

The path to AI implementation in mining

A practical guide for mining, from the pit to the port.



Run Smarter. Grow Faster.

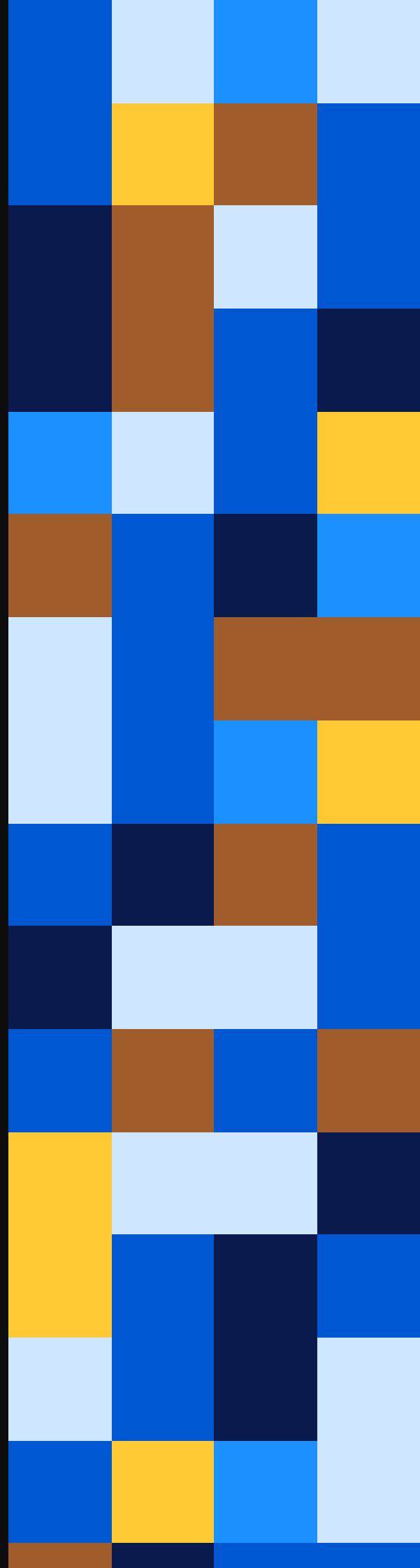


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In mining the pressures are specific: heavy assets that have to keep running, long routes from pit to port, volatile commodity prices, and safety and environmental rules that leave no room for error. AI can help with all of them, but only once you know where to begin. This guide lays out a practical path, from a first honest look at readiness to lasting value, written for mining from the pit to the port.



Charting a clear course for AI in mining

Ask a mine lead, an asset lead, a logistics lead, and a finance lead where AI should start, and you will hear four different answers: lift equipment availability, move material faster, cut cost per tonne, run safer. The opportunity runs from the pit to the port, and so does the temptation to chase all of it at once.

What is usually missing is a route. Deciding to use AI is not the same as knowing which problem to solve first, which asset, logistics, and safety data to trust, or how you will recognise a result at the end of a shift.

This guide gives mining leaders that route. It moves through the journey in order, from a candid read of where you stand to the work of holding on to value once a programme is live. None of it is abstract. Each stage reflects how mining businesses actually run.

Along the way you will see where Hudace and Xenon AI fit across assets, operations, logistics, sustainability, and finance, so the path stays practical rather than theoretical.



Evaluating your AI readiness

Start with an honest picture of your assets, your safety, and your data.

AI rewards preparation. Before the first model or agent, understand how asset, logistics, safety, and finance data flow, and how heavy equipment and strict rules shape what is possible. A grounded readiness check turns interest into progress.

Find your starting point, not a score

Readiness is less about owning the newest sensor and more about the conditions around it: leaders aligned on the goal, data you can rely on from the haul truck to the ledger, and teams, on site and in the office, willing to work in new ways. This is not a test to pass. It is a way to see where you are strong and where you still need to build.

A few signs you are ready to take the next step:

- You can tell apart what your people are ready for and what your systems are ready for.
- You can name specific tasks AI could take on: asset failure prediction, fleet and logistics planning, demand and price forecasting.
- You know whether asset, logistics, and safety data are reachable, accurate, and current.
- You have a real sense of the skills you hold, from the site to data, and the ones to add.
- You can put rough numbers on the time and budget involved.

Done early, this spares you stalled projects later, and lets you scope from facts rather than hope.



How Hudace helps

Running assets, supply, and finance on Hudace means you already have a connected view from pit to port, which is a real head start in spotting where AI adds value.

A short readiness session with our team ranks AI opportunities by site, asset, and route, so your first projects are the ones most likely to pay off. [Talk to Hudace.](#)



Defining strategic AI goals and expected ROI

Tie every AI effort to a number the mine already lives by.

AI earns its place when it moves a number that matters: equipment availability, recovery, cost per tonne, safety. Set goals that are specific, owned, and measurable before the work starts.

Clear goals turn effort into outcomes

The most useful projects open with a plain statement of what should change and by how much: higher availability on a fleet, better recovery, fewer safety incidents. Anchor it to a priority, name who owns it, and the work stays focused.

The question is rarely whether AI can do the task. It is whether you have decided what a good result looks like, in availability, in cost, in safety, before you start.

Worth settling early:

- The outcome you are after, written as a number you can track by site or asset.
- The specific problem, not the broad theme, you are solving.
- A shared view across operations, assets, logistics, and finance on what is feasible.
- Metrics you are willing to revisit each quarter.
- A first ROI range, held loosely enough to adjust.



How Hudace helps

Hudace helps you put numbers behind the ambition. Because asset, logistics, and finance data already live in the platform, goals and ROI ranges come from what is really happening across your sites and routes.

That makes the case for investment far easier to stand behind, and to revisit each quarter.

12% higher

equipment availability at IronPeak, after connecting assets, supply, and finance on one platform. [Read the story.](#)



Building your internal AI coalition

Adoption runs through operations, assets, logistics, and finance alike.

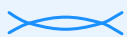
The best model in the world stalls without owners. Progress depends on a small group, drawn from across the business, who share both the goal and the responsibility for reaching it.

Early on, gather a group that reaches well beyond IT: mine operations, asset and maintenance, logistics and supply, EHS, and finance. Their job is not only to comment. It is to own a piece of the change, so it never rests on one team.

This is the group that connects intent to execution. They know which problems are worth solving on site, and their involvement carries a project past the first shift.

What a strong coalition gets right

- It brings the right people in at the start, with a real stake in the outcome.
- It agrees how decisions, risk, and oversight will work before issues arise.
- It leaves room to question, test, and learn out loud.
- It funds the unglamorous parts: enablement, communication, and time.



How Hudace helps

If alignment is the hard part, a Hudace discovery session gives your group a structured place to surface use cases across the operation and agree on priorities, turning scattered opinions into a shared plan.

When the focus shifts to skills, [Hudace Learning](#) offers practical paths so everyone, from the site to finance, feels ready for the change rather than unsettled by it.

Data, the mine, and infrastructure

Good AI depends on good data, from the haul truck to the ledger.

AI is only as good as what it runs on. Real-time, trustworthy data, joined across assets, logistics, safety, and finance, is what separates a promising pilot from something dependable. In mining, much of that data starts on remote sites.

Lay the groundwork for intelligent action

Xenon AI can only reason over what it can reach and trust. That means moving away from data trapped in separate systems toward a connected foundation: asset and condition signals, fleet and logistics, safety and environmental records, and cost, unified and current enough to act on.

Where to focus:

- Data quality: are asset, logistics, and cost records clean enough to use without heavy rework?
- Connectivity: can you bring asset, fleet, and safety data into one view, even from remote sites?
- Infrastructure: can your environment run close to operations and flex through demand?
- Ownership: IT keeps systems ready, but operations, assets, and finance share it.
- Budget: plan for integration, migration, data quality, and training.

None of this slows you down in the end. It is the difference between AI that demos well and AI you can run a shift on.



How Hudace helps

Hudace gives Xenon AI one governed, real-time view across assets, supply, and finance, so prediction, scheduling, and planning work from a single source of truth.

Still untangling older systems? [ACE with Hudace](#) shortens the path to a modern, connected core.

Navigating change across the mine and the office

Bring people with you, from the site to the planning office.

AI changes the shape of work, not only the tools. The mining businesses that get the most from it treat the human side as the main event: building skills, adjusting how work is done, and giving people a reason to lean in.

The technology shift rides on a human one

New capability brings honest questions. Will my role change? What happens to the judgement I bring on a maintenance call, a haulage plan, a grade decision? Will I keep up? Left unanswered, those questions quietly turn into resistance.

Handled well, this stage is where an operator or a planner stops bracing against AI and starts using it, because it makes their own call sharper.

What helps the shift land:

- Map the skills that are changing and offer real paths to build them.
- Talk early and often, especially where daily work on site or in planning will look different.
- Be straight about changing roles, with AI assisting expertise rather than replacing it.
- Set expectations on pace, shift by shift.
- Back it with budget for learning, champions, and the culture work that sticks.



How Hudace helps

[Hudace Learning](#) gives your teams structured, hands-on paths to grow confident with Xenon AI, from the why through to daily use on site, in maintenance, and in planning.

The result is people who feel ready for the change instead of caught out by it, whatever their role.

Measuring success and scaling AI

A pilot proves the idea. Measurement decides what scales across sites and fleets.

Getting one thing working, on one site or one fleet, is the start, not the finish. The mining businesses that scale well look hard at what worked and why, then carry that evidence into the next site and the next quarter.

Let the evidence choose your next move

Useful measurement is not a box-ticking exercise. It is how you learn what really happened, build the confidence to expand, and avoid scaling something for the wrong reasons.

What to track once a pilot lands:

- Measures that reflect real use: equipment availability, recovery, cost per tonne, safety.
- Actual ROI against what you expected, and the surprises along the way.
- Whether the approach travels to other sites and fleets.
- The resourcing, so people and systems are ready for more volume.
- What you learned, written down, so the next rollout starts further ahead.

Scaling is not simply doing more. It is doing more of what is proven, with a clear idea of what good looks like.



How Hudace helps

Hudace shows you how Xenon AI is used across the business: which sites, which fleets, how often, and to what effect.

That visibility keeps your attention on the work that pays back, and makes the case for the next investment concrete.

Risk, safety, and responsible AI

Value and trust have to grow together, with safety first.

AI does not remove human responsibility. On a mine site it raises the stakes on it. Bias, errors, and weak controls are safety, environmental, and margin risks. As AI spreads, the guardrails have to spread with it, and a qualified operator stays in control.

Make trust part of the design

Whether AI is scheduling a fleet, predicting a failure, or flagging a safety or environmental issue, the same questions apply: is it secure, is it safe, can you explain the call? Answering them is the job of clear governance, with operations, EHS, and IT deciding together how AI is run and watched.

Worth getting right:

- Naming the risks plainly: unsafe automation, biased data, environmental breaches, unexplained decisions.
- Keeping a qualified operator in control of safety-critical actions.
- Meeting the rules on safety, environment, and reporting that apply to you.
- Giving safety, environmental, and model checks a clear owner.
- Treating community and worker data with the same care as your own.



How Hudace helps

Keeping operations on one platform means less data scattered across systems to defend. Hudace adds granular access controls and built-in compliance at every level.

[AI Agent Governance](#) gives you the policies, monitoring, and oversight to keep Xenon AI safe, reliable, and accountable as it grows.

Sustaining value, shift by shift

Launch is a milestone. Lasting value is the work that follows it.

Going live is the easy thing to celebrate. Keeping value flowing as prices, grades, and conditions shift is the harder, more rewarding work, and it favours mining businesses that stay curious.

Keep the momentum, and the direction

Maturity does not arrive on launch day. It builds through small iterations, shared learning across sites and fleets, and a willingness to revisit what worked last quarter. Staying ready for what is next takes both the mindset and the systems to support it.

How to stay ahead:

- Watch how AI performs across sites and fleets, and tune where the numbers point.
- Keep your processes loose enough to adopt what comes next.
- Stay close to operations, asset, and logistics teams, and keep learning shared.
- Pair quick wins with the slower investments that make scale possible.
- Keep a habit of small, structured experiments as new options appear.

Lasting value comes from staying adaptable without losing the plot: a safer, more reliable, more profitable operation.



How Hudace helps

Hudace helps you keep sight of where Xenon AI earns its keep across the operation, so your focus stays on the work that matters.

With [Xenon Studio and the wider Xenon AI platform](#), your teams extend AI at their own pace, and the [Hudace Community](#) keeps fresh practice within reach.



Metrics and formulas that matter

AI earns trust when it shows up in numbers you already manage. These are the measures worth instrumenting from the first pilot, with the formulas behind them, so progress is easy to prove and easy to question.

Equipment availability

$$\text{Availability \%} = (\text{available time} / \text{scheduled time}) \times 100$$

How much of the time your fleet is ready to run.

Mineral recovery

$$\text{Recovery \%} = (\text{metal in product} / \text{metal in feed}) \times 100$$

How much of the valuable material you actually capture.

Recordable incident rate

$$\text{TRIR} = (\text{recordable incidents} \times 200,000) / \text{hours worked}$$

The headline read on how safely the site runs.

Cost per tonne

$$\text{Cost per tonne} = \text{total operating cost} / \text{tonnes produced}$$

The number that tracks competitiveness across cycles.

Throughput attainment

$$\text{Attainment \%} = (\text{actual tonnes} / \text{planned tonnes}) \times 100$$

Whether the operation delivers to plan.

Energy intensity

$$\text{Energy intensity} = \text{total energy used} / \text{tonnes produced}$$

A big, controllable cost and emissions driver.

Pick two or three to start. Tie each AI pilot to one, set a baseline before you begin, and review it each quarter.



Putting Xenon AI to work

A workflow worth starting with, and the questions your teams can ask.

From pit to port: a continuous loop

- 1 Sense**
Xenon AI reads fleet, plant, logistics, safety, and demand data into one view.

- 2 Predict**
It forecasts demand and prices and flags asset and safety risks before they cost output.

- 3 Schedule**
It sequences mining, processing, and haulage to protect availability and due dates.

- 4 Act**
Owners approve, the platform updates the plan, work orders, and logistics, and the loop learns.

Ask Xenon AI

- “ Which assets are most likely to fail and cut output, and what maintenance should we schedule?

- “ Where is cost per tonne highest, and what is driving it across the value chain?

- “ Forecast demand and price by product, and align the mine plan.

- “ Show recovery and energy intensity by plant and shift, and the main losses.

- “ Where are safety risks rising, and what should we act on first?

Every answer runs on your governed data, so it reflects what is really happening across your operations.



Your AI journey starts at the mine

The next step is closer than it looks.

You do not need every answer to begin. You need a sensible first move, the right people beside you, and support you can lean on. Followed in order, the steps in this guide take a mining business from a first honest look to results you can measure, in availability, in cost, in safety.

One site or your whole operation, the shape is the same: a path that grows with you, where every shift teaches you something worth carrying into the next.

Hudace stays with you across that path, from the first readiness conversation to AI working quietly across assets, operations, logistics, sustainability, and finance, with Xenon AI built into the platform rather than added on.

When your operation, your data, and your goals point the same way, the results tend to follow.



Learn more

See AI-native ERP for mining at hudace.com/industries/mining.



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