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The coal industry of the United Republic of Tanzania. Part 2.

Review





General characteristics of the coal industry in Tanzania

- ✓ **Potential and Reserves:** Tanzania has the largest coal reserves in East Africa—approximately 1.5 billion tonnes. The main deposits are located in the southwest of the country in **the Ruhuhu, Mchuhuma, Ngaka, and Kivira basins**.
- ✓ **Primary Mining Method:** Opencast mining is used, as the coal seams lie close to the surface.
- ✓ **Coal Type:** The country primarily produces bituminous coal (high-quality thermal coal), which can be used in both the energy sector and industrial applications, such as cement and steel production.
- ✓ **Domestic Market:** Almost all of the coal mined in Tanzania (**94%**) is consumed domestically, as the industry is focused on supporting its growing economy.

The country's main mines and prospects

The main capacities of the coal industry in Tanzania:

- **Ngaka Coal Mine:** The country's largest operating coal mine, with an annual production rate of 0.75 - 1.2 million tonnes. It is operated by Tancoal Energy, a joint venture between Intra Energy Corporation and the state-owned National Development Corporation (NDC).
- **Kiwira Coal Mine:** The second operating small coal mine, operating in the new Songwe region, has an installed annual capacity of 150,000 tonnes. Kiwira Coal & Power holds the mining license for the Iwogo Range. The company is wholly owned by Stamico, the State Mining Corporation, which is 100% government-owned.
- **Mchuchuma Project:** A large, prospective project that involves the construction of a coal-fired power plant. Coal reserves here are estimated at 370 million tonnes.
- **Tankool Mine Project:** Another project of national importance managed by Intra Energy Corporation (IEC) since 2011.

Let's take a closer look at them:

• Ngaka Coal Mine

The Ngaka Coal Mine is the largest operating coal mine not only in Tanzania, but in all of East Africa.

Characteristics of the mine

Location: The mine is located in southwestern Tanzania, in the Ruhuhu Basin, Mbinga District, Ruvuma Region. It is approximately 40 km east of Lake Nyasa and 1,100 km southwest of Dar es Salaam.

Foundation: Tancoal Energy Ltd. was founded in 2008, and active coal production at the Ngaka mine began in 2011.

Number of employees: The mine employs up to 457 people. All staff are local residents.

Management

company: The mine is operated by Tancoal Energy Limited.

- 70% of the shares are owned by Intra Energy Corporation (IEC) of Australia.
- 30% are owned by the state-owned National Development Corporation of Tanzania (NDC).



Capacity: The open-pit mine's design capacity is 1.2 million tons of coal per year.

Current production volume: On average about 0.75 million tons per year.

Production has been volatile in recent years and the latest available data is:

- **2024:** 0.75 million tonnes (per year).
- **2021: 0.75** million tonnes (according to GlobalData, per year).
- **2020: 0.5** million tonnes.
- **2019:** 748,874 tonnes. The decline in 2020 is explained by disruptions caused by the COVID-19 pandemic and increased competition.

Revenue: Information is only available for 2019, when the mine was performing well:

- **Revenue for 2019:** A\$52.277 million Australian dollars (equivalent to US\$36.34 million). This was made possible by a 46% increase in sales compared to 2018.
- **Taxes:** For 2021, the company paid TZS 5.9 billion (approximately US\$2.5 million) in taxes to the Tanzanian government.)

Sales and Buyers: Most coal is consumed domestically, and sales volumes were highly dependent on external factors.

Sales Volumes: 523,027 tonnes were sold in 2021, compared to a record-breaking 788,702 tonnes in 2019 (-34%).

Sales Geography (2019): 67% of coal was sold in Tanzania, 15% in Kenya, and 18% in Rwanda and Uganda.

Consumer Industries (2019): The main buyers were the cement industry (56% of sales) and the ceramics industry (32%). The remainder came from textile and other industries.

Coal type and quality: The mine produces subbituminous thermal coal. Its quality is considered sufficient to compete in export markets, such as with coal from Richards Bay, South Africa.

Plans: The company plans to increase production to 4-5 million tons of coal per year, which will allow it to exploit its proven resources for more than 50 years. This expansion project is currently in the "deferred" status.

- **Kiwira Coal Mine**

Mine Characteristics





Location: The mine is located in southwestern Tanzania in the Songwe Region, 100 km south of Mbeya City, in the Songwe-Kiwira coalfield.

Opening: The mine officially commenced operations in 1988. Infrastructure construction began in 1983 with joint funding and technical assistance from China and the Tanzanian government. In 2013, production at the mine was completely halted, and in 2022, it resumed after extensive reconstruction. The mine is now operational again.

Management Company and Ownership: Kiwira is currently 100% managed by the state-owned Tanzania Mining Corporation (STAMICO).

Until 2005, the mine was state-owned, but was subsequently privatized and transferred to TanPower Resources Limited. Following operational problems and wage arrears in 2019, the President of Tanzania ordered the return of all assets to the state, which was accomplished.

Current Capacity: From July 2024 to March 2025, the Kabulo-Kiwira project (part of the overall complex) produced 208,866 tonnes of coal.

Number of Employees: The exact current number of employees is not disclosed. However, in 2022, it was reported that after the mine resumed operations, all previously laid-off workers would be rehired, with estimates ranging from 400 to 2,500 people being cited at various times. Before production ceased in 2013, the mine employed approximately 600 people. Revenue: For the nine months from July 2024 to March 2025, state-owned STAMICO earned revenue of 7.84 billion Tanzanian shillings (TZS) from the sale of 192,141 tons of coal. This compares to approximately \$2.9 million in the US at current exchange rates.

Taxes: Of this amount, TZS 1.46 billion (\$0.54 million) was paid to the government in taxes and fees.

Coal Sales: The main consumers of Kiwira coal are domestic industrial enterprises, such as the Mbeya Cement Factory and paper mills. Additionally, the coal is used to power a local coal-fired power plant and to produce coal briquettes for farmers in the Tabora region. Type and method of extraction: The coal at Quivira is subbituminous and bituminous, energy-grade, with a calorific value of 5,000–6,200 kcal/kg.

Mining is conducted using a mixed method: both underground (mechanized underground mining) and open-pit mining. The mine also processes the coal (washing, sorting, and removing impurities).

Key development projects and weaknesses

The largest project is Kiwira Mine-2, which envisions the construction of a thermal power plant with a total capacity of 200 MW, expandable to 400 MW in the future. The project is planned to be implemented with the participation of Chinese or Russian companies, but has not yet been launched.

The main risks include outdated equipment after prolonged inactivity, high dependence on government funding, and environmental issues associated with high levels of heavy metals in the coal and waste (high levels of manganese, zinc, and other heavy metals).

The main driver for mining expansion is currently the launch of a new briquette plant (Rafiki Briquettes Factory), which will use Kiwira coal as an alternative to firewood for tobacco farmers, a move supported by the government. Furthermore, the government recognizes the role of coal in ensuring energy security, so significant investment in this sector is expected.

Plans: The large-scale Kiwira Mine-2 project includes the construction of a new open-pit mine capable of producing 1.2 million tons of coal per year, as well as expanding the existing underground mine from



150,000 to 300,000 tons per year. Coal resources (over 300 million tons) are sufficient to maintain this capacity for 40 years.



Major players in the industry

High-calorific thermal coal production in Tanzania is concentrated in the southwestern Ruvuma, Rukwa, and Songwe-Kiwira basins, where key operators include Tancoal Energy Limited, Edenville International (Tanzania) Limited, and the state-owned STAMICO (Kiwira Coal & Power Company).

Ruvuma Basin

Leading Tanzanian legal entities involved in both mining (at the southern deposits) and wholesale distribution of coal through Dar es Salaam:

1. Ruvuma Coal Limited

The largest and most active private player in the thermal coal sales and export market in Tanzania. The company offers a comprehensive service that includes coal mining and delivery to any port worldwide.

- **Mining location:** Mbinga District, Ruvuma Region (south of the country).
- **Sales and logistics office:** Dar es Salaam, on the Indian Ocean coast, the country's main financial center.
- **Products:** The company mines high-calorific bituminous coal and classifies its commercial products according to the international South African Richards Bay (RB) classification, dividing the coal into three export grades: RB1 (premium, clean), RB2/RB3 (energy), and Cobbles (large lump coal). RB1 coal has the highest energy value and lower sulfur and ash content compared to RB2 and RB3 coal.
- **Production capacity:** The company's mine in Songea produces approximately 2.5 million tons of coal per year (2022)
- **Sales markets:** Products are actively exported in large shiploads (from 60 thousand tons each) through the port of Mtwara to the Netherlands, Great Britain, Poland, India, North Africa, Congo, Kenya, Uganda, Rwanda, Pakistan, China, Egypt and Senegal, and are also supplied by land to cement plants in East Africa.
- **Staff:** Approximately 1,250 employees.
- **Market valuation*:**
 - o Taxes and Direct Payments to the Government



According to the official government report of the Tanzania Extractive Industries Transparency Initiative (TEITI), Ruvuma Coal Limited pays approximately 6 billion Tanzanian shillings (TZS) to the government in direct government fees (royalties, license fees, and taxes) alone.

o Revenue Estimates Based on Production Volumes

Based on the volume of thermal coal shipped to domestic and international markets, the company's total annual gross revenue is estimated to be between US\$100 million and US\$150 million, making it one of the main foreign exchange generators in the country's mining sector.

**The exact amount of annual revenue of Ruvuma Coal Limited is not disclosed in public financial statements, as the company is a private legal entity (Private Limited Company) and under Tanzanian law is not required to publish full audited profit and loss statements in the public domain.*

However, the scale of its financial activities can be assessed using official indirect government and operational data:

Modernization: The company's current focus is on a newly developed coal washing plant using dense media separation (DMS).

Additionally, to improve the efficiency of its port facilities and distribution network, the company recently installed two new Samson loaders, which will help speed up vessel turnaround times when unloading and loading cargo.

Ruvuma Coal Limited Laboratory Analysis Specifications

Sample ID	% FIXED CARBON	* Ash content on dry basis, % (*ASH DB)	Volatile matter on a dry basis, % (VOLATILE MATTER DB)	Analytical moisture, % (MOISTURE CONTENT ADB)	Higher calorific value, kcal/kg (GROSS CALORIFIC VALUE)	Sulfur, % (S)
Top grade (Premium/ RB1)	58-62	16-18	15-25	2-4	6 200 — 7 200	0.4-0.7
Energy varieties (RB2 / RB3)	52-56	19-22	20-33	3-5	5000 — 6000	< 1

Evaluation of the above coal samples

The RB1 grade from Ruvuma Coal, thanks to high-quality separation at the processing plant, has a very high peak calorific value (up to 7200 kcal/kg), which makes it in demand for metallurgy and cement plants in East Africa.

The quality of exported Tanzanian coal is officially certified by the state reference laboratory TIRDO (Tanzania Industrial Research and Development Organization) and international inspectors (SGS) before loading at the port of Mtwara (Mtwara Port).

2. Tancoal Energy Limited



Historically a leading coal mining company, established as a joint venture between the government and an Australian investor.

- **Ownership:** Privately held company with state participation.
- **Shareholders:** 70% owned by Australian public company Intra Energy Corporation (ASX: IEC) (through its subsidiary Intra Energy Tanzania Limited), and 30% owned by the Government of Tanzania through the National Development Corporation (NDC).
- Headquartered in Dar es Salaam, Tanzania.
- **Employees:** 445.
- **Mining location:** Ngaka Coal Project, western/southwestern Tanzania.
- **Coal type:** Thermal/Bituminous coal.
- **Brand:** High-quality thermal coal
- **Production capacity:** The company is capable of producing 70,000 to 100,000 tons of coal monthly (~900,000 to 1,200,000 tons per year) subject to high demand and logistics availability. Learn more about production capacity. The company has a weigh station capable of handling over 155 trucks per day.
- **Production potential** is up to 2–5 million tons of coal per year.
- **Actual sales volumes:** Historically, they have ranged from 450,000 to 750,000 tons per year.
- **Primary market:** Coal is supplied unwashed directly to end users (cement plants, ceramic factories).

Laboratory analysis of coal (raw and enriched)

Coal from the Ngaka deposit is characterized by low ash content, low sulfur content, and high calorific value.

We present average design data for raw (unprocessed) coal (Run-of-Mine / ROM), which is mined from the open pit along with waste rock.

1. Raw (unprocessed) coal

- **Gross Calorific Value (GCV):** ~5,000–6,200 kcal/kg
- **Inherent Moisture:** Less than 3%
- **Ash Content:** 18–30% (average 25%)
- **Sulfur Content:** 0–1% (low-sulfur coal)
- **Volatile Matter:** 15–30%

We will consider washed (enriched) coal of the highest quality or clean laboratory samples without impurities.

2. Washed (enriched) coal

- **Calorific Value (GCV):** ~6,000–6,300 kcal/kg (or 25–26 MJ/kg) confirmed by quality assessments at Mining Review Africa.
- **Total Moisture:** ~7–12%
- **Ash Content:** Low, typically 6–10%
- **Sulfur Content:** Low (around 1% or less)
- **Volatile matter:** ~20–30%

3. God Mwanga Gems Limited (Coal Division)

A large Tanzanian diversified company actively developing the sector of production and domestic sales of solid fuels.



- **Location:** Coal mines are located in the Mbinga and Nyasa districts in the Ruvuma region.
- **Sales:** Supplies coal to the domestic industrial sector (including factories in Dar es Salaam).
- **Products:** High-calorific bituminous coal

Laboratory analysis of coals No. 1

Laboratory analysis of two coal samples mined by GODMWANGA GEMS CO.LTD (dated 29.04.2022) (A detailed analysis of all analysis technologies was carried out by the laboratory of the Geological Survey of Tanzania (GST)).

Sample ID	% FIXED CARBON	* Ash content on dry basis, % (*ASH DB)	Volatile matter on a dry basis, % (VOLATILE MATTER DB)	Analytical moisture, % (MOISTURE CONTENT ADB)	Higher calorific value, kcal/kg (GROSS CALORIFIC VALUE)	Sulfur, % (S)
Sample №1	66.15	9.47	24.38	4.17	7274	0.65
Sample №2	66.59	7.61	25.8	3.88	7444	0.90
Units of measurement	%	%	%	%	Kcal/kg	%
Method of analysis	ASTM* D3172	GA03	ASTM D3175	ASTM D3302	Calculation method	XRF01

**The ASTM standards (developed by the American Society for Testing and Materials) cited in the report regulate strictly defined methods for laboratory testing of coal.*

Description of each method

- **ASTM D3172** — *Standard Practice for Proximate Analysis of Coal and Coke. This standard describes the general practice for the integrated determination of the four major components of solid fuel: moisture, ash, volatile matter, and fixed carbon. It serves as a basic "guide" that integrates other analyses into a single system for assessing the quality and market value of coal.*
- **ASTM D3175** — *Standard Test Method for Volatile Matter in the Analysis Sample of Coal and Coke. This test measures the amount of gaseous products (excluding moisture vapor) released from coal when it is heated to a high temperature in the absence of air (approximately 950°C). This parameter is critical for understanding how easily coal will ignite.*
- **ASTM D3302** — *Standard Test Method for Total Moisture in Coal. This standard governs sample collection, preparation, and drying for accurate measurement of water content in coal. Moisture reduces the total heating value and is therefore strictly controlled in commercial transactions.*

Other methods from the table

- **GA03** is an internal or national laboratory test method for combustion of coal in a muffle furnace to determine ash content (the remaining non-combustible mineral impurities).
- **XRF01** is an X-ray fluorescence method. It determines the mass fraction of sulfur in coal by irradiating the sample with X-rays, which allows recording the sulfur emission spectrum without damaging the sample structure.



- **Calculation method** - the Geological Survey of Tanzania laboratory calculated the calorific value mathematically using the results of technical (near) analysis according to ASTM D3172, without burning the coal in a physical apparatus (bomb calorimeter) for this specific measurement.

Evaluation of the above coal samples

This coal is of very high quality and is classified as high-energy hard coal (internationally, as a high-ranking bituminous coal).

Its commercial value is due to the combination of high calorific value and extremely low ballast (ash and moisture) content.):

- **Exceptional calorific value (7,274–7,444 kcal/kg)**

This is a very high value for thermal coal. In the international market, coal with a calorific value of 6,000 kcal/kg (API 2) is often considered the benchmark. This Tanzanian coal exceeds this benchmark by more than 20%, making it a premium fuel.

- **Low ash content (7.61%–9.47%)**

Ash is useless ballast. Values below 10% are considered excellent for unwashed coal. This means minimal solid waste (slag) and high combustion efficiency during combustion.

- **Moderate moisture content (3.88%–4.17%)**

A low analytical moisture content indicates that the coal is dry, will not "waste" its own energy on water evaporation during combustion, and is easy to transport. • Optimal volatile matter content (24.38% – 25.8%)

This level ensures easy and stable combustion of coal in industrial furnaces, while also ensuring a smooth and long-lasting burn.

- **Low to medium sulfur content (0.65% – 0.90%)**

A sulfur content of up to 1% is considered environmentally favorable. Its combustion produces relatively little sulfur dioxide (SO₂), reducing the load on wastewater treatment plants and reducing equipment corrosion.

This is a highly marketable, export-ready product. Sample No. 2 has slightly higher performance (higher calorific value, less ash), but both samples are excellent.

This coal is ideal for:

- • Pulverized coal-fired power plants (for efficient electricity generation).
- • Cement industry (where extremely high temperatures are required).
- • Metallurgy (as a fuel or a component of the charge, if the coking properties allow it).

Laboratory analysis of coals No. 2

The following laboratory analysis reveals the full chemical composition of coal ash and trace element content, and a proximal study of two coal samples (from 11/15/2021).

1: Main oxides and elements in ash

Au (*Gold): < 0.003 g/t (BS ISO 10378-2005 method*) - trace amounts. The remaining elements were measured using the XRF01 method.



Sample ID	SiO ₂ (Silicon dioxide)	CaO (Calcium oxide)	Al ₂ O ₃ (Aluminum oxide)	Fe ₂ O ₃ (Iron oxide)	MgO (Magnesium oxide)	SO ₃ (Sulfur trioxide)	TiO ₂ (Titanium dioxide)	MnO (Manganese oxide)	P (Phosphorus)	Zn (Zinc)
Coal A	5.37	0.19	1.10	0.40	0.40	0.47	0.52	1.89	605	125
Coal B	5.69	0.22	1.09	0.20	0.18	0.52	0.60	0.30	610	120
Units of measurement	%	%	%	%	%	%	%	%	ppm	ppm

*** BS ISO 10378:2005 (for Au — Gold):** The official British and international standard for the determination of gold content in copper, lead, and zinc sulphide concentrates by fire assay followed by gravimetric or atomic emission determination.

XRF01 (for SiO₂, CaO, Al₂O₃, Fe₂O₃, MgO, SO₃, TiO₂, MnO, Zn): X-ray fluorescence spectrometry. An ash sample is irradiated with high-power X-rays. Each chemical element emits a unique secondary (fluorescent) emission in response. The instrument detects this wave and accurately determines the percentage of metal and non-metal oxides. This is the industry standard for the analysis of silicate and carbon matrices.

2. Microelements and heavy metals (in ppm – parts per million)

All parameters in this table are measured by XRF01 (X-ray fluorescence) method).

(Sample ID)	Cl (Chlorine)	Cr (Chromium)	V (Vanadium)	Sr (Strontium)	Cu (Copper)	As (Arsenic)	U (Uranium)	Th (Thorium)	Pb (Lead)	Nb (Niobium)
Coal A	447	71	81	42	28	28	5	3	3	14
Coal B	454	2	54	34	31	7	7	4	5	17
Units of measurement	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

3. Technical analysis / Proximate Analysis

Sample ID	FIXED CARBON	*ASH DB	% (VOLATILE MATTER DB)	% MOISTURE CONTENT ADB	GROSS CALORIFIC VALUE	Sulfur, % (S)
Sample №1	62.98	9.85	27.17	3.53	7243	0.19
Sample №2	65.49	9.47	25.04	3.67	7284	0.21



Units of measurement	%	%	%	%	Kcal/kg	%
Method of analysis	ASTM* D3172	GA03	ASTM D3175	ASTM D3302	Calculation method	XRF01

Evaluation of coals from the second laboratory analysis

These coal samples fully confirm the premium quality and provide important technological insights:

- **Phenomenally low sulfur content (0.19% – 0.21%).** The sulfur values on this sheet are recorded at ultra-low levels. Coal with sulfur below 0.5% is considered environmentally friendly super-premium ("Ultra-low sulfur coal"). Its combustion produces virtually no toxic SO₂ emissions, which saves companies from fines and the cost of expensive gas desulfurization systems.
- **Ash fusibility characteristics (acid-base ratio).** The ash is sharply dominated by "acidic" silicon oxides ($\text{SiO}_2 \approx 5.5\%$) and aluminum ($\text{Al}_2\text{O}_3 \approx 1.1\%$), while the concentration of "basic" oxides (Fe_2O_3 , CaO , MgO) is negligible (less than 1% in total).
- **Technological conclusion:** This coal has a very high melting point (most likely significantly above 1400°C). This means that when burned in thermal power plant boilers, the coal will not clog the tubes or form slag. This is a major advantage for power engineers.
- **Chlorine safety (Cl approx. 450 ppm).** The chlorine content is approximately 0.045%. The critical threshold for power engineering is considered to be 0.1% (1000 ppm), above which severe corrosion of metal boiler parts begins. This coal is absolutely safe for equipment.
- **Environmentally friendly (Toxic elements).** Levels of hazardous volatile metals such as arsenic (As <28 ppm), lead (Pb <5 ppm), and chromium (Cr <71 ppm, and for Coal B, even 2 ppm) are well within stringent international environmental standards. Coal is non-toxic during storage and processing.

This coal is an ideal raw material for export to markets with strict environmental requirements (for example, the EU or Asia). Its combination of calorific value (>7200 kcal/kg), ash (<10%), and sulfur content of only 0.2% makes it a scarce and expensive commodity on the global market. Coal B appears preferable due to its slightly higher calorific value and the almost complete absence of chromium and niobium.

4. Jitegemee Holdings

Jitegemee Holdings is a leading coal company in East Africa, producing high-quality bituminous coal for industrial and domestic applications.

- **Mining location:** Coal mines are located in the Ruvuma region.
- **Sales:** Coal is used in power plants, cement production, carbon fiber production, and home heating.
- **Products:** High-calorific bituminous coal.
- **Type:** Crushed 0-50/75mm, Cobbles 50-75/100mm, ROM 0-400mm

Also Jitegemee Holdings Company Ltd has established a coal briquette manufacturing plant with its production activities taking place in Ruvuma area, Mbinga district near Jitegemee coal mine with a production capacity of at least 5 metric tons per hour and the sale of the products is done in Songea town on Sidfarm road 6 km from Songea town.



- **Products:** Smokeless coal briquettes come in two main categories: spherical and block/rectangular.
- **Application:** Primarily used for heating and cooking at home, their easy ignition and even combustion make them suitable for stoves and fireplaces. Additionally, industries requiring large amounts of heat, such as brick factories and steel mills, use coal briquettes in their boilers. Jitegemee Holdings provides its own transport and logistics services, specializing in the handling of all types of bulk cargo, including coal,



clinker, gypsum, aggregates, fertilizers and other unpackaged goods from various destinations in East and Central Africa.

The main project involves transporting coal from the Jitegeme sales point in the Ruvuma region to the domestic and export markets.

The company operates a state-of-the-art coal laboratory, providing accurate and reliable coal testing, environmental assessment and maintenance services to ensure quality, efficiency and regulatory compliance in mining operations.

Proximate and Ultimate Analysis of Jitegemee Holdings Coal

Analysis Category	Indicator (Component)	Designation / Unit change	Parameter values
Technical (ADB)	Ash	%	17 – 21
	Moisture	%	6
Elemental (Ultimate)	Fixed Carbon	%	до 60 (MAX)
	Volatile Matter	%	21-27
Additional	Gross Heating Value (GCV)	Kcal/Kg	5900 – 6300



Analysis Category	Carbon	%	83.42
Technical (ADB)	Hydrogen	%	4.94
	Nitrogen	%	1.65
Elemental (Ultimate)	Oxygen	%	9.99
	Sulfur	%	0 – 1.3%
	Hardgrove Grindability Index	HGI	50

Fractional composition of products (Particle Size Analysis)

Classification of coal by the size of the fractions obtained.

Class (name of the faction)	Product type	Size of pieces (mm)
ROM (Run of Mine)	Raw coal (unsorted)	0 – 400 мм
Cobbles	Large lump coal "Kobel" / "Plitka"	+50 – 75 мм / 100 мм
Crushed Coal	Crushed fine coal	0 – 50 мм
Crushed Coal	Medium crushed coal	0 – 75 / 100 мм

Chemical composition of ash (Ash Analysis - Major Oxides) Analysis of the main oxides that determine the refractoriness and slag properties of the non-combustible residue of coal

Oxide (Element)	Chemical formula	Percentage content (%)
	SiO ₃	65.33
Silicon Oxide	Al ₂ O ₃	25.74
Aluminum Oxide	Fe ₂ O ₃	4.71
Iron(III) Oxide	TiO ₂	2.09
Titanium Oxide	SO ₃	0.57
Sulfates / Sulfur Trioxide	LOI	0.50
Loss on Ignition	MgO	0.35
Magnesium Oxide	CaO	0.29



Calcium Oxide	K ₂ O	0.20
Potassium Oxide	Na ₂ O	0.08
Sodium Oxide	P ₂ O ₅	0.07



Jitegemee Holdings' product prices depend on delivery terms, batch size, and current exchange rates, averaging between \$40 and \$75 per tonne at the open pit (EXW) and approximately \$110–\$145 per tonne for export (FOB Mtwara/Dar es Salaam). The current global spot price for thermal coal of similar calorific value—the global benchmark (API4)—is approximately \$130–\$148.



In addition to the southern Ruvuma Basin (where Tancoal operates), Tanzania has two other key coal regions with large registered entities. They hold their own licenses, conduct mining operations, and also carry out large-scale wholesale shipments (including logistics through Dar es Salaam).

Rukwa Coalfields

5. Edenville Energy PLC / Edenville International (Tanzania) Limited

- **Ownership:** Public limited company. The parent company, Edenville Energy PLC, is listed on the London Stock Exchange (AIM), and the operating subsidiary in Tanzania is a 100% local legal entity.
- **Structure:** Vertically integrated management structure. Includes its own mining and processing complex (Mkomolo Coal Project), a processing plant, and a logistics/trading department in Dar es Salaam.
- **Products:** Thermal coal (open-pit mining). Bituminous, long-flame thermal coal (Thermal/Steam Coal).
- **Design capacity:** 120,000 tonnes per annum. Actual operating volumes fluctuate between 35,000 and 60,000 tonnes per annum due to capacity modernization.

Laboratory tests (typical parameters):

- **Gross Calorific Value:** 5,200–5,700 kcal/kg.
- **Ash Content:** 22%–28% (reduced to 18% after primary enrichment at the plant).
- **Total Sulfur:** 0.5%–0.9%.
- **Total Moisture:** 4%–6%.



- Volatile

Matter:**24%–28%****Prices (indicative)**

- The base price at the open-pit mine (Ex-mine) is approximately \$40–\$45 per ton.
- The wholesale price with delivery to the port of Dar es Salaam (FOB/stock-on-board warehouse) is \$75–\$85 per ton, depending on the fraction and degree of enrichment.

Songwe-Kiwira Coalfields**6. Kiwira Coal & Power Company (KCPC) / STAMICO**

- **Ownership:** Wholly state-owned. 100% of the shares are owned by the State Mining Corporation of Tanzania (STAMICO).
- **Structure:** A state-owned unitary enterprise under the management of the Ministry of Minerals of Tanzania. The structure includes the management of an underground mine (Ivogo Ridge), beneficiation



facilities, a coal briquette production department (Rafiki Briquettes brand), and a state-owned marketing network.

- **Products:** High-calorific thermal coal.
- **Current production capacity** is 150,000 tonnes per year (large-scale reconstruction is underway under government auspices).
- **Coal grades:** High-grade thermal coal.

Laboratory tests (official specifications of the ministry):

- **Gross Calorific Value:** 6,200–7,200 kcal/kg
- **Ash Content:** 16%–22%.
- **Total Sulfur:** up to 0.6% (low-sulfur).
- **Inherent Moisture:** 2%–4%.
- **Volatile Matter:** 15%–33%.

Prices (indicative)

Due to the higher quality, the price of Ex-mine (at the mine) is higher - about \$55 - \$60 per ton.

- The price for wholesale purchases and logistics through Dar es Salaam terminals is \$90 – \$105 per ton.

How does the coal distribution system work in Tanzania?:



If your task is related to purchasing or distribution in Dar es Salaam, the coal is physically delivered by truck or rail from the southern open-pit mines to warehouses in the industrial zone of the capital, from where it is forwarded to end customers.



Logistics routes to Dar es Salaam

Coal transportation from remote southwestern regions to the Indian Ocean coast is the main factor determining the final price of the raw material. Logistics is distributed across three main corridors, depending on the basin:

1. Ruvuma Basin (Songea) -----> A104 Road Transport / Dry Port -----> Mtwara Port / Dar es Salaam
2. Rukwa Basin (Mndambo) -----> Auto A104 + TAZARA Railway Line -----> Port of Dar es Salaam
3. Songwe Basin (Kivira) -----> Electric Railway SGR / TAZARA -----> Dar es Salaam Port

Route from Ruvuma Basin (Tancoal Mines / Songea)

- **Specifics:** The busiest route. Historically, coal has been transported from here in heavy-duty tipper trucks with a capacity of 30–40 tonnes.*
- **Distance:** Approximately 950–1000 km to Dar es Salaam via Iringa and Morogoro along the A104 highway.
- **Alternative:** A significant portion of the coal from Ruvuma is redirected to the closer port of Mtwara (approximately 750 km away) to reduce truck freight costs.

Route from Rukwa Basin (Edenville Mines)

- **Specifics:** Multimodal route (road + rail)*
- **Delivery scheme:** Coal is transported from the Mkomolo open-pit mine by truck to the nearest junction stations of the TAZARA (Tanzania-Zambia Railway) line or to the new electrified SGR line. The raw material is then transported by freight cars to the berths of the port of Dar es Salaam, reducing the cost per tonne-kilometer by approximately 30% compared to road transport.

Route from the Songwe-Kivira basin (STAMICO State Mines)



- **Specifics:** Utilization of the country's most modern transport infrastructure.
- **Delivery scheme:** Coal is transported via the new Standard Gauge Railway (SGR), which has a direct freight connection (Port Link project) to the Tanzania Ports Authority (TPA) terminals in Dar es Salaam. This allows coal to be loaded directly from railway platforms onto bulk carriers.

Reference:

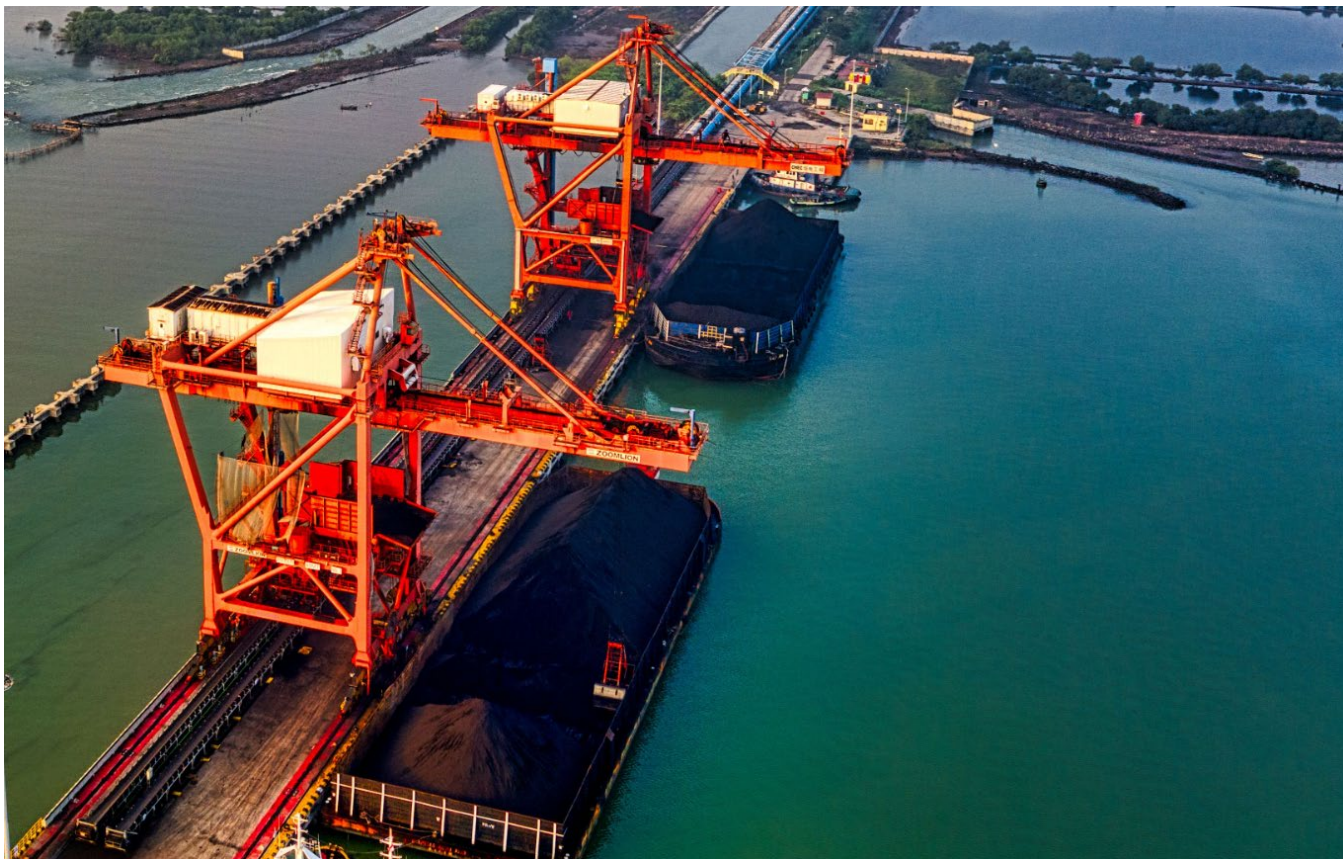
**Road transport is the most common mode of transport in Tanzania, carrying over 90% of passengers and 75% of freight traffic in the country. Currently, Tanzania's road network consists of 86,472 kilometers of roads, of which 12,786 kilometers are trunk roads, 21,105 kilometers are regional roads, and the remaining 52,581 kilometers are district, city, and feeder roads. The Ministry of Works, Transport, and Communications, through the Tanzania National Roads Agency (TANROADS), manages a national road network of approximately 33,891 kilometers, including 12,786 kilometers of trunk roads and 21,105 kilometers of regional roads. The remaining network of city, city, and feeder roads, totaling approximately 53,460 kilometers, is managed by the Office of the Prime Minister for Regional Management and Local Government (PMORALG).*

***Rail transport is the second most important mode of transport after road transport and is crucial for intercity freight transport along Tanzania's main transport corridors. Tanzania has a total of 3,676 kilometers of railway lines, operated by two railway systems: the Tanzania Railway Corporation (TRC) and the Tanzania-Zambia Railways (TAZARA). The TRC main line is a central corridor between the port of Dar es Salaam in the east, connecting the central and western regions of the country, and terminating in Kigoma on Lake Tanganyika in the west. The TAZARA line is 1,860 kilometers long, of which 975 kilometers are in Tanzania and 885 kilometers in Zambia.*

****Water Transport in Tanzania. Tanzania has a coastline of approximately 720 kilometers on the Indian Ocean and borders Lake Victoria, Lake Nyasa, and Lake Tanganyika. Both seaports and inland waterways in Tanzania are managed and operated by the Tanzania Ports Authority (TPA). The main TPA ports on the Indian Ocean are Dar es Salaam, Mtwara, and Tanga. Smaller seaports serving coastal shipping include Lindi, Kilwa Masoko, Mafia Island, Bagamoyo, Pangani, and Kwale. Dar es Salaam is Tanzania's main port, with a throughput of 10.1 tonnes per year. The port handles over 92% of all seaport cargo turnover. It serves the landlocked countries of Malawi, Zambia, the Democratic Republic of the Congo, Rwanda, Burundi, and Uganda. These countries are connected to the port by two railway systems (TRL - 1.0-meter gauge and TAZARA - 1.067-meter gauge), a road network, and the TAZAMA oil pipeline to Zambia. TPA also manages Tanzania's lake ports, serving approximately 20 ports on Lake Victoria. Major ports include Bukoba, Kemono Bay, Musoma, and Nancio. The main lake ports in Tanganyika include Kigoma and Kasanga. In addition, there are 15 smaller ports along the lake. These ports provide trade links between Burundi, the eastern Democratic Republic of the Congo, and Zambia. Lake Nyasa has four important ports: Itungi, Mbamba Bay, Liuli, and Mande. The lake also has up to 10 other smaller ports serving passenger*



traffic on the lake and between Malawi, Mozambique and Tanzania.



Let's look at the logistics on one of these routes, provided by a Tanzanian transport company specializing in bulk cargo transportation.

Calculating the cost of coal logistics to Dar es Salaam

The most popular and stable automobile route is taken as an example:

Ruvuma Basin (Tancoal Ngaka Mine/Songea Region) - Dar es Salaam Port.

The distance is approximately 980 km along the A104 highway via Iringa and Morogoro. Transportation is carried out by heavy-duty 30-tonne coal trucks with tipping trailers).

Calculation of costs per 1 ton of coal (indicative tariffs for 2026):

Expense Item	Cost per ton of coal (USD)	Notes / Calculation Basis
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Basic Multiple Freight	58.80	Standard Multiple Freight rate, \$0.06 per ton-kilometer (\$0.06 × 980 km).
Fuel Add-On	12.5	Adjustment for current diesel fuel prices and challenging mountainous terrain.
Mining Commission Fees	3.14	Royalty (3%) + Transport Inspection (1%), calculated based on the cost of transportation.
Municipal Fee	1.5	Local road and transit duties (Transit/Council Levies).
Port Loading/Unloading Work	6.5	Unloading at the port storage yard and subsequent loading onto the vessel (Stevedoring/Handling).
TOTAL LOGISTICS:	~\$82.44 за тонну	Full cost of coal delivery "from mine gate to ship" (FOB).



With the purchase price of coal at the mine itself being around \$35–\$45, the final cost of coal at the port of Dar es Salaam, taking into account pure logistics, is \$117–\$127 per tonne.

Official Coal Product Prices

The Tanzania Minerals Commission is responsible for setting benchmark prices for minerals based on prevailing local and international market conditions, assessing and valuing minerals, and calculating royalties.

The table below shows the indicative prices for coal products mined on the Tanzanian mainland, as set by the Mining Commission. They are valid from April 1 to June 2026.

Coal prices *

Mineral Type	Region	Unit	Price
Coal Fines (0 – 10)	Thai - Mbinga	USD/ ton	36,00
Coal Fines (0 – 10)	Paradiso - Mbinga	USD/ ton	34,00
Coal Fines (0 – 10)	Mkalole - Nyasa	USD/ ton	32,00
Coal Fines (0 – 10)	Mdunduwalo - Songea	USD/ ton	34,00
(Coal Rom 0 – 200)	Thai - Mbinga	USD/ ton	40,00



(Coal Rom 0 – 200)	Paradiso - Mbinga	USD/ ton	39,00
(Coal Rom 0 – 200)	Mkalole - Nyasa	USD/ ton	40,00
(Coal Rom 0 – 200)	Mdunduwalo - Songea	USD/ ton	38,00
(Coal Crushed 0 – 75)	Thai - Mbinga	USD/ ton	42,00
(Coal Crushed 0 – 75)	Paradiso - Mbinga	USD/ ton	41,00
(Coal Crushed 0 – 75)	Mkalole - Nyasa	USD/ ton	38,00
(Coal Crushed 0 – 75)	Mdunduwalo - Songea	USD/ ton	41,00
(Coal Cobbles 30 – 75)	Thai - Mbinga	USD/ ton	47,00
(Coal Cobbles 30 – 75)	Paradiso - Mbinga	USD/ ton	46,00
(Coal Cobbles 30 – 75)	Mkalole - Nyasa	USD/ ton	41,00
(Coal Cobbles 30 – 75)	Mdunduwalo - Songea	USD/ ton	45,00
(Coal Peas 10 – 30)	Thai - Mbinga	USD/ ton	50,00
(Coal Peas 10 – 30)	Paradiso - Mbinga	USD/ ton	48,00
(Coal Peas 10 – 30)	Mkalole - Nyasa	USD/ ton	44,00
(Coal Peas 10 – 30)	Mdunduwalo - Songea	USD/ ton	48,00
(Coal – Unsorted)	Njombe	USD/ ton	43,00-50,00
(Coal – Sorted)	Mbeya	USD/ ton	43,00
(Coal – Sorted)	Rukwa	USD/ ton	15,00-25,00
(Coal – Fine)	Songwe	USD/ ton	25,00
(Coal – Unsorted)	Mbeya	USD/ ton	40,00
(Coal – Unsorted)	Rukwa	USD/ ton	15,00-25,00
(Coal – Sorted)	Songwe	USD/ ton	33,23
(Coal – Unsorted)	Songwe	USD/ ton	26,54

*Published coal prices are ex-mine prices.

Note: Royalty is charged on prices inclusive of all expenses up to the time of sale.



Government payments, such as royalties, cleaning fees, and inspection fees, are calculated based on the gross value at the time of sale. Estimated mineral prices may be based on the invoice submitted to the Mining Commission.

Taxes and export duties on coal

According to the regulations of the Tanzania Mining Commission (Tume ya Madini), the calculation of all fees is linked to the market value of coal at the time of valuation (Gross Value):

- **Royalty Fee on exports: 3% of the coal value.**
- **Royalty Fee on domestic shipments: Reduced to 1% if coal is sold to local Tanzanian factories (cement, textile) to encourage domestic production.**
- **Clearance and Inspection Fee: 1% for all export shipments of coal.**
- **Service Levy: 0.3%, paid to the District Council where the mine is located.**

Prospects, Weaknesses, and Risks of the Coal Industry

Tanzania's coal industry is poised for significant growth, but faces significant challenges:

Prospects

- **Rising energy consumption:** The country desperately needs cheap and reliable energy for industrial development. Coal-fired power plants are seen as a key solution to the electricity shortage.
- **Regional exports:** Tanzania has the potential to become a major coal supplier to neighboring countries like Kenya, which is currently forced to import coal.



Risks and weaknesses:

- **Logistics and infrastructure:** The main obstacle to the industry's development is poor transportation infrastructure, making the delivery of coal from remote mines to consumers expensive and difficult.
- **Illegal mining:** Unregulated and dangerous artisanal mining poses a significant risk to human life.



- **Weather influence:** The rainy season can seriously disrupt coal mining and beneficiation plans.
- **Pressure from the green agenda:** Investment in coal power is becoming less popular due to the global push for decarbonization, which can limit access to financing.

The content of this review is for informational purposes only and does not constitute investment advice. Since the information has been compiled from various third-party sources, EAST WEST TEMPERI LTD. does not guarantee its accuracy or completeness. All data is subject to change, and the company is under no obligation to do so or notify users of changes.

Our company wishes you success and prosperity!

16.06.2026

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