Severe Career Pivots a Case Example

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TerrasynX

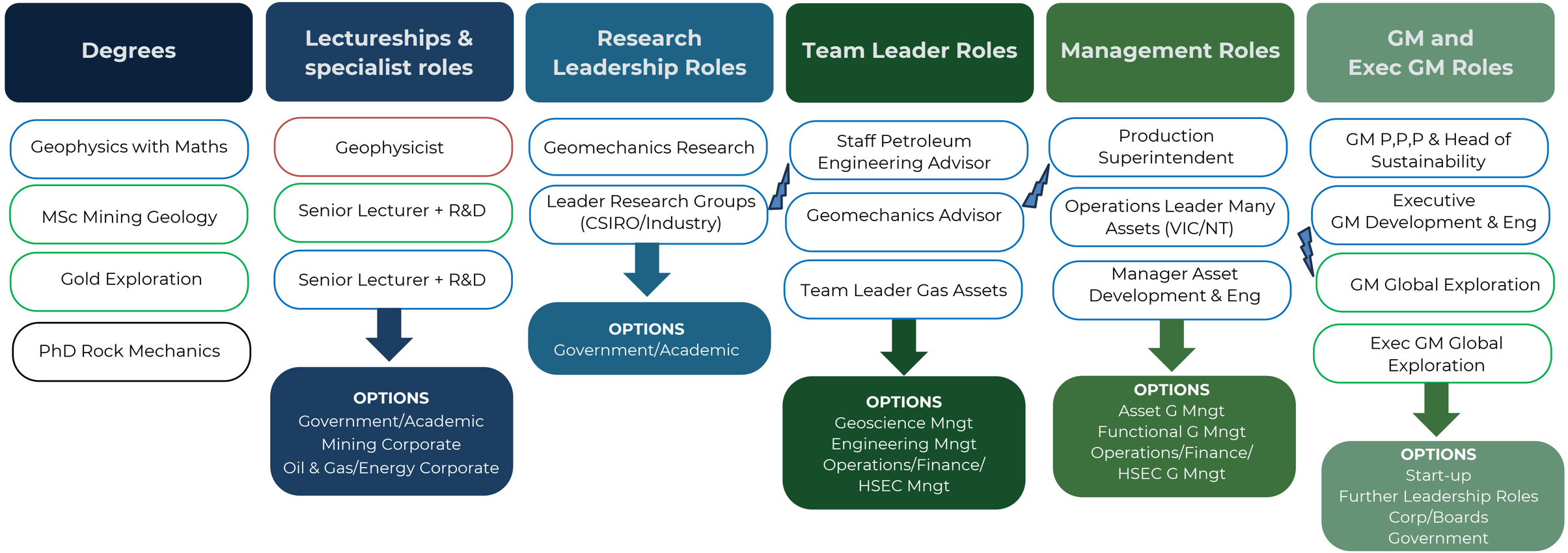
Ground. Synergies. Exchange

Bridging **energy and mining sectors** to **cut cost, carbon and cycle time.**

Agenda

1. A pivoting career
2. Brachiopods and Bivalves – compare and contrast – Energy and Mining Sectors
3. By discipline: Leadership and Culture, Finance, Commercial, Sustainability (HSEC), Technical
4. Your journey options - TerraSynX

A Pivoting or Pivotal Career Path – 17 Roles so far ?

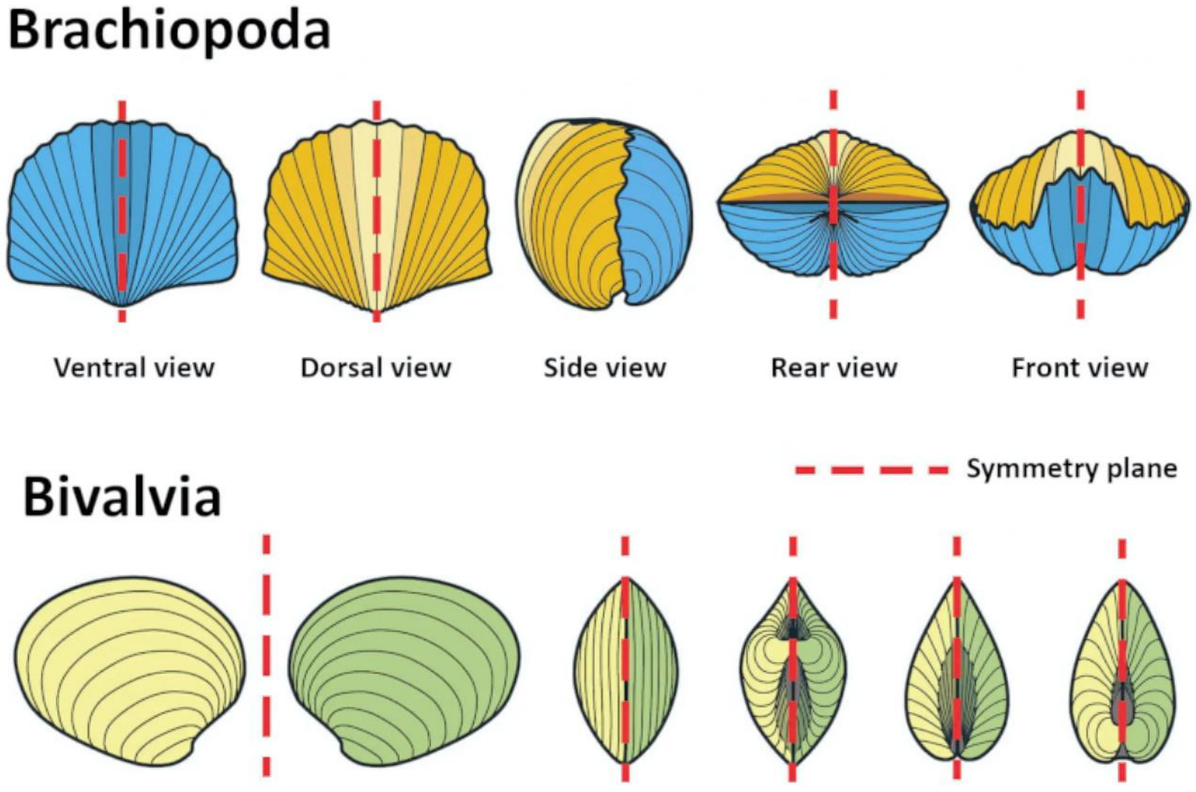


Brachiopods and Bivalves: Energy and Mining

More similarities than differences

Energy Oil &Gas and mining share some cultural DNA as capital-intensive, high-risk, engineering-driven sectors.

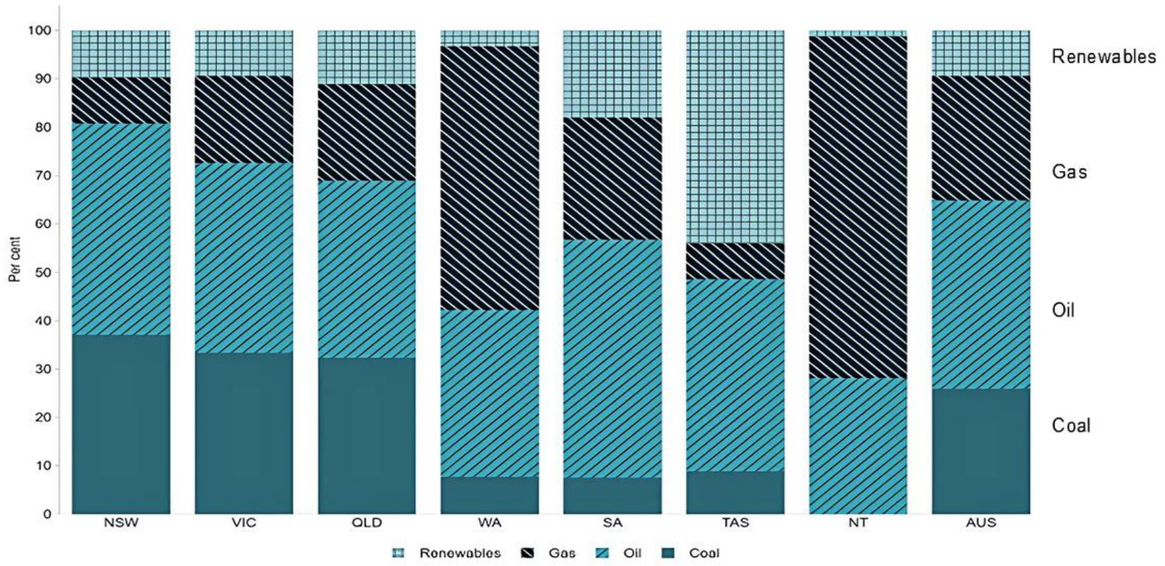
The two broad sectors overlap, as energy sector and the supply mix changing, and energy professionals moving between sectors



Brachiopods and Bivalves: Energy and Mining

More similarities than differences

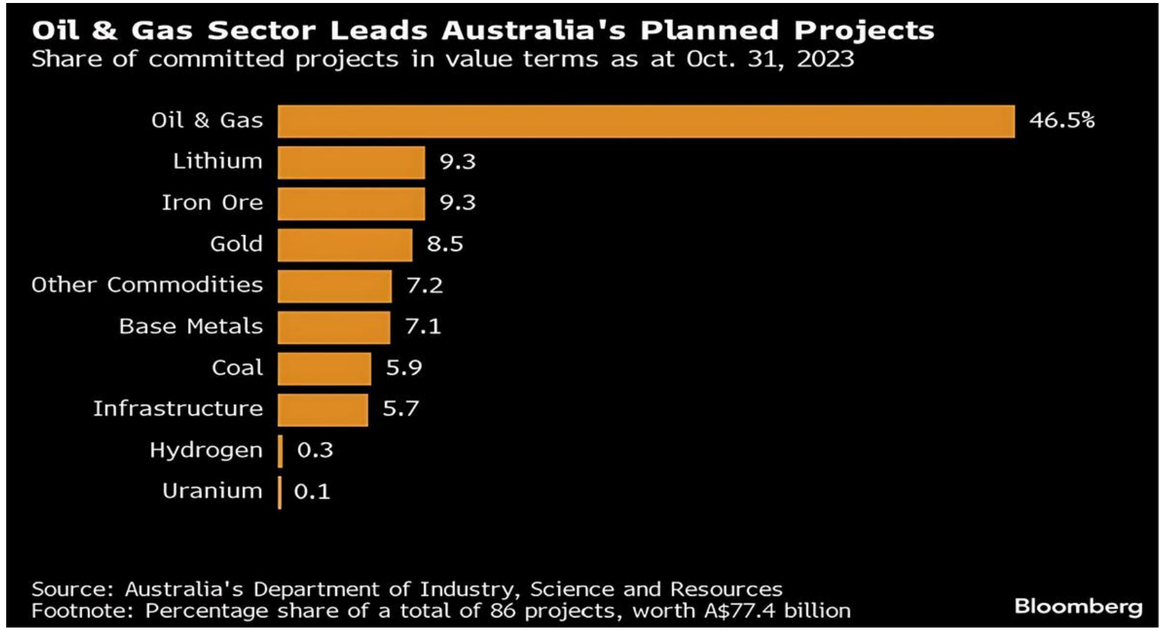
Australian energy mix by state and territory 2022-2023



The figure shows the percentage composition of energy use in each state and territory, by fuel type, in 2022-23. The energy mix varies between states and territories.

Oil and gas projects continuing, carbon sequestration and other sources of natural gas are being discovered.

86 projects planned at the end of 2023 worth $77billion



Leadership and Culture

Leadership, Training and Culture

Leadership and Managing Teams of scientists, engineers, integration of teams across multi-disciplinary functions

2018

2025

	Leadership	Culture
Purpose-driven Leadership, Multi-disciplinary Inclusive Leadership, Emotional Intelligence	Diversity & inclusion rose in priority; focus on leaders as culture-shapers.	Psychological safety: talent attraction
Crisis Leadership, Empathetic Leadership, Resilient Leadership	COVID-19 demanded high trust, transparency, and emotional support for teams.	Redefined norms: Fairness across diverse teams
Systems Thinking Leadership, AI-augmented Leadership, Distributed Leadership (shared teamwork and flexibility)	Complex global challenges and AI integration require networked decision-making and collaborative authority.	ESG integration: AI ethics shaping trust: data literacy as cultural competency

To be aware of:

- **Decision making style:** *O&G. Historically more hierarchical, some shift to integrated asset teams. Quick to adopt cross-disciplinary leadership due to complex projects. Mining. More operational decentralized GM's have more autonomy.*
- **Change Orientation:** O&G. "boom/bust resilience" is ingrained. *Mining*. More conservative; capital allocation decisions often longer-cycle, making change slower
- **Innovation Appetite:** *O&G. High when it comes to prod efficiency, safety and digital twins. Mining increasing focus on innovation for OBK, automation and safety. Historically slower to fund early-stage tech but accelerating due to ESG and cost pressures.*

Financial Systems, Valuation Assessments

Financial Systems, Valuation Assessments

Firstly, at the highest level – ie CFO, known those that have moved between O&G and Mining. Fundamentals are the same, NPV's created per asset via a LOM or LOF models, for opex, capex and production.

Decision-Making and Project Evaluation Culture

Oil & Gas	Mining
Mandatory Business Case: All projects must pass a Value of Information (VOI) test, with Net Present Value (NPV) and, in the case of exploration, a risk based Expected Monetary Value (EMV) analysis.	Business Case Variability: NPV analysis is common, but EMV for exploration projects is not widespread. Technical ranking often dominates over risked financial valuation.
Portfolio Optimisation: Strong systems and software in place. Projects are ranked and optimised at the portfolio level, integrated with strategy.	Portfolio Optimisation Challenges: Multiple commodities complicate optimisation. Portfolio tools and practices are less standardised compared to O&G.
Lifecycle Models: Long-term models (production, OPEX, CAPEX, revenue) are stacked to optimise asset portfolios in a multi-disciplinary, risk-weighted way.	LOM/LOA/LOF Models: Mines rely on Life of Mine (LOM) and Life of Asset/Facility models for CAPEX, OPEX, and revenue forecasts - but integration across portfolios is less mature.
Production Optimisation Culture: Dedicated groups and processes exist (e.g., "produce to the limit") to continuously enhance and extract value from assets.	Operational Optimisation: Mine optimisation tends to be less structured; equivalent processes for production optimisation/enhancement are less embedded than in O&G.

Commercial Agreements

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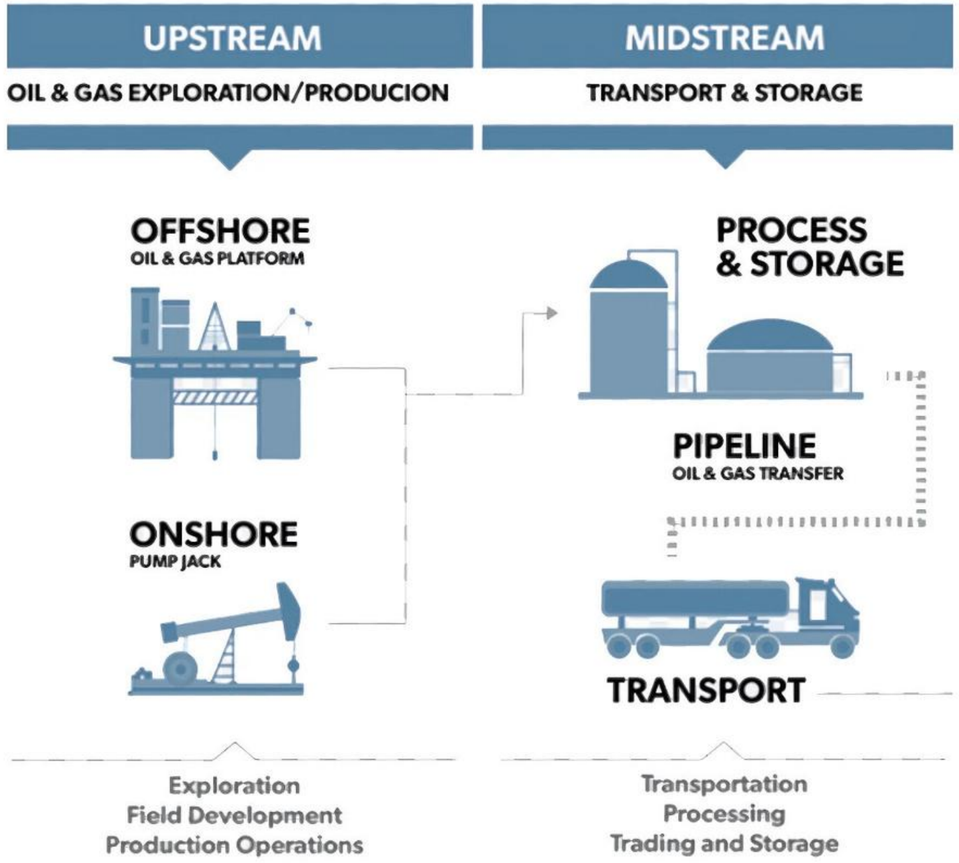


Upstream/Ore Access Agreements

- **Oil & Gas:**
  - **Production Sharing Contracts (PSCs):** Common in many jurisdictions. Government retains ownership; companies recover costs and share profit oil/gas.
  - **Concession/Licenses:** Companies gain rights to explore and produce, often paying royalties/taxes.
  - **Joint Operating Agreements (JOAs):** Between partners in a block; define operatorship, decision-making, cost/profit splits.
  - **Farm-in/Farm-out Agreements:** One company sells a share of its exploration/production rights to another in exchange for funding.

- **Mining:**
  - **Mining Leases/Licenses:** Grant rights to explore, develop, and mine. Usually royalty- and tax-based.
  - **Joint Venture Agreements:** Common where multiple parties co-invest in exploration/development. Tend to be more project/entity-based than O&G JOAs.
  - **Farm-in Agreements:** A junior miner allows a partner to earn into a project by funding exploration.
  - **Option Agreements:** Provide the right, but not obligation, to acquire a mining property after meeting certain milestones.

Commercial Agreements

Midstream & Infrastructure

- **Oil & Gas:**
  - Transportation & Tariff Agreements: Pipelines, LNG shipping, FPSOs (Floating Production Storage & Offloading).
  - Gas Sales Agreements (GSAs) / LNG SPAs (Sales & Purchase Agreements): Often long-term, take-or-pay.
  - Processing Agreements: Access to refineries, gas plants.

- **Mining:**
  - Toll Treatment Agreements: Miners without processing plants pay others to process ore.
  - Offtake Agreements: Buyers agree to purchase future production at negotiated terms. Often used to secure financing.
  - Smelting/Refining Contracts: Define charges, penalties, recoveries on concentrates.

Health Safety Environment, Community, Risk and Sustainability

HSEC, Risk and Sustainability

Dimension	Oil & Gas	Mining
Health	Occupational & process safety, barrier management, global standards	Ocupational health, fatigue, dust, ergonomics
Safety	Preventing catastrophic events (Piper Alpha, Deepwater Horizon lessons)	Operational safety focus; vehicle & ground risks, automation
Environment	Spills, methane, flaring: strong climate/CCUS focus	Tailings, water use, land rehabilitation; ESG supply chain focus
Community	Centralised, government-driven; local content & resettlement	Embedded in local communities; indigenous rights, long-term trust

Critical risk management – identification of critical hazards. Risk owners/control owners/task owners.
Sustainable Development Goals – UN Inter-agency Expert Group on Sustainable Development Goals.

Mining

SDG 6: Clean Water & Sanitation
- Efficient water use, recycling, and protecting water sources.

SDG 8: Decent Work & Economic Growth
- Employment in local/host communities.
- Fair wages, training, and workforce diversity.

SDG 9: Industry, Innovation, Infrastructure
- Building infrastructure in remote regions (roads, power, water).
- Innovation in mining technology, safety, and automation.

SDG 12: Responsible Consumption & Production
- Responsible sourcing, traceability of critical minerals.
- Circular economy initiatives, waste reduction, and tailings management.

SDG 13: Climate Action
- Scope 1 & 2 decarbonization, renewable energy for mine sites.
- Pressure to reduce Scope 3 emissions from steel, EV batteries, etc.

SDG 15: Life on Land

Biodiversity protection, land rehabilitation post-mining.

Oil & Gas

SDG 6: Clean Water & Sanitation
- Reducing water use in operations, especially in refining.

SDG 7: Affordable & Clean Energy
- Core business link — universal access to energy.
- Transition to renewables, gas as a “transition fuel.”

SDG 8: Decent Work & Economic Growth
- Large-scale employment, training, and global mobility.

SDG 9: Industry, Innovation, Infrastructure
- Development of LNG terminals, pipelines, renewable energy hubs.

SDG 12: Responsible Consumption & Production
- Efficiency in refining and production, circularity in plastics.

SDG 13: Climate Action
- Carbon capture, utilization & storage (CCUS).
- Methane reduction and flaring minimisation.

SDG 15: Life on Land
- Biodiversity protection, land rehabilitation post-production.

Technical – Project Management, Engineering and Geoscience

Technical – Project and Portfolio Management

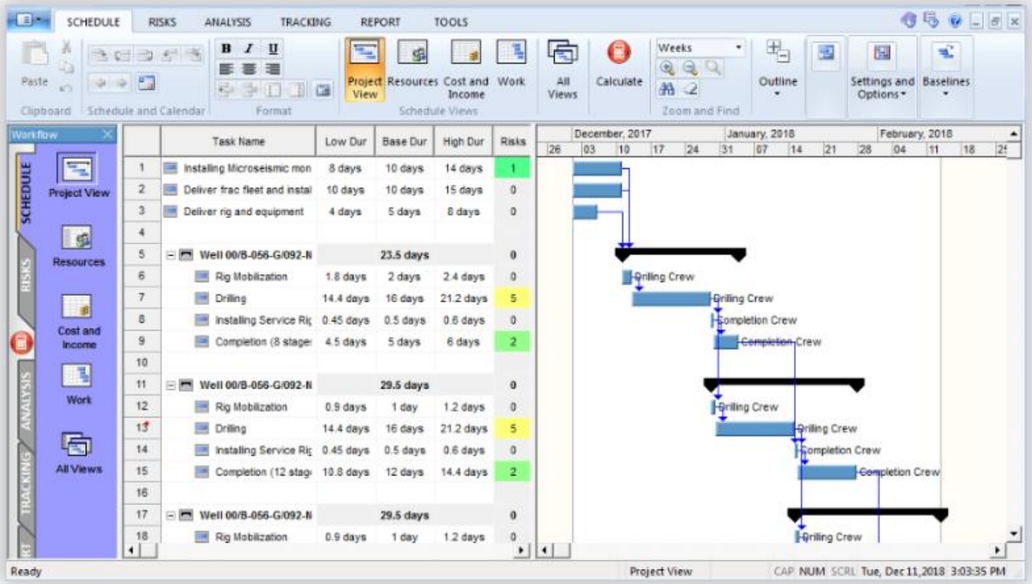
Small projects Informal, lightweight management.

Medium projects Formalized PM, single project manager.

Large projects PMO, structured governance, detailed reporting.

Mega projects Program/portfolio management, multi-level governance.

In summary: Project management scales up in formality, governance, tools, and reporting requirements as projects grow in size, complexity, and risk.



Category	Oil & Gas	Mining	Overlap/Notes
Enterprise PPM (Project Portfolio Mgmt.)	• Oracle Primavera P6 • Microsoft Project / Project Online • SAP PPM • IBM Maximo (with PPM modules)	• Oracle Primavera P6 • Microsoft Project • SAP PPM • IBM Maximo (asset & maintenance heavy)	• Strong overlap – these are the standard global PPM platforms used in both sectors

Technical – Engineering

Oil & Gas

Autonomous Drilling and Smart Logging

- Rapid advances in Oil and Gas Sector in Autonomous Drilling/ Logging while drilling and steering the bit into the formation of interest from seismic data.
- Depth of drilling conventionally up to 3.5km depth and long multi-km laterals/horizontal wells.

Reservoir Engineering for Forecasting

- Detailed field development flow end to end, significant work in optimising number of wells and facilities design.
- Advanced multi-phase simulation, for fluid and rock mass interaction for forecasting production.
- Now being used for CO2 injection, lithium production, In-situ leaching for uranium production, and other ISL commodities

Mining

Early Stage Autonomous Drilling and Smart Logging

- Rapid advances in Autonomous Drilling for blast holes but slow in exploration technology. Downhole logging not advanced significantly and steering via petrophysics and seismic not progressed, although advances in downhole electromagnetics are positive.
- Depth of drilling conventionally <1km depth.

Underground Design, Production Planning

- UG layout and detailed design, ventilation and services, backfill sequencing, tactical LOM scheduling. ET fleet control. Highly specialised multiple software tools skill sets.

- Already considerable overlap and increasing

Technical – Geoscience

Oil & Gas	Mining
Seismic acquisition & inversion, well logging, petrophysics, reservoir characterization.	Geophysics (seismic, gravity, EM, magnetics), drilling & core logging, hyperspectral scanning, resource estimation.
Seismic acquisition & inversion, well logging, petrophysics, reservoir characterization.	Geological block/digital twin models integrating lithology, grade, geotech, hydrogeology.

Similarity: Both build a geologically constrained, multi-disciplinary earth model (reservoir vs. ore body) from sparse and indirect subsurface measurements.

Similarity: Both use *3D/4D models as the "single source of truth"* for planning, decision-making, and risk quantification.

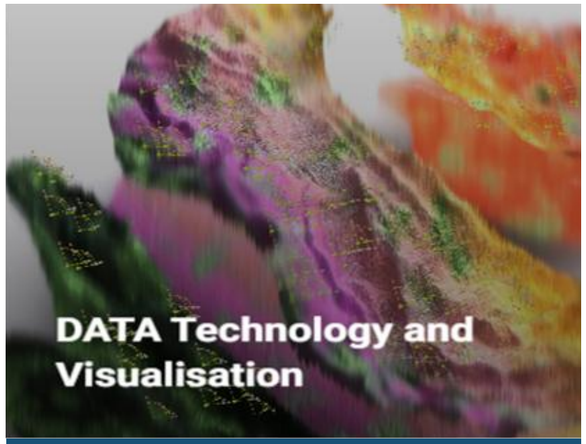
Similarity: Both have production heavily impacted by faulting and folding – major structural attributes, thus definition of these attributes and correlations can enhance production and forecasting

TerraSynX

TerraSynx

We cut costs, carbon and cycle time - transferring know-how, tooling and workflows both ways

Across Mining and the Energy Sectors we will provide a value assessment of your portfolio of projects and provide solution for optimisation using proprietary tools and processes.



We can provide advice and services associated with technology and visualisation of geological and engineering data to accelerate your workflows and enhance value.

Our experienced team acquire assets can provide advice on asset participation, expected value and partnering opportunities.

...a sector conduit between energy and mining

TerrasynX

Consider your career journey options

- Overlap between sectors
- Developing your knowledge base, your starting breadth, early career
- What can you do in parallel, throughout your career
- Where can you specialise, mid career, follow your passion
- Reaching your long-term goals – absolutely perseverance and building an extensive network and robust reputation