



Oyu Tolgoi: Partnering for Growth

Speaker: Ambassador Batsukh Galsan, Ph.D
Chairman of Oyu Tolgoi LLC

5 March, 2017

Oyu Tolgoi in numbers



Operations started in 2013

- Strong safety performance - In 2016, Oyu Tolgoi was injury-free for 355 days, achieving an All Injury Frequency Rate of **0.22**
- Produced over **846,600** tonnes of concentrate in 2016; projected to produce **130,000-160,000** tonnes of copper in concentrate and **100,000-140,000** ounces of gold in concentrates in 2017
- Nearly **3 million** tonnes of concentrate delivered to customers since shipments began in 2013

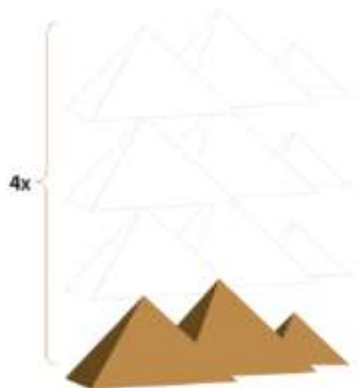
Oyu Tolgoi in numbers

- Employing over 90 per cent Mongolian workforce, focused on training and capacity building
- Total workforce of 9,306 including 6,727 contractor employees
- South Gobi spend of US\$70 million in 2016
- Paid over US\$210 million in taxes, fees and other payments in 2016
- Crossed \$6.1 billion in-country spends since 2010

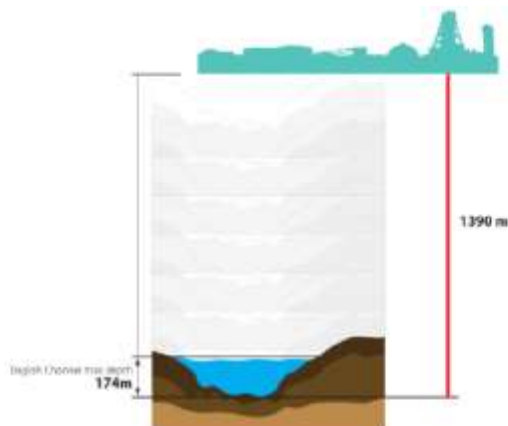


All figures at the end of 2016.

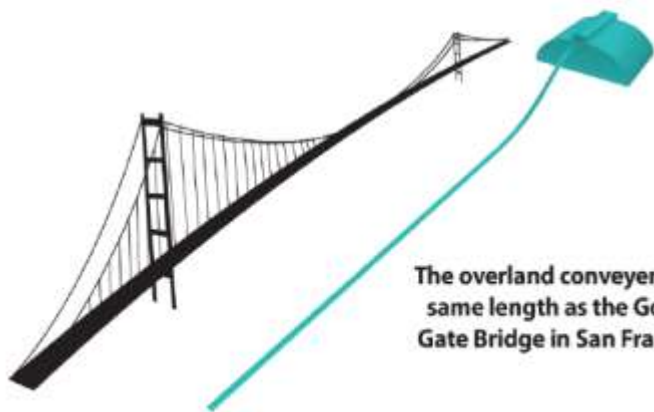
Oyu Tolgoi scale



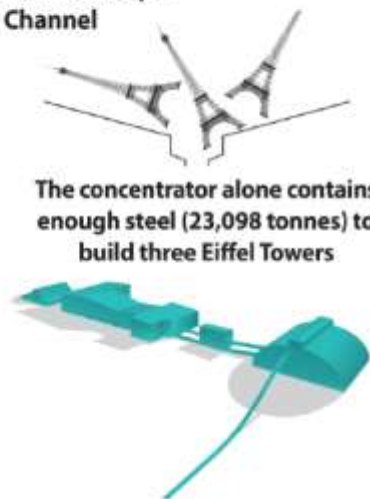
The Open Pit mine will be deep enough to stack the Great Pyramid of Giza on top of itself four times



The deepest shaft is eight times deeper than the English Channel



The overland conveyer is the same length as the Golden Gate Bridge in San Francisco



The concentrator alone contains enough steel (23,098 tonnes) to build three Eiffel Towers



Human capital building

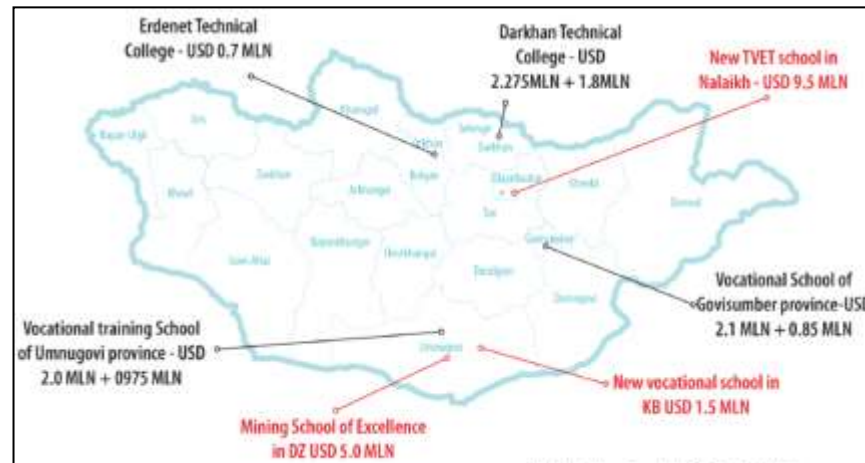


Apprentice and trainee program

- In 2016, we had 228 apprentices, 17 graduates and 54 interns
- 170 apprentices graduated and awarded Trades Qualification according to Australian Quality Training Framework
- 38 apprentices continue training till June 2017 and after their graduation 28 new intakes

Leadership development in operations

- One third of GMs are Mongolian
- 60 per cent managers are Mongolian
- 75 per cent superintendents and 99 per cent supervisors are Mongolian
- Continuing leadership development training



- US\$3.2 million invested in training and supporting skilling in mining and related areas in 2016
- Investment in education and skilling will develop a world class mining workforce, for current and future mines in Mongolia and around the world
- US\$126 million invested in the development of the vocational education and training sector under an MoU signed with the Ministry of Education, Culture and Science between 2010-2015

Environment

Water Use Efficiency

(Cubic metres per tonne of ore processed)



Water Recycling Rate

(Per cent)



In 2016, Oyu Tolgoi used an average of 0.423 cubic meters of water per tonne of ore processed – significantly better than the global average of 1.2 cubic meters per tonne, and achieved a recycling rate of 86.2 per cent.



- Recycling 100 per cent of Wastewater Treatment Plant effluent and no discharge to the environment
- Tailings Storage Facility construction and operation to recycle about 10 per cent of the process water and reduce evaporation
- Advanced thickener to recycle 75 per cent of process water
- Biodiversity programs leading the way in South Gobi
- Committed to achieve Net Positive Impact to offset Oyu Tolgoi activities
- Biodiversity offset projects including anti-poaching and sustainable cashmere
- First in country Khulan and black tailed gazelle satellite monitoring programs
- Environmental, water and biodiversity monitoring program with herders

Sustainable & inclusive development

- Invested US\$9.7 million in social and economic development projects in 2016
- Signed a Cooperation Agreement with its partner communities – composed of the Umnugobi aimag, and the Khanbogd, Manlai, Bayan-Ovoo and Dalanzadgad soums

Cooperation Agreement signing ceremony in Dalanzadgad (April, 2015)



- Sets a strong governance structure for Oyu Tolgoi and local communities to achieve more effective cooperation and address mutual obligations.
- Oyu Tolgoi will make a contribution of US\$5 million every year to a Development Support Fund (DSF) – administered jointly between Oyu Tolgoi and the Community – for community programmes and projects in the Umnugobi aimag

Community projects

Completed projects in 2016:

- Khanbogd bulk water treatment plant (US\$6.1 million project)
- Two kindergartens in Dalanzadgad soum (US\$1.9 million project)
- Dalanzadgad Sports and Cultural Complex (US\$388,000 project)
- Bayan-Ovoo health care center (US\$531,000 project)

Current projects:

- Khanbogd-Oyu Tolgoi 35.1km asphalt road construction (US\$23 million project)
- New Khanbogd school construction (US\$3.8 million project 2017-2018)
- Manlai museum project (US\$18,200 project)
- Livestock veterinary center (US\$529,000 project)



National supply chain development

- Maintains a dedicated national procurement policy focused on promoting and developing a safe, sustainable, and in-country supply chain
- Actively encourages capacity building efforts of new and existing suppliers and will partner with companies to foster in-country manufacturing and service provision for products and services that are currently imported
- Collaborated with 990 suppliers in 2016, of which 623 are national businesses that account for 62 per cent of total operations procurement spend
- Building a pathway for an inclusive economy through investment in local and national manufacturing sectors

2015 Supplier Forum



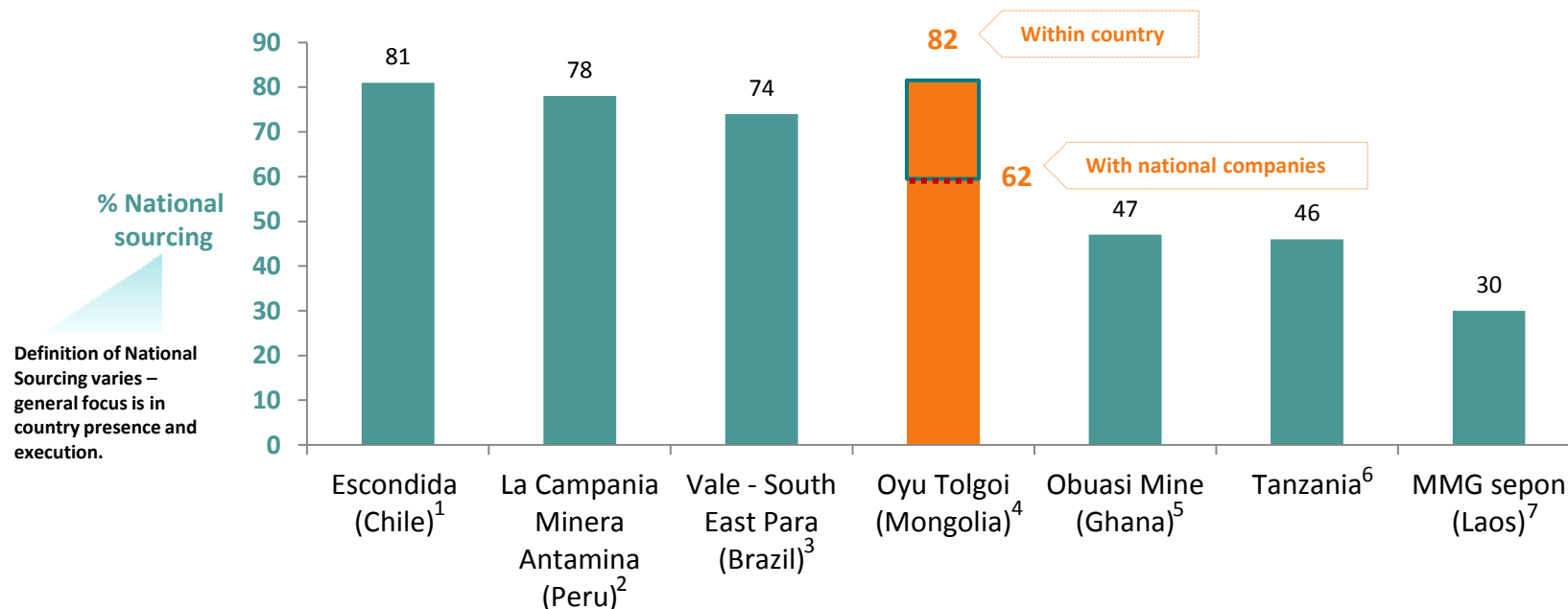
In November 2015, Oyu Tolgoi hosted the Underground Supplier Forum. More than 600 Mongolian and international businesses attended.

2017 Supplier Forum



In January 2017, more than 675 companies and 1,200 visitors participated in the second Oyu Tolgoi Supplier Forum, emphasizing in-country supply chain development for 'Life of Mine' goods and services, covering both operations and underground.

National sourcing levels already very strong for a young operation



Number of firms in supplier database	1,628	957	2,510	3,000+	50	16	n.a.
Years of commercial operations	24	13	17	4	12 ⁸	14	9

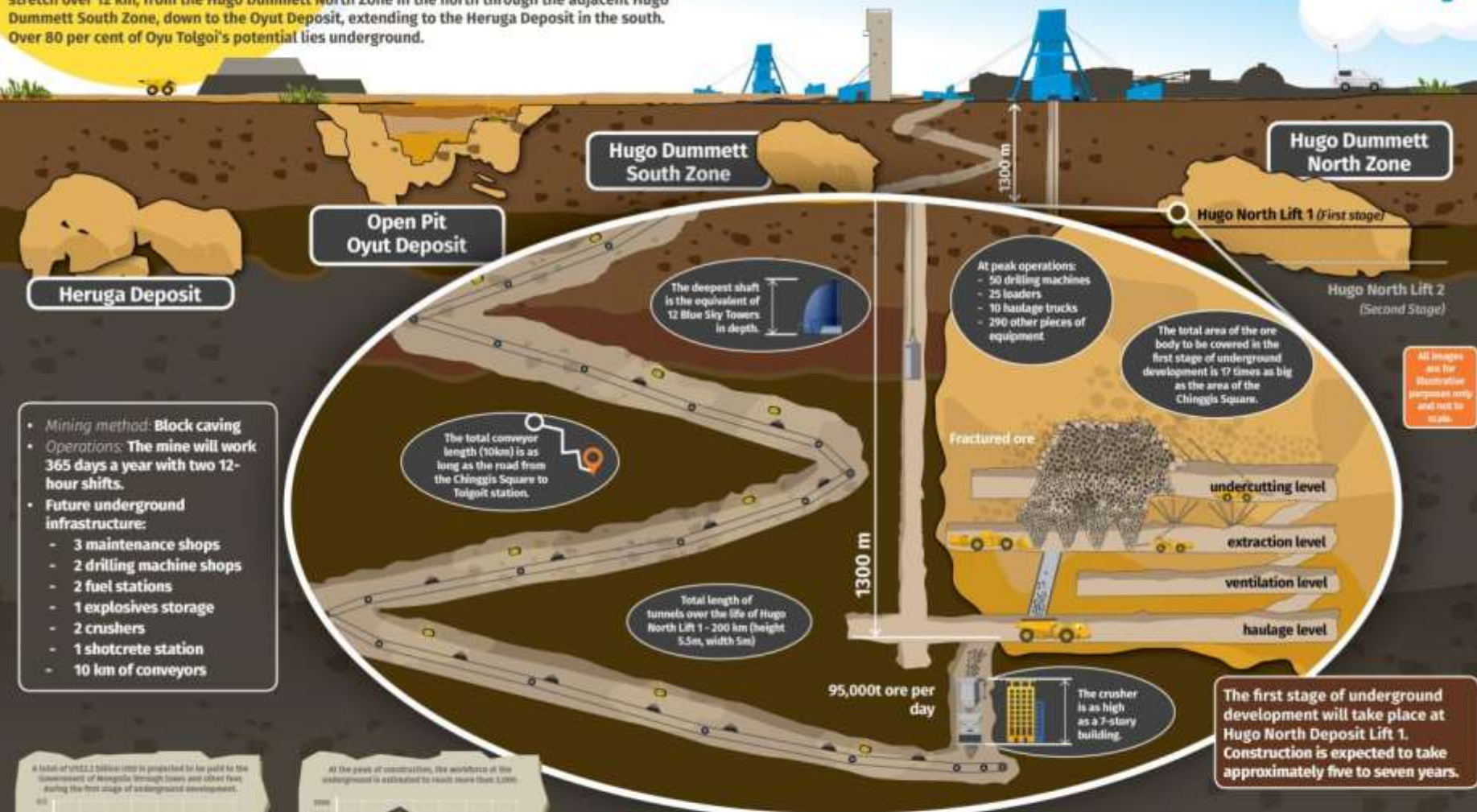
1. Year 2007; 2. Year 2008, based on number of contractors; 3. Year 2010; 4. Year 2016; 5. Year 2007; 6. Year 2007; 7. Year 2010; 8. Years of AngloGold Ashanti operations

Source: ICMM Partnership for Developments Country Reports; Infomine supplier database

Oyu Tolgoi Underground Development



Oyu Tolgoi consists of a series of deposits containing copper, gold, and silver. The deposits stretch over 12 km, from the Hugo Dummett North Zone in the north through the adjacent Hugo Dummett South Zone, down to the Oyut Deposit, extending to the Heruga Deposit in the south. Over 80 per cent of Oyu Tolgoi's potential lies underground.



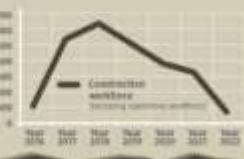
- **Mining method:** Block caving
- **Operations:** The mine will work 365 days a year with two 12-hour shifts.
- **Future underground infrastructure:**
 - 3 maintenance shops
 - 2 drilling machine shops
 - 2 fuel stations
 - 1 explosives storage
 - 2 crushers
 - 1 shotcrete station
 - 10 km of conveyors

A total of US\$1.1 billion (USD) is projected to be paid to the Government of Mongolia through taxes and other fees during the first stage of underground development.



* Figures are inclusive of open pit operations and underground construction.
* All numbers are estimations and may be updated.

At the peak of construction, the workforce at the underground is estimated to reach more than 5,000.

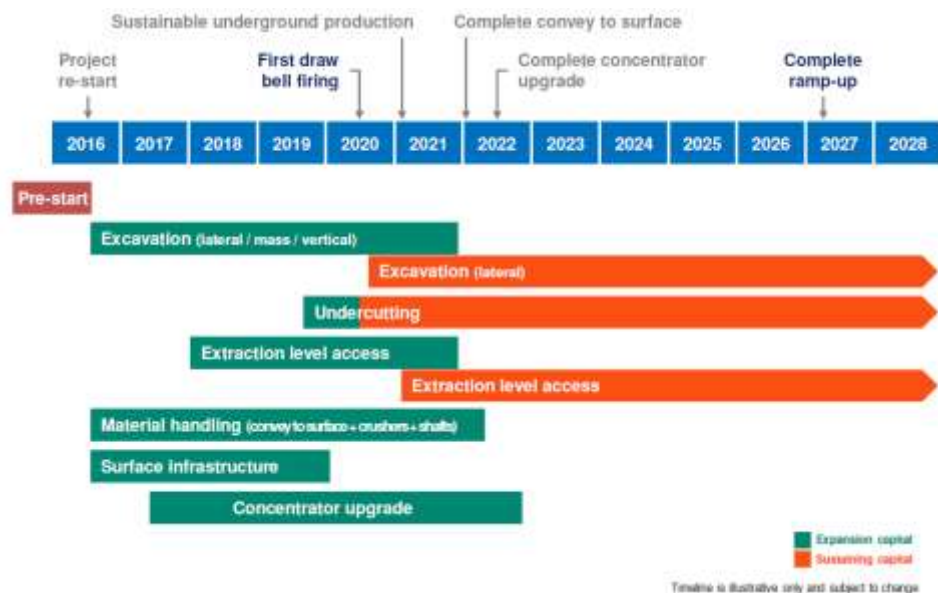


Underground Development Plan enables restart of underground construction

- The Underground Development Plan marks a major step forward in the partnership:
 - Provides a clear way forward for development of underground mine, unlocking value
 - Provides stable funding for construction
- A significant amount will be spent in country including domestic operating cost expenditure, domestic capital cost expenditure, and direct payment to GoM over 5-7 years



Underground development timeline



- Formal notice to proceed by the boards of Turquoise Hill Resources, Oyu Tolgoi and Rio Tinto
- 2016 OT Feasibility Study approved
- Drawdown of \$4.3 billion of project finance
- EPCM services contract awarded to Jacobs Engineering
- Major contracts for the Underground Development Services, Mine Support Services, Shaft 2 and Shaft 5 Sinking awarded
- The underground project workforce ramped up to over 2,000 people (majority are Mongolian)
- Progress made in key areas including construction of on-site facilities



JACOBS

ХИШИГ АРВИН
HARTSPRINGER

REDPATH

MCS

normet



Underground construction in numbers



The underground crusher is as high as a 7-storey building.

Total length of the tunnels over the life of Hugo North Lift 1 is 200km (height 5.5m, width 5m).

Requires sinking of 5 vertical shafts, totaling 6km of vertical development, and a decline with a 10km long conveyor to surface.

At peak operations:

- 50 drilling machines
- 25 loaders
- 10 haulage trucks
- 290 other pieces of equipment

- Mining method: **Block caving**
- Operations: **The mine will work 365 days a year with two 12-hour shifts.**
- Future underground infrastructure:
 - 3 maintenance shops
 - 2 drilling machine shops
 - 2 fuel stations
 - 1 explosives storage
 - 2 crushers
 - 1 shotcrete station
 - 10 km of conveyors

Introducing cutting-edge technology and standards

- **Block caving** for optimal and safe underground mine design
- **Safety related technology** including **Smart Cap** (managing fatigue for haul truck and logistics drivers)
- **Virtual reality technology** used in underground personnel training (for improved safety awareness)
- **Rehabilitation and biodiversity** programmes
- Committed to building a **strong safety culture in Mongolia's mining industry**
- Leading by example with '**The way we work**', reflecting our strong commitment to integrity, rigorous standards of corporate governance



Timeline: Oyu Tolgoi



Early exploration and prospective work was carried out at Oyu Tolgoi over the 1950s.

1950s



BHP receives an exploration license for the area around Oyu Tolgoi. BHP starts its first field exploration in April 1997.

1997



In 2004, PDAC declared the Hugo Dummett deposit as the most significant mineral discovery worldwide.

2003



Oyu Tolgoi commences its first shipment of copper concentrate in July, 2013.

2013



In October 2016, Oyu Tolgoi shipped its 2.5 millionth tonne of copper concentrate.

2016

1987-1989



Detailed mapping surveys of the Oyu Tolgoi area are conducted from 1987 to 1989.

1999



In 1999, Oyu Tolgoi is presented to the mining world for the first time, where ore samples and preliminary information is presented at PDAC.

2009



An Investment Agreement is signed between the Government of Mongolia, Ivanhoe Mines and Rio Tinto on 6 October, 2009.

2015



The Oyu Tolgoi Underground Project Finance package was signed in December, 2015.

Long-term partnership

Oyu Tolgoi is the biggest embodiment of a genuine partnership between the Government and international investors

- It is being built based on mutual respect, trust and collaboration
- It is an example of Mongolia's long-term commitment to the international investment community
- The strong support from stakeholders in Mongolia – across policies and permitting – is key to not only Oyu Tolgoi's progress, but to all other major projects
- This partnership contributes to the development of a positive and enduring image of the country and our business
- Building partnership and nurturing the positive national image essential to being globally competitive to be able to deliver long term value to our stakeholders



RioTinto



Turquoise Hill
Resources Ltd.

