



cutting through complexity

KPMG GLOBAL MINING INSTITUTE

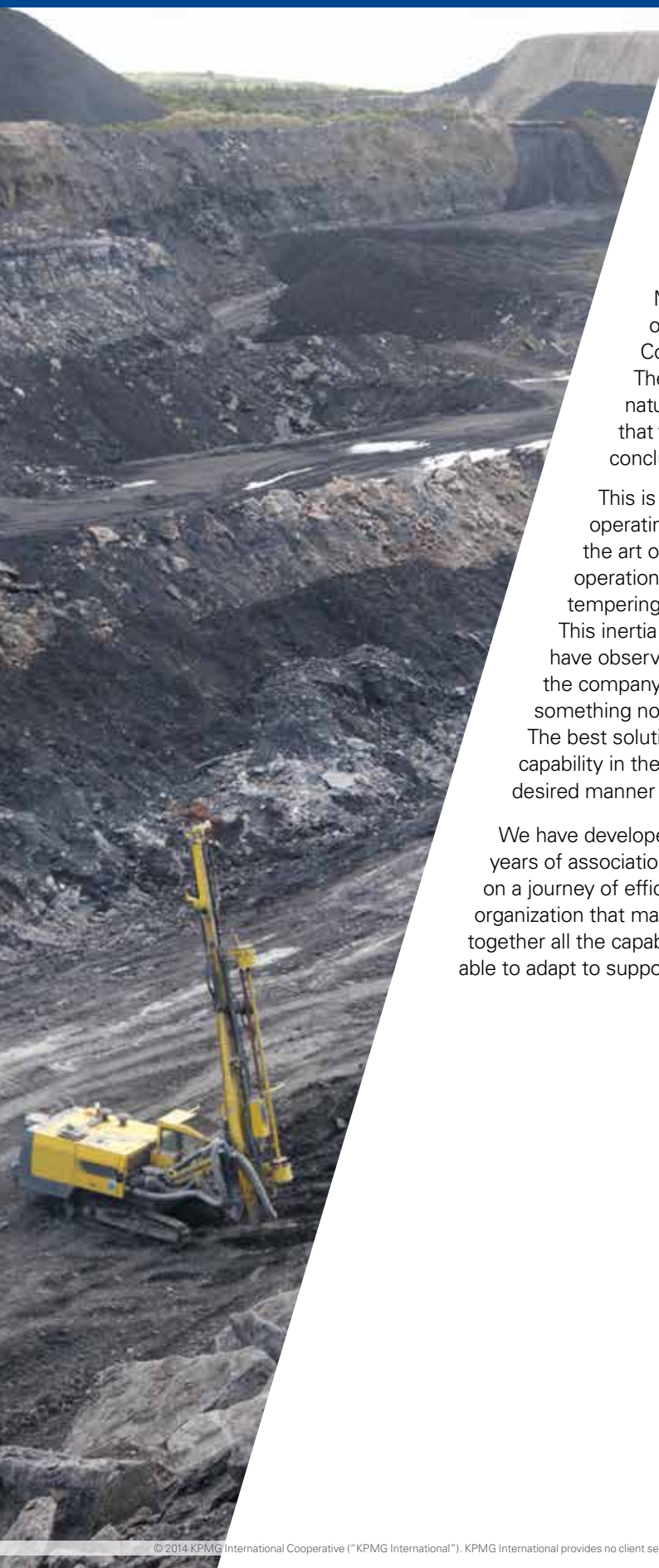
KPMG Mining Operational Excellence Framework

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Introduction



Mining companies have returned more money to shareholders over the last several years than companies in any other industry. Commodity prices have been pointing upwards since mid-2009. These are great times to be in this industry. However, the cyclical nature of this industry is only too well known. Just when it appeared that the recession was behind us, doubts are being cast on such conclusions.

This is one industry where every few years we need to switch operating philosophy and style. Some companies have mastered the art of staying ahead of the commodity cycle by modulating their operational response admirably. Several others however falter at tempering their way of working in line with the business environment. This inertia leads to either missed opportunities or over-reaction. We have observed that mere focus on operations control does not prepare the company to meet the new situation around the corner. There is always something novel about change that throws the earlier formula out of gear. The best solution seems to be to create an operational discipline and reaction capability in the organizational systems and culture that allow it to flex in the desired manner and to the desired degree.

We have developed our operational excellence framework over the last several years of association with leading mining companies. It starts off an organization on a journey of efficiency and then over time embeds such characteristics in its organization that makes the change sustainable over business cycles. This puts together all the capabilities necessary to assure the CEO that “operation” will be able to adapt to support their hunt for the next opportunity, whatever its nature.

Mining Operational Excellence Framework

Typical operational issues faced by resources companies



In context of these challenges, KPMG identified certain parameters of the mining process architecture, which should be revisited and operational parameters and KPI's to be benchmarked to address operational issues and maximize value and minimize risk.

Impact on mining process architecture

Business Strategy & Planning	Mine Strategy, Planning & Design	Mine/Facility Development	Mining Operations	Processing Operations	Asset Management	Customer Management & Logistics	Support
Vision & mission setting	Detailed exploration & survey	Legal/ regulatory/ environment management	Production planning (incl. geological consideration)	Production planning	Asset strategy (lease/own, etc.)	Customer & market strategy (incl. pricing & service strategy)	Finance, accounts, risks & control
Market & business environment assessment	LoM & reserve strategy	Land acquisition	Resource & asset roster deployment/ fleet mgt	Input material/ stockpile management	OEE management	Customer contracting and order management	Human resource (incl. ongoing manpower planning)
Product portfolio planning	Geological modelling	MDO contracting & equipment procurement	Mine to mill integration (bottleneck & stockpile mgt)	Bottleneck management	Maintenance planning & scheduling	Customer relationship management	Town & general administration
Stakeholder management	Progressive development planning	Infrastructure construction (incl. evacuation infra)	Execution – D&B, R&C, L&H, back-fill, etc.	Execution – crushing, beneficiation, waste handling	Maintenance execution	Inventory management	Ongoing sourcing & procurement
Corporate strategy development, implementation & monitoring	Process design & evacuation planning	Rehabilitation & resettlement	Mine to crusher integration incl. bottleneck & stockpile mgmt	Partner/ contractor operations management	Asset condition monitoring replacement or Life extension	Logistics planning & scheduling	Information technology management
	Resource planning (capital, equipment & manpower)	Box-cut or initial drilling etc.	Partner/ contractor operations management	Quality management	Spare management	Partner relationship management	Health, safety & environment
	Financial feasibility	Project monitoring	Quality management	Technical/ engineering services	Maintenance network/ infrastructure management	Transport infrastructure maintenance	Ongoing corporate social responsibility
	Operational/ annual planning	Recruitment & deployment	Technical/ engineering services			Transport execution (rail, jetty, port operation)	Research & development/ product development
							Knowledge management & improvement

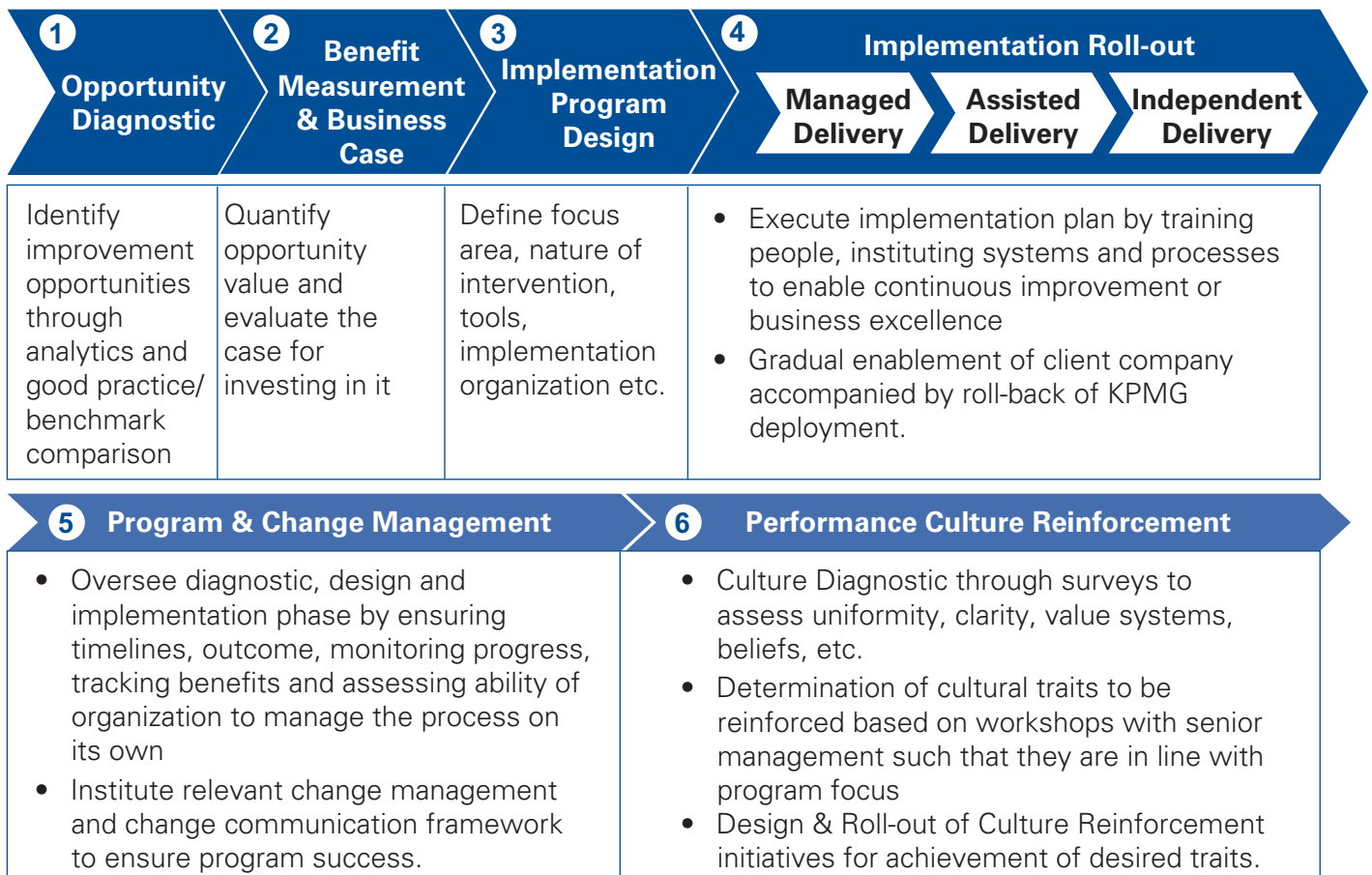
Mining Operational Excellence Framework

KPMG’s Operational Excellence Framework helps mining / resource companies gain a strong position in markets, become industry leaders by EBITDA, retain a leading position in margins and return on investments through high levels of operations integration across functional verticals and cost competitiveness.

Typical operational issues faced by mining companies

Retaining cost leadership	Increase in cost of operation due to escalation in raw material cost (e.g., explosive cost, electric power, etc.). Certain costs of operations such as wages, utilities, construction and maintenance costs are quite sensitive to possible general price increases.
Ensuring investment effectiveness	High capital expenditures with focus on the modernization of mining facilities.
Managing operational flexibility/integration	Multiple entities and mine operations need appropriate level of integration and operational flexibility implemented to manage cyclic nature of commodity industry.
Driving value through carbon optimization	Entities need to evaluate the impact of pricing and regulation of carbon emissions on financial performance in order to optimize operational and technology investment decisions.

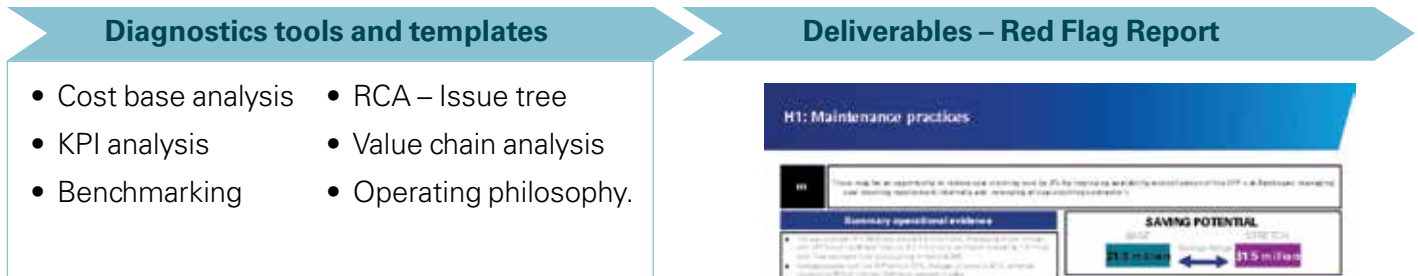
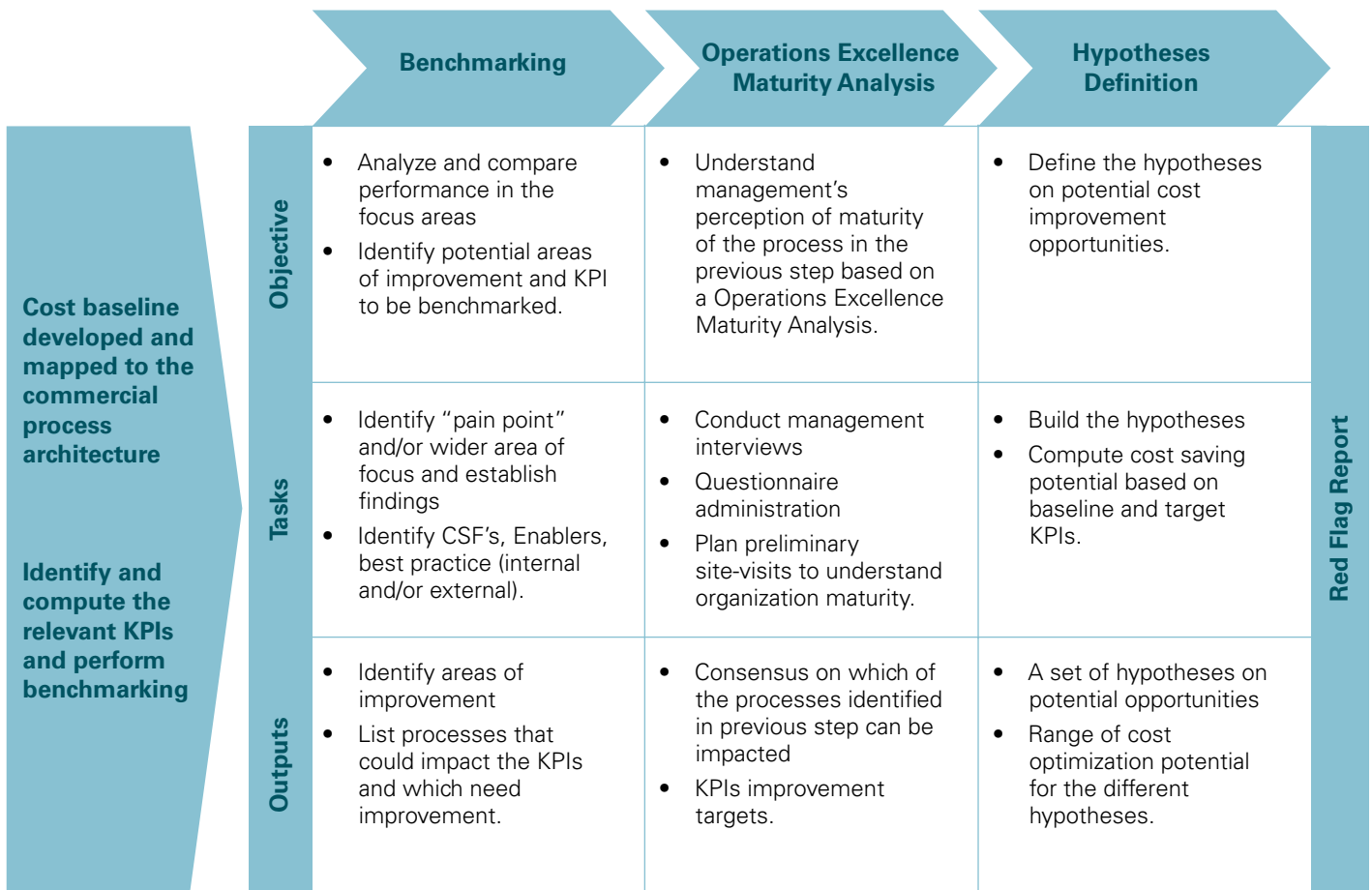
KPMG’s approach towards operational excellence in mining



1 Opportunity Diagnostic

Analyze the cost base of production facilities to identify the cost optimization opportunities across value chain through analytics and good practice/benchmark comparison

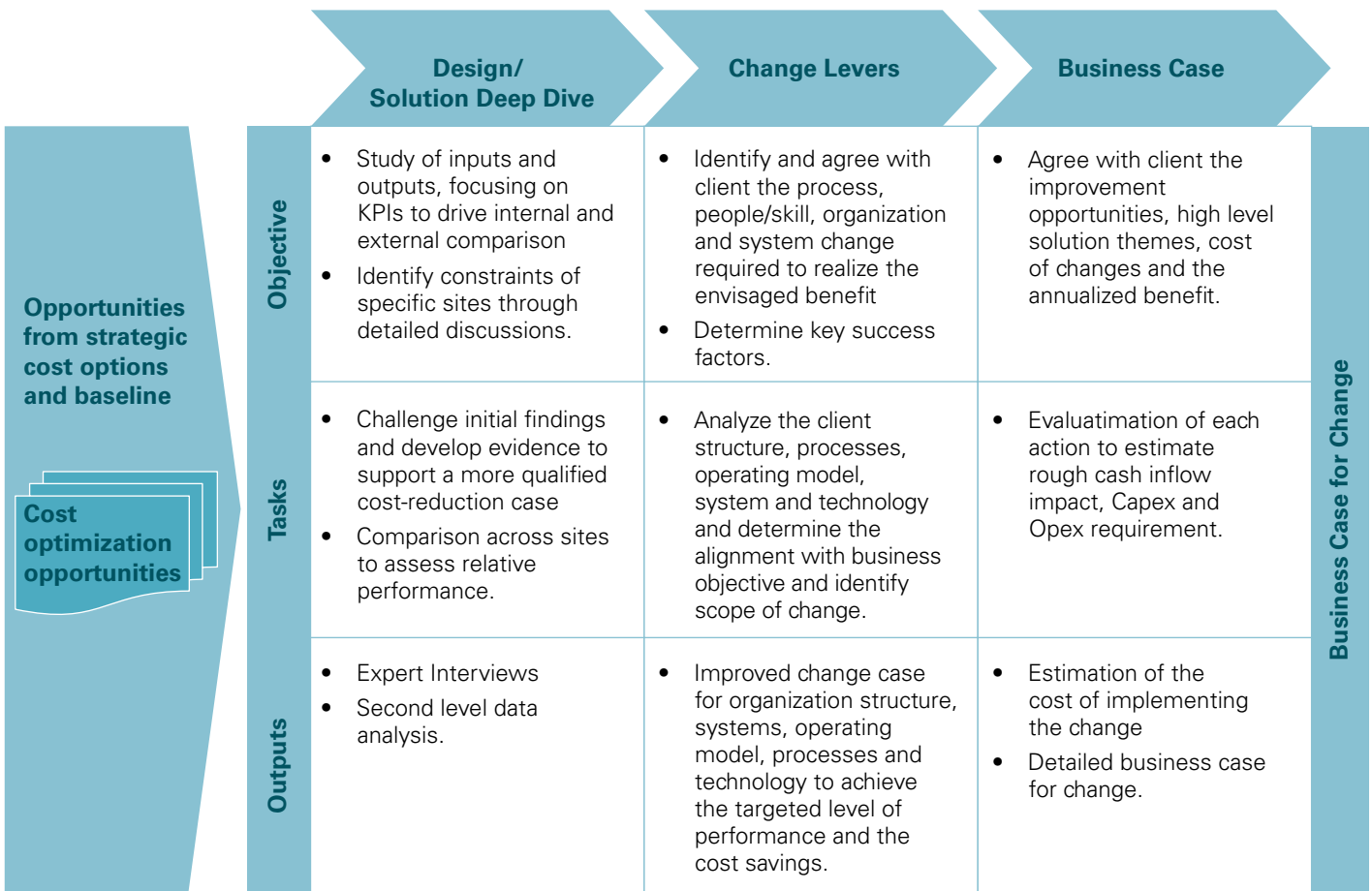
- a. Analyze the major cost and spend categories, identify cost drivers
- b. Identify performance issues for each process (and related drivers) and analyze root cause.



2 Benefit Measurement & Business Case

Delve deeper into the preliminary analysis, build consensus on the cost savings potential and the actions required to achieve them

- a. Validate solution themes through analysis of further secondary/primary information
- b. Identify and agree with client the process, people/skill, organization and system change required to realize the envisaged benefit
- c. Evaluate each action to estimate rough cash inflow impact, Capex and Opex requirement.



Benefit Measurement tools and templates

- Organizational design
- Network modelling
- Trade off analysis
- Operating model
- Current state analysis.

Deliverable – Business Case for Change

The screenshot shows a detailed financial model for a business case. It includes columns for 'Capex', 'Opex', and 'NPV' across various categories and time periods. The data is presented in a structured table format with multiple rows of financial details.

3 Implementation Program Design

Conduct in-depth discussions with the senior management team to agree and finalize the implementation plan, program structure and accountability framework

- a. Interview department heads and above to assess willingness and capability of people to take ownership of the change
- b. Develop detailed implementation plan.

		Implementation Planning	Base and Evaluation of KPI's for benefit tracking mechanism design	Implementation governance structure	
Cost savings potentials Processes to be considered for achieving targets Estimate of costs to achieve the targets	Objective	<ul style="list-style-type: none"> Allocation of required resources and/or budgets Identify key milestones required to deliver change outcomes. 	<ul style="list-style-type: none"> Ensure clarity around key measures to track program benefits Identify and develop a clear evaluation methodology and program dashboard. 	<ul style="list-style-type: none"> Define clear roles and responsibilities of team including the role of the PMO Clarity on the key governance meetings. 	Implementation Plan
	Tasks	<ul style="list-style-type: none"> Identification and development of key activities to achieve the milestones Plan organized by key work stream. 	<ul style="list-style-type: none"> Agreement on the phasing of the identified potential benefits. 	<ul style="list-style-type: none"> Finalize the project management tools and templates Develop Risk management tools and processes. 	
	Outputs	<ul style="list-style-type: none"> Overall program structure. 	<ul style="list-style-type: none"> Methodology for capturing key data on a regular basis, base performance level and signing off the benefits. 	<ul style="list-style-type: none"> Effective program governance structure. 	

Implementation Program Design tools and templates

- Risk analysis
- RACI model
- Benefits delivery.

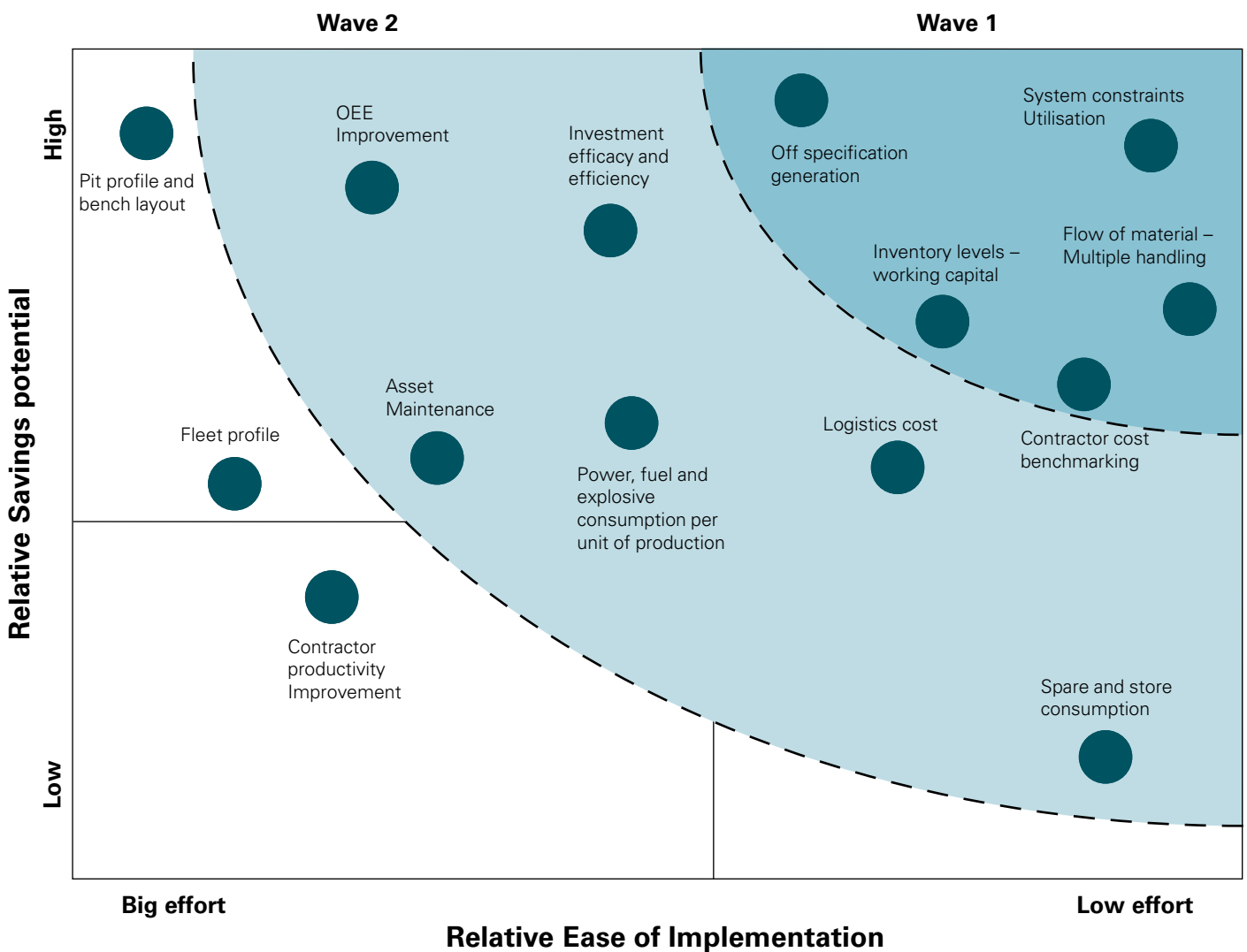
Deliverables – Implementation Plan



4 Implementation Roll-out

- Managed Delivery
- Assisted Delivery
- Independent Delivery
- Execute implementation plan by training people, instituting systems and processes to enable continuous improvement or business excellence
- Gradual enablement of client company accompanied by roll-back of KPMG deployment.

We prioritize actions based on the findings



5 Program & Change Management

- Oversee diagnostic and implementation phase by ensuring timelines, outcome, monitoring progress, tracking benefits and assessing ability of organization to manage the process on its own
- Institute relevant change management and change communication framework to ensure program success.

6 Performance Culture Reinforcement

- Culture diagnostic through surveys to assess uniformity, clarity, value systems, beliefs, etc.
- Determination of cultural traits to be reinforced based on workshops with senior management such that they are in line with program focus.

Case Studies

Operational Excellence

Client: PTTI – SAR (Thailand, Indonesia, Singapore)

Challenge: The client engaged KPMG to assist in assessing the operational performance of the two mining assets

Approach: A detailed assessment of key business processes was performed using KPMG’s “Mining Business Process Improvement Methodology”

Developed solutions in the area of contract management, maintenance strategy, shipping efficiency, Mine planning and marketing contracts.

Identified “Red Flag” in the processes and analyzed root cause; agreed with the management through structured workshops on the improvement areas.

Client: Homeland Mining & Energy (South Africa)

Challenge: KPMG was engaged to carry out a comprehensive review of the operations of a coal mine and implement the recommendations

Approach: KPMG first completed the diagnostic and were then retained for a year-long implementation focused on:

- OEE improvement of key equipments utilized by contractors
- Re-negotiating contracts, new organization structure deployment, performance management system implementation and upgrading the management information system.

Client: Coal India Ltd. (India) – Ongoing

Challenge: KPMG was engaged to help identify bring about efficiency-improvement in operations across CIL’s 400+ mines

Approach: KPMG’s approach was applied to the project and multiple efficiency improvement opportunities were identified for implementation along with culture building. Key programs are centred around:

- Continuous improvement program targeted at throughput increase, cost reduction & quality improvement (including culture & employee engagement improvement)
- Procurement cost reduction by adding new capabilities, standardizing minor equipments, centralizing purchase and using e-procurement wherever possible.



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