# DEVELOP CORE BUSINESS PROCESSES

At Anglo American, our core business processes refer to the fundamentals of our work across our entire value chain – from exploration and discovery to delivering our products to our customers. With innovation and outstanding delivery at the forefront of how we deliver value, the business processes we are implementing are vital to the success of our core activities and achieving best practice across the Group.

ESTIMATED ENERGY COST SAVINGS

**$90 million**

WATER SAVED AS A RESULT OF WATER-SAVING PROJECTS ACROSS THE GROUP

**23 million m$^3$**

REDUCTION IN DEMURRAGE COSTS AT COPPER

Resulting from the implementation of Marketing's ISOP process

**37%**

For more information
**See pages 25-29**

**PILLARS OF VALUE**

- **Environment**
- **Socio-political**
- **Production**
- **Cost**
- **Financial**

For more on pillars of value and our KPIs
**See page 34**

## THE CONCENTRATED MINE

One of the greatest challenges facing the mining industry today is how to develop and implement step-change innovations in order to drive improved productivity and cost performance, while minimising a mine's total physical and environmental footprint.

Concentrate the Mine™ is an integrated mining-systems approach pioneered by Anglo American. It integrates three enabling technologies:

- Advanced mine-to-mill uses new blasting technologies to increase plant throughput and minimise processing costs
- Coarse particle recovery (CPR) is designed to augment advanced mine-to-mill technologies to coarsen the grinding and to reduce energy and water consumption while maintaining, or potentially improving, recovery
- Early-stage gangue rejection separates ore from waste before ore enters the crushing and grinding phase. By rejecting the worthless waste rock earlier in the process, we effectively increase the grade, while reducing processing costs as well as water and energy consumption.

The potential benefits of these Concentrate the Mine™ techniques and technologies are significant, with broad application across our copper, platinum and diamond businesses. Together, they have the potential to deliver a step-change increase in output, without incurring a similar increase in operating and capital costs, in tandem with the prospect of greatly reduced energy and water use.

The Concentrate the Mine™ concept is being developed at the Los Bronces copper mine in Chile. First-phase trials will be completed in the first half of 2017, and early indications are promising. For example, even with only part-implementation of advanced mine-to-mill technologies, we are already achieving a 7% increase in plant throughput and an 84% reduction in blast vibrations.


Concentrate the Mine™ is an integrated mining systems approach pioneered by Anglo American. It is already being developed at our Los Bronces copper operation in Chile, and has the potential for broad application across other copper assets, as well as our platinum and diamond businesses.

**We are starting to see tangible benefits from the roll-out of our Operating Model across our major assets; a more stable and predictable operating performance is leading to improved productivity and costs, fewer environmental incidents and a fuller understanding of our mine-to-market value chain. Working together with all our stakeholders, we are beginning to deliver on the full potential of our portfolio and enhance the sustainable value we can create for all our stakeholders.**

## DELIVERING VALUE THROUGH INNOVATION

By accelerating the implementation of the Operating Model, we have made good progress at a number of our major assets, and we now have clear foundations in place for how we do our work.

Operating excellence remains a focus for our technical function and we aim to continually improve our operating standards which, in turn, helps to boost cash generation. For example, at the Los Bronces molybdenum plant in Chile, metal recovery has increased by more than 10 percentage points. This performance reflected a range of technical improvements, including improved understanding of the mineralogy and orebody, and processing optimisation that builds on a solid knowledge of plant capacity, allowing stable, maximum feed through the plant.

It is essential that we continually focus on, and invest in, innovation and technology development if we are to find more productive, efficient and sustainable ways of extracting value from the minerals we mine and deliver to our customers.

Traditional means of innovating are translating into new approaches that are more collaborative and inclusive. Anglo American's FutureSmart™ approach to innovation includes bringing together stakeholders with different perspectives to reframe challenges, produce rough prototypes to quickly test ideas and co-create user-centred solutions that can be adopted faster.

During 2015 and 2016, we convened FutureSmart™ Open Forums covering four major challenges – Sustainability, Processing, Mining, and Energy. We have also formulated a disciplined approach to innovation implementation which combines the exploration of long term possibilities with pragmatic implementation activities that realise short term value. Our unique innovation process, named 'SmartPath', allows us to move quickly from new ideas to new knowledge. It does so through a process of continuous assessment, with the aim of achieving relatively low cost, high reward capital expansions that can improve our position on the cost curve. This is essential in a prevailing environment of economic uncertainty, water scarcity and energy shortages, declining ore grades, and a productivity decline of around one-third in the mining industry over the past decade.

The most aspirational element of FutureSmart™ is our ambition to make dry tailings a normal operating practice. Water sent to tailings disposal often represents the largest water loss at a mine. Fine particle slurries are particularly difficult to dewater and current dry disposal options have prohibitive capital and operating costs. We are examining how we can reduce the cost of dewatering and are looking at the physical and chemical properties of the fine ore particles to understand why they cling so resolutely to water. If successful, we have the potential to significantly limit how much fresh water we draw, while also gaining access to orebodies in water-stressed areas that are critical to supplying the world's ongoing demand for metals and minerals.

## MARKETING PRODUCTS FOR FULL VALUE

During 2016, our Marketing business made good progress with marketing activities designed to create maximum value across the entire value chain – from mine to customer. These activities are designed to contribute value to the Group in a number of ways: improving EBIT; enhancing cash flow through tighter working capital management; better risk- and control-management; and stimulating sustainable demand for PGMs through a structured market development programme.

Focusing on our principal strategic 'levers' to generate additional EBIT across the Group, we continue to deliver value through:

- Marketing excellence: continuing to build direct customer relationships and obtain full value for our products.

  Through our dedicated sales and marketing hubs in Singapore and London, we continue to strengthen customer focus and build on our strong relationships. Throughout the year we sold all our equity volume available while managing supply challenges through proactive action such as the purchase of third party material. Close customer relationships have seen us explore and develop innovative propositions that have delivered shared benefits and additional value. Marketing excellence activities have continued to generate a large proportion of Marketing's value for the Group.

- Value chain optimisation: integrated sales and operations planning (ISOP) capability to ensure we make the most of our mineral resource in light of market conditions; ensuring customers get the right products, at the right time; and leveraging our logistics capabilities and shipping services.

  Our approach to planning and execution through our ISOP activities is now established across the majority of our commodities. This has realised specific benefits in higher throughput, lower logistics costs, and improved margins on qualities and quantities shipped.

# DEVELOP CORE BUSINESS PROCESSES continued

## EFFICIENTLY MANAGING THE INTERFACE BETWEEN PRODUCTION AND MARKETING

ISOP is a core element of Anglo American's Operating Model that is now established across the majority of our commodities. ISOP is Marketing's process for planning the movement of product from the mines' finished-goods stockpiles to end-customer delivery. Through the ISOP process, marketing and mine production plans are reconciled to maximise the value of product delivery into the market within the constraint of our supply capacity.

ISOP provides a structured framework for planning, scheduling and execution from mine to market across two time horizons: an 18-month Sales & Operations (S&OP) planning horizon; and an eight-week Tactical Planning horizon.

**ISOP in action at Copper**
ISOP was introduced in Copper in January 2016. The S&OP process allowed us to assess potential risks and opportunities beyond the two-month Tactical Planning horizon. For example, the S&OP process typically aligns operation and maintenance plans between our mines, smelter and port. This year, when operations and maintenance plans at the Chagres smelter could not be aligned with Los Bronces' and El Soldado's, ISOP identified an opportunity to source third party concentrate, thereby optimising the smelter's feed and financial performance.

The shorter Tactical Planning process has provided increased visibility of the production forecast which has, in turn, led to an improved shipping schedule, and a 37% reduction in demurrage costs.

**ISOP in action at Thermal Coal**
ISOP was introduced in Thermal Coal operations in 2013. In early 2016, the market anticipated high demand for lower calorific value (CV) product by India. ISOP provided the agility to react to this trend and maximise the value presented by the recently negotiated extra rail capacity. Through integrating production, logistics and demand plans, ISOP enabled four South African coal mines to supply the Indian market with low CV coal at higher yields, realising significant additional value for our Coal business.

The Richards Bay Coal Terminal (23.2% interest held) achieved its best ever shipping performance in 2016, while export sales at Coal South Africa were the second highest ever recorded.

During the year, several other value chain optimisation activities created additional earnings, including the further expansion of our shipping portfolio, with linked freight trades that yielded cost advantages and benefits relative to stand-alone routes. It was a year when we shipped record volumes across our bulk commodities on a CFR basis.

- Customer value proposition: through creating our own capability to access financial and third party physical markets, broadening the offer we make to customers. Thermal coal trading continues to perform well and we are therefore now active in related areas, including price-risk management in other commodity groups.

Good progress has also been made with our PGMs market development activities. Short term demand drivers include the jewellery and investment sectors; while in the longer term, we are investing in new technologies that are expected to drive new sources of demand for PGMs – such as fuel cell electric vehicles.

All Marketing activities are executed in an increasingly sophisticated risk-management environment. Ensuring the risk factors which affect marketing – including price, credit, operational, and regulatory risks – are transparent and comprehensively managed remains a key priority, helping to maximise value for the Group.

Throughout the year, in addition to progress against our levers, we made good progress on a number of enabling projects to improve our effectiveness and efficiency, and more importantly, set us up for future growth. These included improving our sales operation processes and supporting our IT systems globally.

## MANAGING OUR IMPACTS ON COMMUNITIES AND THE ENVIRONMENT

As a responsible miner, our social and legal licences to operate stem largely from our ability to demonstrate compliance with permitting requirements, responsible environmental management and the equitable distribution of the economic value generated by our operations. Our aim is to have a net positive lasting impact on our host communities through forming mutually beneficial partnerships, as reflected in our vision: 'partners in the future'.

The principal environmental and social risks facing our business are associated with socio-economic development, water quality and security, climate change and extreme weather, and mine closure. We report extensively on our approach and performance related to these and other material sustainability issues in our Sustainability Report.

For more information, visit
**http://www.angloamerican.com/investors/annual-reporting**

## MITIGATING ENVIRONMENTAL IMPACTS

The past three years have shown a steady decline in the number of environmental incidents reported, indicating continued improvement in the management of environmental controls across operations. In both 2015 and 2016, no Level 4 or Level 5 incidents (high impact) were reported. During 2016, four Level 3 (medium impact) environmental incidents were reported that resulted in no lasting harm to the environment (2015: six Level 3).

### Water

Water management is of great significance to our business activities, given that a large proportion of our current portfolio is located in regions with high levels of water risk. The water related challenges faced by our sites typically fall into three categories: water security; managing highly variable rainfall; and mitigating the impact of mining activities on water quality and the rights of other users.

In line with International Council on Mining and Metals (ICMM) guidance, we have developed a new water management standard in partnership with our regional stakeholders, which has a more focused and structured approach to managing basin-wide water risks. We are working towards more ambitious water savings targets for 2020, which include reducing our absolute freshwater intake by 20% and recycling/re-using water for 75% of our water requirements.

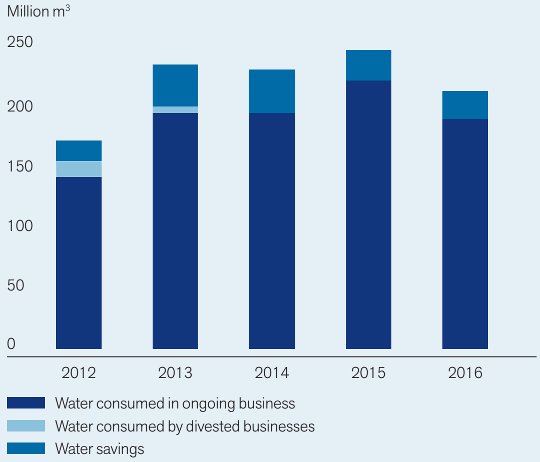
Water security across the Group has improved, with eight sites reporting water shortages during 2016, down from 11 sites in 2015. Continued drought conditions and water restrictions in South Africa and possible shortages in Minas Gerais State in Brazil, however, may increase water scarcity risk in the future.

In South Africa, our Platinum business has started modelling water supply scenarios for the next 20 years for each of its water stressed operations, where there are rapidly growing demands for water to support agricultural, mining, industrial and domestic consumption. In Limpopo province, the business has developed a bulk-water strategy and infrastructure plan to safeguard long term water availability for its operations and surrounding communities. Since a high number of our assets are in southern Africa, we have developed a collaborative water strategy for the region, which will be launched in 2017.

In Chile, our Los Bronces copper mine continues to mitigate water supply challenges by implementing technical solutions that promote water efficiency and water resilience. The site has reduced its water consumption by 20% from 0.69 $m^3$/tonne of ore to around 0.54 $m^3$/tonne. During 2016, additional technical solutions were identified that could reduce operational water consumption further.

Water saving projects saved the Group a further 23 million $m^3$ of water in 2016 (2015: 25 million $m^3$). Anglo American's total new-water consumption decreased by 14% from 222 million $m^3$ in 2015 to 191 million $m^3$ in 2016. The decrease was primarily due to divestments and efficiency measures.

**Total water consumed against business as usual 2012–2016**




### Climate change and energy

In April 2016, the Board supported a special resolution proposed by a group of shareholders that was then passed by shareholders at the AGM, in support of strategic climate resilience for 2035 and beyond. The resolution was prepared by the 'Aiming for A' coalition of institutional investors, and seeks a step change in companies' disclosure to investors on how they measure and manage climate change risks and opportunities to their businesses. Further information on our response to the resolution is available in the Anglo American Sustainability Report.

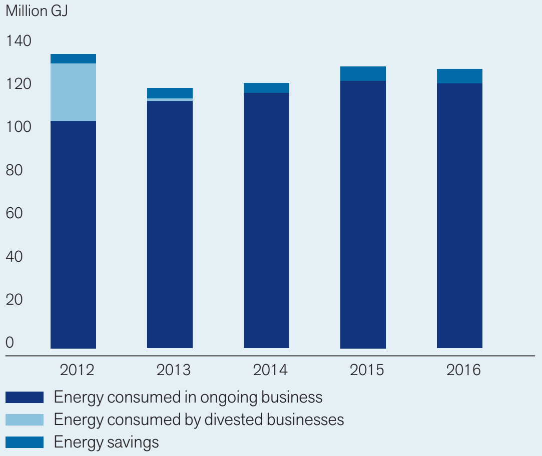
Our climate change strategy is designed to safeguard the business and host communities against climate change risks, and to contribute to mitigating global greenhouse gas (GHG) emissions. We expect that climate change will affect our business in three principal ways: climate regulation and taxation will have a financial impact; demand for PGMs and copper – critical products in enabling alternative energy technologies – will increase, while demand for thermal coal will decrease over the long term; and the physical and social impacts of a changing climate may affect our operations and host communities.

We anticipate a range of carbon pricing and offset/incentive policies to emerge in all our operating geographies. Carbon pricing scenarios are factored into project investment decisions and climate change risk and adaptation assessments have been conducted at vulnerable operations.

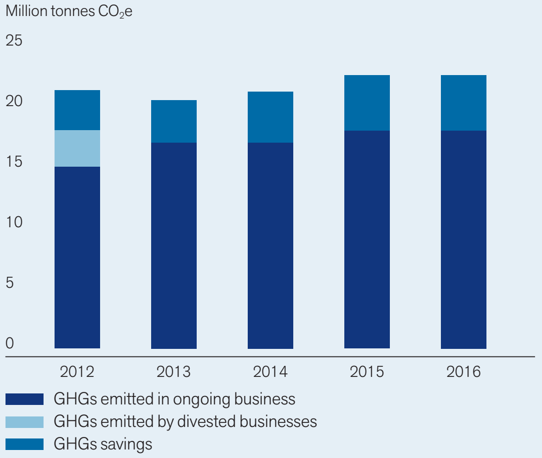
Progress on operational energy and carbon performance is driven through our energy- and carbon-management programme, $ECO_2MAN$. In 2015, the Group set new reduction targets for 2020, including: 8% for energy and 22% for GHG emissions, with 2015 set as the base year. These were agreed in the context of capital constraints and market complexities and uncertainties, and are subject to divestments and significant business changes.

# DEVELOP CORE BUSINESS PROCESSES continued

**Total energy consumed against business as usual 2012–2016**




**Total GHG emissions against business as usual 2012–2016**




In 2016, our $ECO_2MAN$ energy- and GHG-reduction programme prevented 4.5 million tonnes of $CO_2$-equivalent ($MtCO_2e$) emissions from entering the atmosphere. By year end, a total of 320 $ECO_2MAN$ and business improvement projects had accounted for estimated energy savings of 5.8 million GJ, representing energy cost savings of approximately $90 million. Performance is driven through the implementation of discrete projects that reduce energy and emissions intensity at the operations concerned.

In 2016, Anglo American operations were responsible for 17.8 Mt $CO_2e$ (2015: 18.3 Mt $CO_2e$). The Group's total energy consumption was 105 million GJ (2015: 106 million GJ). Total energy used decreased slightly (1%), while GHG emissions fell by 3% when compared with 2015. A large increase in energy consumption at Barro Alto in Brazil following the furnaces' rebuild (around 7 million GJ) was offset by lower consumption across most other businesses owing to divestments, efficiency measures and operational changes. The reduction in GHG emissions was a result of divestments, lower electricity emissions factors in Brazil and South Africa, and GHG mitigation projects.

### Tailings storage facilities

Tailings storage facilities are classified as one of our top 10 major risks and are subject to a rigorous risk management programme.

In February 2014, we began implementing a new mineral residue management technical standard, to be fully implemented by the end of 2017, for tailings and water retaining dams. Most businesses are phasing in the new standard and its requirements ahead of schedule.

During 2016, we completed a comprehensive inventory of, and updated risk tables for, all the containment facilities in Anglo American (90 tailings storage facilities and 213 water containment structures). Critical controls at facilities are audited internally on a rotational basis and each of the businesses is addressing identified priority issues. External technical review panels are being established for our mineral residue facilities to undertake independent reviews, and are already in place at several of our operations.

## PARTNERS IN THE FUTURE

As a major mining company, with the great majority of our operations in developing markets, we are committed to supporting our host governments to achieve social development goals. We endeavour to design and execute our projects according to the highest social standards, and to ensure our presence in host countries leaves a positive lasting legacy.

Our drive to manage social impacts and enhance positive benefits to communities is influenced significantly by growing legal and regulatory requirements, as well as by evolving societal and stakeholder expectations. This has highlighted the growing strategic significance of environmental, social and governance issues, and emphasised the important business benefits in building trusted and constructive relationships across stakeholder groups. This is essential to effectively manage social risks, maintain and strengthen our socio-political licence to operate, and support business milestones to achieve our vision of becoming 'partners in the future'.

### Managing our social impacts

Inclusive stakeholder engagement underpins our approach to respecting human rights and to responding to legitimate stakeholder aspirations and concerns.

Our Social Way defines Anglo American's governing framework for social performance. It provides clear requirements for all Anglo American-managed sites to ensure that policies and systems are in place to engage with affected communities; to avoid, prevent and mitigate adverse social impacts; and to optimise development opportunities. Each site is assessed annually against the Social Way requirements and is required to implement an improvement plan for requirements that are not met in full; progress is monitored at executive level on a quarterly basis.

Our industry-leading Socio-Economic Assessment Toolbox (SEAT) is used to improve operations' understanding of their positive and negative socio-economic effects, enhance stakeholder dialogue and the management of social issues, build our ability to support local socio-economic development, and foster greater transparency and accountability.

Through our responsible sourcing programme, we aim to ensure that the goods and services we procure do not cause harm to individuals or the natural environment.

Social instability leading to community unrest remains a particular challenge in South Africa, and particularly for our operations in Limpopo province. To address this, we continue to seek to engage and work collaboratively with employees, trade unions and the South African government, and with communities around our mines. We have placed a particular strategic focus on mitigating social conflict and promoting socio-economic development across Limpopo.

### Optimising the benefits of mining

Our strategic focus is on improving the productivity of local markets and public institutions to support sustainable job creation and effective public service delivery. Our integrated approach is concentrated on promoting local and preferential procurement, enterprise development and workforce development, working with local institutions to strengthen their capacity, maximise the socio-economic benefits from our own infrastructure, and deliver social investment that supports those most in need.

This approach is most advanced at our South American operations, where we believe that our leading socio-economic development initiatives are a driver of competitive advantage. This is recognised in the $2 million of grant funding secured from the Inter-American Development Bank to expand our integrated enterprise and supplier development programmes in the region.

Our focus on leveraging our core business activities and skills in collaboration with expert partners, enables us to have a significantly greater positive impact on host communities at a much lower cost than conventional social investment-led approaches.

#### Global expenditure by country

| | $ million | % |
|---|---|---|
| South Africa | 40.1 | 48 |
| Peru | 13.6 | 16 |
| Chile | 10.3 | 12 |
| Brazil | 9.9 | 12 |
| Canada | 4.9 | 6 |
| Namibia | 3.0 | 4 |
| Botswana | 1.0 | 1 |
| United Kingdom | 0.8 | 1 |
| Rest of World | 0.3 | – |
| Australia | 0.2 | – |
| **Total** | **84.1** | |

In 2016, 23% ($2.0 billion) of supplier expenditure was with host communities (2015: $1.8 billion, 17%), while our enterprise development programmes in Botswana, Brazil, Chile, South Africa and Peru supported 62,447 businesses and created/sustained 116,298 jobs.

In 2016, Anglo American's corporate social investment (CSI) expenditure in local communities, including by the Anglo American Chairman's Fund and Zimele, totalled $84.1 million (2015: $124.1 million). This figure represents 2.5% of underlying EBIT, less underlying EBIT of associates and joint ventures.

### Responsible mine closure and divestment

We design, plan and operate our mines with closure in mind, and plan for 'post-closure' long term sustainability in consultation with communities and other stakeholders. In doing so, we aim to reduce long term risks and liabilities to our business from an environmental and socio-economic perspective, and to ensure that we leave a positive legacy when our mines conclude their operational lives.

Our Mine Closure Toolbox provides a structured approach to closure planning and management. It is aimed at ensuring that the full spectrum of opportunities, risks and liabilities is effectively identified, that plans are fully costed, and that financial provision is made for premature closure.

When operations are divested or placed onto care and maintenance (C&M) there are impacts on employees, communities and the environment. Our aim is to divest businesses responsibly by ensuring that new owners are credible and ethical, that liabilities are fully transparent, and that our legal and other social and environmental commitments are honoured. Efforts around mitigating the effects of C&M focus on stakeholder engagement, mitigating job losses and wider social impacts, and ongoing environmental care and monitoring.

#### Global expenditure by type

| | $ million | % |
|---|---|---|
| Community development | 50.9 | 60 |
| Education and training | 15.0 | 18 |
| Water and sanitation | 5.3 | 6 |
| Health and welfare | 5.1 | 6 |
| Other | 3.0 | 4 |
| Sports, art, culture and heritage | 2.2 | 3 |
| Institutional capacity development | 1.8 | 2 |
| Environment | 0.6 | 1 |
| Disaster and emergency relief | 0.1 | – |
| Energy and climate change | 0.1 | – |
| **Total** | **84.1** | |