

## The evolution of strategic long-term planning at Anglo Platinum

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Following a restructuring of Anglo Platinum Limited in 2004 the strategic long-term planning function has been centralized. This paper describes the revised strategic long-term planning process covering aspects of the planning cycle, systems and methodologies, categorization of capital expenditure, corporate governance and planning tools.

### Introduction

Anglo Platinum was created in the mid 1990s as an outcome of the unbundling of Johannesburg Consolidated Investments (JCI) and as a result acquired ownership and control of Rustenburg Platinum mines (Amandelbult, Union and Rustenburg sections), Potgietersrus Platinum and ATOK or Lebowa Platinum Mine as we know it today.

The consolidation of previous JCI platinum operations brought with it a mix of operational approaches and planning perspectives. The approach to running the Anglo Platinum operations at this time was that of autonomous, empowered, decentralized business units where each business unit developed and pursued its own strategy.

The inevitable result of this philosophy was that each business unit developed its own planning methodology and systems, resulting in difficulty in making comparisons, benchmarking of performance and developing effective Group consolidations.

In late 2003 Anglo Platinum and its major shareholder Anglo American plc conducted an operational review of the company which highlighted the need to move to a centralized and standardized way of conducting business and running its operations. Subsequently, during 2004 restructuring of corporate and technical support staff was implemented. The objective of the restructuring process, in the technical arena, was to streamline decision making from the corporate head office, provide a central knowledge pool of how various technical functions should be undertaken in the Group and assess the competence and capacity of the operational technical support staff.

A critical outcome of this process was the centralizing of strategic long-term planning with the objective of ensuring effective engagement with the operations, in terms of strategic long-term planning, and the Executive Committee (EXCO) in terms of strategic alignment, scenario development and evaluation, and capital investment prioritization.

Key deliverables from the strategic long-term planning department are:

- Creation of a single point of accountability for the entire Group's strategic long-term planning activities
- Development and implementation of an integrated

strategy, planning and capital management process and systems on a coordinated timeline for the Group mineral assets

- Effective integration of scenario optimization and capital efficiency prioritization into the long-term planning process
- Development and implementation of an enhanced Group value optimization process and systems.

### The annual strategic long-term planning cycle at Anglo Platinum

Anglo Platinum's long-term planning cycle is initiated in the first half of the year (see Figure 1), with clear objectives (output, operating cost and capital expenditure) defined by the Anglo Platinum EXCO in the context of the Group strategy.

Within this strategic context each operation conducts a review of its strategy and previous long-term planning to ensure alignment with Group objectives. Detailed operational planning is conducted to develop an optimized long-term plan (LTP), based on forecast economic parameters, anticipated production performance and updated mineral resource estimates.

The first three years of this long-term plan, which is completed in June, provides the basis for refinement of the operational budget during the second half of the year. Subsequently, following budget approval, final budget parameters are aligned within the original planning resulting in a final LTP in the 4th quarter.

The long-term planning process is thus a continuous process that, when carried out comprehensively, reduces risk and improves accuracy, integrity and achievability with each cycle.

### Systems and methodologies

Mining operations within the Group develop and articulate a mine strategy, from which a mining right plan (MRP) is developed and the long-term plan (LTP) extracted. Each step in the process is a path along a decision tree, with choices being identified, rationalized, motivated and implemented.

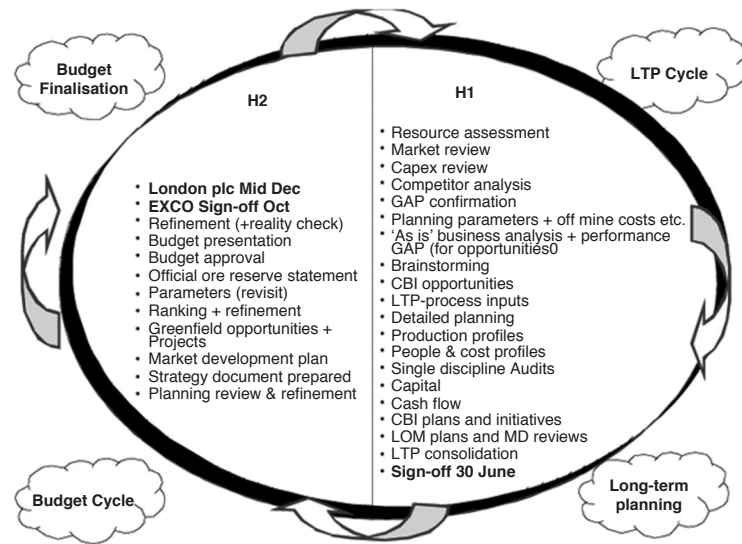


Figure 1. Long-term planning cycle (Andersen *et al.*, 2006)

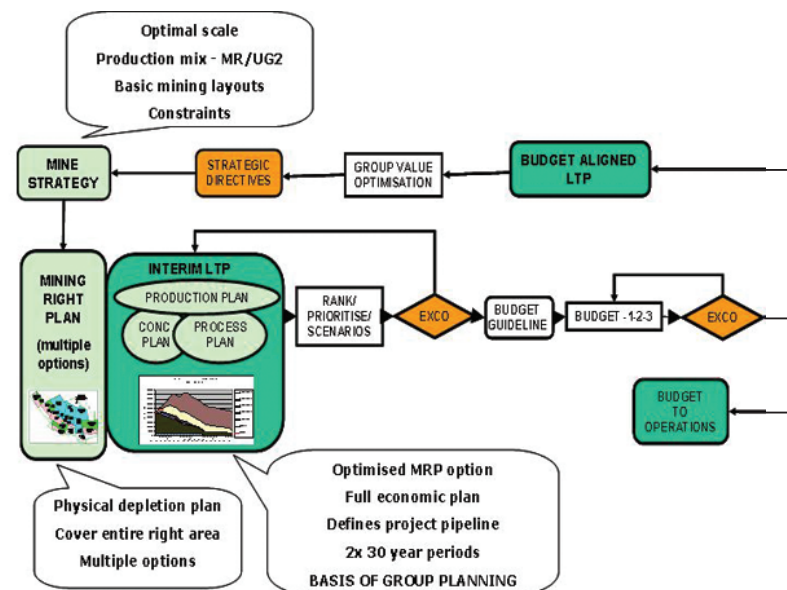


Figure 2. The integrated strategic long-term planning process (Smith and Pearson-Taylor, 2006)

The relationship of these integrated planning elements within the overall strategic planning process is represented in Figure 2.

#### Mine extraction strategy (MES)

The mineral resource forms the fundamental asset of any mining company. In order to optimize economic return (viz. to maximize net present value), clarity is required on:

- How the entire mineral resource associated with the mining right area is to be exploited
- Over what time period, and
- At what cost (capital and operating).

The mine extraction strategy sets the context in which all other strategic planning is done. Key issues that must be addressed are:

- Optimal scale of operations
- The associated tonnage source split from multiple reef horizons

- Technology selection and associated mining layouts
- Critical constraints, e.g. water supply, tailings disposal
- The influence of existing asset base, e.g. timing to optimal rate and split
- Identification of consequences for downstream recovery processes and other critical interfaces such as skills resourcing.

The mine extraction strategy thus informs the nature of the mining right plan, specifically: optimal scale, associated reef mix (where multiple economic horizons occur in a mining right area), basic infrastructure options and critical constraints.

It is important to note that the mine extraction strategy is not 'the plan' but a clear, motivated statement of the basic rules that will guide development of the mining right plan and the subsequent long-term plan on which investment decisions will be made.

### Mining right plan (MRP)

This is a physical depletion plan that covers the area over which a mining right has been granted in terms of the Mineral and Petroleum Resources Development Act (MPRDA). The MRP is driven by the mine extraction strategy (scale of operations, layouts, existing asset base, associated reef split, constraints). As such it is not time limited and will have a life span, resulting from the optimal scale of operations as identified in the mine extraction strategy.

It is not necessary that the MRP be economically viable across the full life span but rather that the full extent of the mining right is planned out in a technically defensible manner using appropriate capital and operating cost estimates, and the prevailing global planning parameters. Several options (normally extraction sequencing) should be developed in order to identify an optimized (maximized NPV) plan.

The planning horizon of the MRP must cover the entire mining right area—viz. it is not time constrained but area constrained. The MRP is reviewed and updated annually as part of the long-term planning process.

### Long-term plan (LTP)

The long-term plan, which comprises production, operating cost and capital cost estimates for the life of the operation or the first 60 years (two periods of 30 years), whichever comes first, provides the basis from which requirements for concentrating, smelting and refining capacity are estimated. Two 30-year periods are considered as ‘new order’ rights granted in terms of the MPRDA are initially granted for 30 years with a right of first refusal for a further 30-year renewal period.

The LTP is a full economic plan indicating the optimized exploitation option selected from the MRP. Support infrastructure and service requirement forecasts are based on the production profile and project pipeline as defined in the long-term plan.

The LTP is updated twice a year (interim and budget aligned final) for level 1 plans, and quarterly for all projects in execution in level 1 and any unapproved projects at study levels 2a, 2b, 2c and 3 categories (Andersen *et al.*, 2005). This logic is represented schematically in Figure 3.

- *Level 1*—Comprises current operations and approved projects (in implementation/execution phase) that have

all the necessary capital expenditure already approved and thus require only the necessary stay in business capital expenditure for the balance of its life.

- *Level 2*—Proposed capital investments or projects and are divided into 3 sub-categories (a, b and c), which are related to the confidence stage that the respective proposed capital investment or project has been reviewed. These sub-categories are governed by a stage-gate review and approval process and comprise:
  - Level 2a Feasibility study = ± 10%;
  - Level 2b Pre-feasibility study = ± 15%;
  - Level 2c Conceptual study = ± 25%;
- *Level 3*—Extraction plans that effectively cover the remaining extent of potentially exploitable resource within the area covered by the mining right and are, at best, scoping studies (not yet a project in the stage-gate review process) at a confidence level of > ± 30%.

This approach to the development of the LTP defines a project pipeline and as such forms the basis of the Group production and cost (operating and capital) forecasting and is used for capital prioritization and value optimization.

For the purpose of coherent and logical consolidations, model file naming conventions, consistent with the mining right plan for each mining right, are established. This approach facilitates the Group consolidation and scenario evaluation.

### Capital expenditure categorization in the LTP

Capital costs are divided into two broad categories: projects (proposed capital investments) and ‘stay in business’. The purposes of this classification is to provide a more meaningful distinction between capital expenditure, which is in the normal run of business (typically relating to existing assets and likely to be relatively stable from year to year), and significant projects, which are ‘one off’, and serve to expand or maintain total business capacity. The relationship of these categories is indicated in Figure 4.

### Projects (proposed capital investments)

Expansionary Projects, where no minimum value of project is set, but in practice expansionary projects involve only material increases in production output rather than small-scale capacity creep. Expansionary projects typically comprise new operations (greenfield projects) or an increase in output at an existing operation on a trajectory towards optimal scale.

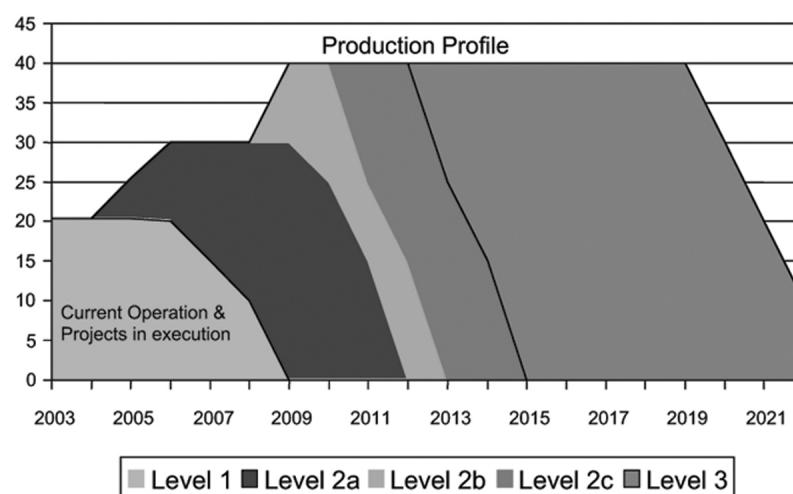


Figure 3. Schematic representation of a mining right plan and associated project pipeline (Pearson-Taylor and Smith, 2006)

CAPITAL CATEGORIES					
PROJECTS		STAY IN BUSINESS			
<b>EXPANSION</b> Production increases capacity	<b>REPLACEMENT</b> Maintains production capacity	<b>REPLACEMENT (OF EQUIPMENT)</b> Replacement of specific assets	<b>BUSINESS IMPROVEMENT</b> Business improvement projects based on business case. Includes IT projects	<b>RISK</b> Any projects initiated due to risks in the following categories: Safety Legislative Business risk	
<b>PREVIOUSLY EXPANSION</b>	<b>PREVIOUSLY ONGOING</b>				
				<b>ORE RESERVE DEVELOPMENT</b> Recapitalized when written down	

Figure 4. Capital categories

Replacement projects, the primary objective of which is to replace capacity lost due to the decommissioning or 'working out' of an existing production unit, thereby maintaining the overall level of output. Replacement projects typically involve a collection of assets that together represent a discrete new income generating unit, although the new unit may share certain infrastructure with existing production units. Replacement projects would therefore not include replacement of individual assets such as haul trucks, loaders, or capitalized rebuilds of existing equipment, which should be included in stay in business.

#### Stay in business

Capital expenditure undertaken in order to maintain the life of existing assets without materially increasing capacity. This would typically include:

- Replacement or capitalized rebuild of individual assets such as vehicles, machinery, plant, etc.
- Ore reserve development, where relevant
- Capital expenditure undertaken primarily for non-financial reasons, such as in the safety, health and environment area, and
- Business improvement.

#### Corporate governance

Effective governance of the planning process is essential to ensure overall integrity and is achieved primarily through data validation and auditing processes (planning components and valuation modelling) coupled with a comprehensive risk assessment process.

Validation and auditing of the various components of the LTP is due to the following requirements:

- Good business practice—the application of due diligence and corporate Governance
- Group consistency—a requirement of the Turnbull Report (Turnbull, 1999)
- Mitigation of risk—secondary view on issues may pre-empt negative occurrences
- Quality assurance—ensuring correctness as opposed to accuracy
- Identification of skills shortage and training requirements
- Skills development function.

A key component of the validation logic and process is the concept of a single point of accountability for data

integrity, control and reporting. The entire process is structured to pass on only validated authorized data from one component of the planning sequence to the next.

Auditing of the LTP is effected through both a single discipline audit aimed at assessing the viability of the individual disciplines and processes through which long-term planning data is determined and reported. This is followed by a multi-discipline audit of the consolidated long-term plan, which assesses the technical content, achievability, practicality, continuity, integrity and integration into the mining right plan.

Application of a qualitative risk assessment to establish and record issues of potential threat to achieving the LTP is carried out in conjunction with the multi-discipline audit. Additional issues highlighted by the array of disciplines represented in this forum are added to the issues collected from other risk assessments and consolidated in a central risk database used for Turnbull reporting.

#### Planning tools

Anglo platinum operates a significant suite of technical applications (mineral resource management, survey, geology, labour, etc.) to ensure effective planning and management of its operations. Within this context planning and scheduling of mining operations is primarily conducted with CADSmine®, as the standardized planning tool. CADSmine schedules thus form the basis for the monthly planning protocols, which form the basis for the first three years of the long-term plan. Longer-term scheduling of level 3 exploitation options in the projects domain may, however, be executed in a range of applications more suited to rule-based planning such as Mine 2-4D®.

All plans, regardless of level of estimate, are ultimately imported into the LTP application, which is a centralized data warehouse, holding core input data for discounted cash flow analysis.

Financial valuation is conducted on a discounted cash flow basis using Hyperion Strategic Finance (HSF) software (Smith *et al.*, 2006). This valuation package has been extensively customized to meet Anglo Platinum requirements (Marsh *et al.* 2005).

#### Conclusion

Strategic long-term planning is concerned with decisions that determine the long-term value of the business as a



whole while tactical mine planning is concerned with the tasks required to achieve that value. The two processes are totally interdependent and must not be separated with respective emphases being understood and acknowledged.

Critical to the success of any planning system is the effective integration of the correct processes, supported by appropriate technological platforms and competent motivated people who understand the systemic interdependency of mining activities. These critical building blocks have been established and the revised strategic long-term planning system at Anglo Platinum is progressively delivering improved data and information on which appropriate investment decisions can be made.

#### **Acknowledgement**

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