



Mining Operational Excellence

Chamber of Mines of the Philippines: Digging Deeper

OCTOBER 2024

Takeaways from our recent project experiences

Operational improvement is an immediate **priority for miners all across the region** e.g. Australia, PNG, Indonesia, Laos etc.

Large multi-asset miners and single asset operators have the same pressure to define asset full potential and what they are doing to realize it

Regardless of asset and commodity, operational improvement is the biggest controllable driver of **EBITDA uplift**



Mining operations face a challenging environment for improvement...



Increased prioritization complexity

Many low-hanging improvement opportunities already harvested; unpredictable market prices, digital technologies & new constraints (e.g., CO2) drive complexity in where to allocate resources



Pressure to resolve known bottlenecks

More shareholder oversight in understanding and measuring value chain performance (e.g. crushing, milling etc.) driving greater pressure on operational decisions and execution



Continuous focus on both cost and pricing

Unpredictable market prices driving continuous focus on leveraging operational excellence to improve efficiency and increase price realization (e.g. mine planning, blending etc.)



More operational variables to manage

Multitude of operational variables (e.g. weather, attrition among drivers/operators, multiple makes of equipment, geological surprises etc.) putting more emphasis on operations planning



...making it harder to navigate a path forward

Mining Ops
Catalyst is our
approach to
navigating this
complex
environment



Value
levers



Lasting
results



World class performance



Increased productivity

Unit cost take-out

Focus of this next example



High-performance
culture



Rhythms and
routines



Digital analytics
& tools

Approach to Improving Productivity in operations

1 Develop value chain theory of constraints

- Map E2E value chain at right level of detail to develop value chain theory of constraints.
- Assess value pools along value chain based on unconstrained potential and historical performance (90-day, 30-day, 7-day best).

Value pools



2 Rapidly validate path to higher performance

- Analyse source of loss (OEE, VDTs) to identify pathway to record-breaking performance at every step.
- Advanced analytics deep dives for key areas of interest
- Simulate key nodes of value chain, with option to build full value chain simulation model for ongoing use.

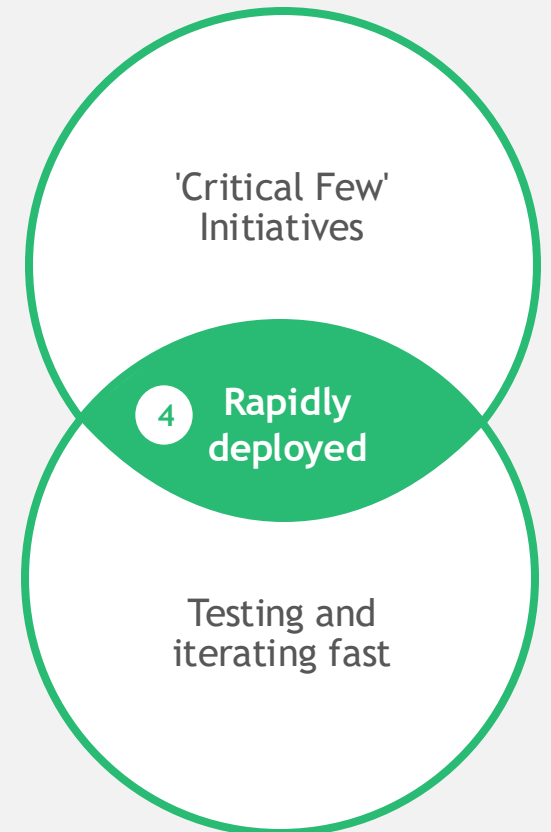
Source of loss analysis



3 Prioritise 'critical few', stop low value work

- Prioritise critical initiatives in charters with minimum sufficient milestones linked to physical changes.
- Deploy critical initiatives as ready to drive fast value realisation.
- Deprioritise and stop low value work.

'Critical Few' focus areas



Deep-Dive: Crusher throughput increase at a gold mine



Understand the constraint

Inconsistent crusher throughput (>50% variation) creating unintended bottleneck and impacting ability to realize budgeted mill feed rate



Validate the path

Analysis of crusher downtime time identified that operational issues drove 70% of the throughput loss



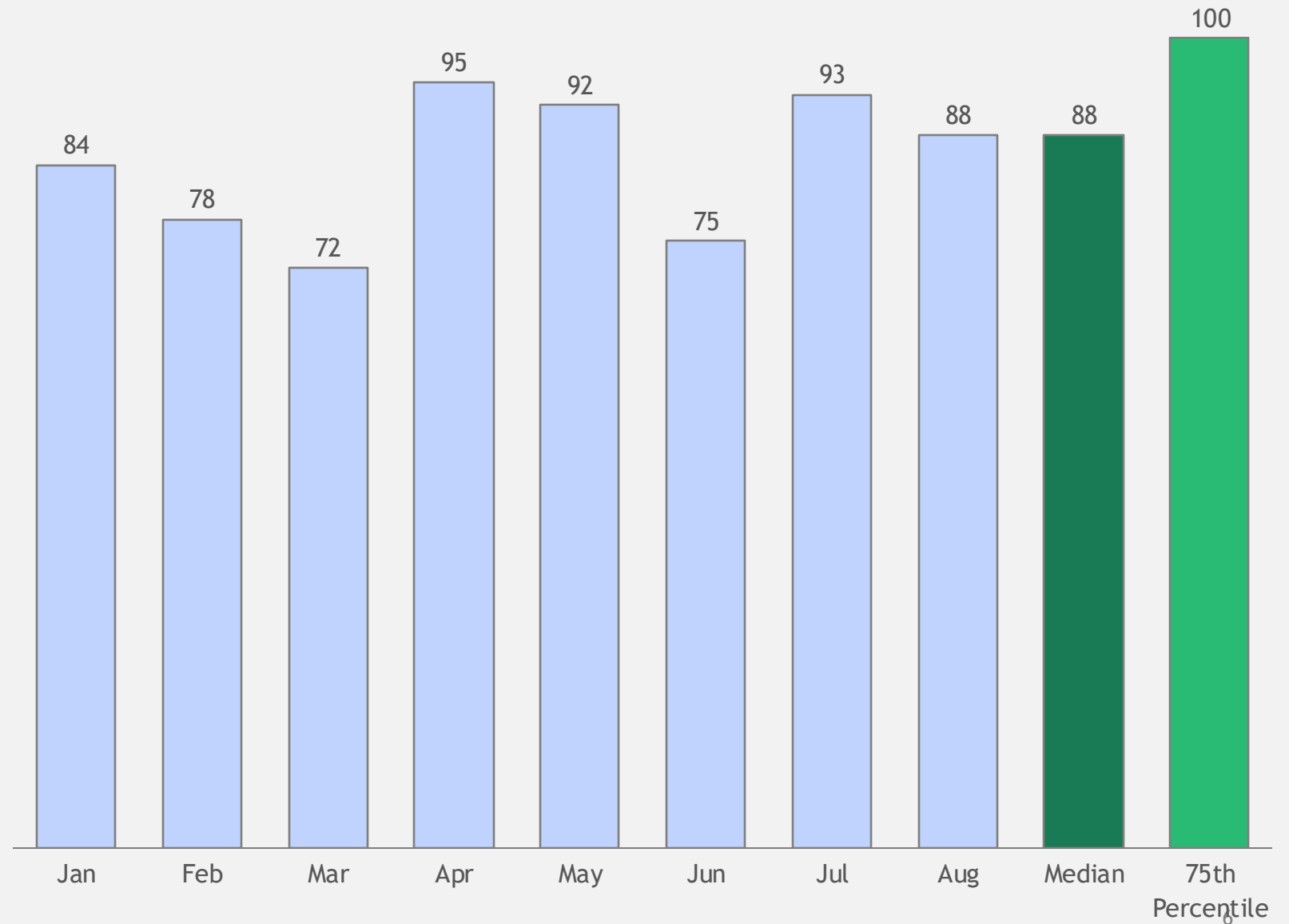
Prioritize the critical few

Resolving 4 issues that cuts across mining and processing departments could lift throughput by >40% in the near-term and without capex

Inconsistent crusher performance impacting ability to realize budgeted feed rate

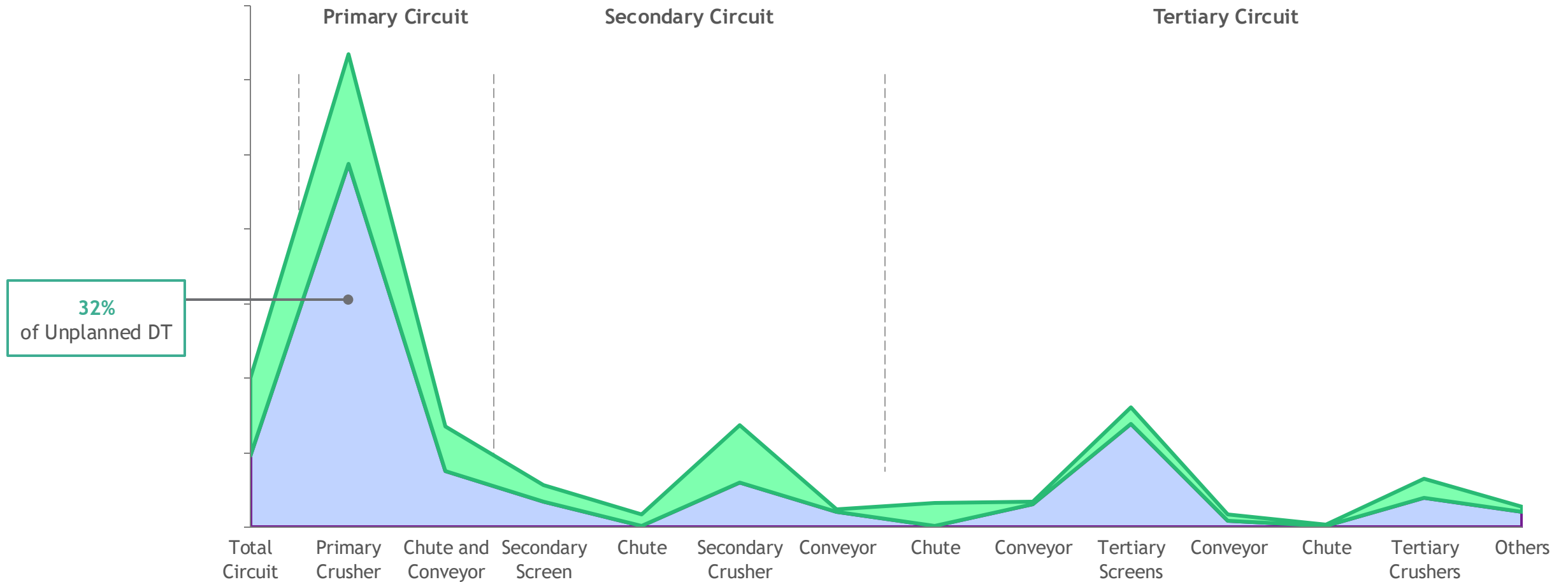
Feed Rate YTD (tonnes / operating hour normalized)

Average Monthly Median Daily 75th Percentile Daily

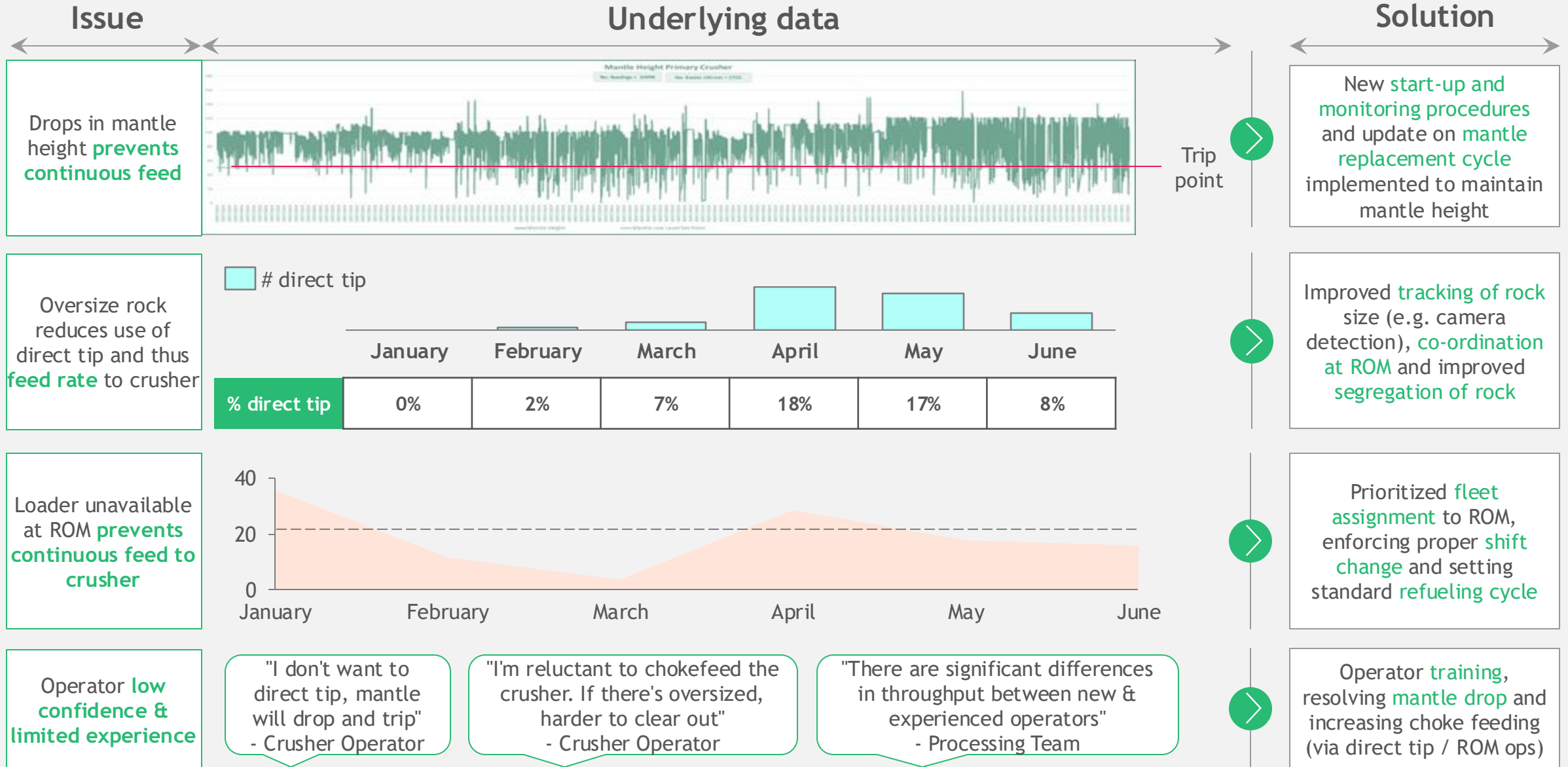


Analysis, visibility and prioritization of the drivers of unplanned downtime along the crusher...

Jan-Jun Unplanned Downtime by Equipment (hours)



...informs priorities to deliver near-term improvement





What are the implications we can draw for mining operational improvement programs in the Philippines

The time is ripe for step change in productivity

Beware of Initiative overload - hundreds of initiatives distracting from the 'critical few' that will unlock production

Establish the right performance & improvement culture

Challenge role of improvement meetings not focused on the physical changes required on the ground

Change is a cross-departmental effort

Actively intervene departments that optimise within siloes, with lack of collaboration across the value chain

Be value focused, not technical/process orientated

Step-in to reinforce top value drivers - detailed analysis will lead the team to miss the "big picture"

Your panel discussion participants today

Moderator

Industry Experts



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Head of BCG Philippines



Euls Austin

President and CEO,
Philex Mining Corporation



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