Potash outlook and fundamentals 101

Dr Huw McKay Chief Economist
Dr Paul Burnside Manager Potash Analysis

17 June 2021
Disclaimer

Forward-looking statements

This presentation contains forward-looking statements, including statements regarding: trends in commodity prices and currency exchange rates; demand for commodities; production forecasts; plans; strategies and objectives of management; assumed long-term scenarios; potential global responses to climate change; the potential effect of possible future events on the value of the BHP portfolio; closure or divestment of certain assets, operations or facilities (including associated costs); anticipated production or construction commencement dates; capital costs and scheduling; operating costs and shortages of materials and skilled employees; anticipated productive lives of projects, mines and facilities; provisions and contingent liabilities; and tax and regulatory developments.

Forward-looking statements may be identified by the use of terminology, including, but not limited to, ‘intend’, ‘aim’, ‘project’, ‘anticipate’, ‘estimate’, ‘plan’, ‘believe’, ‘expect’, ‘may’, ‘should’, ‘will’, ‘would’, ‘continue’, ‘annualised’ or similar words. These statements discuss future expectations concerning the results of assets or financial conditions, or provide other forward-looking information.

These forward-looking statements are based on the information available as at the date of this presentation and/or the date of the Group’s planning processes or scenario analysis processes. There are inherent limitations with scenario analysis and it is difficult to predict which, if any, of the scenarios might eventuate. Scenario analysis do not constitute definitive outcomes for us. Scenario analysis relies on assumptions that may or may not be, or prove to be, correct and may or may not eventuate, and scenarios may be impacted by additional factors to the assumptions disclosed. Additionally, forward-looking statements are not guarantees or predictions of future performance, and involve known and unknown risks, uncertainties and other factors, many of which are beyond our control, and which may cause actual results to differ materially from those expressed in the statements contained in this presentation. BHP cautions against reliance on any forward-looking statements or guidance, particularly in light of the current economic climate and the significant volatility, uncertainty and disruption arising in connection with COVID-19.

For example, our future revenues from our assets, projects or mines described in this presentation will be based, in part, upon the market price of the minerals, metals or petroleum produced, which may vary significantly from current levels. These variations, if materially adverse, may affect the timing or the feasibility of the development of a particular project, the expansion of certain facilities or mines, or the continuation of existing assets.

Other factors that may affect the actual construction or production commencement dates, costs or production output and anticipated lives of assets, mines or facilities include our ability to profitably produce and transport the minerals, petroleum and/or metals extracted to applicable markets; the impact of foreign currency exchange rates on the market prices of the minerals, petroleum or metals we produce; activities of government authorities in the countries where we sell our products and in the countries where we are exploring or developing projects, facilities or mines, including increases in taxes; changes in environmental and other regulations; the duration and severity of the COVID-19 pandemic and its impact on our business; political uncertainty; labour unrest; and other factors identified in the risk factors discussed in BHP’s filings with the U.S. Securities and Exchange Commission (the ‘SEC’) (including in Annual Reports on Form 20-F) which are available on the SEC’s website at www.sec.gov.

Except as required by applicable regulations or by law, BHP does not undertake to publicly update or review any forward-looking statements, whether as a result of new information or future events. Past performance cannot be relied on as a guide to future performance.

BHP Climate Change Report 2020

This presentation should be read in conjunction with the BHP Climate Change Report 2020 available at bhp.com. Some of the information in this presentation provides a concise overview of certain aspects of that Report and may omit information, analysis and assumptions and, accordingly, BHP cautions readers from relying on that information in this presentation in isolation.

Presentation of data

Numbers presented may not add up precisely to the totals provided due to rounding.

No offer of securities

Nothing in this presentation should be construed as either an offer or a solicitation of an offer to buy or sell BHP securities in any jurisdiction, or be treated or relied upon as a recommendation or advice by BHP.

Reliance on third party information

The views expressed in this presentation contain information that has been derived from publicly available sources that have not been independently verified. No representation or warranty is made as to the accuracy, completeness or reliability of the information. This presentation should not be relied upon as a recommendation or forecast by BHP.

BHP and its subsidiaries

In this presentation, the terms ‘BHP’, the ‘Company’, the ‘Group’, ‘our business’, ‘organization’, ‘Group’, ‘we’, ‘us’ and ‘our’ refer to BHP Group Limited, BHP Group Plc and, except where the context otherwise requires, their respective subsidiaries set out in note 13 ‘Related undertaking of the Group’ in section 5.2 of BHP’s Annual Report and Form 20-F. Those terms do not include non-operated assets. This presentation includes references to BHP’s assets (including those under exploration, projects in development or execution phases, sites and closed operations) that have been wholly owned and/or operated by BHP and that have been owned as a joint venture operated by BHP (referred to as ‘operated assets’ or ‘operations’) during the period from 1 July 2020 to 31 December 2020. Our functions are also included.

BHP also holds interests in assets that are owned as a joint venture but not operated by BHP (referred to in this presentation as ‘non-operated joint ventures’ or ‘non-operated assets’). Our non-operated assets include Antamina, Cerrejón, Samarco, Atlantis, Mad Dog, Bass Strait and North West Shelf. Notwithstanding that this presentation may include production, financial and other information from non-operated assets, non-operated assets are not included in the Group and, as a result, statements regarding our operations, assets and values apply only to our operated assets unless otherwise stated. References in this presentation to a ‘joint venture’ are used for convenience to collectively describe assets that are not wholly owned by BHP. Such references are not intended to characterise the legal relationship between the owners of the asset.

Potash outlook briefing
17 June 2021
Potash: a future facing commodity with attractive long term fundamentals
Potash fundamentals: key messages

A future facing commodity with attractive long term fundamentals from multiple angles

<table>
<thead>
<tr>
<th>A Future Facing Commodity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Potash sits at the intersection of global demographic, social and environmental megatrends</td>
</tr>
<tr>
<td>• The environmental footprint of potash is considerably more attractive than other major chemical fertilisers</td>
</tr>
<tr>
<td>• Conventional mining with flotation is more energy and water efficient than other production routes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reliable base demand with attractive upside</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Traditional demand drivers of population and diet are reliable and slow moving</td>
</tr>
<tr>
<td>• Attractive upside over basic drivers exists due to the rising potash intensity-of-use needed to support higher yields and offset depleting soil fertility</td>
</tr>
<tr>
<td>• On top of the already compelling case, decarbonisation could amplify demand upside¹</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The industry’s 4th wave is underway: demand to catch-up over the course of the 2020s</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Demand is catching up to excess supply, and major supply basins are mature</td>
</tr>
<tr>
<td>• Price formation regime accordingly expected to transition from current SRMC to durable inducement pricing, with Canada well placed to meet market growth longer term at LRMC in the mid $300s</td>
</tr>
<tr>
<td>• Post the balance point, long-run geological and agronomic arguments skew probabilistic risks upwards (LRMC plus fly-up) rather than downwards (SRMC), in our view</td>
</tr>
</tbody>
</table>

Note: Short Run Marginal Cost (SRMC); Long Run Marginal Cost (LRMC).

¹. Based on BHP’s 1.5°C Scenario. Refer to the BHP Climate Change Report 2020 for information about this scenario and its assumptions.
Potash attractiveness parameters

Transitioning towards inducement pricing as consistent demand uplift absorbs today’s excess supply

Favourable supply and demand gap

Inducement pricing expected to emerge and sustain once demand growth absorbs current supply excess

Large market size

~70 Mt today, 89-97 Mt in 2035¹

Differentiated demand drivers

Considerable differentiation from industrial metals over the course of the development process: no global demand peak in prospect

Value creation and return potential

Capital intensity of new supply creates steep inducement curve
Operating margins superior in upstream segment

Thrive in a Paris-aligned world

¹ The rounded average of Argus, CRU and IHS is ~89 Mt. ~97 Mt is the level implied by Nutrien’s 2020s range midpoint of 2.25% extrapolated to 2035.
Downstream potash drivers highly differentiated

Diversification in terms of demand drivers vs. our wider portfolio of steel making, non-ferrous and energy commodities

Note: Illustrative only, reflecting stylised empirical path of major societies through time that have reached high income levels.

1. Recycling of nutrients via crop residue or manure occurs, but the food value chain is very inefficient and highly subject to waste.
2. Petroleum value chain specifically features plastics recycling, but this is a very small item in the entire value chain (a sub set of a sub set). Carbon capture use and storage (CCUS) expected to increasingly feature in industrial applications.

Potash outlook briefing
17 June 2021
Fundamental relationships are extremely reliable

Crop production growth has exceeded population growth in the long run: potash has in turn exceeded growth in crop production.

Population up ~2.5 fold since 1960, crops ~3.5 fold, potash ~4.5 fold (Index, 1960 = 100)

CAGR, 1960-1993 (%)

Population: 1.9
Crop production: 2.3
Potash fertiliser: 2.4

CAGR, 1993-2020 (%)

Population: 1.2
Crop production: 2.1
Potash fertiliser: 2.7

Data: UN World Population Prospects 2019; International Fertilizer Association; BHP analysis based on multiple sources. Note that 'potash fertiliser demand' relates to estimated underlying consumption at the farm-level rather than to upstream MOP shipments.

Potash outlook briefing
17 June 2021
Potash benefits in a decarbonising world

Rising biofuels production and land use implications of afforestation burnish an already attractive potash demand profile

Cumulative demand in the next 30 years compared to the last 30 years¹

(%) 400 300 200 100 0

Nickel² Potash Copper² Iron ore³ Metallurgical coal Oil

Already compelling demand case … … potentially amplified under a 1.5 degree pathway

Data: BHP; Vivid Economics.
1. Our portfolio is tested across a range of futures. Refer to the BHP Climate Change Report 2020 for more information about these climate-related scenarios and their assumptions.
   Scenarios were developed prior to the impacts of the COVID-19 pandemic, and therefore any possible effects of the pandemic were not considered in the modelling.
2. Nickel and copper demand references primary metal.
3. Iron ore and metallurgical coal demand based on Contestable Market (Global seaborne market plus Chinese domestic demand).
The waves that have defined the potash industry

A 4th wave is underway, with demand in catch-up mode. Once it does, an inducement pricing regime is the most likely outcome.

Data: BHP analysis based on multiple sources
Note: New supply from FSU is shown in 1990s when existing supply was re-directed from domestic and Eastern Bloc markets after local demand collapsed. Eastern Bloc demand excluded until 1992. 2009 demand excluded.

Potash outlook briefing
17 June 2021
How soon will demand catch-up in Wave #4?

Consensus view is that demand will catch-up in the late 2020s/early 2030s

Historical data: CRU. Nutrien range of 2.0% to 2.5% in the 2020s as disclosed in 2021 Q1 earnings call. Achievable production is BHP analysis based on multiple sources.

Historical data: CRU. Nutrien range of 2.0% to 2.5% in the 2020s as disclosed in 2021 Q1 earnings call. Achievable production is BHP analysis based on multiple sources. Note that the chart shows linear interpolations that result in the same 2020-2035 aggregate tonnage increment as the stated CAGRs.

1. Specialist average based on CRU, Argus, Fertecon (IHS Markit). 2020-2035 CAGR calculated relative to trend level in 2020 (69.5 Mt) not to actual level estimated by CRU (71.6 Mt).

Potash outlook briefing
17 June 2021
What can be expected under inducement & fly-up pricing?

Forward looking LRMC is broadly in line with through-cycle averages, considerably above SRMC experience of the last few years.

MOP price (US$/t real)

<table>
<thead>
<tr>
<th>Year</th>
<th>MOP Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>~250</td>
</tr>
<tr>
<td>2003</td>
<td>~470</td>
</tr>
<tr>
<td>2004</td>
<td>~500</td>
</tr>
<tr>
<td>Mid 2005</td>
<td>~$350</td>
</tr>
<tr>
<td>Mid 2010</td>
<td>~$260</td>
</tr>
<tr>
<td>2015</td>
<td>~250</td>
</tr>
<tr>
<td>2020</td>
<td>~750</td>
</tr>
</tbody>
</table>

Indicative of multi-year “fly-up” pricing should a strong demand-led cycle emerge with a delayed supply response from ageing basins.

Long-run marginal cost (LRMC) at mid case macro assumptions¹

Short-run marginal cost (SRMC) across a range of macro assumptions¹

Data: IHS Markit. Average trade value of Canadian MOP exports.

¹. Macro assumptions include items such as FX rates, energy costs, carbon and labour. Shaded boxes are the approximate price range associated with the operating conditions described therein.

Potash outlook briefing
17 June 2021
Inducing solution mining will provide tilt to the cost curve

SRMC significantly higher than conventional flotation, forward looking LRMC for Canadian solution mining is mid-$300/t

**Operating cost curve**

<table>
<thead>
<tr>
<th>SRMC conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution mines use significantly more energy and more water than conventional mines. Sustaining capex is also higher.</td>
</tr>
<tr>
<td>This comes at a material operational cost disadvantage that is expected to amplify under rising carbon pricing.</td>
</tr>
<tr>
<td>• The lowest cost mines (~US$100/t FOB), and the vast majority of mines in Q1 of the operating cost curve, are large scale conventional operations.</td>
</tr>
<tr>
<td>• Operating solution mines in Canada are currently in the range of US$180-$210/t (FOB).</td>
</tr>
</tbody>
</table>

**Inducement cost curve**

<table>
<thead>
<tr>
<th>LRMC conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The inducement curve is steep due to the underlying capital intensity of projects.</td>
</tr>
<tr>
<td>Solution mining in Canada is expected to set the industry LRMC.</td>
</tr>
<tr>
<td>• Other candidates are too small, or disparate, to serve as an effective “bench” to anchor long run trend pricing.</td>
</tr>
<tr>
<td>• This solution mining bench is still “available” because conventional opportunities, with their favourable operating costs, have been rightly prioritised for development.</td>
</tr>
<tr>
<td>• In bulk mining, you do not save the best for last.</td>
</tr>
<tr>
<td>• We estimate a trend price in the mid-US$300/t region will be required to induce a material portion of this Canadian bench into production.</td>
</tr>
</tbody>
</table>

1. Source: CRU.  
Note: Long Run Marginal Cost (LRMC); Short Run Marginal Cost (SRMC).
Fertiliser and the global food supply chain
Crop yields hold the key to future food security

Impressive gains in yields have offset declining cropland per head since the 1960s, but there remain major yield gaps between regions that could narrow with better farm practice, including scientific fertiliser application.

Data: UN FAO, IHS Markit; BHP analysis based on multiple sources.

Potash outlook briefing
17 June 2021
What governs crop yields?

Potential yield
Determined by genetics

Attainable yield
Limited by external factors – aspects of climate, soil type and geography

Achieved yield
Dependent on farm practice to optimise availability of water and nutrients, to minimise the impact of pests, disease and bad weather, and to condition the soil

Potassium availability is just one of a complex web of interacting factors that impact crop yield
Why do plants need potassium?

Potassium works as a chemical regulator – adequate potassium is needed for healthy growth

Liebig’s Law of the Minimum

Potassium availability is one of dozens of factors that influence crop yields

Any one of these factors may be yield-limiting

If potassium availability isn’t yield-limiting then applying more won’t have any effect on yield

Identifying existing or approaching yield limitations, including potassium, is critical in closing the gap to Attainable Yield

Building block
Potassium is found in cells throughout a plant; it regulates critical processes including photosynthesis, enzyme activation and temperature control

Drought tolerance
Potassium plays a major role in the transport of water, and in the uptake of other nutrients

The ‘quality nutrient’
Potassium can improve appearance, taste, shelf life and nutritive value

Potash outlook briefing
17 June 2021
What is fertiliser?

Fertilisers are materials that contain essential nutrients that are the “building blocks” of plants

- The primary nutrients are nitrogen (N), phosphorus (P) and potassium (K) but many other nutrients are also needed
- Different nutrients perform different functions in plants and are not substitutable
- Plants can draw on native potassium in the soil, but farmers commonly provide additional nutrients by spreading potash fertiliser and/or organic material like animal manure

Consumption of primary nutrients via inorganic fertilisers

- Nitrogen fertilisers such as urea and ammonium nitrate account for ~55%
- Phosphate fertilisers such as DAP and SSP account for ~25%
- Potash fertilisers account for ~20%

Consumption of potash fertiliser in different forms

- Potassium chloride (MOP) is the most common type of potash fertiliser
  - Purity (KCl / K₂O):
    - Agricultural: min 95% KCl (60% K₂O)
    - Technical: min 98% KCl
    - Pharmaceutical: 99.9% KCl
  - Particle size:
    - Fine: ~ 0.2 - 0.5mm
    - Standard: ~ 0.5 - 1mm
    - Coarse: ~ 2 - 3mm
    - Granular: ~ 3 - 4mm
  - Colour:
    - Red
    - White

Data: BHP; IFA.

Potash outlook briefing
17 June 2021
Most potash operations fall into three basic types

MOP is extracted from underground ore deposits or recovered from natural brines

Conventional mining

- Sylvinite ore
  - Flotation-based mill
  - Standard MOP
    - Jansen is designed to produce MOP via flotation
  - Compaction plant
  - Granular MOP

Solution mining of ore

- Sylvinite brine
  - Crystallisation-based mill
  - Crystallising MOP from sylvinite brine is more energy-intensive than flotation

Natural brines

- Carnallite slurry
  - Crystallisation-based mill
  - Fine MOP

Solution mining is more water-intensive than ore flotation

Potash outlook briefing
17 June 2021
How is MOP used?

Most MOP is used as fertiliser, often in combination with other nutrients.

Data: BHP analysis based on multiple sources.

Potash outlook briefing
17 June 2021
Geography of supply and demand

Production concentrated in Canada, Russia and Belarus; Biggest consumers China, Brazil, United States and India

Supply

Conventional mining (~70%)  Surface brines (~25%)  Solution mining (~5%)

Demand

Standard/fine (~45%)  Granular (~45%)  Industrial (~10%)

Data: BHP analysis based on multiple sources.
Note: 2020, 70 Mt MOP production, 72 Mt MOP sales (CRU). Split by grade is approximate.

Potash outlook briefing
17 June 2021
Major producers and trade flows

Highly globalised commodity, most major markets have multiple sources of imports

Global overview

Potash outlook briefing
17 June 2021
Raw potassium ore is processed into MOP at the mine. Product for export is railed to port terminals and loaded onto bulk carriers. Commonly, sales are made inclusive of ocean freight (CFR).

Supply chains are long with several steps even in-market.

Fertilisers are transported by rail, road or barge; farms may be over 1,000km from the point of import. National and regional distributors take the product to market.

Retailers can offer a suite of products: fertilisers, seeds, equipment, agronomic services.

Local blenders mix bulk-blended NPKs. Retailers can offer a suite of products: fertilisers, seeds, equipment, agronomic services.

Fertiliser factories use MOP to make compound NPKs or other potash fertilisers.

Jansen product will be sold both onshore and offshore into upstream supply chain.
Potash: a low emission, biosphere friendly fertiliser

MOP is a critical nutrient with a modest environmental footprint, with conventional flotation route advantaged over solution mining

<table>
<thead>
<tr>
<th>Production footprint</th>
<th>MOP (flotation-based)</th>
<th>MOP (solution mining)</th>
<th>Nitrogen fertilisers</th>
<th>Phosphate fertilisers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Scope 1+2 emissions (&lt;100kg CO₂e/t)</td>
<td>✓</td>
<td>×</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>Low water consumption (&lt;1t/t)</td>
<td>✓</td>
<td>×</td>
<td>×</td>
<td>×</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Consumption footprint</th>
<th>MOP (flotation-based)</th>
<th>MOP (solution mining)</th>
<th>Nitrogen fertilisers</th>
<th>Phosphate fertilisers</th>
</tr>
</thead>
<tbody>
<tr>
<td>High nutrient content, minimises relative transportation emissions</td>
<td>✓</td>
<td>✓</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>No energy-intensive downstream processing required</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>No N₂O/CO₂ release upon use²</td>
<td>✓</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
</tr>
<tr>
<td>No risk to waterways</td>
<td>✓</td>
<td>✓</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>Enables higher crop yields, reducing need to cultivate virgin land⁴</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

1. Varies for different fertilisers.
2. Nitrogen fertiliser use releases N₂O directly via leaching/volatilisation and indirectly through microbial denitrification. This contributes 10% of CO₂-equivalent emissions from the global food system.³
3. Some common phosphate fertilisers also contain nitrogen, which generates N₂O upon use.
4. Land-use and land-use change (LULUC), mainly in the form of deforestation, contributes 32% of CO₂-equivalent emissions from the global food system and 11% of all anthropogenic emissions.⁵

Potash outlook briefing
17 June 2021
Pricing realisation calculation

Prices are influenced by grade and volume, but there are also (fluid) variations between prices in different regions

- Most sales are made on a delivered basis
- Sales may be spot or contract
- Transacted prices are monitored by specialist price-discovery services
- Prices vary by product (e.g. standard/granular)

- Sellers may offer volume-based discounts, conditional rebates or extended credit

- For CFR sales, sellers arrange ocean freight either using spot or long-term charter

---

Discounts

Seaborne freight

Port costs and inland freight = Realised price FOB mine

Data: CRU Fertilizer Week; Nutrien.

Potash outlook briefing
17 June 2021

---

US$/t MOP (quarterly average)
(nominal)

There is no single “potash price”: for example, this chart shows a 5-yr history of Nutrien’s realised price (FCA, offshore sales only) against benchmarks reported by CRU Fertilizer Week
BHP

The outlook for potash
Demand drivers: from demographics to fertiliser demand

Forecasting long-term MOP demand is a 3-step process

**Socio-economic drivers**

- From population and income to crop production
  - How much do people eat?
  - Which crops are needed to meet that requirement?
  - Where are those crops grown?
  - What about crops for fuel and fibre?

**Crop production**

- From crop production to potash fertiliser
  - How much potassium nutrient do crops take up?
  - Where does that nutrient come from?
    - Potash fertilisers
    - Nutrient recycling
    - Native potassium
  - How much nutrient is lost in-situ?

**Potash fertiliser demand**

- From potash fertiliser to potassium chloride
  - How much potash fertiliser comes from other primary sources?
  - What about non-fertiliser applications?
Forecasting Demand: Step 1 – crop requirements

Estimate the quantity of each crop required to meet demand for the 4Fs: food, feed, fibre, fuel

1. Wastage includes inbound supply-chain losses and post-retail waste.

Potash outlook briefing
17 June 2021
Forecasting Demand: Step 2 – potash requirements

Estimate the quantity, and source, of potassium nutrient needed to support crop production

Observed K balance
= Observable K input
– K output
This “equality” is frequently negative as farmers “mine the soil” for the required potassium and do not provide sufficient external sources to maintain soil quality.

Inferred K balance
= Observable K input
+ Inferred soil K mining
– K output
This requires a step up in the supply of external potassium sources if yields are to be maintained, leading to a rising intensity of potash use.

Data: BHP analysis based on multiple sources.
Note: Figures are approximate estimated global average; regional/local contributions to K uptake vary widely.

Potash outlook briefing
17 June 2021
Fundamental relationships are extremely reliable

Crop production growth has exceeded population growth in the long run: potash has in turn exceeded growth in crop production

Population up ~2.5 fold since 1960, crops ~3.5 fold, potash ~4.5 fold
(Index, 1960 = 100)

Data: UN World Population Prospects 2019; International Fertilizer Association; BHP analysis based on multiple sources.
Note: ‘potash fertiliser demand’ relates to estimated underlying consumption at the farm-level rather than to upstream MOP shipments.

Potash outlook briefing
17 June 2021
Rising Intensity of Use (IoU): indicative ranges

To reduce rates of soil K depletion, IoU will have to accelerate; growth of 1.5% p.a. corresponds to incremental demand of 42Mt.

If IoU continues to rise at roughly the historical trend, this corresponds to incremental demand of 28Mt.

We expect crop production to slow as a result of demographic factors; crop production alone is forecast to require 15Mt incremental potash fertiliser demand by ~2040.

Historical norm of potash growth exceeding crop growth is not under plausible threat. Attractive upside should IoU accelerate further.

Potash fertiliser demand: both rising crops and rising IoU have/will contribute

(Mt MOP-equivalent)

Data: BHP analysis based on multiple sources.

Potash outlook briefing
17 June 2021
Potash demand outlook to 2030 by region

Soil depletion a global phenomenon, underscoring our belief that IoU is likely to rise across multiple regions

**Additional tonnes 2020-2030**

<table>
<thead>
<tr>
<th>Region</th>
<th>Historical demand growth</th>
<th>BHP forecast growth</th>
<th>External forecast growth</th>
<th>Soil nutrient imbalance</th>
<th>Potash contribution to K uptake</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NORTH AMERICA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Historical demand growth</td>
<td>0.2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BHP forecast growth</td>
<td></td>
<td>1.0-3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External forecast growth</td>
<td>1.7%</td>
<td></td>
<td></td>
<td>Poor, deteriorating</td>
<td></td>
</tr>
<tr>
<td>Soil nutrient imbalance</td>
<td></td>
<td></td>
<td></td>
<td>Poor</td>
<td></td>
</tr>
<tr>
<td>Potash contribution to K uptake</td>
<td>30-35%, recently improving</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CENTRAL &amp; SOUTH AMERICA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Historical demand growth</td>
<td>4.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BHP forecast growth</td>
<td></td>
<td>2.0-4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External forecast growth</td>
<td>2.9%</td>
<td></td>
<td></td>
<td>Poor, deteriorating</td>
<td></td>
</tr>
<tr>
<td>Soil nutrient imbalance</td>
<td></td>
<td></td>
<td></td>
<td>Poor</td>
<td></td>
</tr>
<tr>
<td>Potash contribution to K uptake</td>
<td>35-40%, stable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AFRICA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Historical demand growth</td>
<td>6.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BHP forecast growth</td>
<td></td>
<td>5.0-10%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External forecast growth</td>
<td>2.9%</td>
<td></td>
<td></td>
<td>Poor, deteriorating</td>
<td></td>
</tr>
<tr>
<td>Soil nutrient imbalance</td>
<td></td>
<td></td>
<td></td>
<td>Poor</td>
<td></td>
</tr>
<tr>
<td>Potash contribution to K uptake</td>
<td>-5%, improving</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EUROPE &amp; CIS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Historical demand growth</td>
<td>0.2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BHP forecast growth</td>
<td></td>
<td>1.0-3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External forecast growth</td>
<td>1.1%</td>
<td></td>
<td></td>
<td>Poor</td>
<td></td>
</tr>
<tr>
<td>Soil nutrient imbalance</td>
<td></td>
<td></td>
<td></td>
<td>Poor</td>
<td></td>
</tr>
<tr>
<td>Potash contribution to K uptake</td>
<td>20-25%, stable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ASIA &amp; OCEANIA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Historical demand growth</td>
<td>4.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BHP forecast growth</td>
<td></td>
<td>1.0-4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External forecast growth</td>
<td>2.0%</td>
<td></td>
<td></td>
<td>Poor, deteriorating</td>
<td></td>
</tr>
<tr>
<td>Soil nutrient imbalance</td>
<td></td>
<td></td>
<td></td>
<td>Poor</td>
<td></td>
</tr>
<tr>
<td>Potash contribution to K uptake</td>
<td>30-35%, improving</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>WORLD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Historical demand growth</td>
<td>2.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BHP forecast growth</td>
<td></td>
<td>1.0-3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External forecast growth</td>
<td>2.0%</td>
<td></td>
<td></td>
<td>Poor, deteriorating</td>
<td></td>
</tr>
</tbody>
</table>

2. Forecast average growth per annum of MOP shipments 2019-20 to 2030 (BHP range).
3. Forecast average growth per annum of MOP shipments 2019-20 to 2030 (Argus; CRU; IHS).
5. BHP analysis based on multiple sources.

Potash outlook briefing
17 June 2021
Big picture themes in agriculture

Climate change and “Precision Ag” are both principally opportunities for potash, in our view

Climate change

- Rapid decarbonisation:
  - Greater pressure on land use
  - Possible resurgence of biofuels
- Physical impacts of climate change:
  - Harvests vulnerable to extreme weather events
  - Changing temperatures and rainfall
- Intensification positive for potash IoU
- Biofuels still heavily dependent on crop-fed 1st-gen tech
- Crop failures may become more frequent
- Potassium aids drought tolerance

Precision Agriculture

- Leverage advanced tech to optimise farm practice
  - Improve application efficiency
  - Better identify nutrient deficiency
  - Adopt ‘nutrient-budget’ approach
- In-situ losses of K are much lower than N+P, so less potential efficiency gain
- Correcting K deficiency, reducing reliance on N fertiliser, ‘nutrient-budgets’ are all supported by Precision Ag

- There are many barriers to global adoption of Precision Ag, particularly if labour is cheap, but even in the US farmers don’t always see positive cost:benefit in some technologies
- But for potash, Precision Ag presents net upside and could accelerate potash IoU

Rapid decarbonisation offers potential upside for potash

Adaptation (technology and farm practice, cultivated area, crop choice) expected to prevent supply constraint on crop production

Any supply constraint would likely push up food prices and potash IoU
Big picture themes in agriculture

If the world cuts its meat intake, it is not a negative for potash demand. Food waste is likely to get worse before it gets better.

**Meat consumption**
- Negative aspects of meat consumption are in the headlines:
  - Major emitter of GHGs
  - Uses lots of land and water
  - Ethical concerns
- Possible solutions include:
  - Reduce meat consumption via substitutes / flexitarianism
  - Intensify livestock production to reduce land use and manage emissions
- Pace of dietary change is extremely slow
- Per capita meat consumption still rising in many parts of the world
- When/if meat consumption does start to decline this is not negative for potash: livestock currently supplies tens of millions of tonnes of K into agriculture that would have to be replaced with potash
- Replacing meat calories with plant-based calories lowers overall crop production, but also removes K input from animal manure
- Intensification will require greater use of animal feed crops versus grazing

**Food waste**
- Up to one-third of food supply is lost or wasted
- Upstream waste is highest in developing economies:
  - Lack of cold-chain infrastructure
  - Slow / inefficient distribution
  - Often hot / wet climates
- Consumer waste is highest in developed economies:
  - Diversified diets, including perishables
  - Food cheap relative to income
  - Strict food hygiene regulations
- Tracking food waste over time is difficult – not commonly reported
- Cutting waste requires both major investment and behavioural change
- Developed economies have not made significant inroads on consumer waste
- Can developing economies cut upstream waste while avoiding rising consumer waste?
- Cutting food waste would reduce crop production required per capita
- Unfortunately global food waste is likely to get worse before/if it gets better, given the interplay between economic development & food consumption behaviour
**Geography of supply**

**Production concentrated in Canada, Russia and Belarus**

**Canada** (Saskatchewan)
- 32% of production in 2020
- 3 companies: Nutrien, Mosaic, K+S
- 7 conventional mines, 3 solution mines
- Industry dates back to 1950s

**China** (Qinghai)
- 10% of production in 2020
- 1 major company: QSL Industry (+numerous smaller producers)
- Production is based on natural brines
- Industry dates back to 1990s

**Middle East** (Dead Sea)
- 9% of production in 2020
- 2 companies: ICL, Arab Potash
- Production is based on natural brines
- Industry dates back to 1930s

**Russia and Belarus**
- 37% of production in 2020
- 3 companies: Uralkali, Belaruskali, EuroChem
- All conventional mines, but some refineries use thermal processing
- Industry dates back to 1930s, but only returned to the seaborne trade in the 1990s

**Germany**
- 6% of production
- 1 major company: K+S
- All conventional mines, most production based on Hartsalz ore
- Industry dates back to 19th century

Data: 2020, 70Mt MOP production (CRU).

*Potash outlook briefing*
17 June 2021
Recent and forthcoming greenfield additions to supply

Centred on the three major basins: other deposits are either small, inaccessible or already extensively developed

North America
(Mtpa¹, MOP)

CIS
(Mtpa, MOP)

Data: BHP analysis based on multiple sources.
1. Estimated Achievable Production (after disruption allowance but before voluntary curtailment).
2. Includes Phase I capacities only.
3. Includes new mine to recover lost capacity at Solikamsk-2.

Potash outlook briefing
17 June 2021
Identifying available capacity

Estimated ~76 Mt Achievable Production in 2020, rising to ~86 Mt with forthcoming additions

Data: BHP analysis based on multiple sources.

Potash outlook briefing
17 June 2021
How soon will demand catch-up in Wave #4?

Consensus view is that demand will catch-up in the late 2020s/early 2030s

MOP demand (Mt)

Historical data: CRU. Nutrien range of 2.0 to 2.5% in the 2020s as disclosed in 2021 Q1 earnings call. Achievable production is BHP analysis based on multiple sources.

1. Specialist average based on CRU, Argus, Fertecon (IHS Markit). 2020-2035 CAGR calculated relative to trend level in 2020 (69.5Mt) not to actual level estimated by CRU (71.6Mt). Note that the chart shows linear interpolations that result in the same 2020-2035 aggregate tonnage increment as the stated CAGRs.
Canada is well placed to meet long-term demand growth

Other deposits are either small, inaccessible or already extensively developed

Canada
Canada is home to more than half of global reserve base
Options for conventional mining and solution mining
Ore body is generally flat, thick and high-grade

Western Europe
Deposits in Western Europe are lower grade than Canada; some operations date to early 1900s

South America
Production is South America, mainly from salars, has declined with focus shifting to lithium. Water stewardship an important issue, especially in Chile.

Middle East
Brine operations in Middle East limited by physical footprint and water withdrawal

Russia
Deposits in Russia and Belarus are physically much smaller than in Canada.
Limited greenfield opportunity beyond current tranche of projects (2 being replacement)
Depletion will be an issue in 2040s and beyond

Belarus

United States

Africa

China
Main salt playa in China is being fully exploited

Southeast Asia
Potash occurrences in Southeast Asia and Africa are scattered and small-scale

Deposits in Russia and Belarus are physically much smaller than in Canada.
Limited greenfield opportunity beyond current tranche of projects (2 being replacement)
Depletion will be an issue in 2040s and beyond

Inducement cost of greenfield projects\(^1\) are typically US$300-500/t
Large ‘bench’ of resource still available for future development in Canada

\(^1\) Greenfield inducement cost is all-in opex plus capital servicing, expressed in real US$ per tonne production, FOB Vancouver-equivalent. (CRU, Argus, Nutrien).

Potash outlook briefing
17 June 2021

Data: USGS (2009). ‘Reserve base’ includes sub-economic reserves that may be developed in the future. USGS has switched to much smaller ‘reserves’ metric in recent years.
### Potash fundamentals: key messages

**A future facing commodity with attractive long term fundamentals from multiple angles**

| **A Future Facing Commodity** | • Potash sits at the intersection of **global demographic, social and environmental megatrends**  
| | • The **environmental footprint of potash** is **considerably more attractive** than other major chemical fertilisers  
| | • Conventional mining with flotation is **more energy and water efficient** than other production routes |
| **Reliable base demand with attractive upside** | • Traditional demand drivers of **population** and **diet** are reliable and slow moving  
| | • Attractive upside over basic drivers exists due to the **rising potash intensity-of-use** needed to support **higher yields** and offset **depleting soil fertility**  
| | • On top of the already **compelling case**, decarbonisation could amplify demand upside¹ |
| **The industry’s 4th wave is underway: demand to catch-up over the course of the 2020s** | • **Demand is catching up** to excess supply, and major **supply basins are mature**  
| | • Price formation regime accordingly expected to transition from current SRMC to **durable inducement pricing**, with Canada well placed to meet market growth longer term at LRMC in the mid $300s  
| | • Post the balance point, long-run geological and agronomic arguments skew probabilistic risks upwards (LRMC plus fly-up) rather than downwards (SRMC), in our view |

Note: Short Run Marginal Cost (SRMC); Long Run Marginal Cost (LRMC).

¹. Based on BHP’s 1.5°C Scenario. Refer to the BHP Climate Change Report 2020 for information about this scenario and its assumptions.
BHP

Appendix
What governs crop yields?

Potassium availability is one of many factors

There are many interacting factors that influence crop yield. Any one factor may be yield-limiting.

- The **potential yield** is determined by genetics.
- The **attainable yield** is limited by external factors – aspects of climate, soil type and geography.
- The **achieved yield** depends on farm practice to optimise availability of water and nutrients, to minimise the impact of pests, disease and bad weather, and to condition the soil.
### Themes in agriculture

#### Good or bad for potash demand?

<table>
<thead>
<tr>
<th>Climate change</th>
<th>Precision Ag</th>
<th>Food waste</th>
<th>Plant-based meat</th>
<th>Potash ‘holidays’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shifts in average temperature and more frequent extreme weather poses a risk to future food security.</td>
<td>PA is a broad term applied to tools or services that leverage advanced technologies to optimise farm practice. Examples include GPS guidance, telematics, variable-rate technology of seeds, fertiliser and pesticides, and aerial imagery. PA technologies seek to reduce the cost of labour and/or crop inputs, or increase revenue via the quantity and/or quality of production. Some PA technologies are aimed specifically at the efficient use of fertilisers. The main focus is the precise and timely application of nitrogen and phosphate fertiliser, which are it risk of high in-situ loss. Potassium is applied in smaller quantities, less often and is less mobile in the soil – the potential efficiency gains are thus much less. Efficient application poses little threat to potash demand. However, regular and accurate soil testing will help to identify under-application of K that might otherwise be missed. Adoption of a 'nutrient-budget' approach, rather than depleting native K, provides further demand upside.</td>
<td>Up to one-third of upstream food production is never eaten. Tackling food loss and waste (FLW) is part of the UN’s Sustainable Development Goals. • Developed economies have high rates of wastage at the retail and consumer level. • Developing economies have high rates of loss in processing and distribution. There is little data on FLW over time, but it may still be getting worse. Factors that can increase FLW include: • Varied diets that include many perishable foodstuffs • ‘Cheap’ food relative to household income and consumer quality expectations • Food hygiene regulations Tackling FLW should be a global priority and over time will allow the world to feed more people with less crop production. But doing so will need both big investment and big shifts in behaviour, so progress will likely be slow.</td>
<td>Alternatives to conventional meat, including plant-based proteins, cultured meat and insects have grabbed the headlines. People in some places are choosing to eat less meat for environmental (as well as ethical) reasons. Livestock practices vary widely but, on average, each meat-based calorie requires more crop input than each plant-based calorie. Usually, beef has more feed-crop input than pork or lamb, which in turn have more than poultry. Reduction of meat consumption is thus associated with lower crop production for the same calorie intake. However, animal manure contributes millions of tonnes of K to crops every year. The substitution of animal manure with potash negates the impact on potash demand of lower crop production. Meat consumption patterns change very gradually. Despite temporary dips resulting from swine fever and the COVID-19 pandemic, meat consumption is still on an upward trend globally. However, a reversal of this trend is not negative for potash demand.</td>
<td>K does not leach out from soils as easily as nitrogen and phosphate fertilisers. Soils also contain ‘native’ K from naturally-occurring minerals. Soils that have been well-maintained may be able to support several harvests without further application. This gives farmers flexibility to adjust potash purchases from season to season in a way that is not possible with nitrogen (or, to a lesser extent) phosphates. They can ‘bank’ potash in the soil when it’s affordable or skip application when it’s not. Other drivers of demand volatility include weather conditions, seasonality of application, and stock-change through the supply chain. Farmer response to potash affordability is a key driver of short-term demand volatility. However, K is an essential ‘building block’ in plants and over the long-term, consumption is driven by agronomic requirement. Crop prices will adjust if necessary to support the appropriate use of fertiliser needed to achieve required crop yields.</td>
</tr>
</tbody>
</table>

#### Farmer response to potash affordability

- **Climate change**
  - Shifts in average temperature and more frequent extreme weather poses a risk to future food security.
  - We expect that adaptation – both through biotechnology and farm practice – will avoid food production becoming supply constrained.
- **Water stewardship** will be vital – adequate potassium helps plant tolerate drought.
- **Rapid decarbonisation pathways** offer potential upside to potash demand, particularly through resurgent growth in biofuels and the pressure to accelerate yield growth if large-scale afforestation diminishes available cropland.
- However, outcomes that further decelerate population growth and/or depress income growth are negative for crop demand.
- **Global agriculture will have to adapt to changing climate, but this does not alter our basic thesis on potash demand growth.** A 1.5C Paris-aligned pathway provides potential demand upside.

#### Best practices in agriculture

- **PA** is a broad term applied to tools or services that leverage advanced technologies to optimise farm practice. Examples include GPS guidance, telematics, variable-rate technology of seeds, fertiliser and pesticides, and aerial imagery.
- PA technologies seek to reduce the cost of labour and/or crop inputs, or increase revenue via the quantity and/or quality of production.
- Some PA technologies are aimed specifically at the efficient use of fertilisers. The main focus is the precise and timely application of nitrogen and phosphate fertiliser, which are it risk of high in-situ loss.
- Potassium is applied in smaller quantities, less often and is less mobile in the soil – the potential efficiency gains are thus much less.
- Efficient application poses little threat to potash demand. However, regular and accurate soil testing will help to identify under-application of K that might otherwise be missed. Adoption of a ‘nutrient-budget’ approach, rather than depleting native K, provides further demand upside.

#### Food waste

- Up to one-third of upstream food production is never eaten. Tackling food loss and waste (FLW) is part of the UN’s Sustainable Development Goals.
- • Developed economies have high rates of wastage at the retail and consumer level.
- • Developing economies have high rates of loss in processing and distribution.
- There is little data on FLW over time, but it may still be getting worse. Factors that can increase FLW include:
  - Varied diets that include many perishable foodstuffs
  - ‘Cheap’ food relative to household income and consumer quality expectations
  - Food hygiene regulations
- Tackling FLW should be a global priority and over time will allow the world to feed more people with less crop production. But doing so will need both big investment and big shifts in behaviour, so progress will likely be slow.

#### Plant-based meat

- Alternatives to conventional meat, including plant-based proteins, cultured meat and insects have grabbed the headlines. People in some places are choosing to eat less meat for environmental (as well as ethical) reasons.
- Livestock practices vary widely but, on average, each meat-based calorie requires more crop input than each plant-based calorie. Usually, beef has more feed-crop input than pork or lamb, which in turn have more than poultry.
- Reduction of meat consumption is thus associated with lower crop production for the same calorie intake. However, animal manure contributes millions of tonnes of K to crops every year. The substitution of animal manure with potash negates the impact on potash demand of lower crop production.
- Meat consumption patterns change very gradually. Despite temporary dips resulting from swine fever and the COVID-19 pandemic, meat consumption is still on an upward trend globally. However, a reversal of this trend is not negative for potash demand.

#### Potash ‘holidays’

- K does not leach out from soils as easily as nitrogen and phosphate fertilisers. Soils also contain ‘native’ K from naturally-occurring minerals.
- Soils that have been well-maintained may be able to support several harvests without further application.
- This gives farmers flexibility to adjust potash purchases from season to season in a way that is not possible with nitrogen (or, to a lesser extent) phosphates. They can ‘bank’ potash in the soil when it’s affordable or skip application when it’s not.
- Other drivers of demand volatility include weather conditions, seasonality of application, and stock-change through the supply chain.
- Farmer response to potash affordability is a key driver of short-term demand volatility. However, K is an essential ‘building block’ in plants and over the long-term, consumption is driven by agronomic requirement. Crop prices will adjust if necessary to support the appropriate use of fertiliser needed to achieve required crop yields.
Potash operations fall into 3 basic types

MOP is extracted from underground ore deposits or recovered from natural brines

**Conventional mining**
- Usually 400m to 1,100m deep and accessed by shaft
- Usually room & pillar with continuous mining machines
- Widely used in Canada, Russia, Belarus

**Solution mining of ore**
- Hot water (or brine) is pumped underground to dissolve the potash ore
- Potash brine is pumped back to the surface for processing
- Employed on a large scale only in Canada

**Natural brines**
- Potassium-bearing brines are channelled into ponds and concentrated by solar evaporation until potash salts crystallise
- Salts are either harvested by cutting dredges or mechanical shovels
- Employed in China, Israel, Jordan and Chile
Global diets dominated by crop and vegetable products

1. IHS Markit (2019).
3. BHP estimate (excludes hay/silage/forage).

Food and agriculture in numbers

Potash outlook briefing
17 June 2021
Potash fertiliser use by crop

Global agriculture is fragmented, but top 10 country-crop combinations account for 50%

Potash outlook briefing
17 June 2021

International Fertilizer Association “Assessment of Fertilizer Use by Crop at the Global Level” (2017).
Forecasting Demand: Step 1 – crop requirements

Estimate the quantity of each crop required to meet demand for the 4Fs: food, feed, fibre, fuel

2. This includes inbound supply chain losses (e.g. crops rotting before they reach market due to lack of cold storage infrastructure) and post-retail waste (e.g. food expiring in homes before consumption, unfinished portions in restaurants, etc). The former is principally a developing world problem and the latter is principally a developed world problem.

Potash outlook briefing
17 June 2021
Forecasting Demand: Step 2 – potash requirements

Estimate the quantity, and source, of potassium nutrient needed to support crop production

Potash fertiliser
Animal manures
Crop residues

Residues have alternative uses including heat/power generation, animal feed, construction

K doesn’t leach out of soils as easily as N and P. Healthy soils have a K ‘reserve’ and farmers can “mine” this reserve based on short-term farm economics, as a trade-off. As reserves are finite and this process degrades natural soil fertility, it is not sustainable to continuously thrust on external spoil of potassium. Long-term application must be driven by agronomics.

Observed K balance = Observable K input – K output
Potash fertiliser
Animal manures
Crop residues
Crop K uptake

This “equality” is frequently negative. How so? Because farmers “mine the soil” for a proportion of the required potassium, and do not provide sufficient external sources to maintain soil quality. Which gives the following:

Inferred K balance = Observable K input + inferred soil K mining – K output

At some point, the ability to “mine the soil” at historical rates will decline, perhaps starkly in some regions. That will require a step up in the supply external sources of potassium if yields are to be maintained, with rising intensity of potash use being the logical conclusion.

Intensity-of-use = potash use crop production
Forecasting Demand: Step 3

Estimate the contribution of other primary potash fertilisers; Estimate non-fertiliser consumption of MOP

1. NPK fertilisers can also be based on other primary potash materials.

Potash outlook briefing
17 June 2021
Potash: a low emission, biosphere friendly fertiliser

MOP is a critical nutrient with a modest GHG and broader environmental footprint

<table>
<thead>
<tr>
<th>GHG emissions intensities inform our investment decisions:</th>
<th>Not all fertilisers have the same environmental footprint:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scope 1+2</strong> ► ▼ <strong>Scope 3</strong></td>
<td>![Checkmark] Potash doesn’t have high emissions in production or distribution</td>
</tr>
<tr>
<td>![Green Circle] Low</td>
<td>![Checkmark] Potash doesn’t release CO&lt;sub&gt;2&lt;/sub&gt; or N&lt;sub&gt;2&lt;/sub&gt;O</td>
</tr>
<tr>
<td>&lt;100 kg CO&lt;sub&gt;2&lt;/sub&gt;e/t</td>
<td>![Checkmark] Potash doesn’t pollute waterways</td>
</tr>
<tr>
<td>![Yellow Background] Medium</td>
<td></td>
</tr>
<tr>
<td>&lt;1,000 kg CO&lt;sub&gt;2&lt;/sub&gt;e/t</td>
<td></td>
</tr>
<tr>
<td>![Orange Background] High</td>
<td></td>
</tr>
<tr>
<td>&gt;1,000 kg CO&lt;sub&gt;2&lt;/sub&gt;e/t</td>
<td></td>
</tr>
</tbody>
</table>

1. Scope 3 impact relates only to emissions associated with downstream processing and use, not other considerations such as transportation.
2. Based on MOP produced by flotation and without downstream processing.
3. Based on ammonium phosphates (DAP/MAP).
4. Based on urea.

**Note:**
- a) Scope 1+2 emissions for flotation-based MOP ~50-80 kg CO<sub>2</sub>e/t, other production routes are 100-500kg. High nutrient concentration (60% K<sub>2</sub>O) maximises efficiency in transportation and spreading.
- b) From BHP research conducted so far, nitrogen-based fertilisers rather than potash appear to have a larger downstream emissions impact. However, trying to estimate the GHG contribution impact of fertiliser on soils and crops is very complicated. We continue to develop and improve our knowledge in this area.
Jansen fits our strategic framework

Our strategy identifies how to position the portfolio to maximise long-term value and deliver high returns for shareholders

<table>
<thead>
<tr>
<th>Attractive commodity</th>
<th>• Future fit, exposure to global mega trends: decarbonisation and land use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Attractive fundamentals, supply-driven market, growing population and diet</td>
</tr>
<tr>
<td></td>
<td>• Durable inducement pricing transition from short-run marginal cost</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>World class asset</th>
<th>• High-quality resource, low-cost, high-margin, long-life in a stable mining jurisdiction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Capital efficient expansion options</td>
</tr>
<tr>
<td></td>
<td>• Diversification of commodities, customer base, operating footprint</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operational excellence</th>
<th>• Expertise in bulk mining, logistics and product marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• High-performing culture, latest technology enabling top quartile operational performance</td>
</tr>
<tr>
<td></td>
<td>• Low-carbon footprint and lower water intensity</td>
</tr>
</tbody>
</table>

Potash outlook briefing
17 June 2021
Jansen offers structural, competitive advantages

Hard-to-replicate design, could be leveraged further in future stages

- **Operations Strategy**: Performance driven culture
  - Culture to drive higher productivity, lower operating costs

- **Underground**: Upfront geological information
  - Leveraged 3D seismic technology to gain understanding of underground resource

- **Mining System**: 60% less equipment highest throughput
  - Automation approach resulted in fewer higher producing borers

- **Hoisting**: Shaft design 40% larger than other producers
  - Increased ventilation, capacity for multiple brownfield expansions

- **Processing**: Leading equipment and material handling systems
  - Advanced predictive maintenance drives higher plant availability, operating hours

- **Outbound Logistics**: Continuous, automated loading system
  - Automation maximises efficiency and removes all interactions between equipment and personnel

Across the value chain we have built in structural advantages, incorporated latest proven equipment and digital technologies
Jansen is low-cost, high-margin and long-life

Simpler, smarter design adopted, while shaft completion de-risks project

Final investment decision on track for mid-CY21

- **Project scope**: Shaft equipping, mine development, processing facility, site infrastructure and outbound logistics
- **First production**: ~5 to 6 years construction timeframe, ~2 years from first production to ramp up
- **Volumes**: 4.3 – 4.5 Mtpa (potassium chloride, KCl)

Cash positive with high margins through the cycle

- **Opex**: US$100 per tonne
- **Sustaining capex**: US$15 per tonne, (real) long term average

Steps before FID

- Finalise port
- Consider final project risk and return metrics

Major construction permits in place, port to be finalised

<table>
<thead>
<tr>
<th>Major permits</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Impact Study</td>
<td>Approved</td>
</tr>
<tr>
<td>Mining Plan</td>
<td>Approved</td>
</tr>
<tr>
<td>Mining Closure Plan</td>
<td>Approved</td>
</tr>
</tbody>
</table>

Other key requirements

<table>
<thead>
<tr>
<th>Other key requirements</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Water Authorisation</td>
<td>Approved</td>
</tr>
<tr>
<td>Port and Rail</td>
<td>In progress</td>
</tr>
</tbody>
</table>

Shaft progress

| Final lining completion                | 91% complete³ |

1. Project scope includes finishing the excavation and lining of the production and service shafts, and continuing the installation of essential surface infrastructure and utilities.

Potash outlook briefing

17 June 2021
Jansen must compete for capital

Stage 1 will be assessed through CAF at both project and portfolio level

New capital tested against the CAF framework

• **Project capital**: US$5.3 – 5.7 billion

• Projects need to compete against alternatives with similar risk, time horizons, with life cycle returns also a consideration

• Capex spend over seven years
  – peak spend in FY25 and FY26

Economic risks considered

• Our assessment incorporate: project specific risks, economic exposure risks, country risks and non-quantifiable risks

• Cash generation at the low point of the cycle underpinned by low industry cost position

---

1. NPV: Net Present Value; ROCE: Return on average capital employed; IRR: Internal Rate of Return.

Potash outlook briefing
17 June 2021