

Economic Impact Assessment of Erdenes Tavan Tolgoi

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Abstract

This study estimates the long-term direct and indirect economic impacts of the Tavan Tolgoi project on the Mongolian economy through 2030. Tavan Tolgoi is one of the world's largest coking coal deposits, with approximately 7.4 billion tons of thermal and coking coal resources, located 270 kilometers from the Chinese border. The analysis considers planned mining operations and associated infrastructure projects, including a railway linking Tavan Tolgoi to the Chinese border and a 450 MW power plant. Using a computable general equilibrium (CGE) model, the study evaluates the economy-wide impacts of mining and infrastructure development. The results indicate that Erdenes Tavan Tolgoi is expected to become one of the largest contributors to Mongolia's economic growth over the long term.

Keywords:

Erdenes Tavan Tolgoi, economic impact assessment, computable general equilibrium, Mongolia

Ulaanbaatar, Mongolia

2014



AN ECONOMIC IMPACT ASSESSMENT OF ERDENES TAVAN TOLGOI

May 2014



Erdenes Tavan Tolgoi (ETT) will be the second biggest contributor to the Mongolian economy after Oyu Tolgoi in the future

Summary Findings

This study seeks to estimate the direct and indirect impact of the Erdenes Tavan Tolgoi on the Mongolian economy until 2030

Current situation

- ETT has licenses covering five of the six sub-fields at Tavan Tolgoi, representing ~18% of Mongolia's future coal export volume
- A US\$350 million prepayment[^] enabled exports from East Tbankhi to commence in 2011, but at a ~20-30% discount to market prices
- ~US\$310 million in operating capital was transferred to the HDF[^] in 2011, leaving ETT technically insolvent without debt financing
- Insolvent, and with negative cash flow, a funding package allowed suppliers to be paid and debt payments to commence

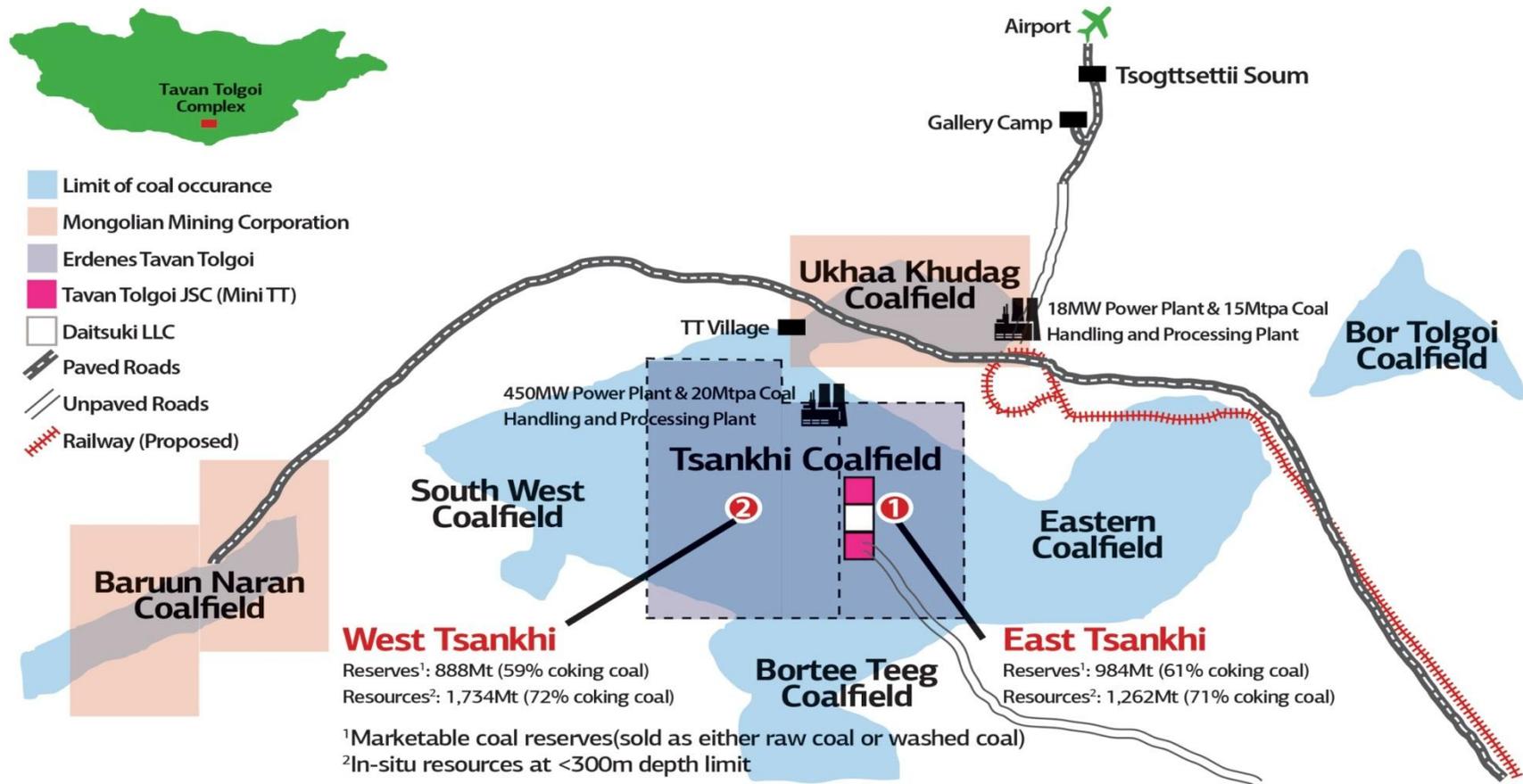
Future outlook

- Commercial production at ETT will gradually 'ramp up' to ~25Mtpa (ROM) by 2019
- At full production, the Mongolian economy will be ~10% larger than what it otherwise would have been
- Investment in associated enabling infrastructure (coal railway and power plant) could represent a further 5% growth in the economy
- Although the economic impact of enabling infrastructure is small, it will have a meaningful 'input' impact on other elements of the economy sectors (ie a cheaper power source for OT)
- With enabling infrastructure, ETT can increase the economy by ~US\$3 billion on average annually in 2014-2030

[^]Chalco (China) purchased 5Mt at an agreed rate of US\$70/t

ETT has licenses covering five of the six sub-fields at Tavan Tolgoi, representing ~18% of Mongolia's future coal export volume

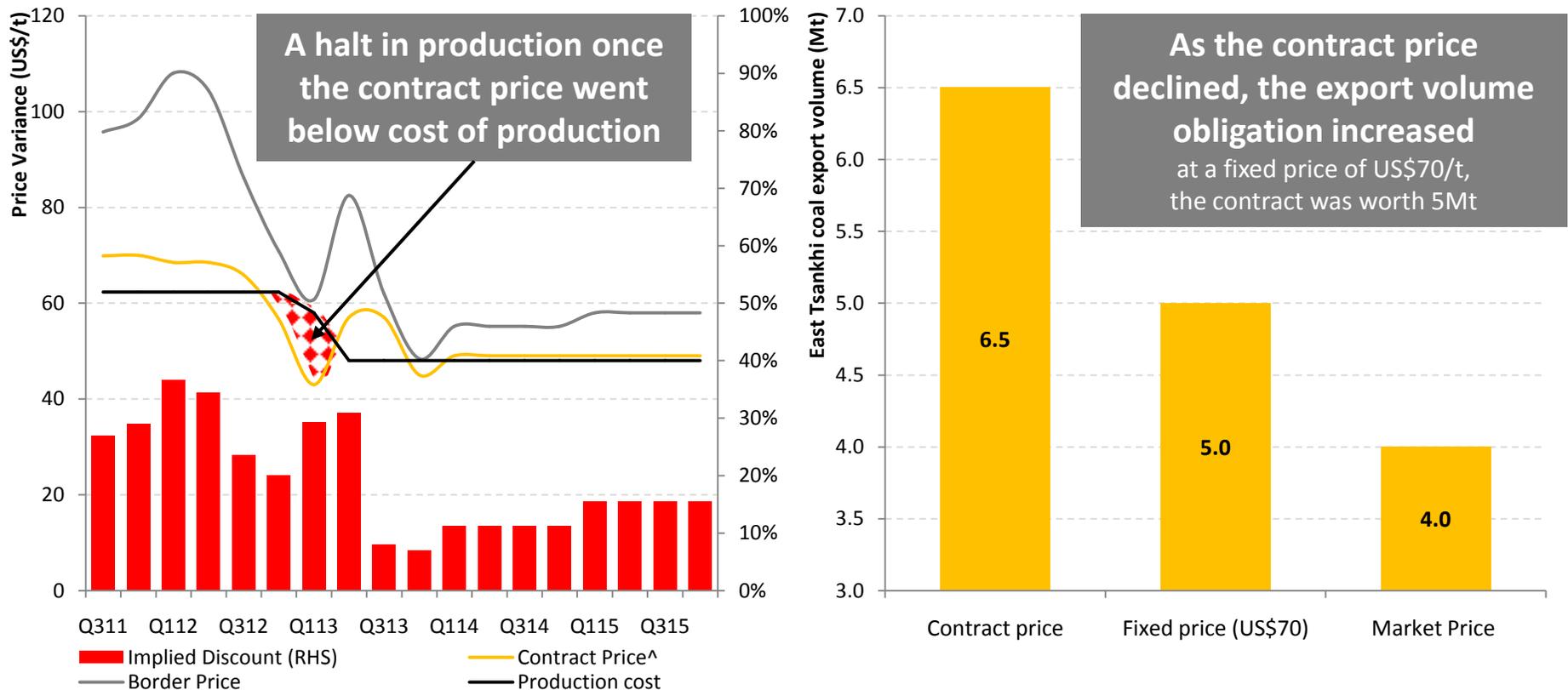
Tavan Tolgoi Coal Complex



The analysis only considers the East and West Tsankhi tenements of Erdenes Tavan Tolgoi (ETT)

Exports from East Tsankhi commenced in 2011, funded by a US\$350 million prepayment from Chalco, but at a 20-30% discount

Contract Price Variance (East Tsankhi)

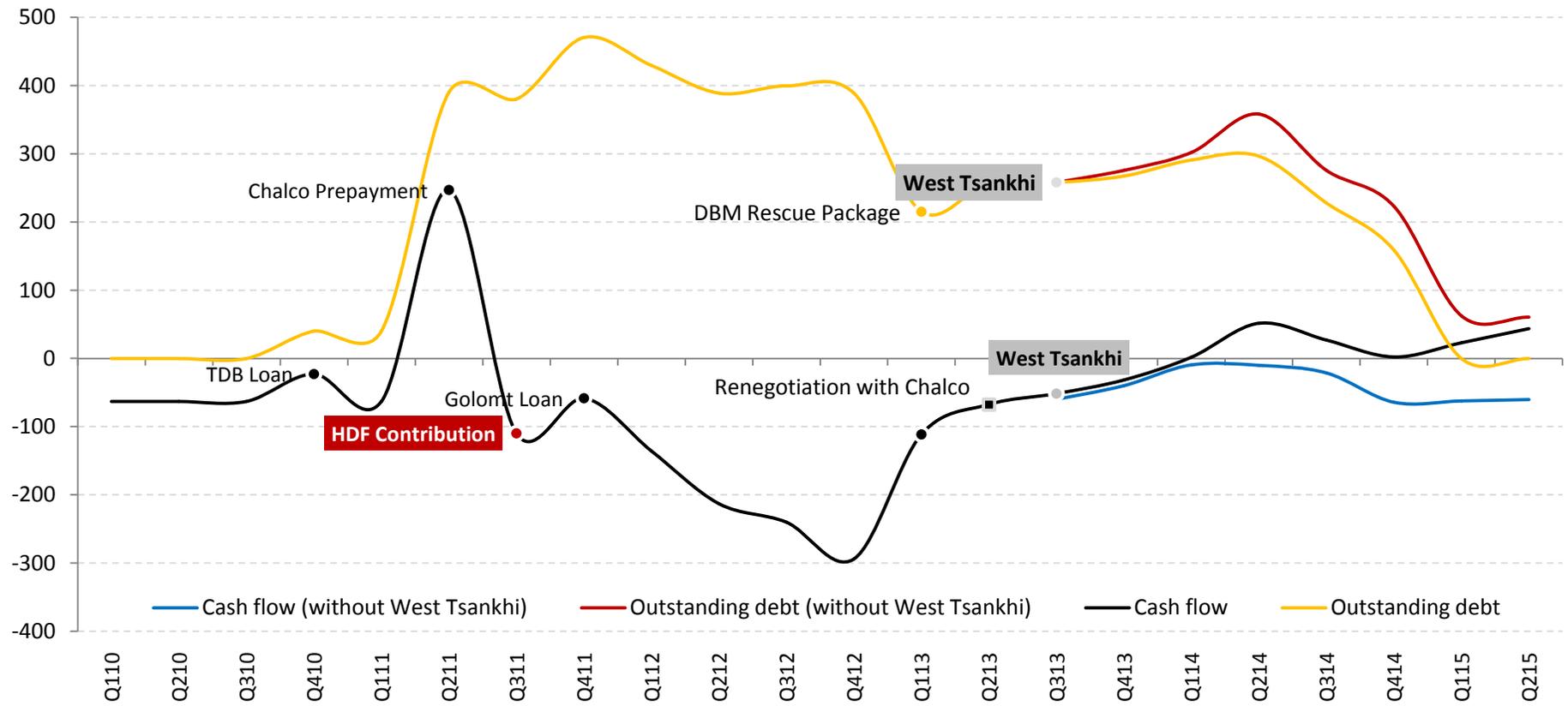


ETT's outstanding debt to Chalco was US\$132 million as of the end of March 2014 which is equivalent to 2.7 Mt of export at the current contract price of US\$49/t

^Initial contract price with Chalco was US\$70/t adjusted quarterly based on Chinese coal indices

~US\$310 million in operating capital was transferred to the HDF^ in 2011, leaving ETT technically insolvent without debt financing

Erdenes Tavan Tolgoi's Cash flow (US\$ million)



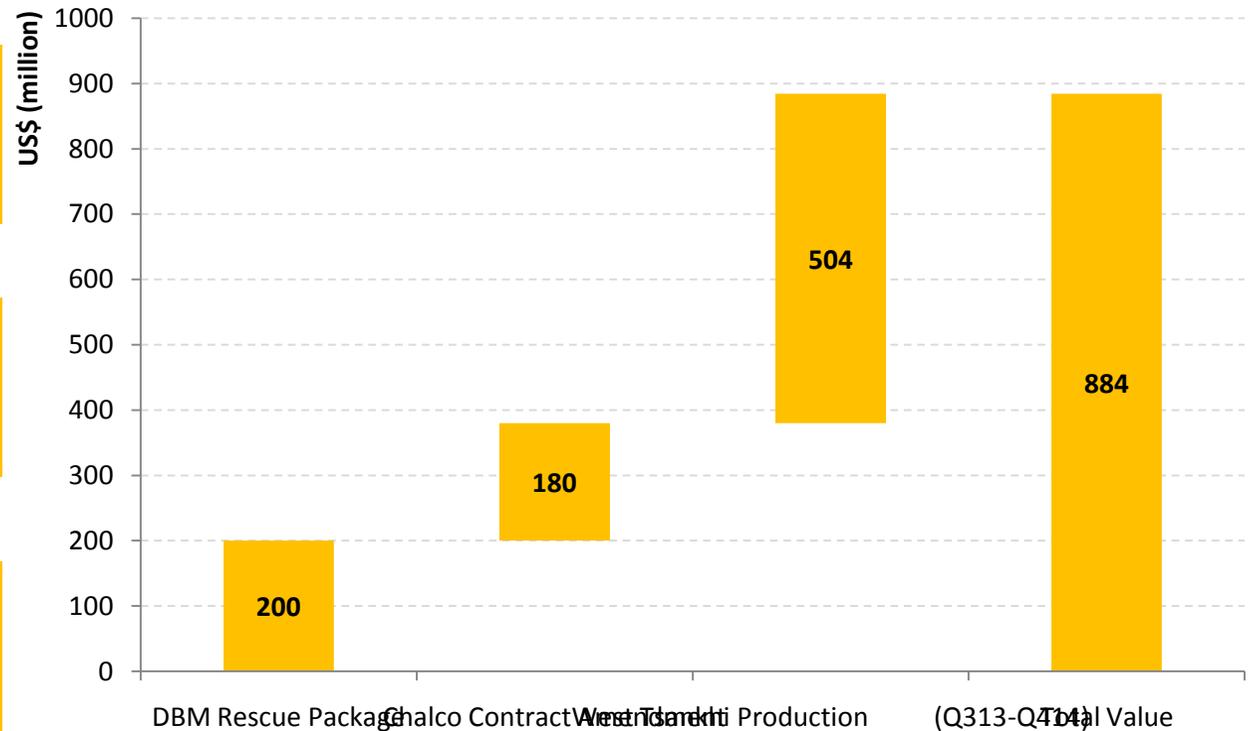
Production at West Tsankhi commenced in Q313 in order to finance its operation and repay commercial debts to banks and suppliers

^Distributed to citizens through the Human Development Fund as cash handout (2011 election commitment)

Insolvent with negative cash flow, a funding package allowed suppliers to be paid and debt payments to commence

Components of the Erdenes Tavan Tolgoi Funding Package

- 1 **DBM Rescue Package** a direct cash injection that has since been converted to preferred stock[^]
- 2 **Chalco Contract Amendment** to transport coal directly to the Chinese border at Gants Mod (without the need for trans-shipment at Tsaggan Khad)
- 3 **West Tsankhi Production** funded ongoing OPEX and enabled repayment of outstanding commercial loans

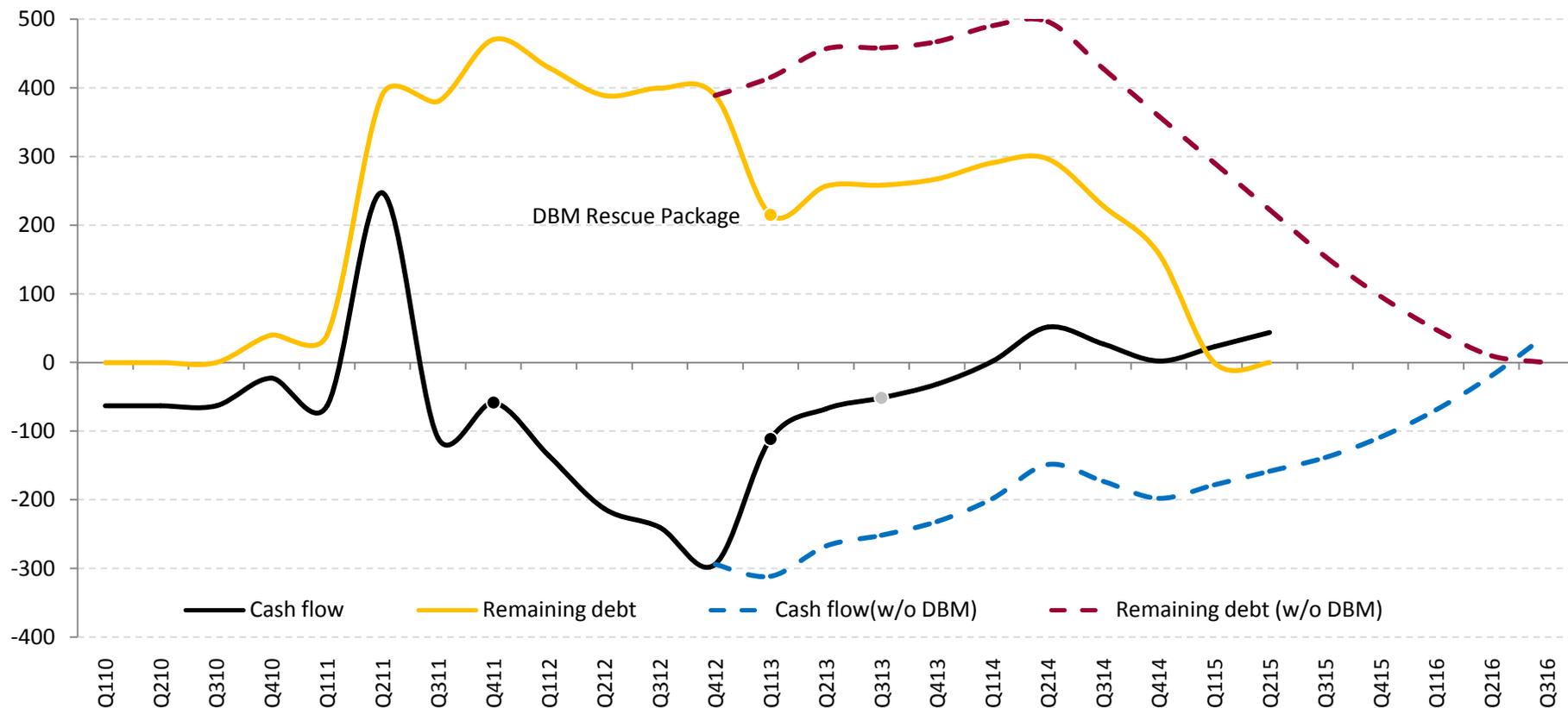


Exporting coal from West Tsankhi was critical for Erdenes Tavan Tolgoi to cover operating expenses, pay suppliers and repay commercial loans

[^]DBM financing has been converted to preferred stock and is not recorded as a payable debt

1 DBM Rescue Package was absolutely necessary for ETT to bring brought forward the timing of positive cash flow by two years

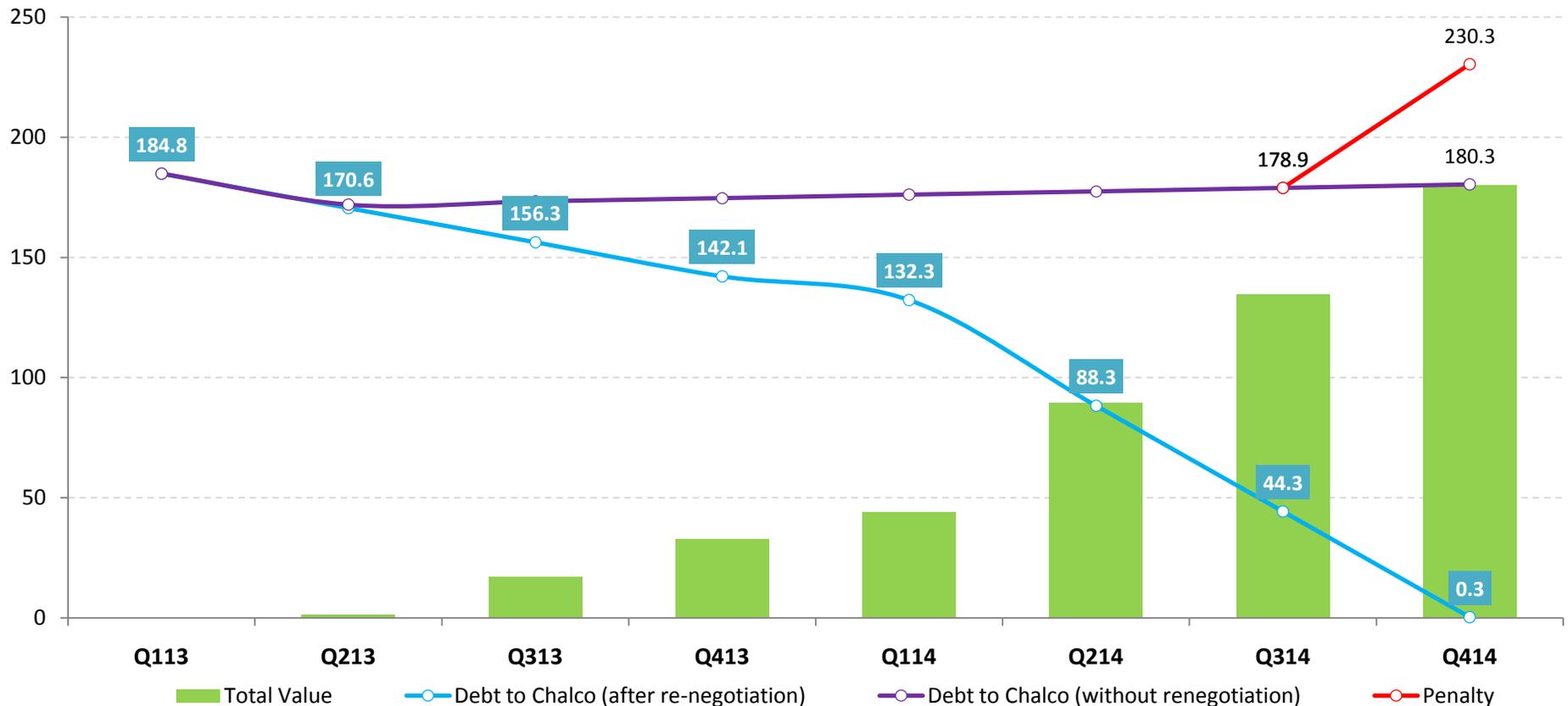
Impact of DBM Rescue Package on Erdenes Tavan Tolgoi's Cash flow (US\$ million)



US\$110 million was used to pay outstanding commercial debts to banks and suppliers out of US\$200 million from the DBM, while it financed its operation (OPEX) with the rest of US\$90 million including starting West Tsankhi

2 Chalco Contract Amendment reduced transport costs, enabling Erdenes Tavan Tolgoi to sell production with a profit margin

Impact of Chalco Contract Amendment on Erdenes Tavan Tolgoi's Cash flow (US\$ million)

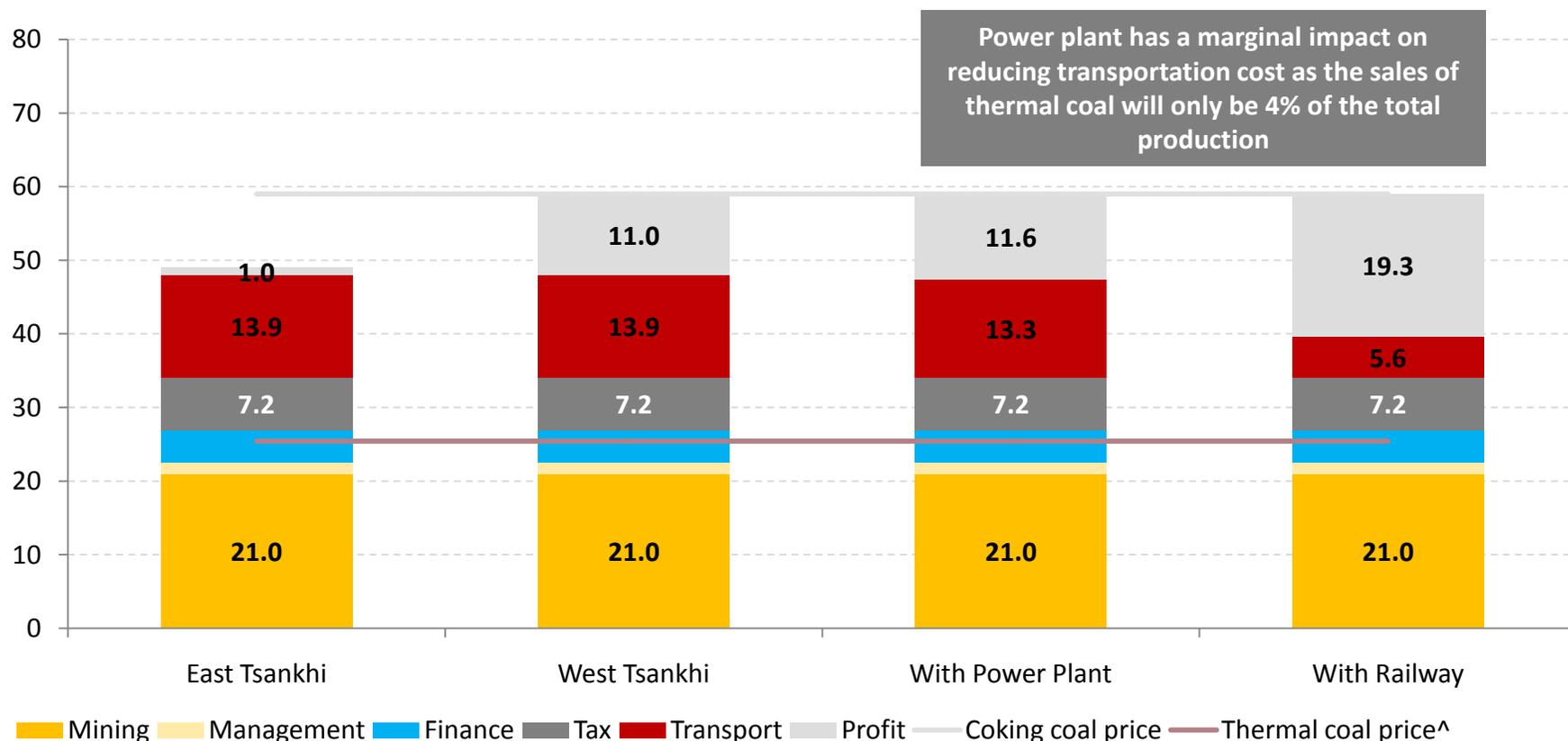


By transporting directly to Gants Mod[^] resulted in US\$180.3 million in total value gained and further avoided a US\$50 million penalty

[^]Eliminating the need for trans-loading at Tsaggan Khad for customs documentation

3 West Tsankhi Production was profitable in 2013 but transport was a significant cost and thermal coal was unable to be sold

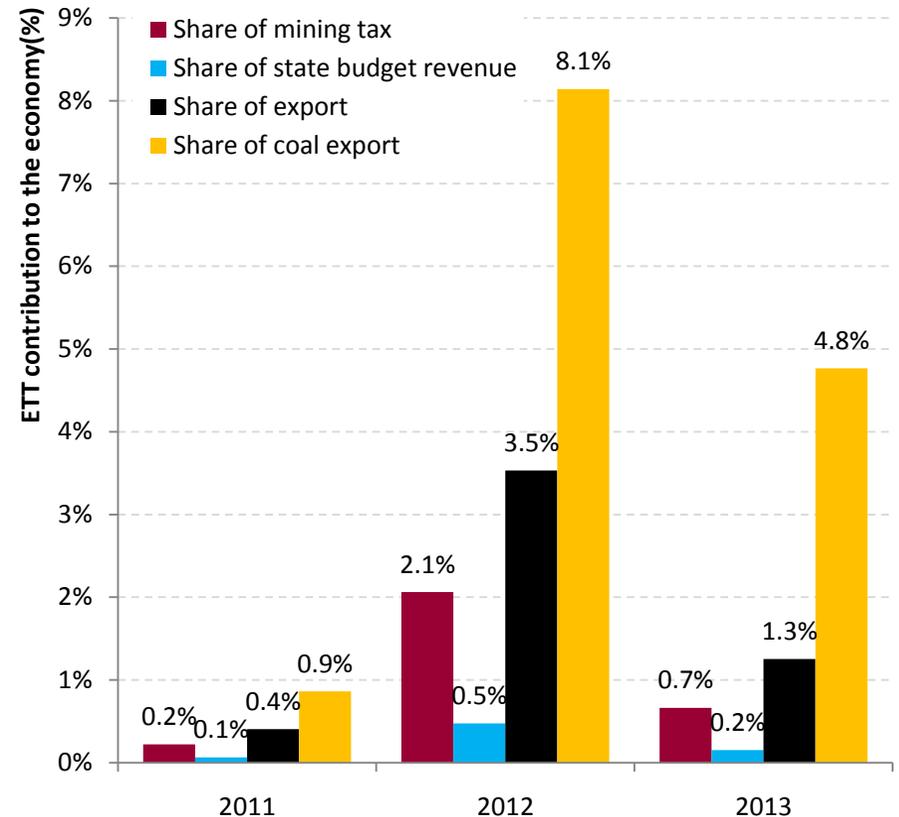
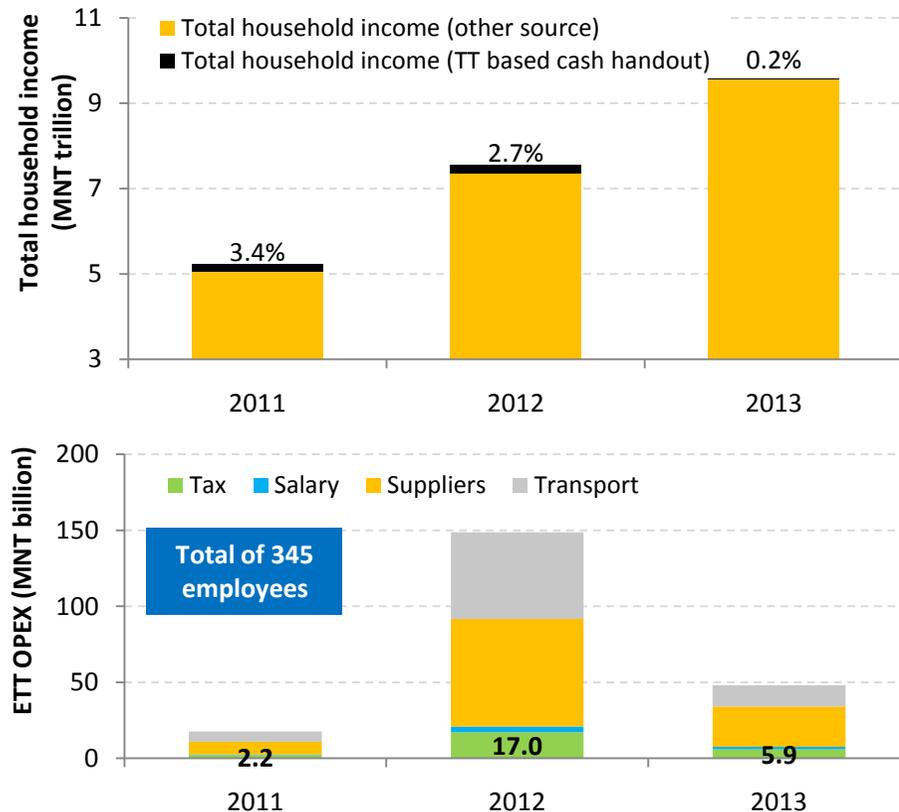
Erdenes Tavan Tolgoi Operating Costs (US\$/t)



A mine mouth Power Plant at Tavan Tolgoi will use 1 Mtpa (4% of total coal production) of thermal coal without incurring a significant transport cost

Despite cash flow issues, ETT represented 4.6% of export revenue, 1% of mining tax, and 2.2% of household income in 2011-2013

ETT impact on the economy

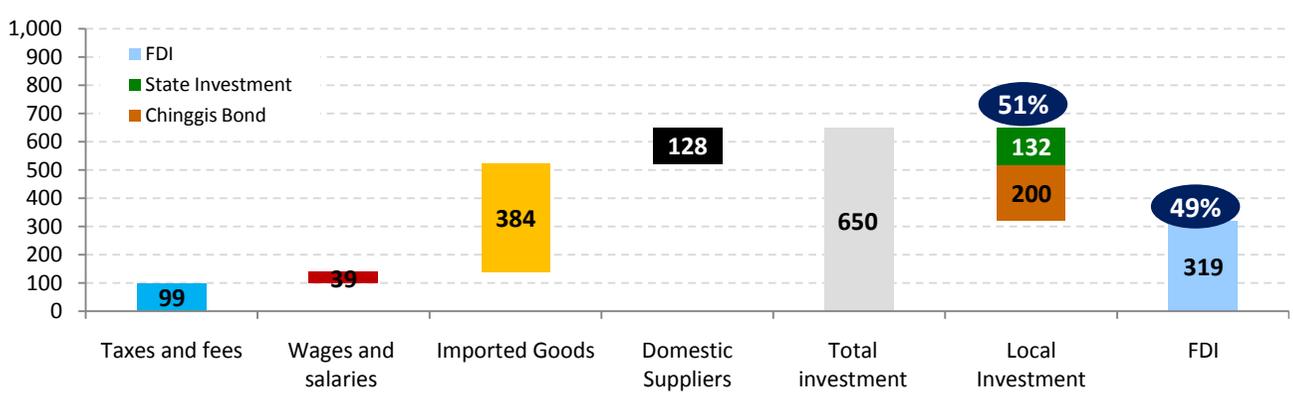
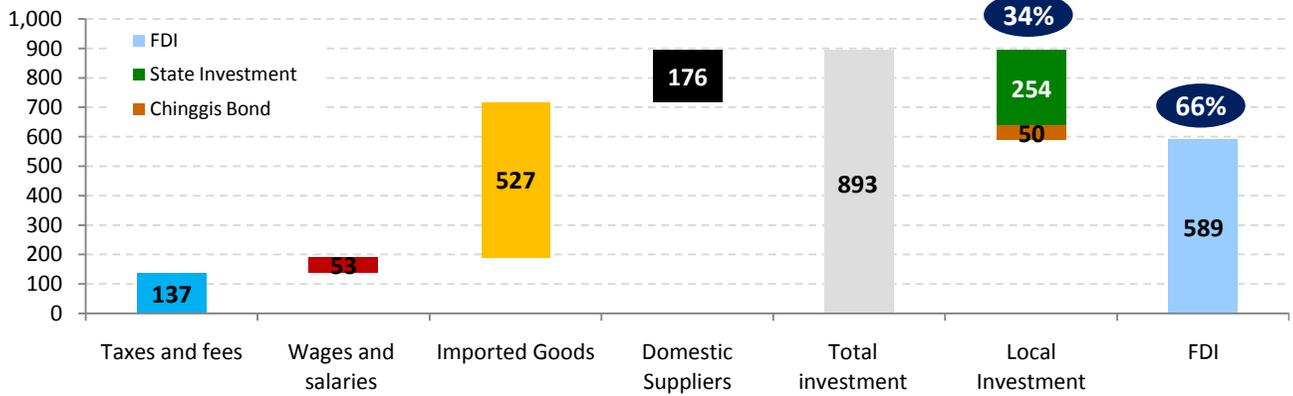


Export revenue from East Tsankhi in 2011-2014 had little impact on the exchange as there was no currency exchanged, however West Tsankhi's export revenue had a small appreciation impact

^By GoM forecast (approved in 2014's budget)

Current plans are to build a coal railway and thermal power plant at Tavan Tolgoi under a concession agreement

Investment assumptions (US\$ million)

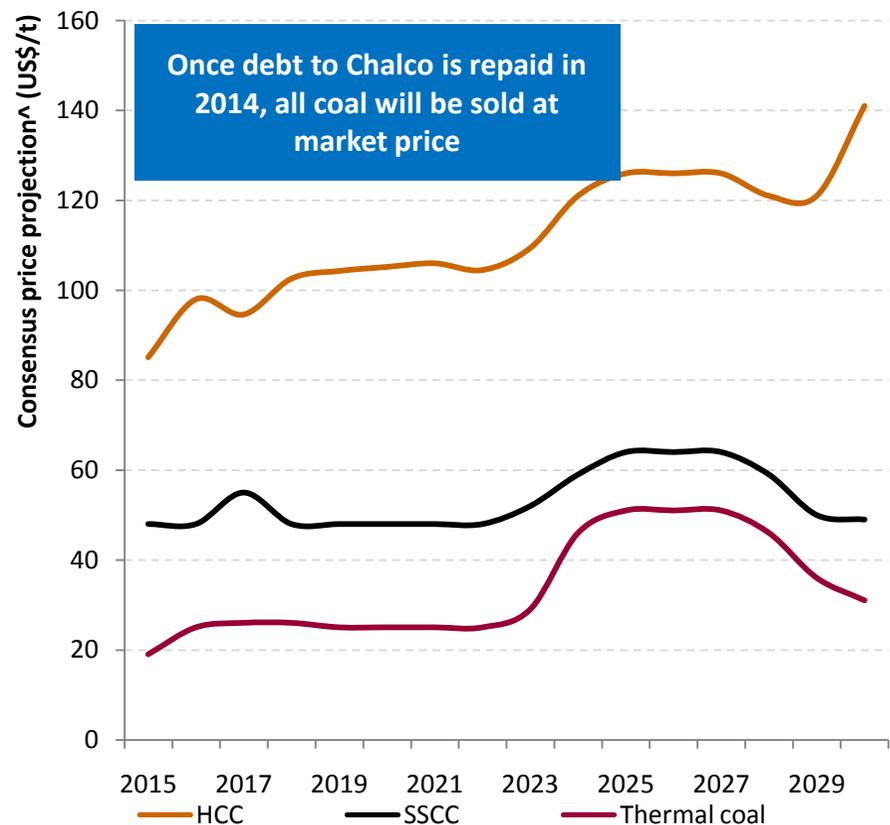
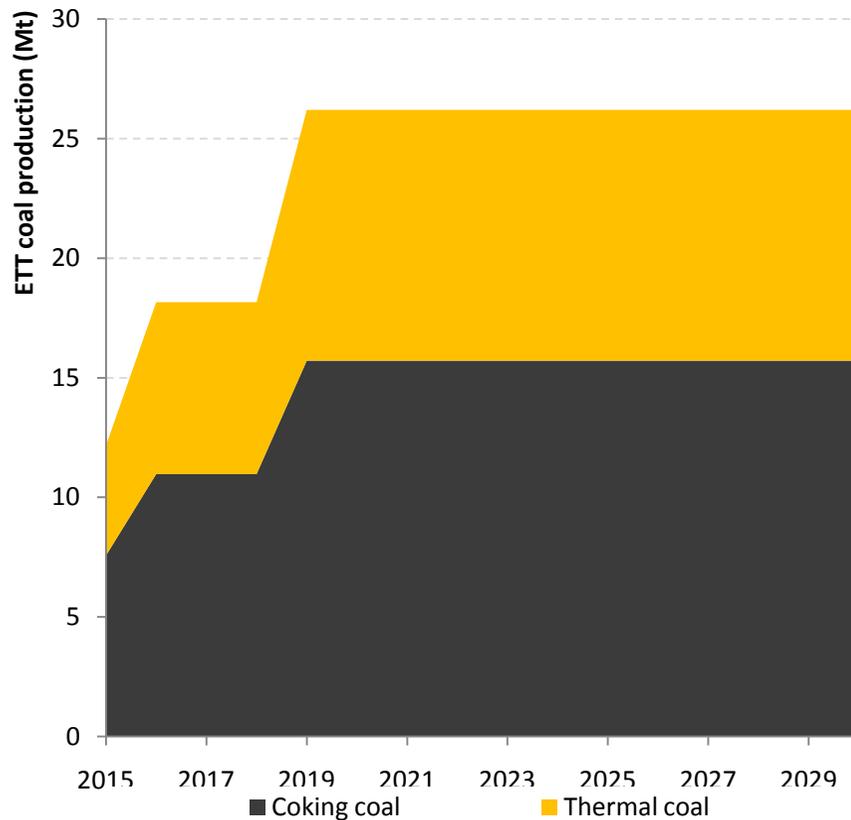


Erdenes Tavan Tolgoi is not a large consumer of power, however a power plant[^] enables a revenue stream for its otherwise stranded thermal coal

[^]The main consumer will be Oyu Tolgoi and will enable substitution of current power imports from China

Planned infrastructure will enable production at Erdenes Tavan Tolgoi to 'ramp up' to ~25Mtpa (ROM) by 2019

Production and price projection



Coking coal will be 100% exported when ~20% of thermal coal is planned to be exported to China, and rest of thermal coal will be used domestically for power plants

^Discounted to Mongolian border price

To estimate the economic impact of ETT in the Mongolian economy, this analysis considered three different scenarios

Assumptions used in these three scenarios

Base Case: No ETT *(hypothetical)*

- This modelling assumes **all major mining projects** will operate according to their **mine plans**[^] except ETT (**excludes ETT operation and Chalco prepayment and related infrastructure projects**)
- Commodity prices are based on **consensus prices** discounted to Mongolian border price
- Additional FDI into the mining sector development is estimated to be US\$13 billion, out of which: Thermal coal - **US\$1.4 billion**, Metallurgical coal - **US\$1.2 billion**, Copper - **US\$8.7 billion**

Policy Case 1: ETT Mining Operations

- In addition to base case mining production, **236 Mt of coking coal and 155 Mt of thermal coal** (of which 20% will be exported) will be produced by ETT between 2014-2030
- East Tsankhi's debt to Chalco will be fully repaid by 2014 and all subsequent volume will be sold based on consensus forecast with an adjustment for Mongolian quality from 2015

Policy Case 2: With ETT Infrastructure

- In addition to Mining Operations policy case;
- **A new power plant** with 34% state ownership will supply 450MW electricity to both OT and TT starting from 2017, substituting current electricity imports from China
- **A new railway** with 51% state ownership will carry coal from TT starting from 2015, decreasing transportation costs to the Chinese border

All indicators are in 2013 prices and are converted to USD with USD/MNT exchange rate of 1523

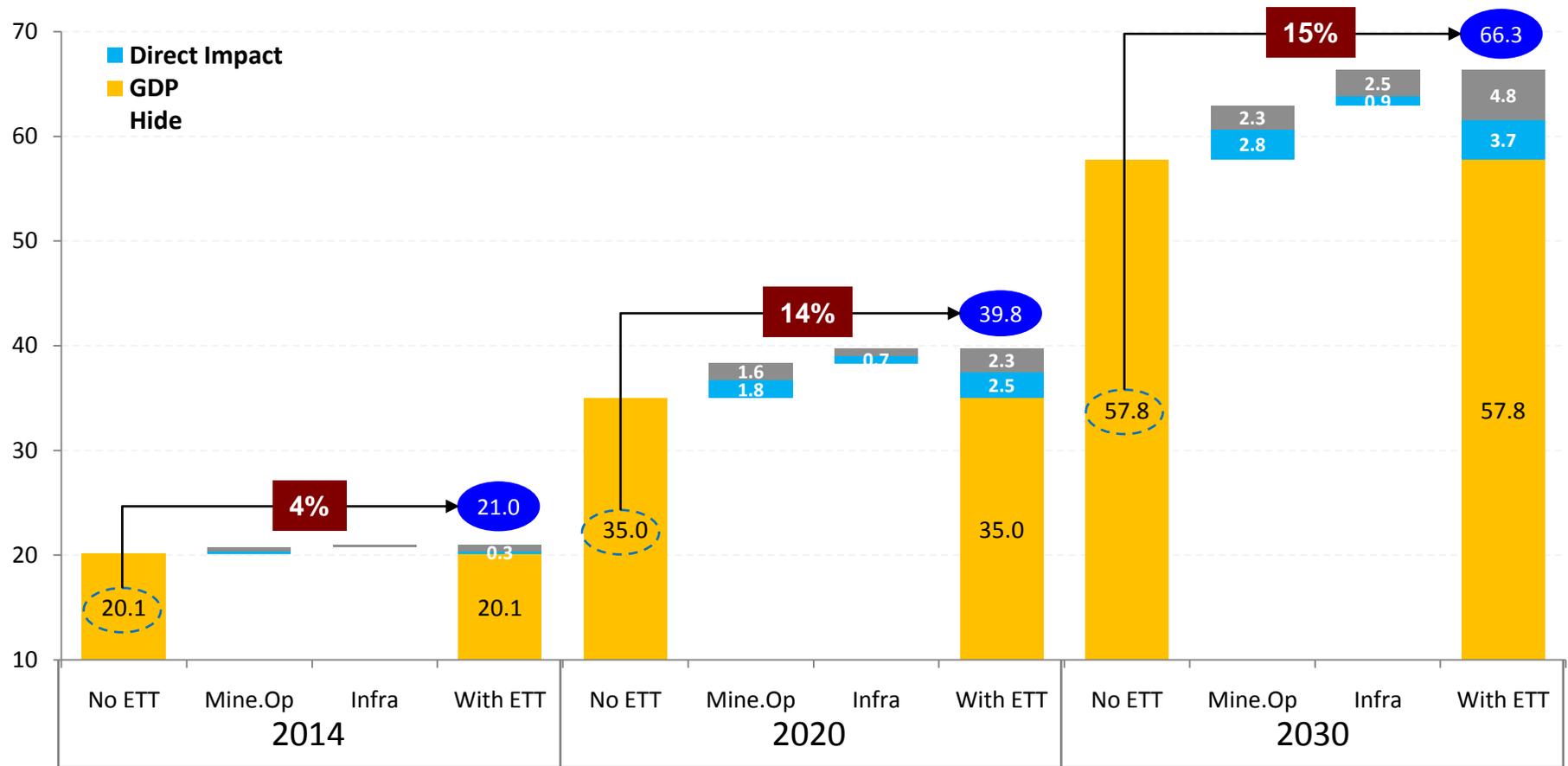
[^]Assumes OT underground starts in 2015

IMPLICATION

With enabling infrastructure, ETT can increase the economy by ~15%, of which one third is from railway and power plant

Total

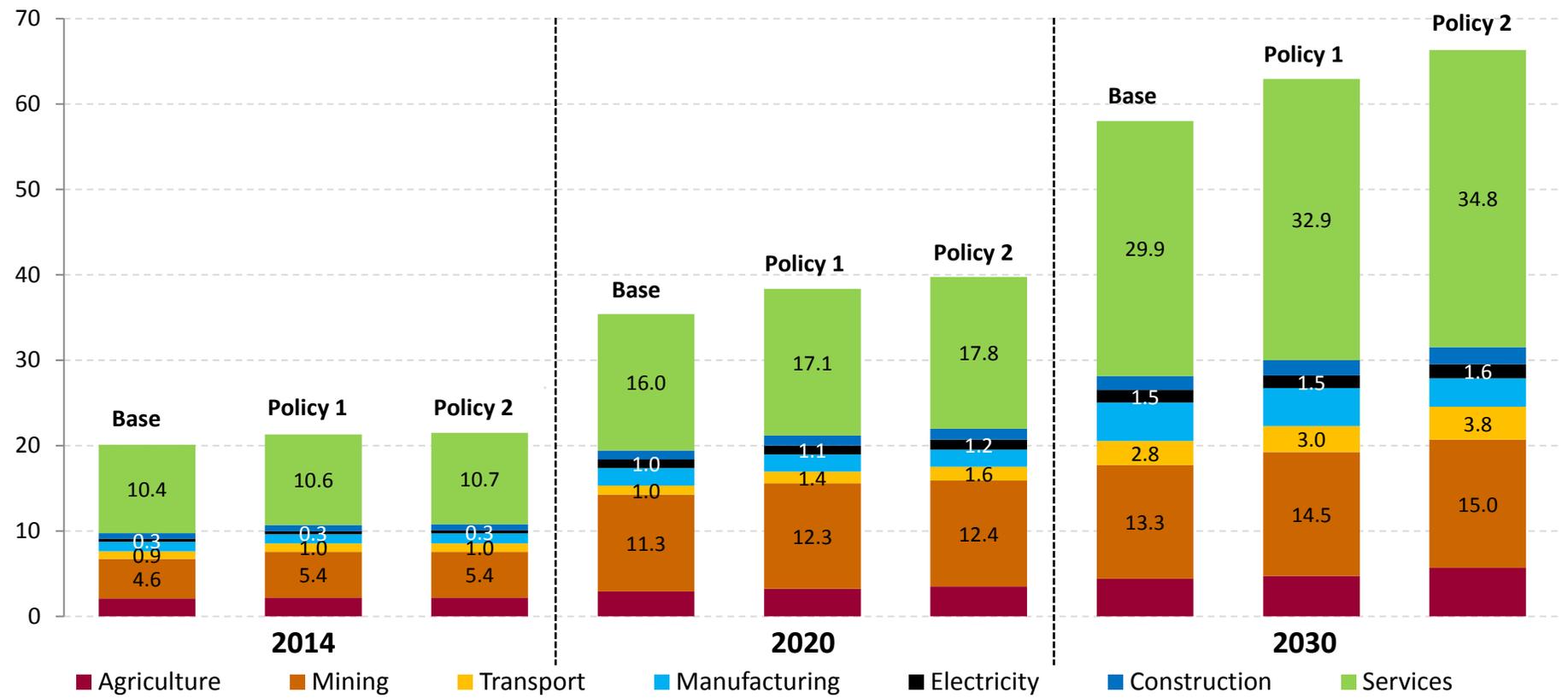
Direct and indirect impact of ETT on Real GDP in 2013 (MNT trillion)



With enabling infrastructure, ETT can increase the economy by ~US\$3 billion on average annually in 2014-2030

Although the value add from a railway and power infrastructure is insignificant, it has a noticeable impact on other sectors

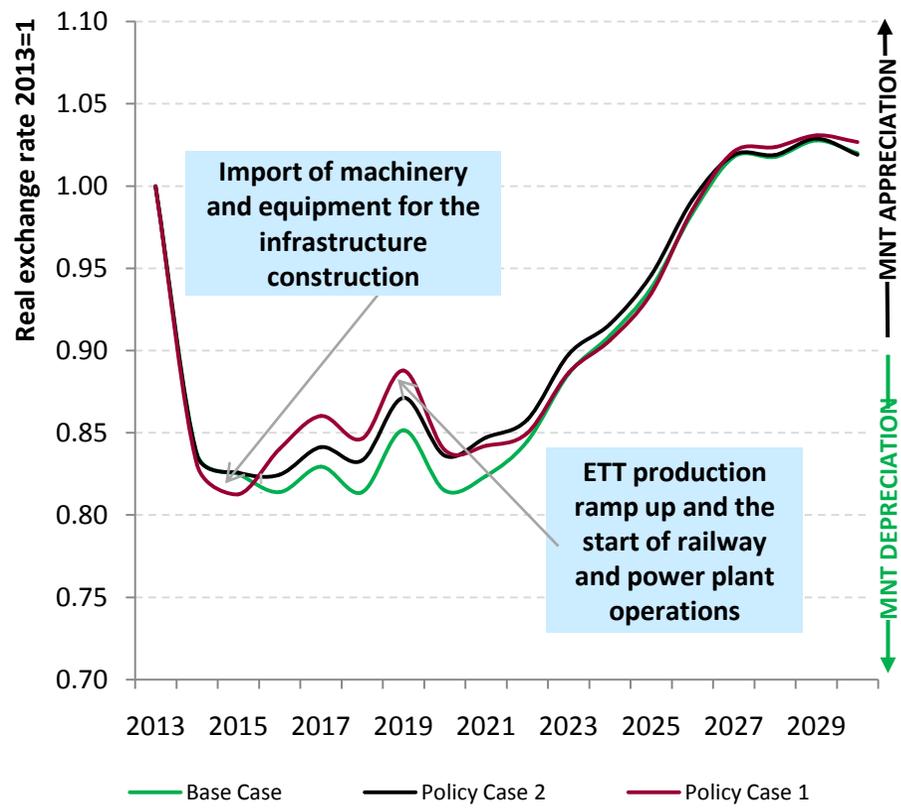
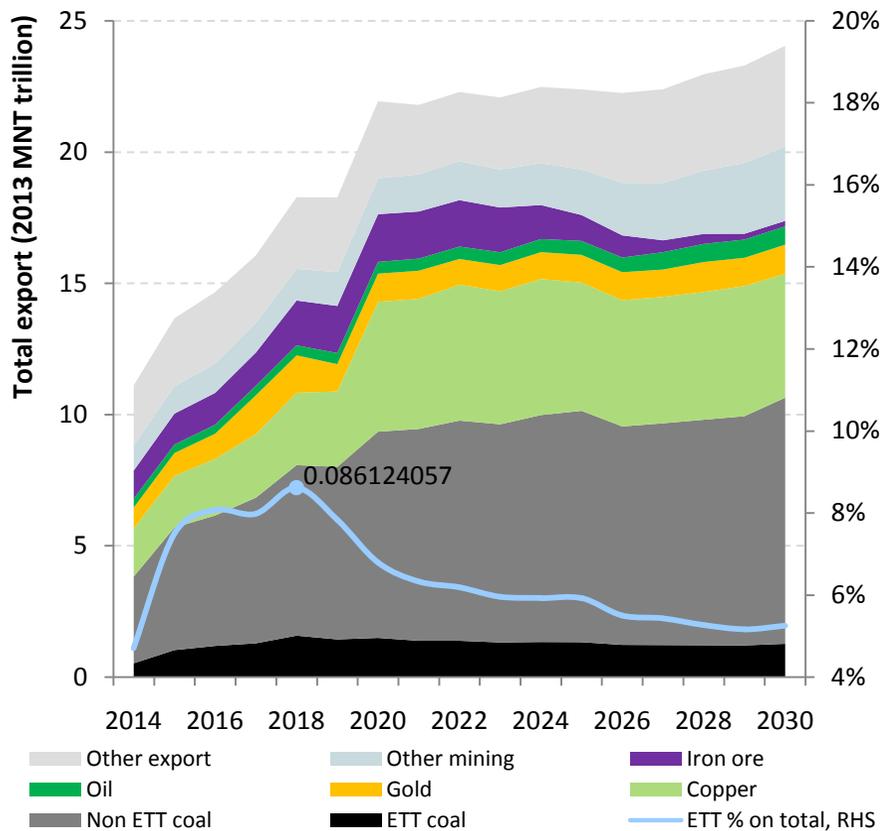
Real GDP by sectors (2013 MNT trillion)



The direct value add from building a coal railway is much higher and requires less investment than building a power plant (US\$650 million vs. US\$893 million)

By contributing 9% of Mongolian total export revenue, ETT will appreciate the MNT against USD after its ramp up

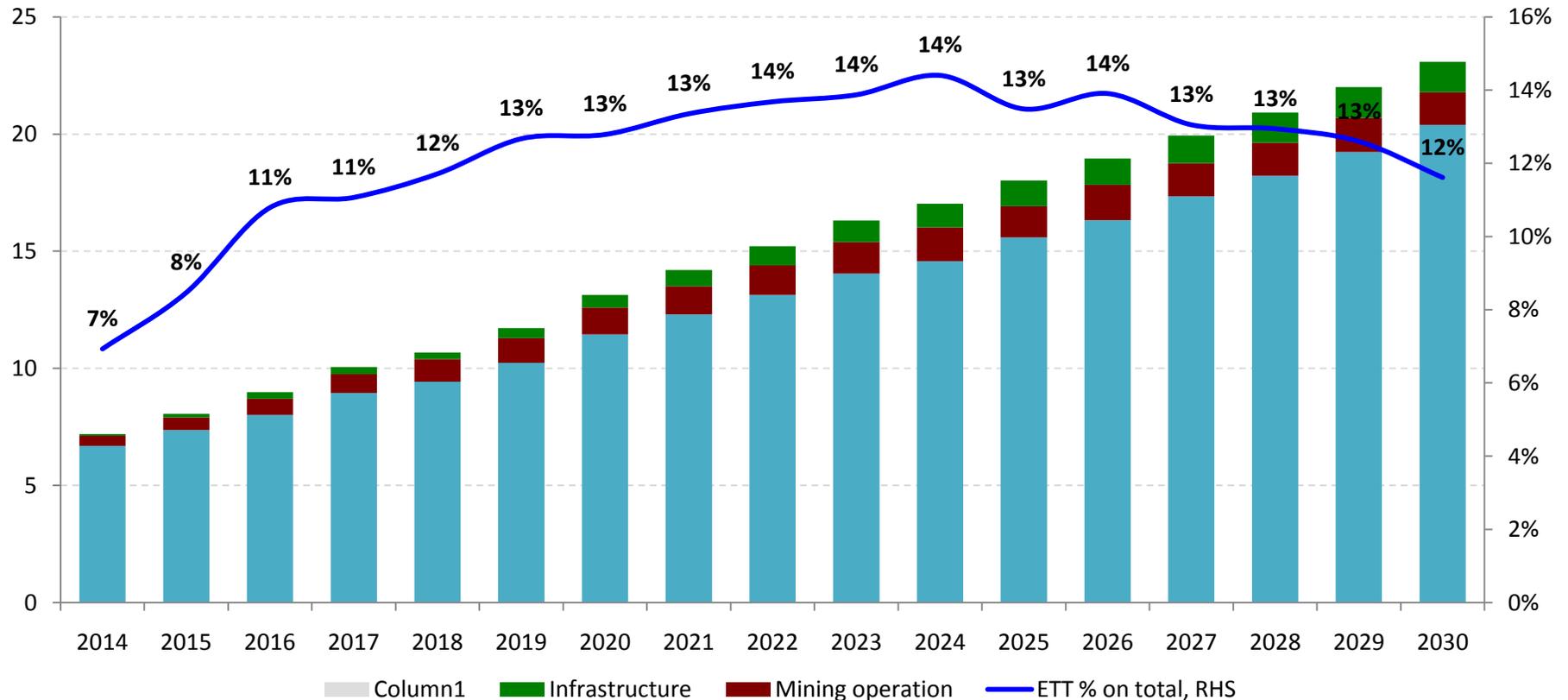
Impact on foreign trade and exchange rate



Since 2020, TT's impact on import will be approximate to its export

Coal production and enabling infrastructure development will account for approximately one tenth of state budget revenue

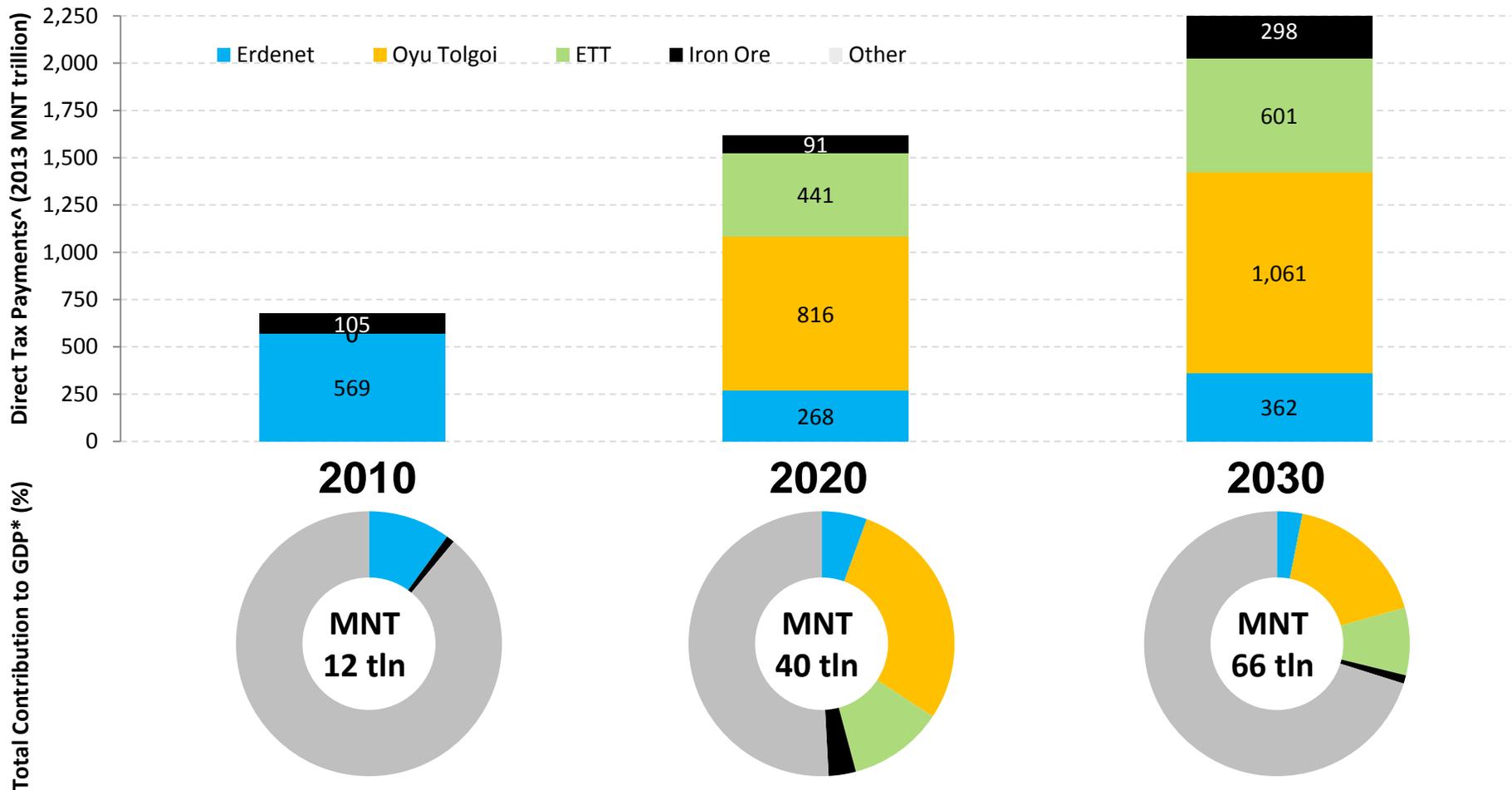
Impact on budget revenue (2013 MNT trillion)



ETT impact on budget will peak by 2025 at 14% when the mine production fully ramps up with infrastructure projects completed and operating

ETT will be the second biggest contributor to the Mongolian economy after Oyu Tolgoi (half of OT impact)

Summary: Impact on the economy and state budget revenue (2013 MNT trillion)

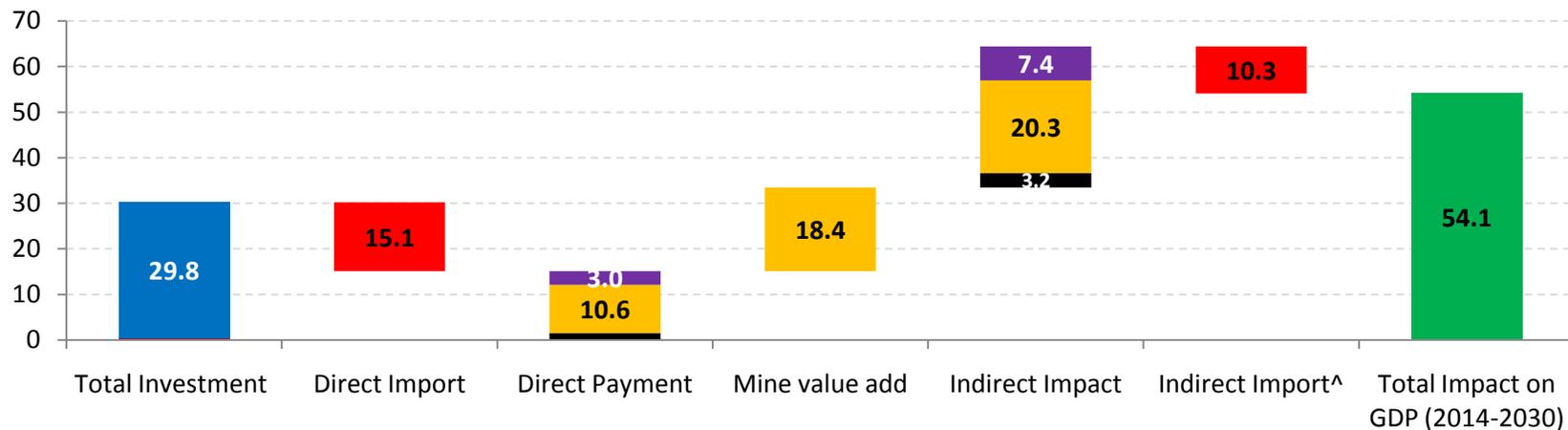


*Direct and indirect impact , ^Indirect impact on tax revenue is not considered

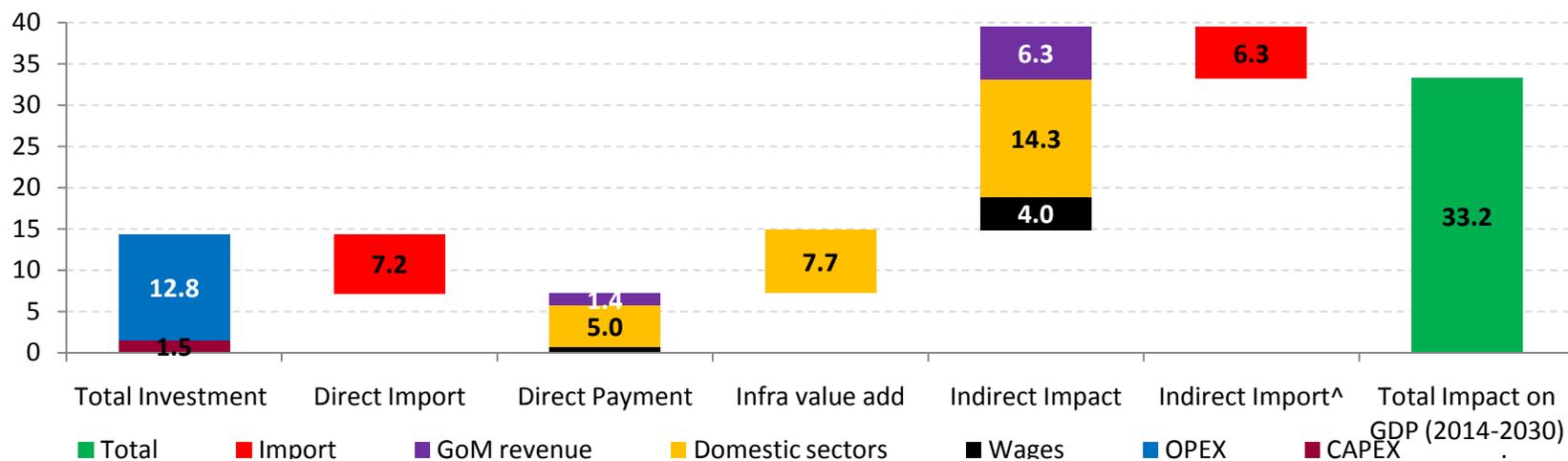
ETT mining operation will impact the economy mainly through its direct value add where the infrastructure projects will benefit the economy through indirect value generation

Impact of Erdenes Tavan Tolgoi on the economy in 2014-2030 (MNT 2013 trillion)

Policy Case 1:
ETT Mining Operations



Policy Case 2:
With ETT Infrastructure



[^]Domestic suppliers, employees and government's import purchase based on revenue from ETT

In 2030, ETT mine production and its infrastructure projects will have increased the economy by approximately half the size of the current economy

Summary

MNT trillion (2013 terms) Economic Impact we expect:	Now: 2013	In 2030		
		Base Case: No TT	Policy Case 1: Mining Operation	Policy Case 2: Infrastructure
Real GDP	17.5	57.8	62.9	66.3
Private Consumption	8.0	23.0	25.4	27.4
Government consumption	2.9	7.8	8.5	9.1
Investment	8.7	20.6	22.3	24.1
Export	4.3	22.8	24.0	25.2
Import	6.4	16.5	17.3	18.9
Total wage payment	8.2	27.6	30.2	33.2
Budget Revenue	5.9	20.4	21.8	23.1