

# Infrastructure Financing for Mining

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October 2017



**WayPoint** Infrastructure  
Water Power Transportation

# Bios

- Rosemary Niechcial is the Managing Director of Waypoint Infrastructure Inc and a Chemical Engineer who specializes in water treatment and infrastructure. She was VP Canada then Account Executive, Mining Americas at Veolia, in charge of sourcing and developing third party water and energy projects for a range of clients. She has also worked as Director, Project Development at Hatch, working on water projects globally for a range of clients in mining and energy. She started her career designing water treatment plants at GE Water for the power sector.

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- Scott Fraser, Chief Technical Officer for Waypoint Infrastructure Inc and a Mechanical Engineer with an MBA (Finance and Capital Budgeting) who has focused on the development of electrical/thermal supply and transmission solutions globally for utilities, independent power producers, and large industrial clients including mining developments and operations. More recently, Scott has focused on renewable energy and alternative energy supplies including LNG and bio-fuels. Scott was previously Director of Power Projects for Barrick Gold.

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# Context

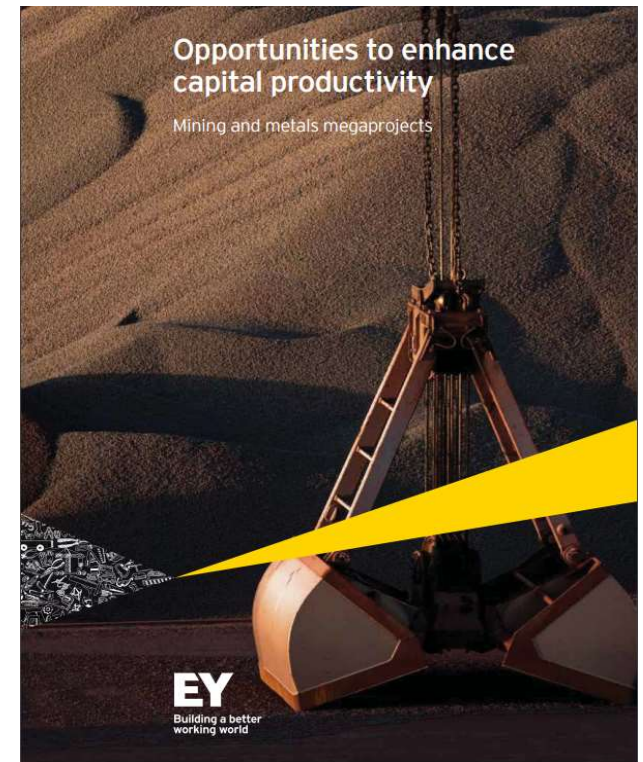
- Mining Development is Moving Ahead Again
- Capital Remains Scarce in the Sector
- Greenfield Developments are Larger and More Costly
- Non-core Infrastructure can Represent up to 50% of Capital Cost
- Water, Energy, and Transportation Requirements are More Extensive
- Environmental regulations are tightening
- Mines are more remote with less available infrastructure
- Social issues are increasing.
- **Global Markets are Awash with Conservative Long-term Investors Seeking Solid De-risked Opportunities**

# Capital Productivity – E&Y Survey 2015

- 108 megaprojects surveyed at various stages of investment and project delivery.
- Each project >US\$1B.
- Cumulatively, total investments were US\$367B.
- **69% were facing cost overruns.**
- **Average cost overruns were 62% above initial estimate.**
- **50% reported schedule delays.**

Solutions to the Contributing factors cited:

- **Establish accountabilities and appropriate contract incentives.**
- **Engage experts early to address logistical challenges of remote geographies** (access to water, power, rail, roads).



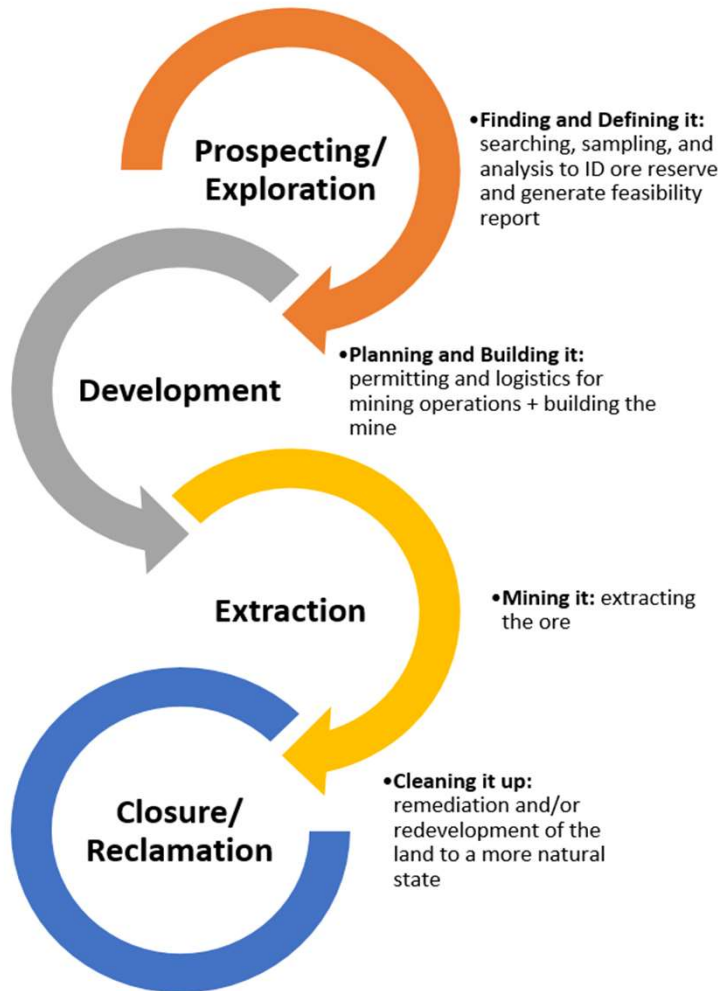
“Opportunities to Enhance Capital Productivity: Mining Metals and Megaprojects,” Ernst & Young, copyright 2015, <http://www.ey.com>

# Top Ten Business Risks Facing Mining & Metals 2017-18: EY Report 2017

- 9. Access to and Optimization of Energy
- 7. Social License to Operate
- 6. Cash Optimization
- 5. Regulatory Risks



# Mine Development Process



	Conventional	Infrastructure
Screening	Eng. Costs	Cost Range
Scoping	Uncertainty	Define Req.
Pre-Feasibility	Final Scope	Market Opp.
Feasibility	EPCM Design	Permit/T & C's
Execution	EPCM	Cont./Monitor
Operation	Need Experts	Monitor
Closure	Cost Removal	Alt. Uses
Alt Uses	Mine Focused	Wider Scan



# Alternative Infrastructure Delivery

## Choice of Delivery Model Affects:

- Off-/On-Balance Sheet Structure (IFRS Accounting Rules)
- Insurance Risk (Varies by Asset Class)
- Access to and Cost of Capital
- Social/Political Risk (particularly linear assets)
- Land Acquisition/Rights-of-way
- Closure Obligations
- Regulatory/Permitting
- Closure Bonds
- Taxation
- Access to Expertise
- CAPEX/OPEX vs. Predictable Tariffs
- Project outcome due to incentivizing the right approach

## **Renewable Energy Hypothetical Opportunity 200 MW Mine Load 'Chile'**

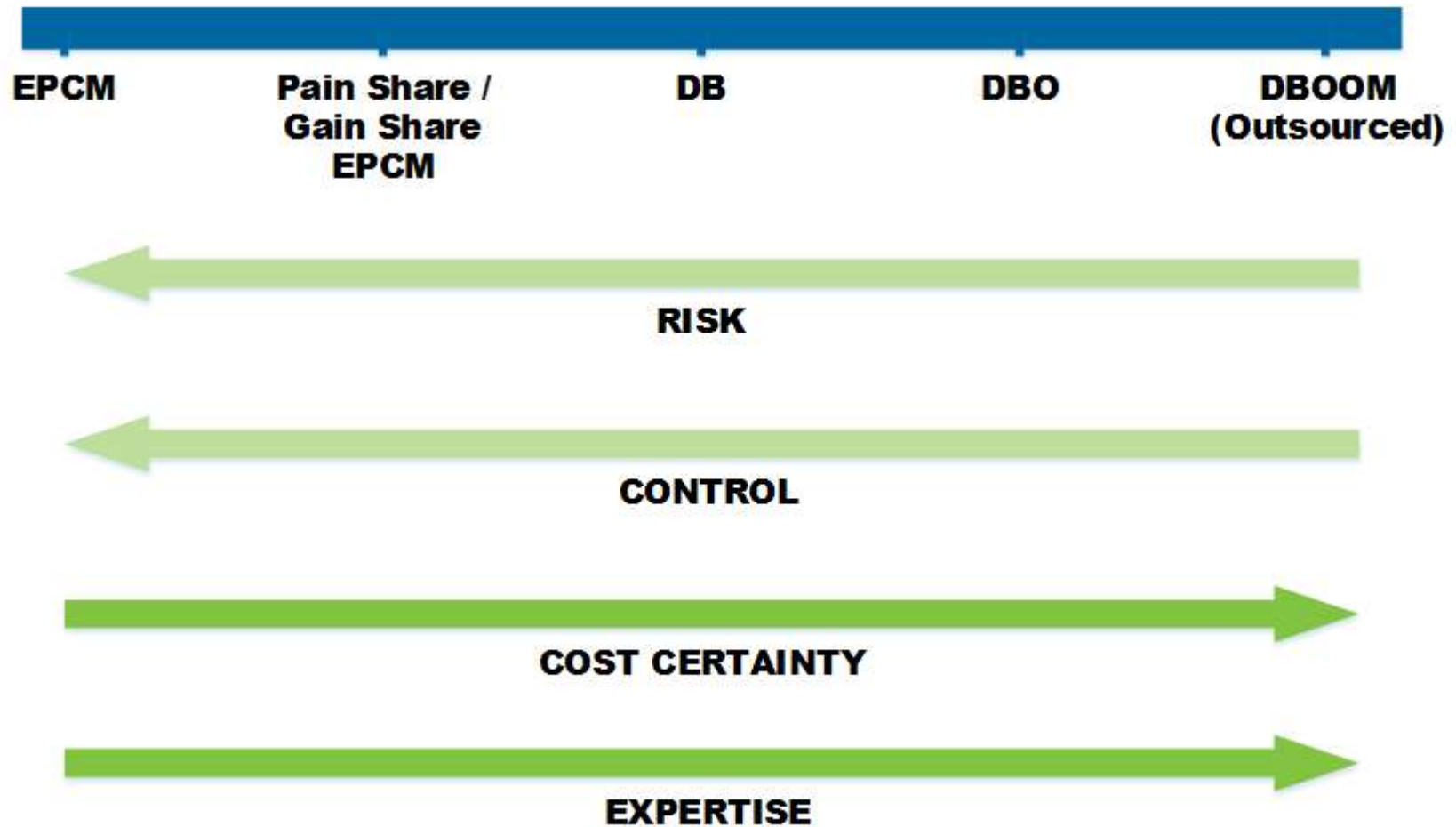
- **Isolated Mine Site**
  - Requires 600 MW PV  
PV Capex \$600 M
  - Grid Tie \$ 0 Million
  - Storage 3200 MWh  
Capex \$1000 M
  - Total Capex \$1600 M
  - Utilization Factor 93%
  - At 15% WACC 15 ¢/kWh
- **Grid Tie to Same Mine**
  - Requires 600 MW PV  
PV Capex \$600 M
  - Grid Tie \$200 Million
  - Storage 3200 MWh  
Capex \$1000 M
  - Total Capex \$1800 M
  - Utilization Factor
  - At 6% WACC 6 ¢/kWh



# Insurance Planning & Risk

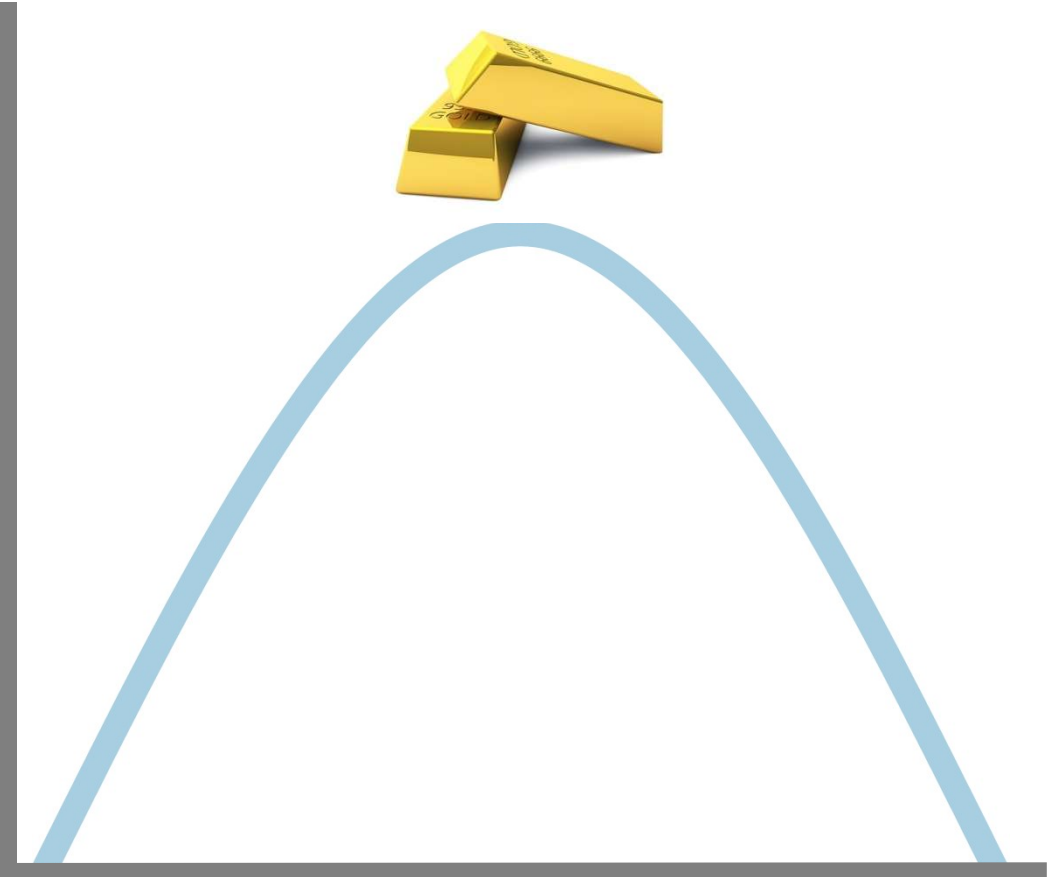
- Insurance premiums based on perceived risk by insurers
- Mine risk has increased with incidents such as Samarco.
- Political risk is high in many mining jurisdictions.
- Isolating infrastructure from core mine development can impact overall insurance premiums significantly
- Infrastructure (up to 50% of overall project value) is ascribed only the risk associated with it and not burdened with risk assignment of mine development.
- **Financing insurance is lower due to lower risks of infrastructure vs Mining or Processing Asset**
- **Assign risk to parties best able to manage them**

# Delivery Models



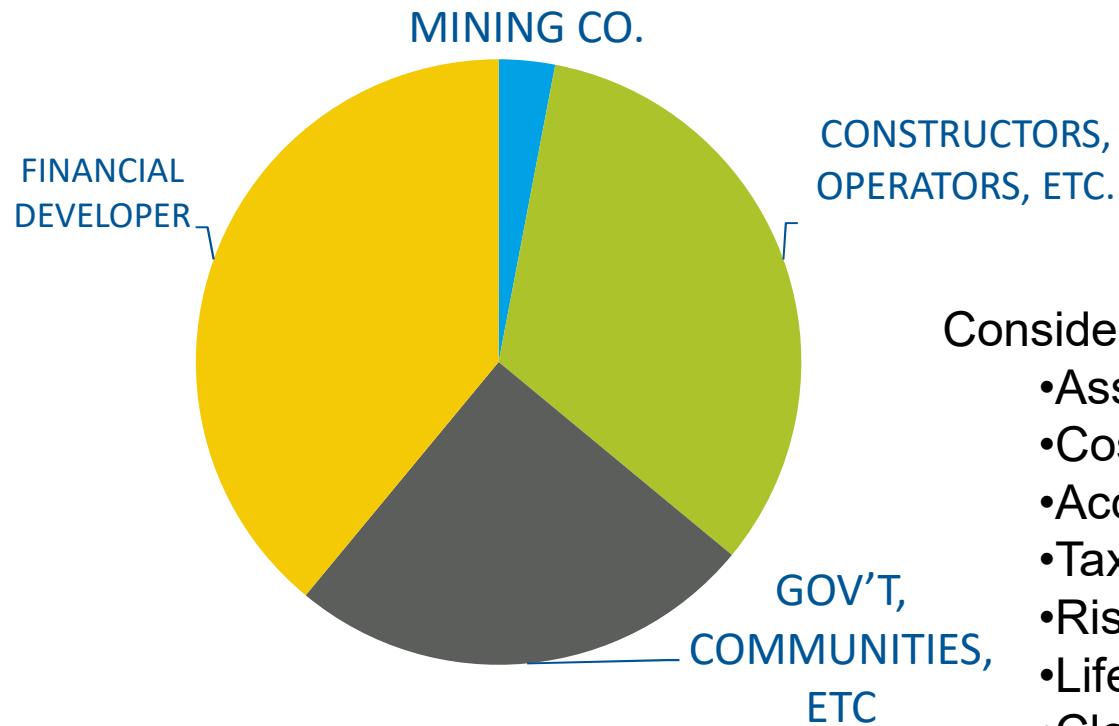
# Optimized Delivery Model

- Risk**
- Costs**
- Schedule**
- Insurance**
- Expertise**
- Technology**
- Social License**
- Tax**
- Cost of Capital**
- Access to Capital**
- Bonding**
- Closure Obligations**
- Contract Incentives**



# Example: Outsourced Entity Model

## SPECIAL PURPOSE COMPANY (SPC)



### Considerations for Mining Co.:

- Assurance of outcome
- Cost control
- Access to capital
- Tax positioning
- Risk sharing/transfer
- Life Cycle OPEX
- Closure obligations
- Change of Law clause

# Sources of Infrastructure Financing

- Pension Funds Have Massive Assets
- Seeking Longterm Moderate Returns
- Avoid Develop. and Construct. Risk
- Underweighted In Infrastructure Due to Limited Quality Opportunities
- Limited Development Activities
- Green Investments
- \$3.7 Trillion Assets in 2014 (top tier pension funds only)
- Brookfield Infrastructure \$40 B
- Growing Source of Infrastructure Funds

The logo for OMERS, featuring a stylized orange and blue circle followed by the word "OMERS" in blue capital letters.The logo for CalPERS, featuring a blue triangle icon and the word "CalPERS" in blue capital letters.The logo for CuprumAFP, featuring the word "Cuprum" in blue and "AFP" in orange, with the text "Miembro de Principal Financial Group" below it.The logo for WayPoint, featuring the word "WayPoint" in blue capital letters.

# Summary - Bauxite Refinery Energy Island



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# Summary - Bauxite Refinery Energy Island

## Issues To Be Solved

- Originally Used HFO
- Oil Price Fluctuations
- Heat/Power Balance
- % E Limited by Cycle
- Power Costs in Jamaica
- Local Emissions S part.
- Internal Capital Cost 20%
- No Expertise With CCPP
- Planning for 10 Yr

## Solution

- LNG for 200 MW
- Grid (2nd Offtake)
- Special Purpose Vehicle
- \$265 Million Capital
- Financed at Under 8%
- Lower Cost for Refinery
- O&M Contractor
- Significant Emissions and GHG Reduction



# Summary of Third Party Investment

## Proyecto Caserones Chile Transmission

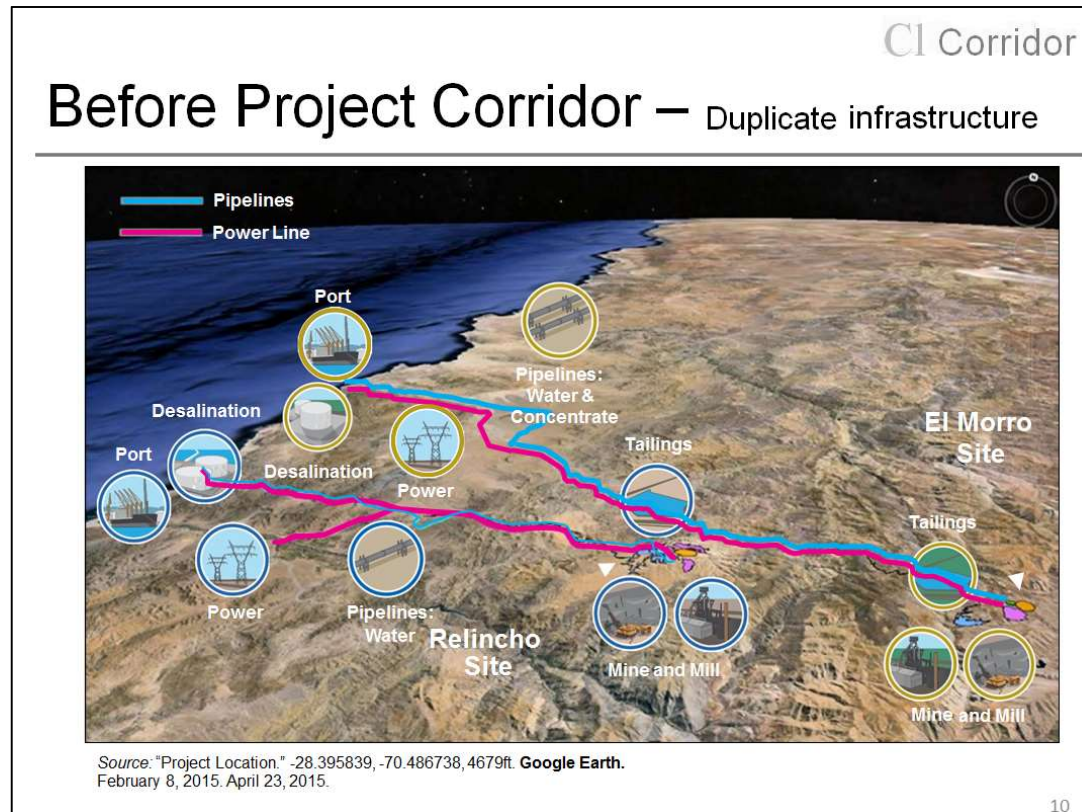


# Summary of Third Party Investment

## Proyecto Caserones

- 183 km 220 kV double circuit transmission line to the SIC Region
- Caserones Proyecto is an international joint venture
- Designer, Constructor and Owner of the Line is Transelec who operates regulated (Truncal) and non regulated transmission lines in Chile **Represents Specialized Capabilities**
- Transelec which is owned by Brookfield since 2006 **operates 9600 km** of transmission lines
- Project was developed on Balance Sheet By Transelec then SPV by CyT Operaciones SpA \$146 Million - **Project Finance**
- Utility Rating
- **Single User** Required Mine to provide a fixed Take or Pay
- Power Supply is from the Chilean Grid

# Typical Mine Development

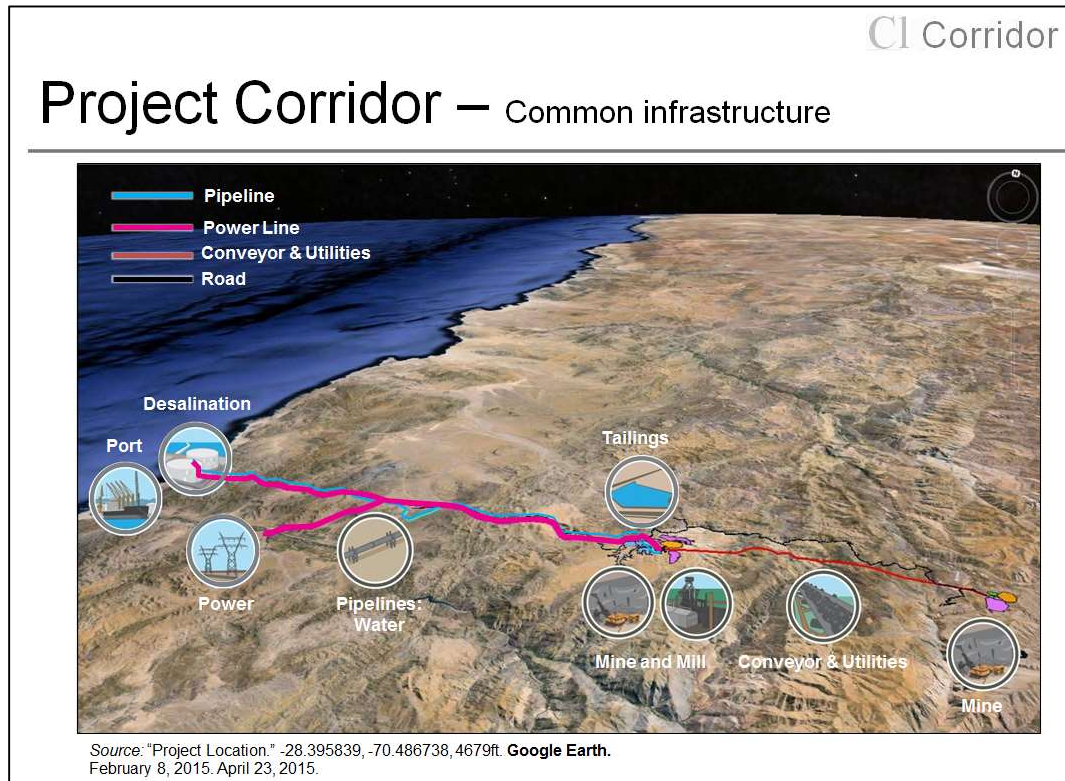


Source: "Project Corridor-Building a Better Project Together" August 27, 2015 Santiago, Chile.

- Typically, miners develop dedicated infrastructure to maintain control
- Results in inefficient, duplicate and costly infrastructure

# Progress: Collaboration

## NuevaUnion Example



### Separate Projects

El Morro:	US\$3.9B
Relincho:	US\$4.5B
Total Capital:	US\$8.4B

### Combined Projects

Construction  
~US\$3.5B<sup>3</sup>

Reduced scope and improved capital efficiency through common infrastructure

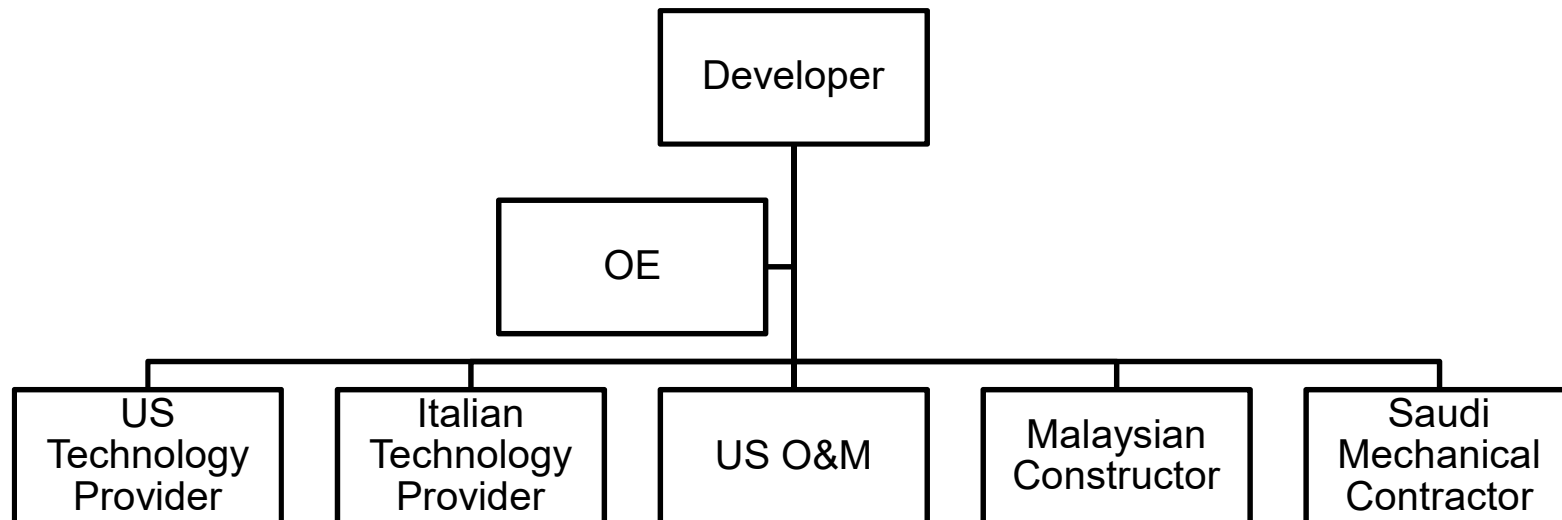
- Goldcorp and Teck negotiated a collaboration to reduce costs significantly and share risk
- **US\$4.9 billion savings!**

## **Example** - Desalination Plants in Chile

- Most miners today ask consultants to evaluate outsourced vs traditional EPCM delivery for desalination and overland pipelines.
- Many evaluations have been linear, rather than robust and multi-faceted.
- NPV calculations do not always incorporate appropriate risk.
- Engaging specific expertise is critical to capture and quantify risk for all contract models.
- Outsourced contracts should represent the tightest confidence interval for cash flow modelling.

## Example – IWPP Saudi Arabia

- Engaged as OE after vendors selected and scope defined.
- Gaps between vendor's scopes and incentives.
- Lack of design collaboration within the team adding life-cycle costs.
- Vendors were not shareholders in the SPC.
- Contracts were English common-law creating challenges with vendors used to civil law.



## **Example** – Acquire Own Operate

- Arcelor Mittal purchased a brownfield steel plant in Brazil in 2000
- Facility utility infrastructure required upgrading and expansion
- Veolia created a SPC called CLE Brasil and purchased existing utility infrastructure and upgraded this infrastructure
- CLE Brasil now provides power, natural gas, water, wastewater treatment, and solid waste management for the facility
- Arcelor Mittal has certainty of rates for life-cycle of facility
- CLE Brasil provides specialized expertise to operate and maintain the facility
- Veolia's Global pricing of new equipment and spare parts reduced capex and opex of facility
- Lack of Multiple Users Increased Cost of Capital for Veolia and indirectly cost to Arcelor Mittor



## Comparison of Non-Core Infrastructure Criteria

	Desalination & Pipelines	Brownfield Energy/Water	Outside of Fence CHP	Single Use Transmission
Spec. Expert	Yes	Yes	Yes	Yes
Financing	Market Dep.	No Advantage	Under 8 %	Estimated 9%
Multiple User	Potentially	Limited	Yes	No
SPV	Yes	Yes	Yes	Yes
Permitting	Separate	Facility	Joint	Separate
Develop. Time	Mine Sched	Fast	Many Delays	Fast
Facility Risk	Cont./Monitor	Cont./Monitor	Cont./Monitor	Minimal
Operations	Expert	Expert	3 <sup>rd</sup> Party Exp.	Expert
Alternate Use	Market	Not likely	Grid	Market
Community	Pot. Shared	Minimal	Yes	Potential
Closure	Not Mine Dep	Oper. Depend	Not Ref. Dep	Not Mine Dep

# Challenges

- Combining projects requires cooperation on investment and timelines.
- Mining projects are notorious for delays. Third Party Developers need certainty of purchase agreements.
- Organizing multiple users from different sectors who can commit to common timelines difficult.
- If single-user is only option, then very hard to get the assets off-books.
- Third Party Developers are Seeking Almost Shovel Ready Projects
- Mine Development is a Long Process Development Team Needs to Look Ahead at Third Party Alternatives

# Opportunities

- Infrastructure experts can visualize how to develop facilities in stages with modularization to accommodate varying user schedules.
- Engaging communities or governments in an ownership position of the infrastructure creates an interdependence and shared stake in the success of the mining infrastructure.
- Life-cycle costs are often much greater than the initial capex. Off-loading asset responsibility to experts who have global pricing agreements, established maintenance plans, and troubleshooting expertise can save miners money over the life of the mine.
- Third party ownership still offers many advantages to on-book assets, including cost certainty, liberation of capital, and repurposing opportunities of assets upon closure.

# Conclusions

- Mining companies need different perspectives and best practices from other sectors. Power, Water, Transportation are examples
- Miners should focus on core areas of expertise. Outsource Non-core Asset Development Where/When Feasible
- Outsourcing can improve access to capital, expertise, cost certainty.
- Negotiating outsourced contracts requires expertise - the devil's in the details.
- Examining infrastructure financing, insurance costs, accounting implications, taxation, and social license opportunities, etc. impact the cost of new mine developments more than pure engineering solutions.
- Typical Mine Development Will Require Owners to Fund Non-Core Infrastructure Development (Scoping, Permitting, Contracts) Before the Project is Shovel Ready
- Specialized Expertise Can Guide This Process.

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Questions?