay until increasing water storage and treatment, including permitting, construction, implementation Adjustments: - Additional USD 15 million in capital costs - Modelled additional delays to implementation of increased mining rates	Risk: - Road in very poor condition at times, potential slope failure Consequence: - Interrupted haulage and production for some days, and safety to personnel and vehicles Adjustments: - Additional USD8 million in capital costs

Reduce CO₂e via:

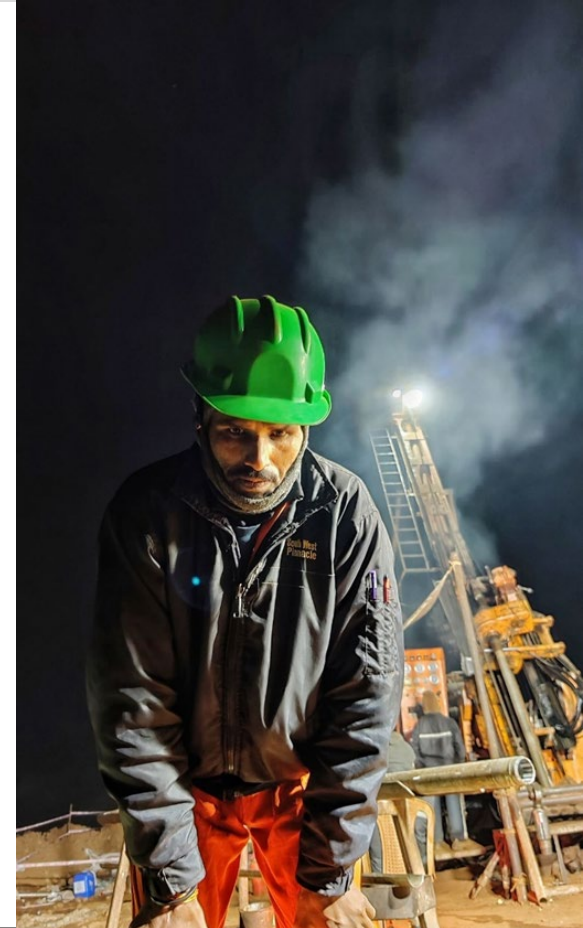
- Equipment matching and sizing
- Reduce high stripping areas
- Reduce rehandle
- Reduce low grade stockpiling
- Reduce hauling distances
- Improved maintenance
- Consider truck horizontal and vertical hauling distances, and speed (reduce diesel / electric consumption)
- Can align or conflict with operating costs



EXAMPLES

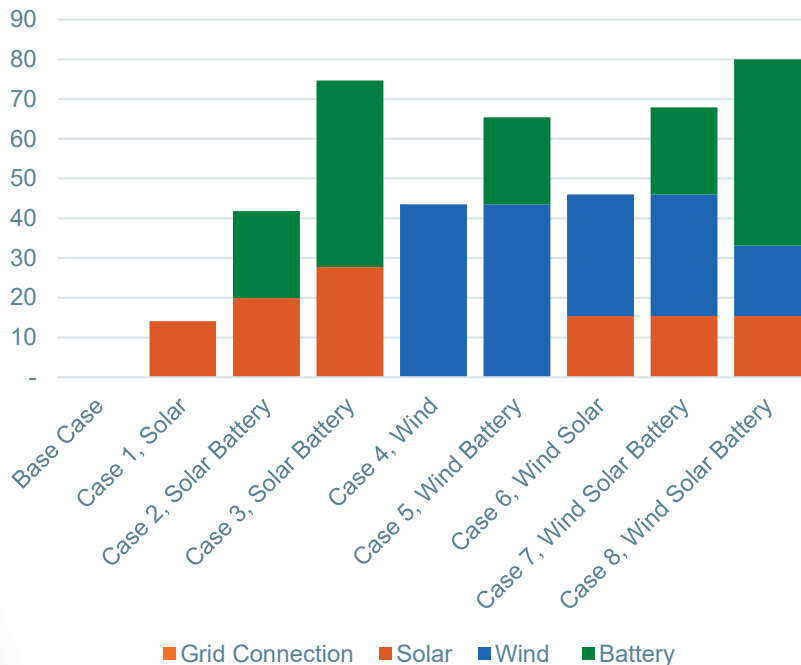
POWER SUPPLY AND HAULAGE TRADE OFF STUDY TO REDUCE CO₂e
EMISSIONS

- Countries have carbon quotas and strategies
 - KZ carbon neutrality strategy includes a 15% reduction in emissions by 2030 and achieving net zero by 2060
- Cost of carbon credits under ETS (emission trading system)
 - KZ ~USD 1 /t CO₂e in 2024
 - EU ~USD 90 /t CO₂e in 2023
 - China ~USD 8 /t CO₂e in 2024

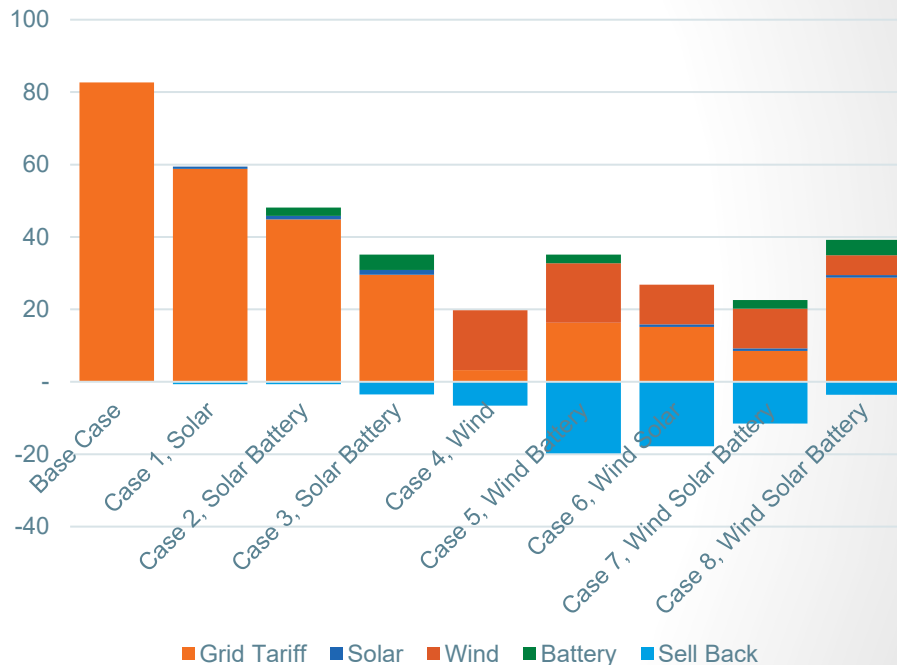


- Considering Impact on CO2e, capital and operating costs

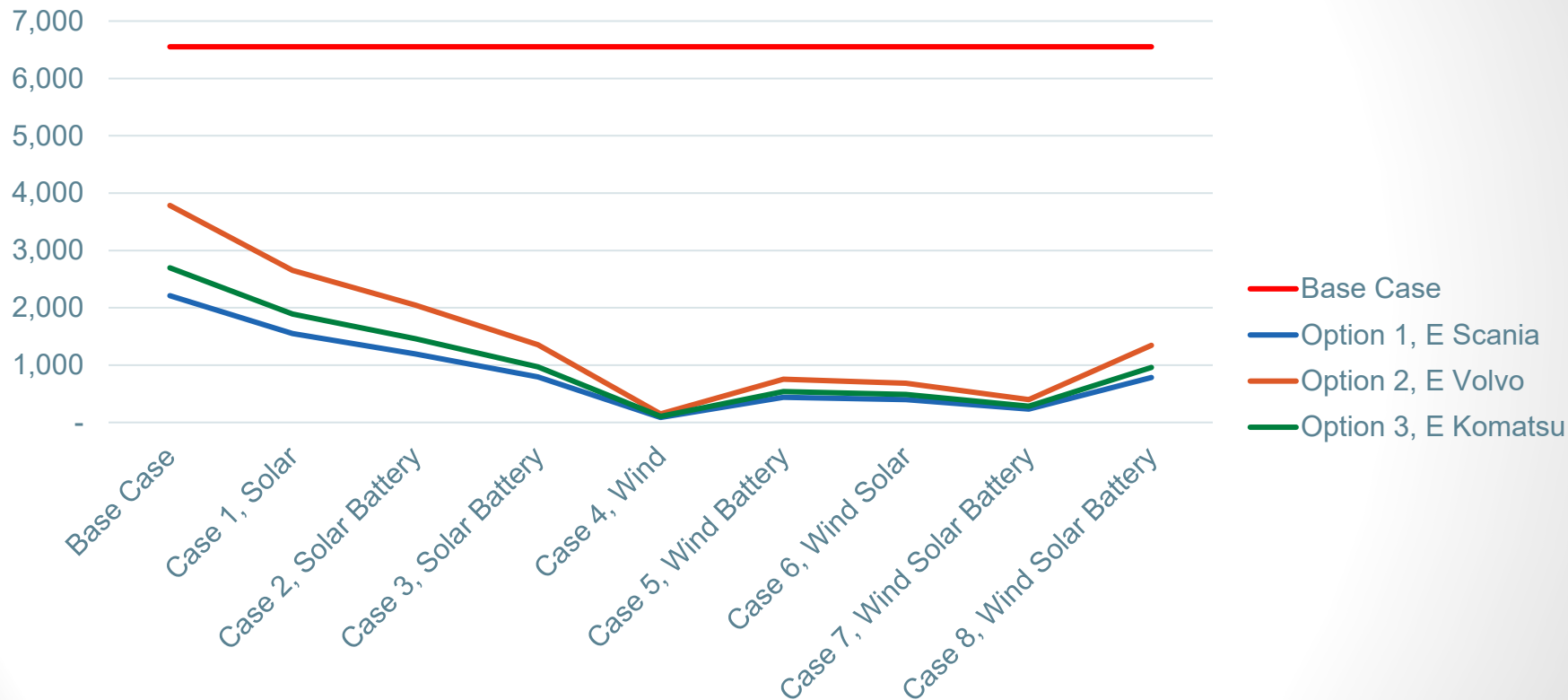
Capital Costs by Case



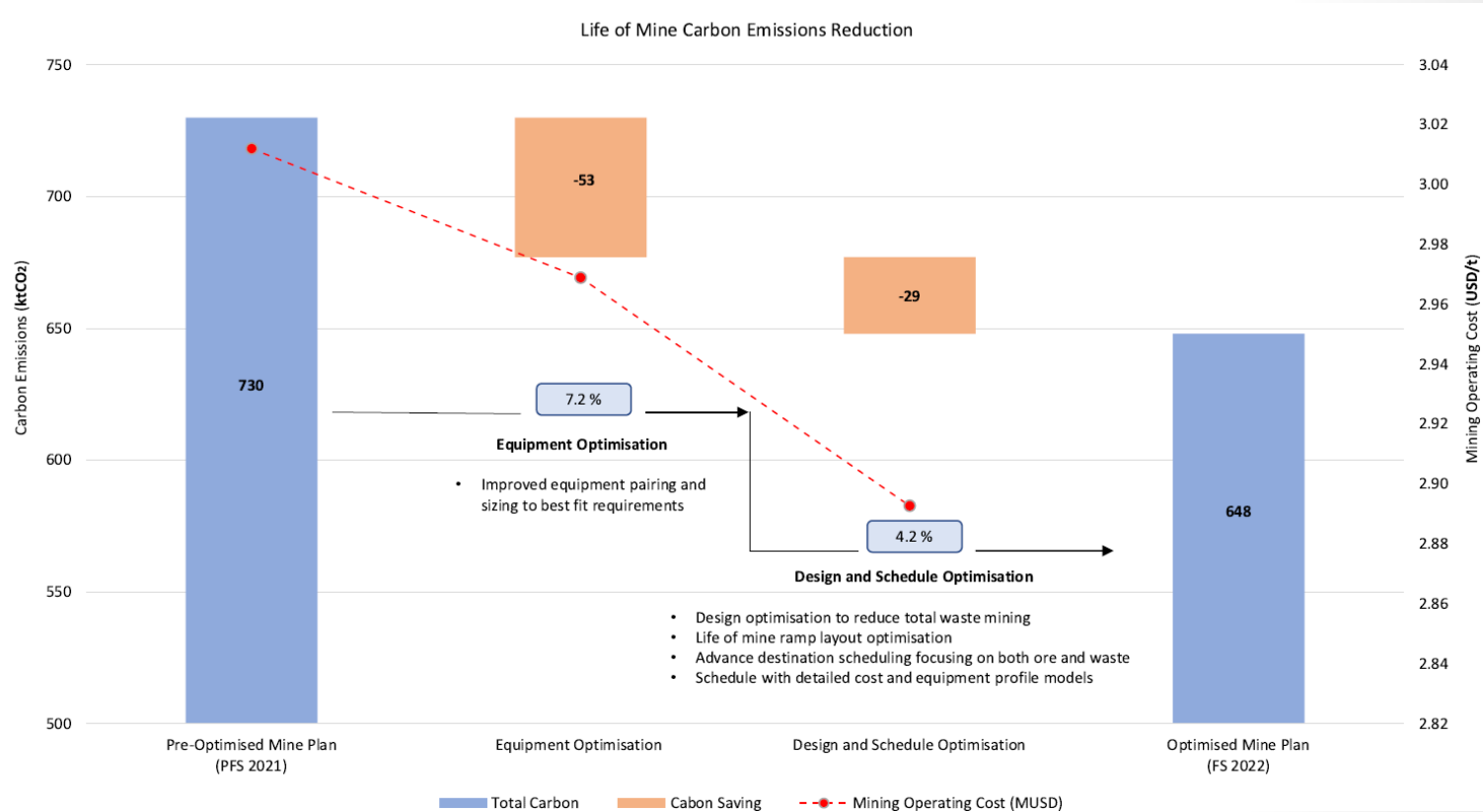
Operating Costs by Case



Mining Fleet LoM CO2e Absolute (t CO2e)



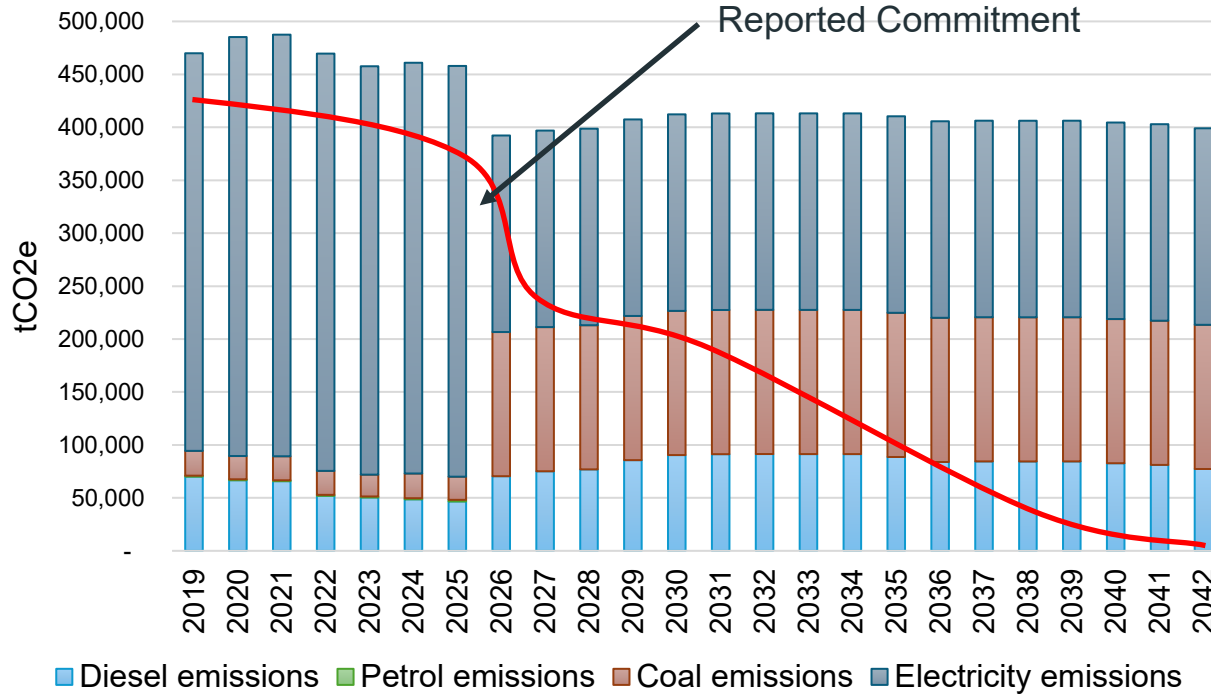
- Carbon emissions can be reduced by optimising mine strategy, planning and operating with current technology



EXAMPLE

ALIGNING COMPANY COMMITMENTS WITH DESIGN OBJECTIVES

- Projected emission profile for an expansion
- Misalignment with Company commitment and capital project frameworks meant redesign of power solution



EXAMPLE

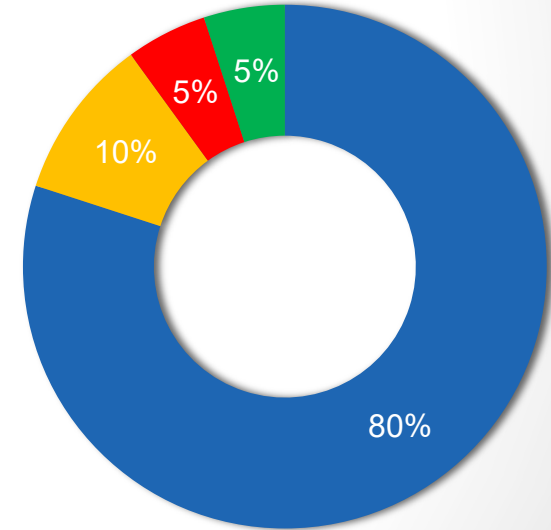
IMPACT OF POLLUTION PAYMENTS AND ENVIRONMENTAL REGULATIONS ON PROJECT VALUE IN KAZAKHSTAN

- In 2023, a KZ mining company environmental payments were KZT 9.5 billion (USD 17 million)

- EP based on formula $\varphi = m(t) * \alpha * \beta * MCI$

- The base rate α is increasing, set by tax code, is increasing 4 fold between 2025 and 2031
- Large polluters (top 50) have a higher β , increasing 8-fold between 2022 and 2038 (smaller polluter increase in 4-fold)
- Facilities with an Integrated Environmental Permit (IEP) will be rewarded with a full exemption from pollution payments for at least a decade
- Fines for exceeding allowed levels can be **100x** standard payment

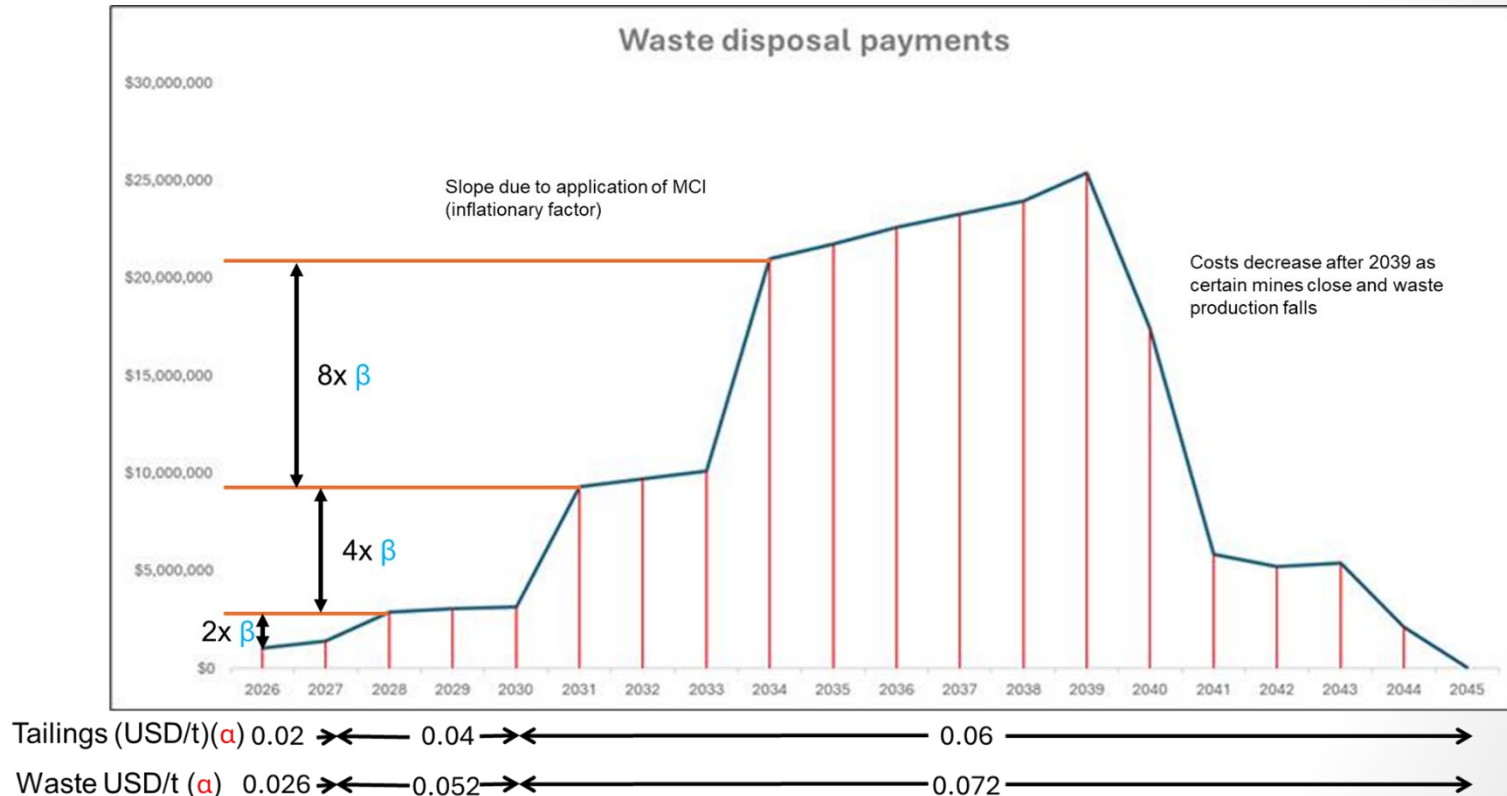
- Smelter Emissions
- Power Plant Emissions
- Tailings (m3)
- Waste Rock (m3)



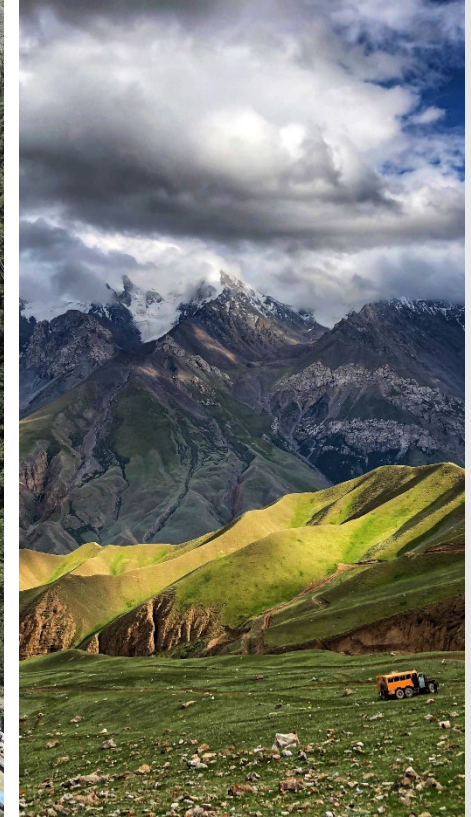
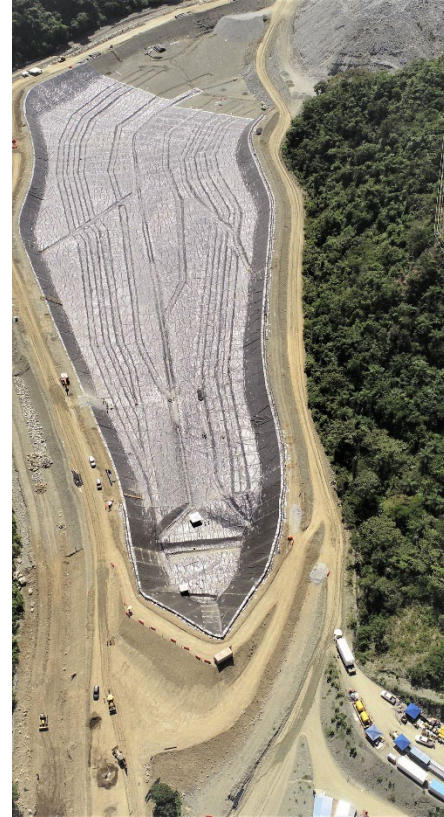
KZ Environmental Payments – Emissions, Tailings, Wastes

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- LoM pollution payments in the absence of an Integrated Environmental Permit (with a BAT improvement programme)
- Waste production profile relatively static between 2026 and 2041



- Water – abstraction and discharge limits
- GHG – USD/t basis
- End of LoM
 - Social obligations
 - Retraining obligations
 - Mine closure
 - Funding / provision for these during the LoM
- Social obligations and contributions to local development funds



Year	Carbon Quota (tCO ₂ e)	Emissions (tCO ₂ e)	Comment
2024	12,000	10,000	Under the carbon quota
2025	10,000	9,000	Under the carbon quota
2026 onwards	TBD	50,000	Likely significantly exceeded

Year	Carbon Price (USD/tCO ₂ e)	Carbon Quota (tCO ₂ e)	Emissions (tCO ₂ e)	Difference (tCO ₂ e)	Annual Payment (USD)
2024	1	12,000	10,000	-2,000	-
	50	12,000	10,000	-2,000	-
	80	12,000	10,000	-2,000	-
	100	12,000	10,000	-2,000	-
2025	1	10,000	9,000	-1,000	-
	50	10,000	9,000	-1,000	-
	80	10,000	9,000	-1,000	-
	100	10,000	9,000	-1,000	-
2026 onwards	1	8,000	50,000	42,000	42,000
	50	8,000	50,000	42,000	2,100,000
	80	8,000	50,000	42,000	3,360,000
	100	8,000	50,000	42,000	4,200,000

- Emissions within quota limits are currently free
- Carbon pricing in KZ is currently very cheap
- If alignment with other nations is anticipated, costs for exceeding quotas become expensive quickly.



ESG Impact on Valuation and Transactions:

Undertake Fit for Purpose Technical and ESG Reviews

OUTREACH

THE MINING INDUSTRY STILL NEEDS TO CHANGE PUBLIC PERCEPTION

Monday morning: "Attitude on mining"



- Didn't really care
- Bad for the environment
- Very unethical
- Money could be invested better elsewhere
- Very corrupt industry
- Lack of a range of possible jobs
- Is a dying industry
- Is an industry driven by greed
- Mining companies do not care about the consequences of their actions

Friday: "What I've learnt"



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- Mining is actually a very broad
- Mining is absolutely essential
- Humans are bad for the environment
- Mining can be ethical (to an extent)
- Not that bad for the environment
- A mining engineer can specialise in many different subjects
- Mining is very cross disciplinary
- Mining involves many different processes e.g logistics
- There are lot of opportunities for travel in mining
- And more...



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