



# Base Metals Markets

April 4, 2018

Andrew Stonkus, Senior Vice President, Marketing and Logistics



# Forward Looking Information

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# The Future for Copper and Zinc

## Copper demand boosted by new energy

- Supply growth constrained due to lack of investment
- Global synchronized growth today
- Electric efficiency & new energy will drive future growth

## Zinc supply constrained

- Zinc market destocked for five years
- Supply growth but structural deficit remains
- New demand growth should support incentive pricing



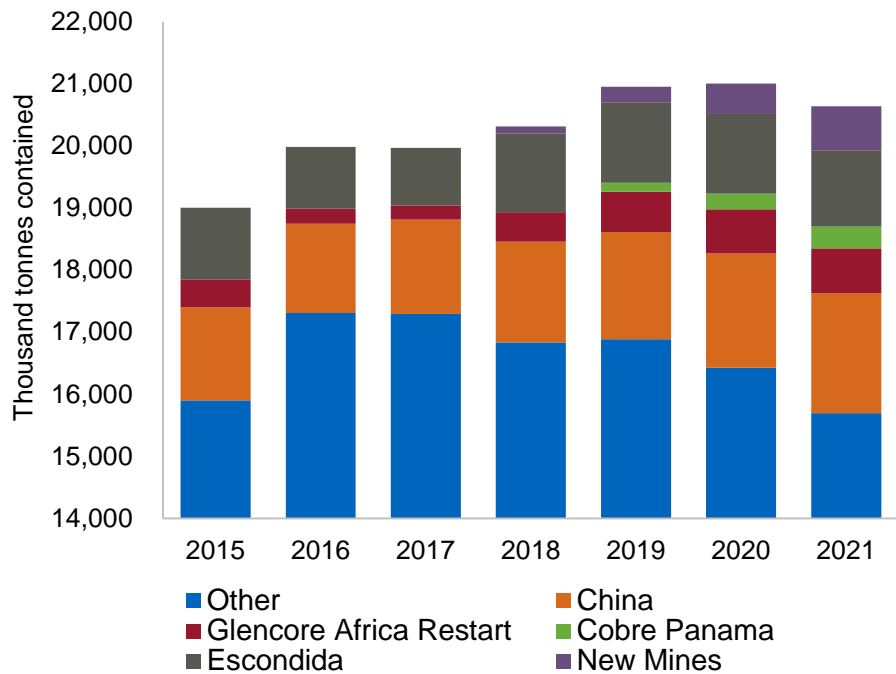
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# Copper Market Outlook

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# Global Copper Mine Production Increasing Slowly

## Global Copper Mine Production<sup>1</sup>

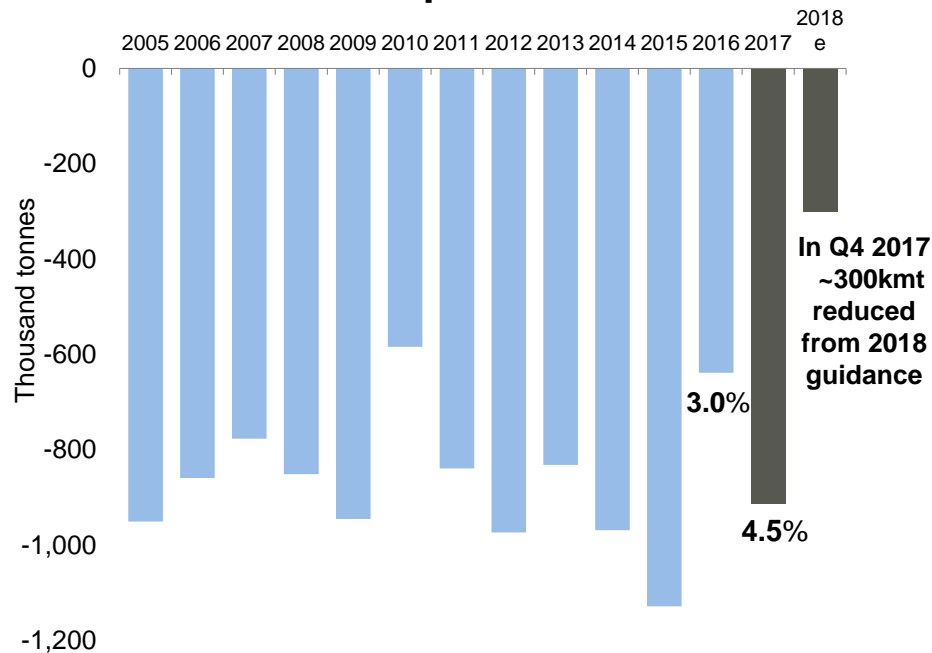


- Mine production set to increase 700 kmt by 2021, including:
  - Glencore's African mine restarts: 500 kmt
  - Cobre Panama 350 kmt
  - Escondida 300 kmt
  - China (maybe) 400 kmt
  - All others 700 kmt
    - Oyu Tolgoi UG, Spence, Chuquibambilla UG
  - Reductions & closures (1,600 kmt)
- Mine production currently peaks in 2020
- Chinese mine production relatively flat at ~100 kmt per year
- Total probable projects: 545 kmt

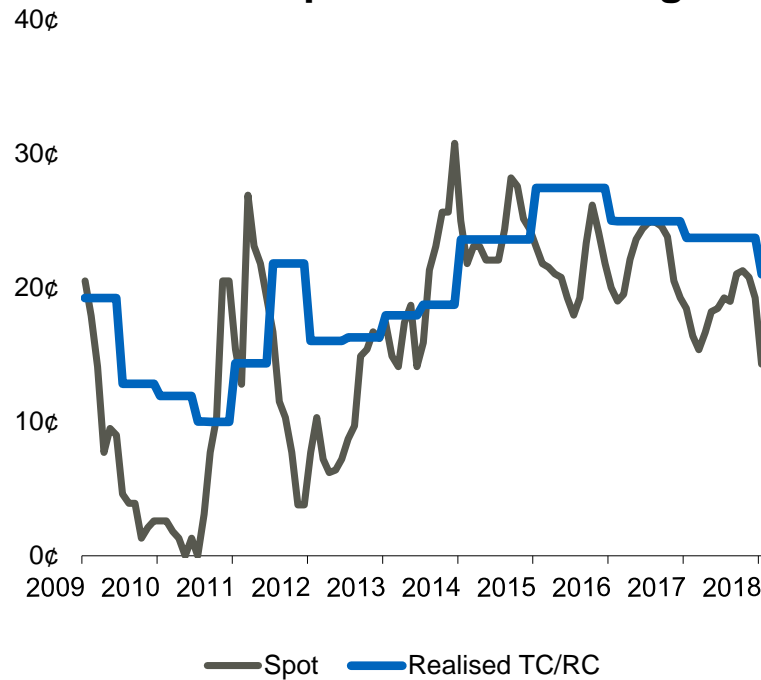
# Copper Disruptions Continue into 2018

~6-7 Mt of copper production under labour negotiations this year

## Disruptions<sup>1</sup>



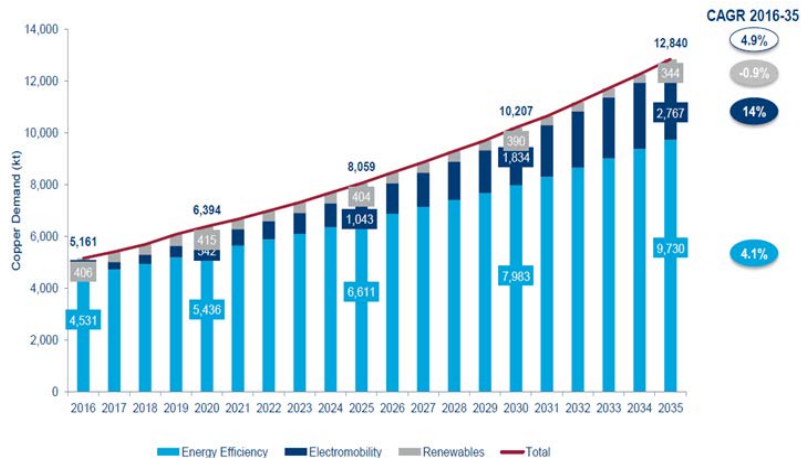
## TC/RCs Spot and BM Falling<sup>2</sup>



# Copper Demand from De-Carbonization

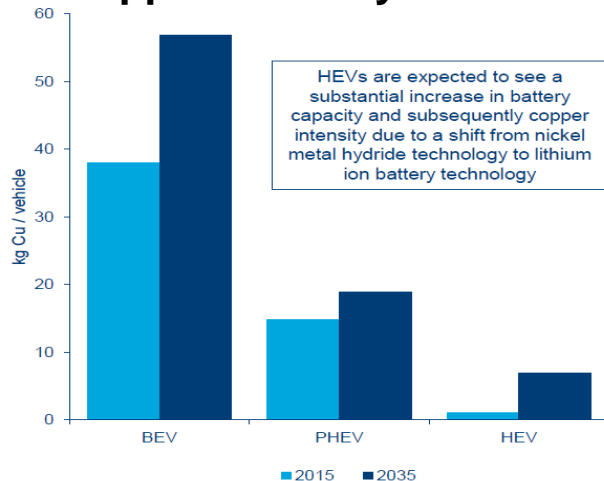
Greatest demand impact from energy efficiency; Highest growth rate in EVs

## Energy Efficiency & EVs Strong Growth<sup>1</sup>



- Energy efficiency:
  - 4% CAGR
  - 80% of tonnage increase to 2035
- Power Distribution: 17% electricity loss
- Motors & Drives: 40% electricity loss
- Improving energy efficiency through copper intensity could add 5.2 Mt to demand by 2035
- Lower electricity loss, which reduces carbon emissions

## Copper Intensity of EVs<sup>1</sup>



- Electric vehicles/mobility: smaller today, larger growth potential; 14% CAGR
  - Battery range constraints require increased efficiency requiring additional copper
  - Rapid charging infrastructure will increase copper intensity
- Renewable energy generation & local distribution could see additional potential copper growth

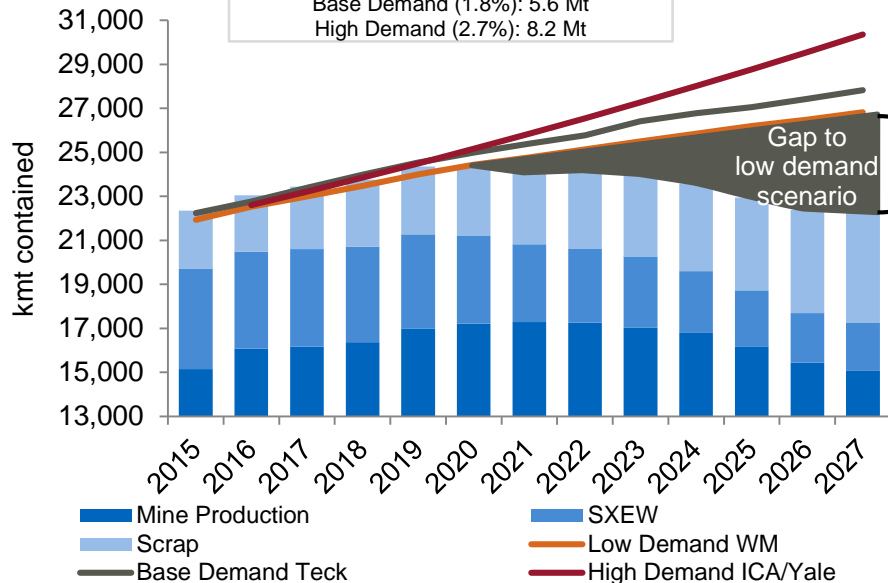
# Planned Copper Projects Will Not Meet Demand

## Copper mine production peaks in 2020

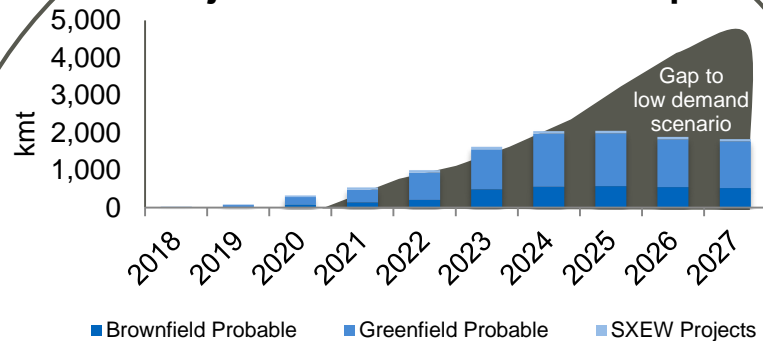
### Existing and Fully Committed Supply<sup>1</sup>

**At least 4.6 Mt needed  
from new projects by 2027**

Low Demand (1.6%): 4.6 Mt  
Base Demand (1.8%): 5.6 Mt  
High Demand (2.7%): 8.2 Mt



### Highly Probable + Probable Projects Insufficient to Fill Gap<sup>1</sup>



### Mine projects set to increase 1.8 Mt by 2027

*Includes:*

Quellaveco (330 kmt)	Kamoa/Kakula (300 kmt)
QB2 (275 kmt)	Golpu (110 kmt)
Rosemont (120 kmt)	Tominsky (90 kmt)
Manto Verde (80 kmt)	Mirador (60 kmt)
Los Pelambres Exp (55 kmt)	Iranian Small Mines (135kmt)
Others, e.g Oyu Tolgoi UG, Spence, Chuqui UG (225 kmt)	



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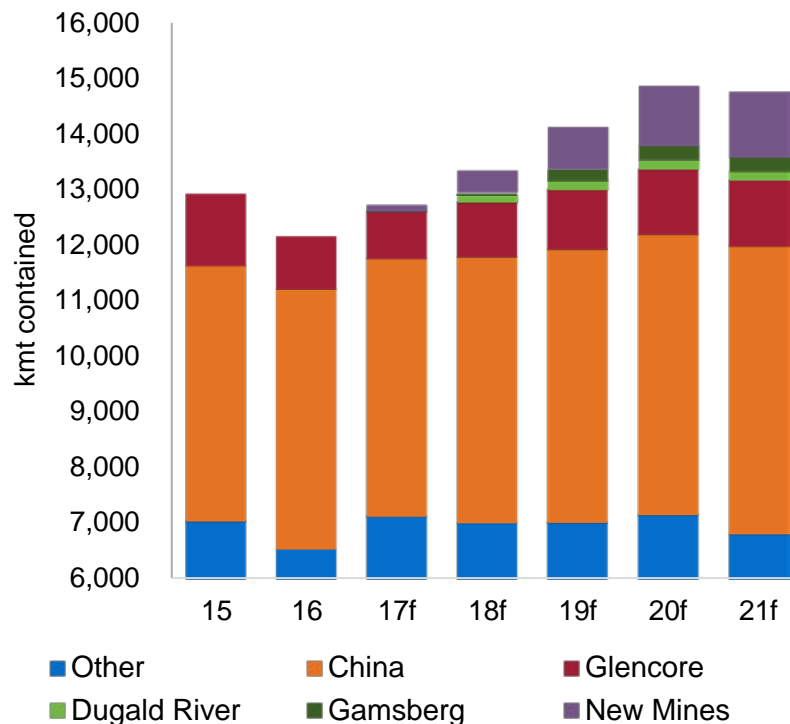
# Zinc Market Outlook

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# Zinc Price Incentivizing New Mines

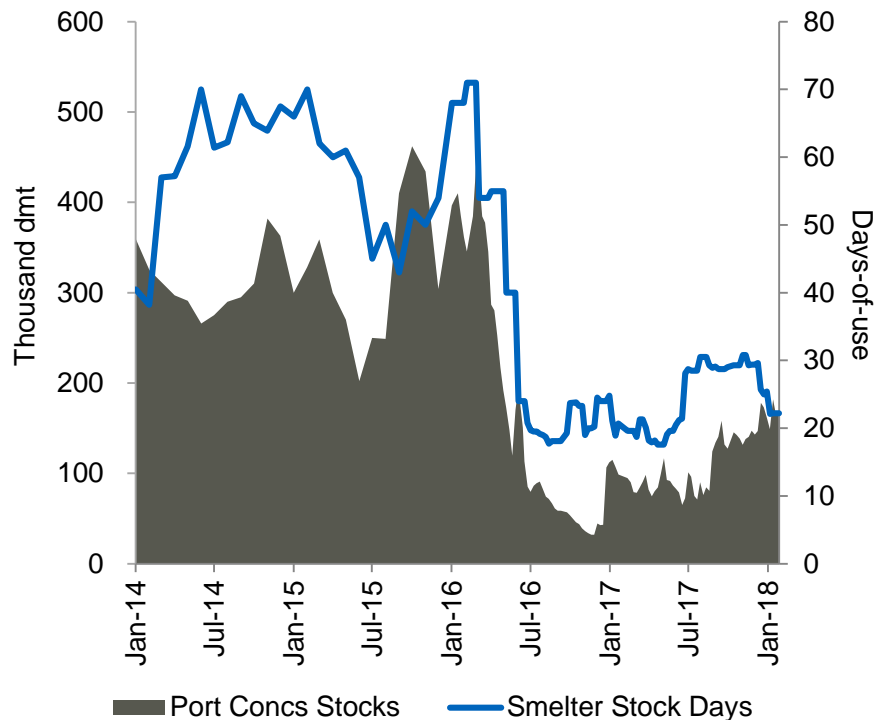
- Decline in mine production in 2016 (800 kmt)
- 2018 increase brings mine production back to 2015 levels
  - Market living off refined stocks for the past four years
- Mine production peaks in 2020
- Mine production set to increase 840 kmt this year
  - Dugald River (170 kmt)
  - Gamsberg (250 kmt) to ramp up towards 2019
  - Mount Isa (160 kmt)
  - Zhairem (160 kmt) by mid-2020
  - Several new small mines and restarts also planned
- Estimate mine production will increase 3.7%/yr 2018-2021
  - Limited Chinese mine growth (~100-150 kmt increase)

**Global Zinc Mine Production<sup>1</sup>**

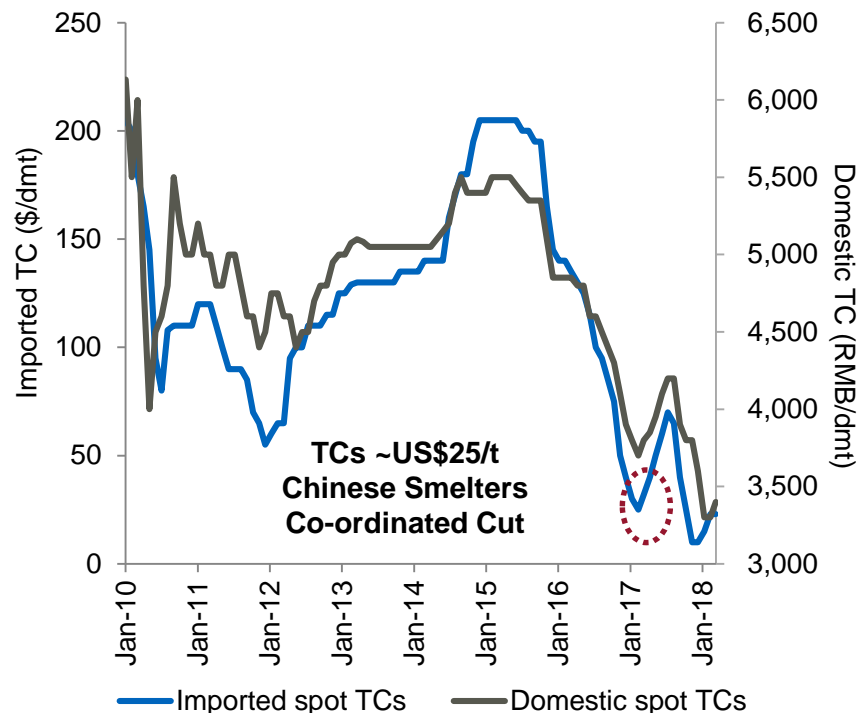


# Zinc Treatment Charges Falling to Record Lows

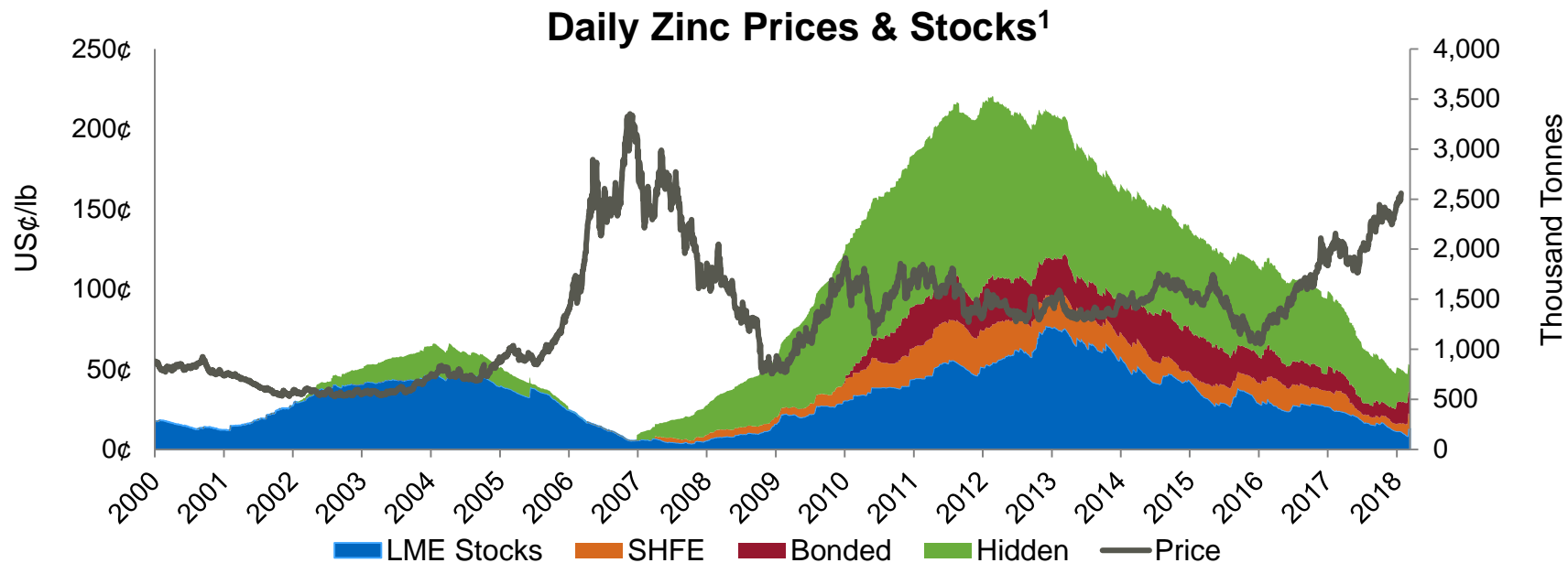
## Concentrate Stocks Seasonally Low<sup>1</sup>



## Not Enough to Prevent TCs Falling Further<sup>2</sup>



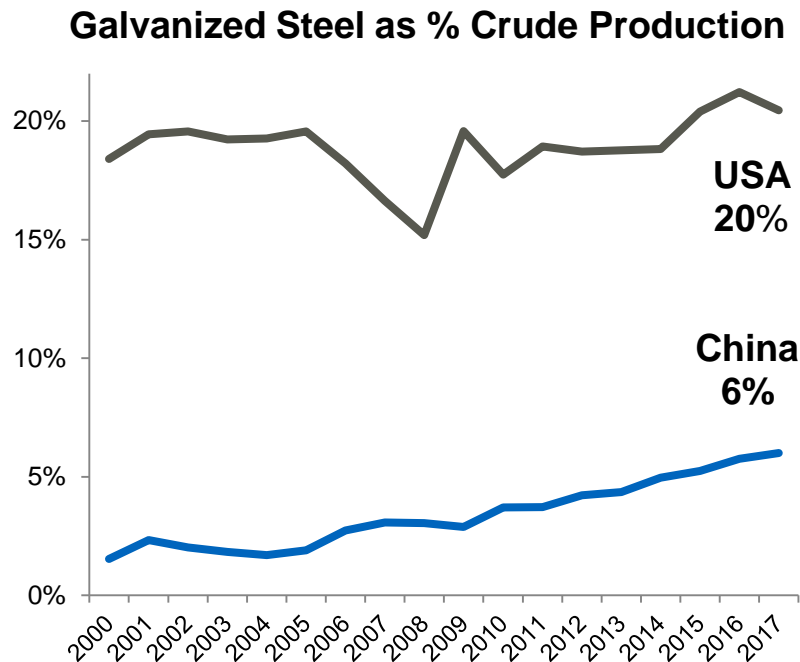
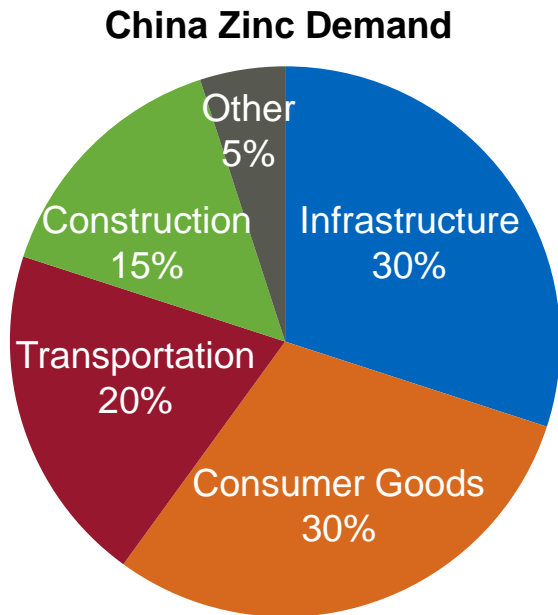
# Consecutive Deficits Decreasing Zinc Inventory



- Global hidden stocks may have reached ~1.4 Mt in 2012, and total global stocks reached ~3.3 Mt
- Currently, hidden stocks are estimated to be <400 kmt
- Total stocks expected to reach critical levels in H1 2018, which will make the metal market very tight

# Chinese Zinc Demand to Remain Strong

If China were to galvanize crude steel at half the rate of the US using the same amount of zinc/tonne, a further 2.8 Mt would be added to global zinc consumption<sup>1</sup>



# Defending / Expanding The Zinc Market

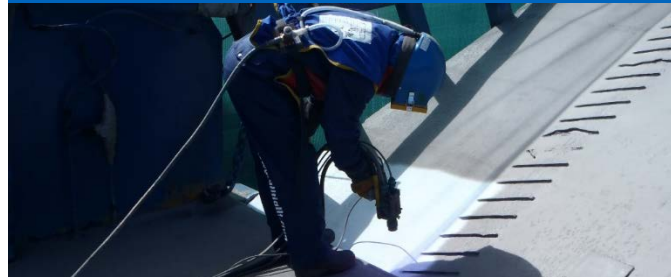
## Giga Steel (+380 kmt)

Ultrahigh-strength & galvanizable competes well with aluminum.



## Zinc Thermal Spray (New)

Portable technology to spray molten zinc onto a steel surface.



## Continuous Galv. Rebar (+132 kmt)

High productivity process which enables coated rebar to be shaped in the field.



## Zinc Micro-Nutrient (+400 kmt)

Zinc micronutrient in fertilizer well accepted and growing market.



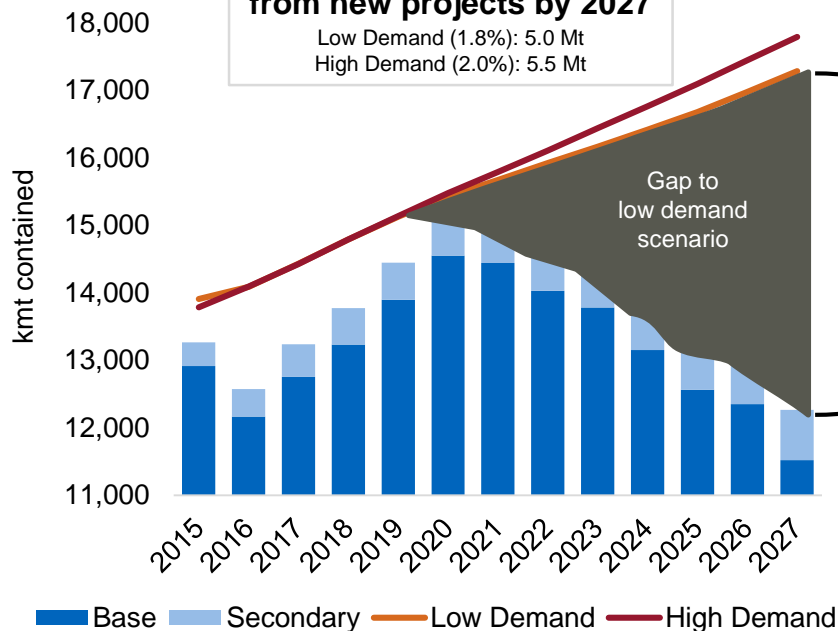
# Zinc Gap Forecast to Continue

## Zinc mine production peaks in 2020

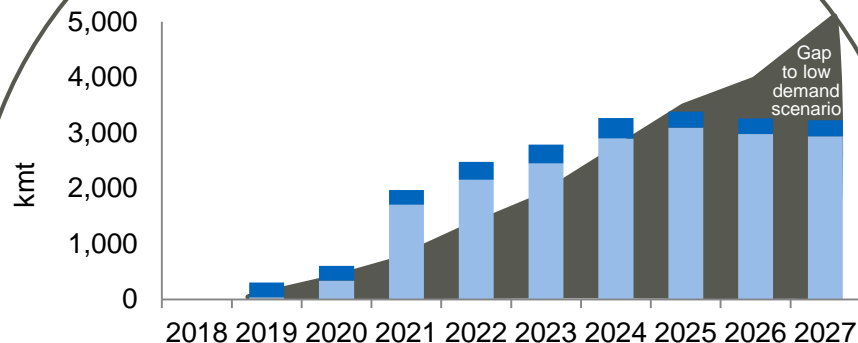
### Existing and Fully Committed Supply<sup>1</sup>

**At least 3.4 Mt needed  
from new projects by 2027**

Low Demand (1.8%): 5.0 Mt  
High Demand (2.0%): 5.5 Mt



### Uncommitted Projects Insufficient to Fill Gap<sup>1</sup>



Includes:

Tala Hamza (175 kmt)  
Citronen (180 kmt)  
Ozemo (350 kmt)  
McArthur Exp (185 kmt)  
Selwyn (450 kmt)  
Asmara (75 kmt)  
Iscaycruz (80 kmt)  
Other projects (450 kmt)

Huoshaoyn (400 kmt)  
Mehdiabad (400 kmt)  
Pavlovskoye (150 kmt)  
Aripuana (85 kmt)  
Kipushi (225 kmt)  
Dairi (125 kmt)  
Aznaicollar (100 kmt)

# The Future for Copper and Zinc

## Copper demand boosted by new energy

- Copper supply peaks in 2020, while current market is trending to deficit
- Copper limited supply response at current prices will likely lead to structural deficits
- Significant new metal demand growth for energy efficiency and EV applications

## Zinc supply constrained

- Zinc mine production outside China is increasing but insufficient to meet demand
- Chinese mine production response impacted by environmental inspections
- Structural deficit is here with higher prices incentivizing new production
- Increasing metal demand from new applications and China galvanizing growth





# Notes

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## **Slide 5: Global Copper Mine Production Increasing Slowly**

1. Source: Wood Mackenzie, AME, Teck.

## **Slide 6: Copper Disruptions Continue into 2018**

1. Source: Wood Mackenzie, AME, Teck, Company Reports.
2. Source: Wood Mackenzie, CRU, Metal Bulletin.

## **Slide 7: Copper Demand from De-Carbonization**

1. Source: ICA.

## **Slide 8: Planned Copper Projects Will Not Meet Demand**

1. Source: Wood Mackenzie, AME, Teck.

## **Slide 10: Zinc Price Incentivizing New Mines**

1. Source: Wood Mackenzie, AME, Teck.

## **Slide 11: Zinc Treatment Charges Falling to Record Lows**

1. Source: MyMetal, Industrial sources, Teck.
2. Source: MyMetal, SMM, Teck.

## **Slide 12: Consecutive Deficits Decreasing Zinc Inventory**

1. Source: LME/SHFE, GTIS, Teck. Plotted to February 28, 2018.

## **Slide 13: Chinese Zinc Demand to Remain Strong**

1. Source: Wood Mackenzie, IZA, CRU, AISI.

## **Slide 14: Defending / Expanding Zinc Market**

1. Source: IZA, New York State Thruway Authority, Zinc.org.

## **Slide 15: Zinc Gap Forecast to Continue**

1. Source: Wood Mackenzie, AME, Teck.



# Steelmaking Coal Market

April 4, 2018

Réal Foley, Vice President, Coal Marketing



# Forward Looking Information

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# Demand Supporting Steelmaking Coal Prices

## **Synchronized global economic growth**

- Supports steel demand and pricing



## **Healthy steel industry**

- Stimulates global demand for seaborne coal



## **Capacity reductions in China continue**

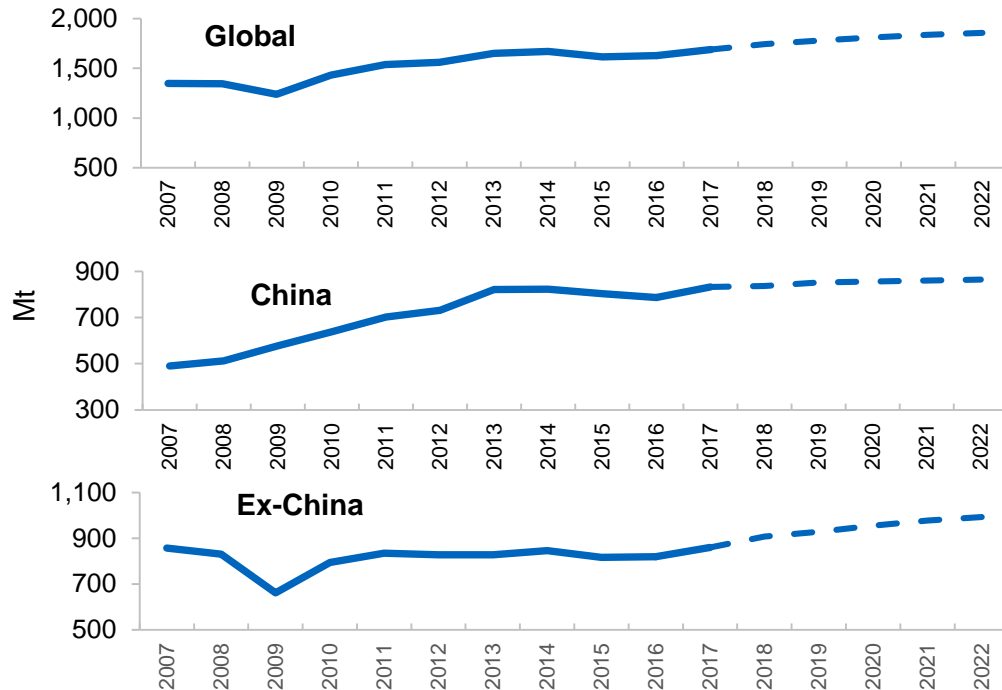
- Steel: Improves financial condition and reduces exports
- Coal: Restricts domestic production and supports seaborne imports



# Synchronized Global Growth

Strong steel production and improved steel pricing

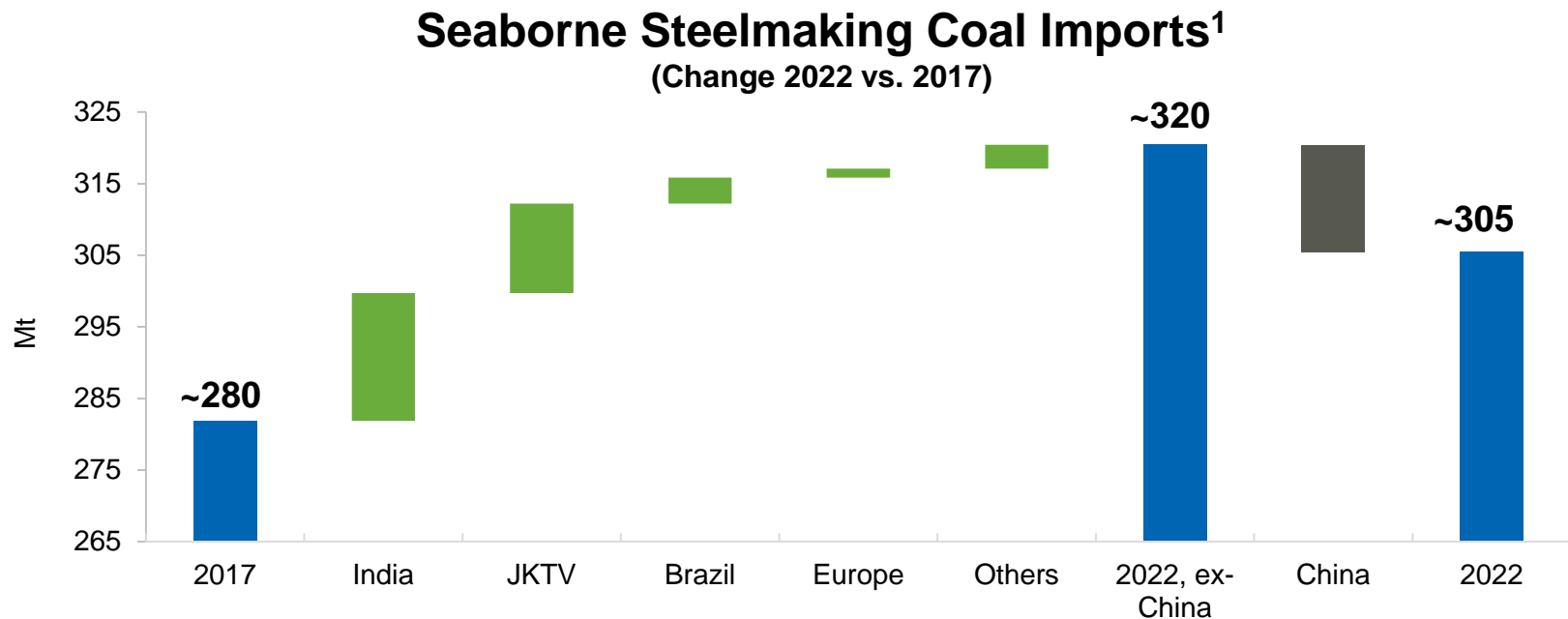
## Crude Steel Production<sup>1</sup>



## Solid 2017 Growth<sup>2</sup>

2017 YoY Growth	Crude Steel Production
Global	5.5%
China	5.7%
Ex. China	4.9%
Europe	5.7%
JKTV	3.1%
India	6.2%
Brazil	9.9%

# Strong Demand Fundamentals ex. China



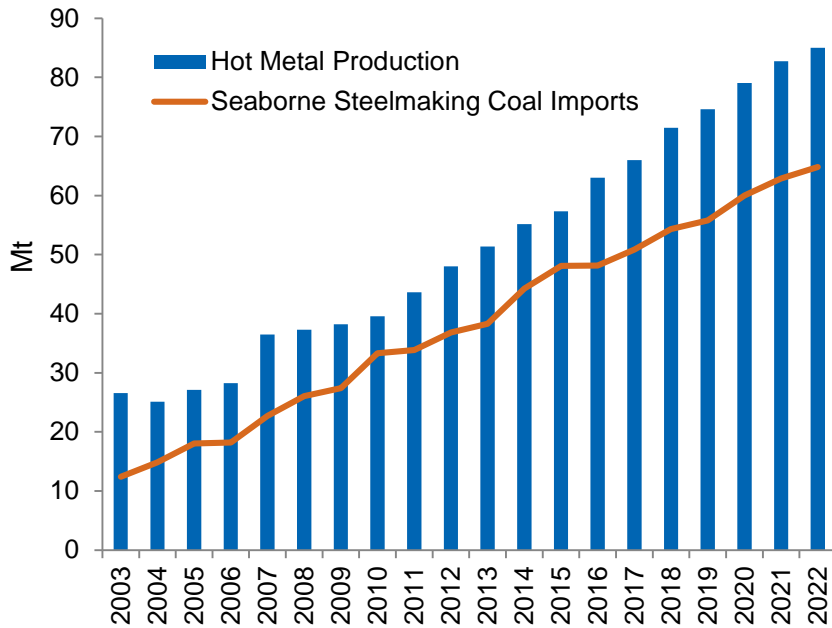
## *Includes:*

- India: Urbanization, steel capacity expansion
- JKTV: 2020 Tokyo Olympics, steel capacity expansion
- Brazil: Improving economy
- Europe: Domestic coal supply issues, improving economy
- China: Currently stronger demand, coastal plants rely on imports

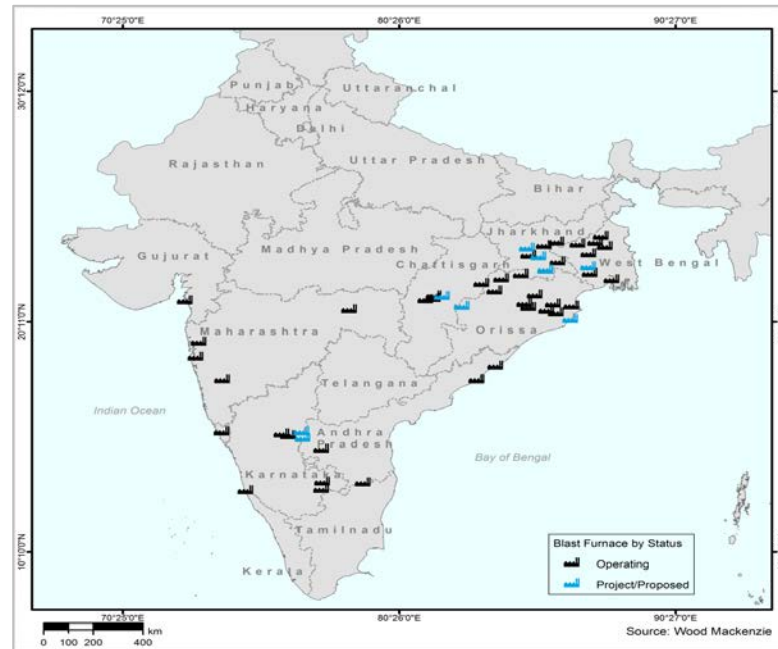
# Growing India Steelmaking Coal Imports

India plans to achieve 300 Mt of crude steel capacity by 2030-2031

## Seaborne Steelmaking Coal Imports Forecasted to increase by >25%<sup>1</sup>

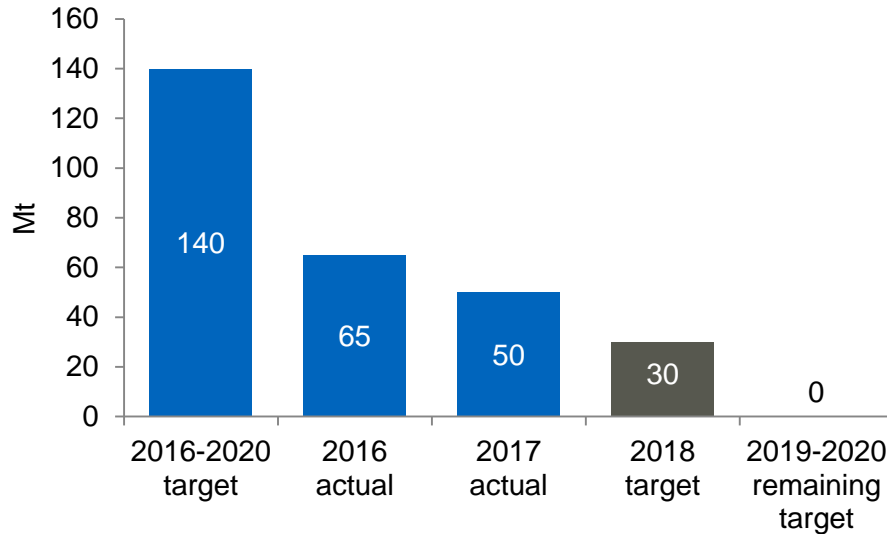


## India's Hot Metal Capacity; Projects and Operations<sup>2</sup>

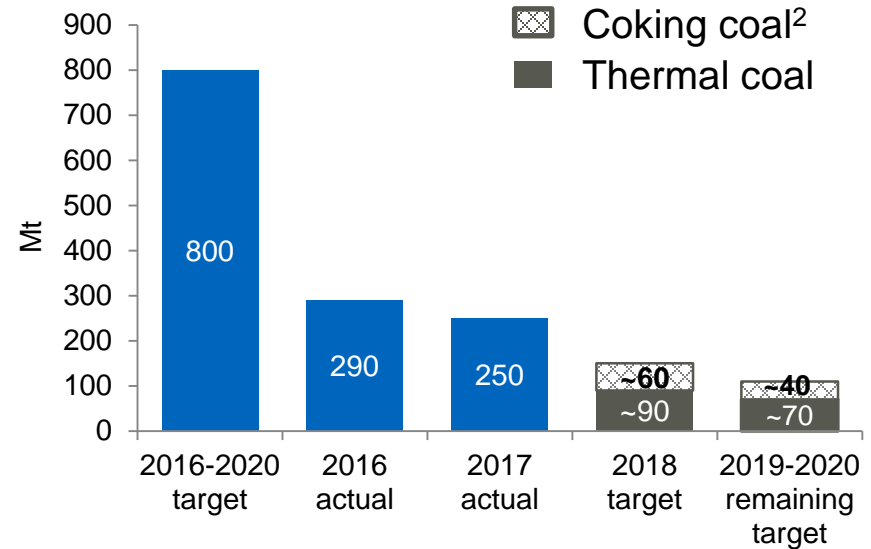


# Capacity Reductions in China Support Pricing

## Steel Capacity Reduction Target<sup>1</sup>



## Coal Capacity Reduction Target<sup>1</sup>



- Steel: Profitable steel industry supports raw materials pricing
- Coal: Capacity reductions support seaborne imports

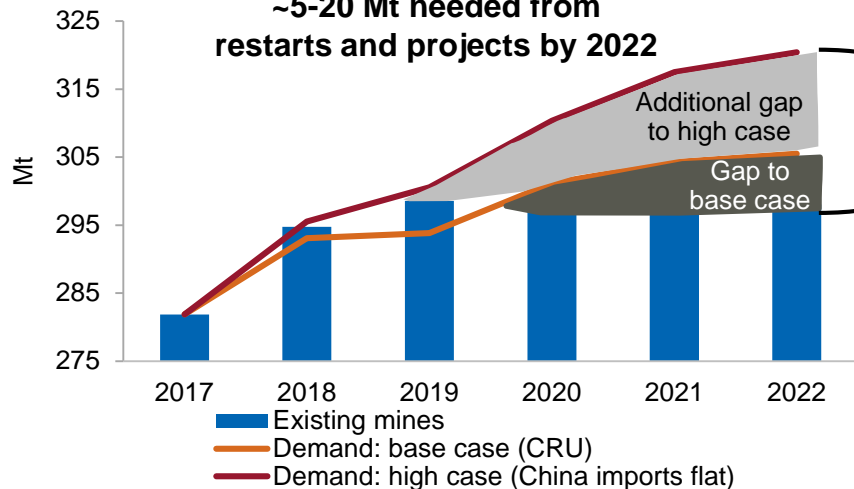


# Seaborne Steelmaking Coal Exports

Coal gap developing and market could be short due to typical disruptions

## Supply & Demand from Existing Mines<sup>1</sup>

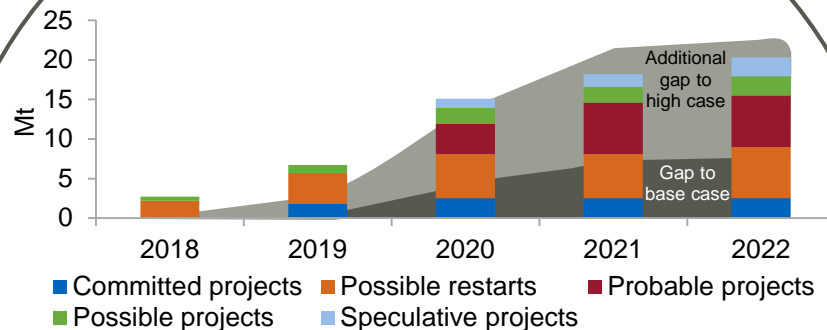
~5-20 Mt needed from restarts and projects by 2022



### Includes:

- Existing mines: expansion (~30 Mt) and depletion (~15 Mt)
- Expansions: Australia (~1/2); Mozambique (~1/5); Russia/USA/Canada/Indonesia (~1/3)
- Depletion: Australia

## Possible Restarts and Projects<sup>1</sup>



### Includes:

- Committed projects: Australia
- Possible restarts: Australia
- Probable projects: Australia
- Possible projects: Indonesia (~4/5); Russia (~1/5)
- Speculative projects: Australia

# Teck's Pricing Mechanisms

Coal sales book generally moves with the market

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## Sales Mix

- ~40% quarterly contract price
- ~60% shorter than quarterly pricing mechanisms (including "spot")

## Product Mix

- ~75% of production is high-quality HCC
- ~25% is a combination of SHCC, SSCC, PCI and a small amount of thermal

## Key Factors Impacting Teck's Average Realized Prices

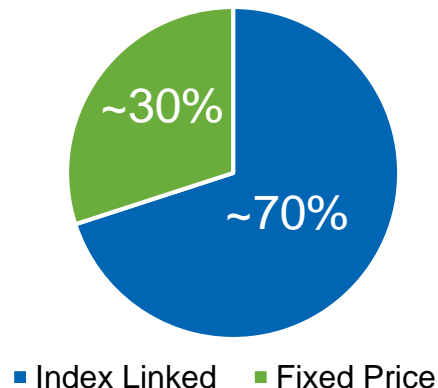
- Variations in our product mix
- Timing of sales
- Direction and underlying volatility of the daily price assessments
- Spreads between various qualities of steelmaking coal
- Arbitrage between FOB Australia and CFR China pricing

## Index Linked Sales

- Quarterly contract sales index linked
- Contract sales index linked
- Contract sales with index fallback
- Spot sales index linked

## Fixed Price Sales

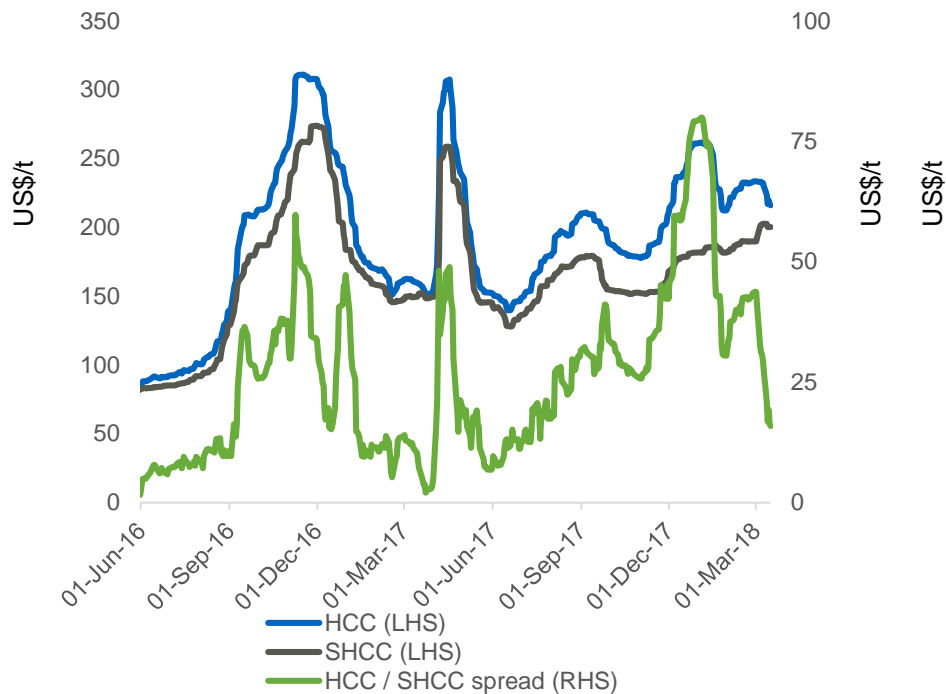
- Contract sales spot priced
- Contract sales with index fallback
- Spot sales with fixed price



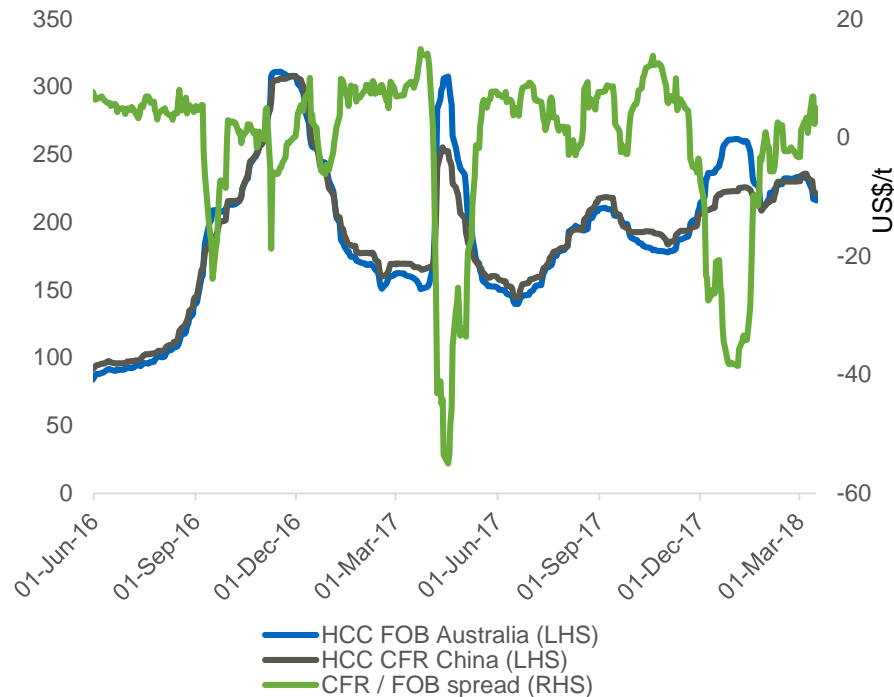
# Quality and Basis Spreads

Impact Teck's average realized steelmaking coal prices

## HCC / SHCC Prices and Spread<sup>1</sup>



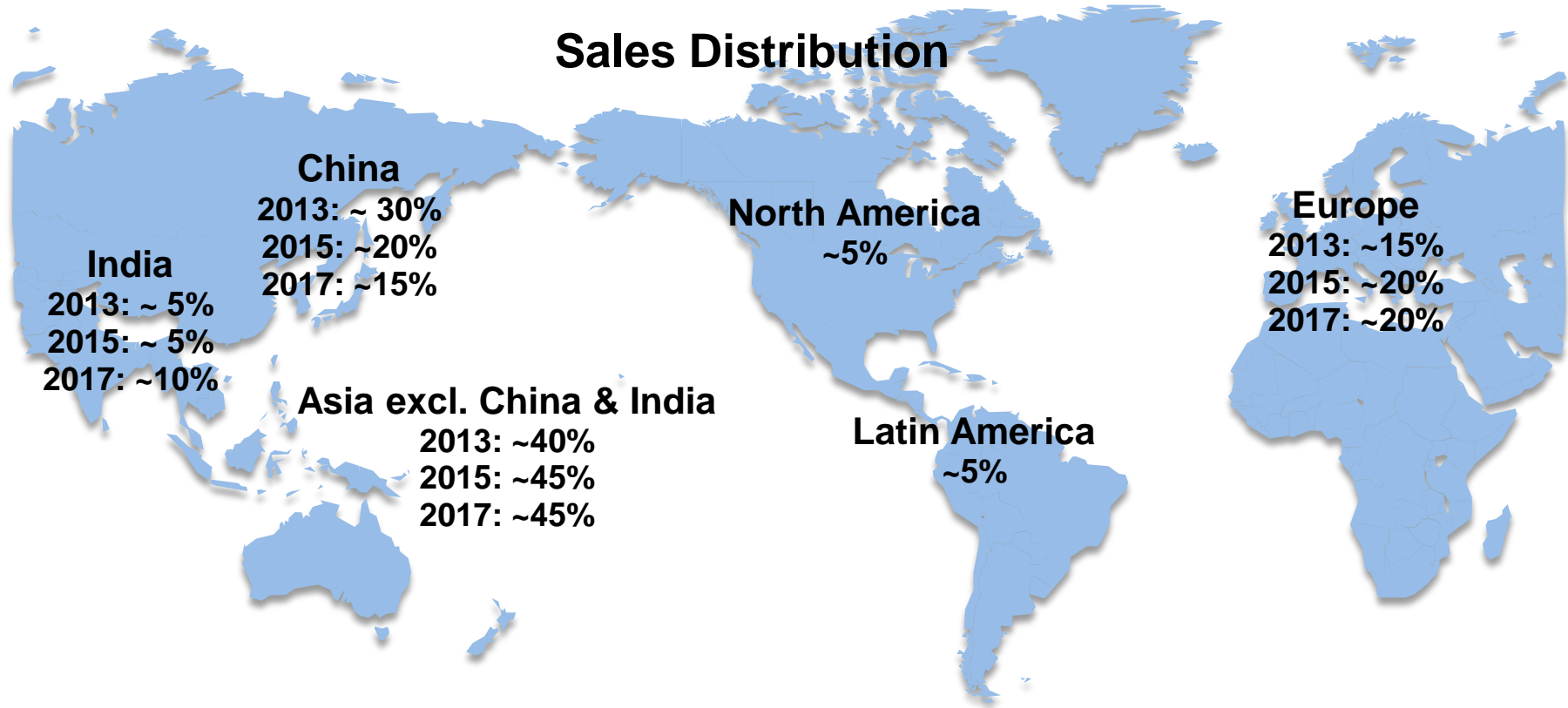
## HCC FOB / CFR Prices and Spread<sup>2</sup>



# 2<sup>nd</sup> Largest Seaborne Steelmaking Coal Supplier

Competitively positioned to supply steel producers worldwide

## Sales Distribution



# Demand Supporting Steelmaking Coal Prices

## **Synchronized global economic growth**

- Supports steel demand and pricing



## **Healthy steel industry**

- Stimulates global demand for seaborne coal



## **Capacity reductions in China continue**

- Steel: Improves financial condition and reduces exports
- Coal: Restricts domestic production and supports seaborne imports



# Notes:

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## **Slide 21: Synchronized Global Growth**

1. Source: WSA, CRU.
2. Source: WSA, NBS.

## **Slide 22: Strong Demand Fundamentals ex. China**

1. Source: CRU.

## **Slide 23: Growing India Steelmaking Coal Imports**

1. Source: WSA, Global Trade Atlas, Wood Mackenzie, CRU.
2. Source: Wood Mackenzie

## **Slide 24: Capacity Reductions in China Support Pricing**

1. Source: Governmental announcements.
2. Breakdown of the remaining target for coal capacity reductions is calculated based on Fenwei estimates. Source: Fenwei, Teck.

## **Slide 25: Seaborne Steelmaking Coal Exports**

1. Source: CRU

## **Slide 27: Quality and Basis Spreads**

1. HCC price is average of the Argus Premium HCC Low Vol, Platts Premium Low Vol and TSI Premium Coking Coal assessments, all FOB Australia and in US dollars. SHCC price is average of the Platts HCC 64 Mid Vol and TSI HCC assessments, all FOB Australia and in US dollars. Source: Argus, Platts, TSI. Plotted to March 15, 2018.
2. HCC FOB Australia price is average of the Argus Premium HCC Low Vol, Platts Premium Low Vol and TSI Premium Coking Coal assessments, all FOB Australia and in US dollars. HCC CFR China price is average of the Argus Premium HCC Low Vol, Platts Premium Low Vol and TSI Premium JM25 Coking Coal assessments, all CFR China and in US dollars. Source: Argus, Platts, TSI. Plotted to March 15, 2018.



# Energy Marketing

April 4, 2018

Glenn Burchnall, Director, Energy Marketing and Logistics





# Forward Looking Information

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These forward-looking statements involve numerous assumptions, risks and uncertainties and actual results may vary materially. These statements are based on a number of assumptions, including, but not limited to, assumptions noted in the various slides and oral presentation and assumptions that Fort Hills start-up proceeds as planned, our customers fulfill their obligations and that Teck’s logistics resources perform as anticipated.

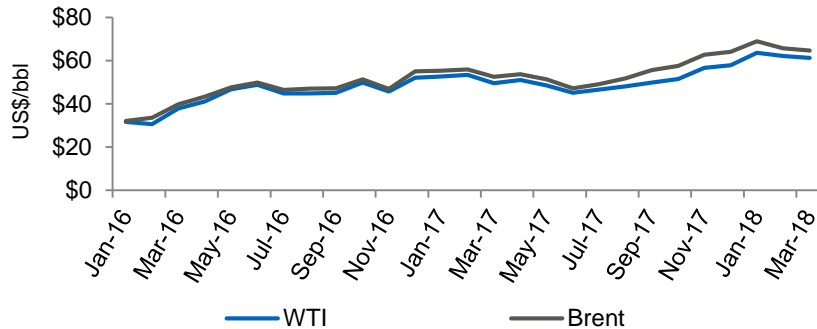
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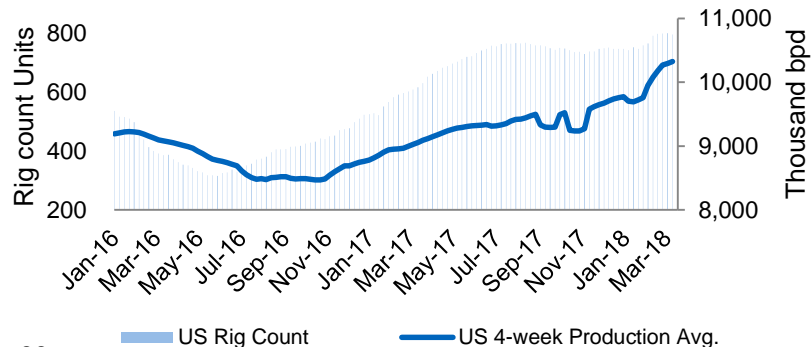


# Oil Prices Improving

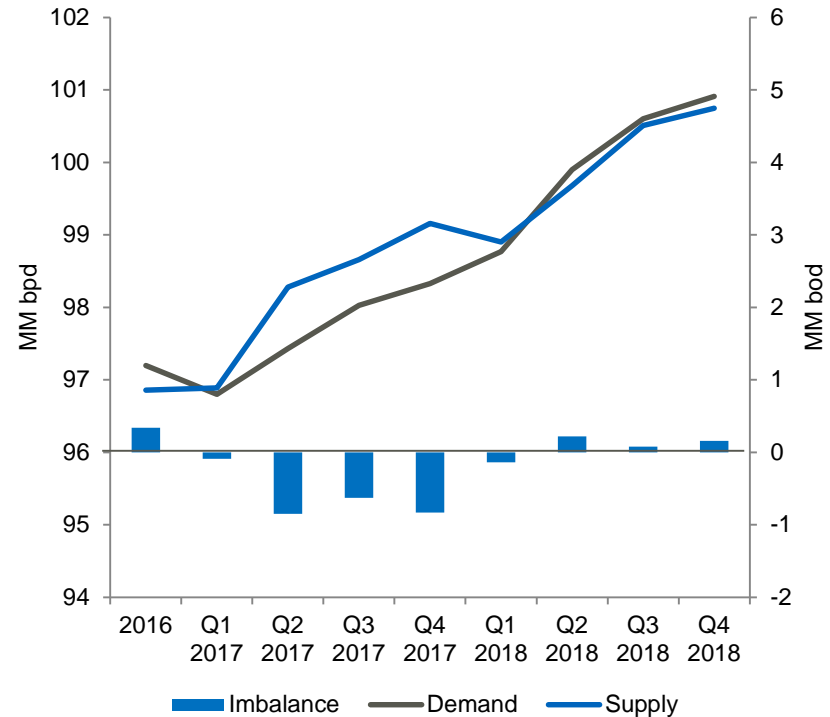
## Benchmark Prices (US\$/bbl)



## North American Rig Count & US Production<sup>1</sup>

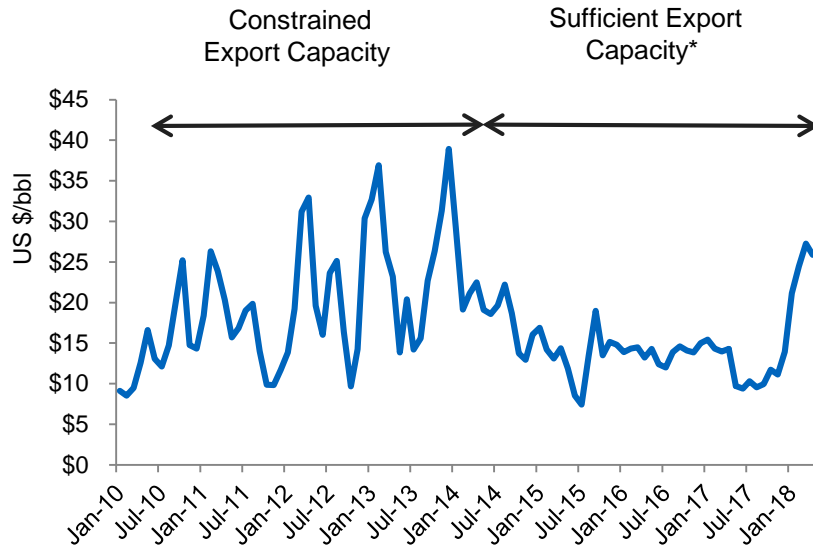


## World Liquid Fuels Production & Consumption<sup>2</sup>



# Heavy Oil Benchmark Differentials

## WTI - Western Canadian Select (WCS) Differential<sup>1</sup>



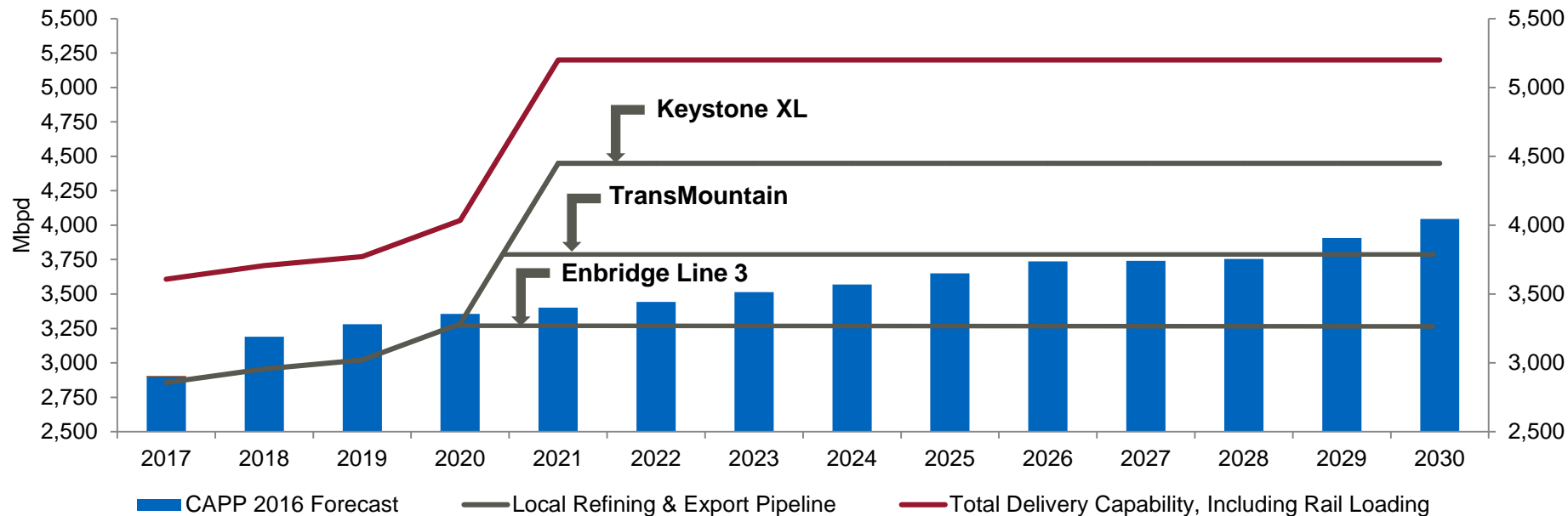
- Wider differentials in short term
  - Constrained pipeline capacity
  - Change in bunker fuel oil specifications
- Pipeline/rail capacity sufficient to meet export requirements
- Pipeline additions will improve differentials
- Price risk and volatility evident

# Pipeline Development Constructive

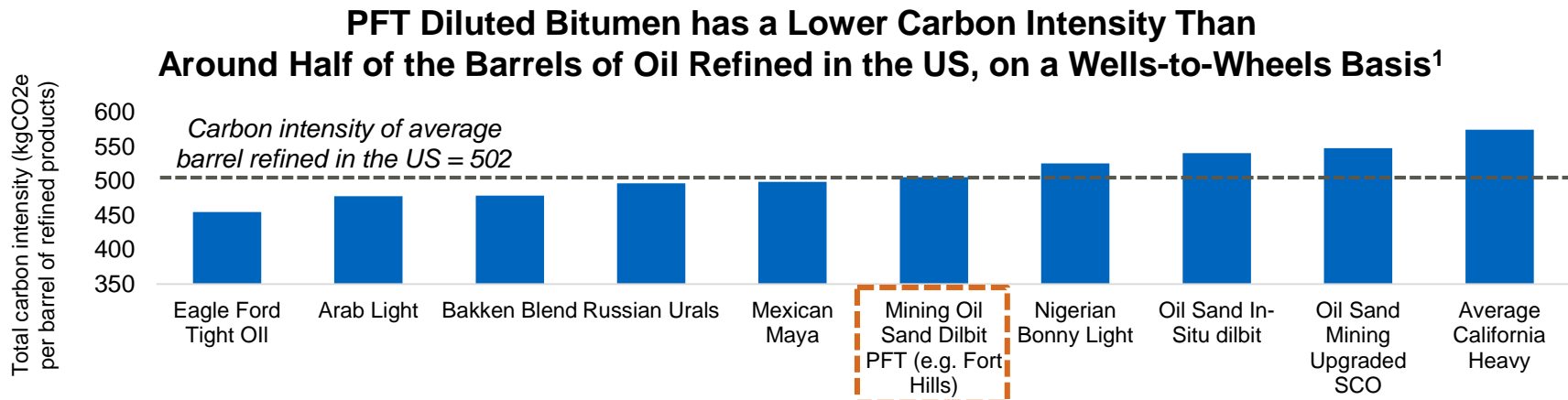
WTI-WCS differentials forecast to improve with export pipeline capacity

## Western Canada Heavy Supply/Demand Balance<sup>1</sup>

Potential For Incremental 1.5M Barrels Per Day Export Pipeline Capacity



# Lower Carbon Intensity Product



Source: IHS Energy Special Report "Comparing GHG Intensity of the Oil Sands and the Average US Crude Oil", May 2014.

## 'Fort Hills Reduced Carbon Dilbit Blend'

- Utilizes Paraffinic Froth Treatment (PFT) solvent based secondary extraction process
  - Removes fines & asphaltines, upgrading the quality of our blended bitumen
  - Used by Kearl and Albian mining projects
- Result:
  - A product with a lower carbon intensity than around half of the oil refined in the US
  - A superior refinery feedstock
  - Lower pipeline diluent requirements

# Fort Hills Diluted Bitumen (FRB) Sales

- First oil: January 27, 2018
- Facility and pipeline commissioning in February 2018
- First sales: March 2018
- Strong customer demand for FRB



## Teck's Commercial Activities<sup>1</sup>

Bitumen production	38.3 kbpd
+Diluent acquisition	11.2 kbpd
<b>=Bitumen blend sales</b>	<b>49.5 kbpd</b>

# Hardisty Is A Major Heavy Oil Market Hub

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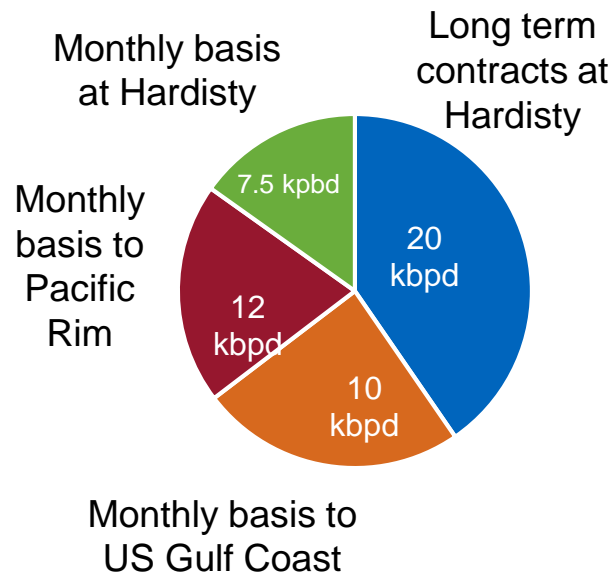


- **Terminal storage<sup>1</sup>:**
  - 34 million barrels
  - 425 kbbbls contracted by Teck
- **Export pipeline capacity: 3.7 mbpd**
  - Enbridge common carrier
  - Keystone & Express pipelines
  - Origination point for Keystone XL
- **Rail car loading capability: 120 kbpd**

# Energy Sales & Logistics Strategy

Based on diverse market access & risk mitigation

## Sales Mix



## Market Profile

### Pipelines:

- 10 kbpd Contracted capacity on existing Keystone pipeline to the US Gulf Coast
  - +12 kbpd Contracted capacity on proposed TransMountain (TMX) pipeline to the west coast of Canada
  - +27.5 kbpd Remainder at Hardisty via customer contracted pipeline capacity, or common carrier pipelines
- =49.5 kbpd blended bitumen<sup>1</sup>**

### Additional options available include:

- Increasing capacity on Keystone XL pipelines
- Selling additional product at Hardisty
- Shipping by rail, if required

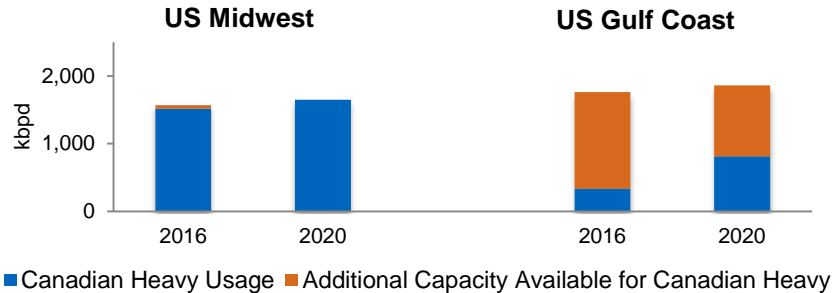
# US Midwest/Gulf Coast Key Markets

## Blended Bitumen Pipelines



- US Midwest largest existing market
- US Gulf Coast exceptional growth opportunity
- Deep water port access via proposed TransMountain & Keystone XL pipelines

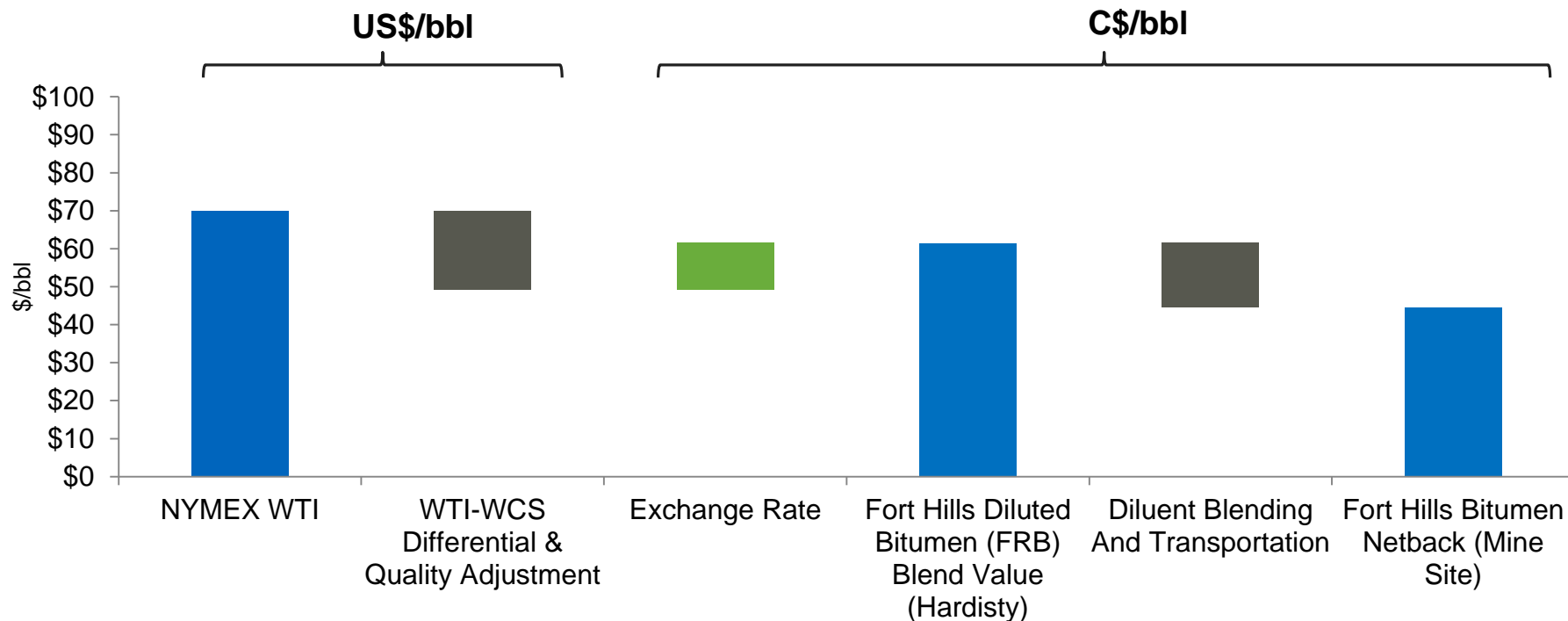
## Heavy Blend Processing





# Illustrative Bitumen Netback At Mine Site

Assuming steady state operations (2019-2022)<sup>1</sup>



# Summary

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- First sales in March
- Strong market acceptance of our high quality dilbit blend
- Well positioned with contracted storage at Hardisty market hub
- Developing a portfolio of market access opportunities to diversified markets<sup>1</sup>
- Long life stable production to generate significant cashflow



# Notes

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## **Slide 33: Oil Prices Improving**

1. Source: Baker Hughes, EIA. As at March, 2018.
2. Source: Energy Aspects market Fundamentals, EIA, OPEC, IEA Short Term Outlooks March 2018.

## **Slide 34: Heavy Oil Benchmark Differentials**

1. Export capacity includes pipeline and rail loading capacity. Actuals plotted to the April Production month 2018.

## **Slide 35: Pipeline Development Constructive**

1. Source: CAPP 2016 and 2017 Supply Forecasts, Lee & Doma, Teck. Production and pipeline throughputs are annual averages.

## **Slide 36: Lower Carbon Intensity Product**

1. Source: IHS Energy Special Report “Comparing GHG Intensity of the Oil Sands and the Average US Crude Oil” May 2014. SCO stands for Synthetic Crude Oil.

## **Slide 37: Fort Hills Diluted Bitumen (FRB) Sales**

1. Annualized average at full production. Reflects 21.3% Fort Hills partnership interest. Photo source: Suncor.

## **Slide 38: Hardisty Is A Major Heavy Oil Market Hub**

1. Photo source: Gibson Energy.

## **Slide 39: Energy Sales & Logistics Strategy**

1. Annualized average at full production. Reflects 21.3% Fort Hills partnership interest.

## **Slide 41: Illustrative Bitumen Netback At Mine Site**

1. Estimates are based Calendar NYMEX WTI, Canadian Benchmark heavy oil pricing and C\$/US\$ exchange rates as shown.

## **Slide 42: Summary**

1. Photo source: Suncor.



# The Right Commodities at the Right Time

April 4, 2018

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