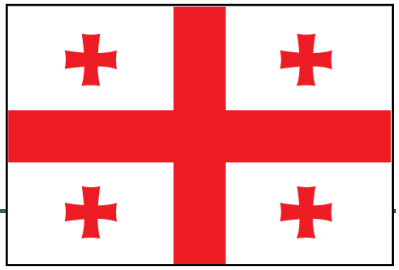
13 Georgia



13.1 Summary of Coal Industry

13.1.1 Role of Coal in Georgia

Coal deposits were discovered in Georgia in the first half of the 19th century, although until the 1930s geological exploration of these deposits was sporadic. Rapid development of the coal deposits in Georgia began after World War II, with produced coal being supplied to the Rustavi iron and steel works. Seven coal deposits have been discovered in Georgia, but only three of them are of commercial importance: the Tkibuli-Shaori and Tkvarcheli bituminous coal deposits and the Akhaltsikhe brown coal deposit (Figure 13-1). Most of the republic's coal reserves are concentrated in these deposits and the Tkibuli-Shaori deposit accounts for more than 75 percent of Georgia's coal reserves, followed by Akhaltsikhe and then Tkvarcheli (UNFCCC, 2009).

Figure 13-1. Georgia's Main Coal Fields

Source: Adapted from UN (2004)

Table 13-1. Georgia's Coal Reserves and Production

Indicator	Anthracite & Bituminous (million tonnes)	Sub-bituminous & Lignite (million tonnes)	Total (million tonnes)	Global Rank (# and %)
Estimated Proved Coal Reserves (2011*) (2013**)	331.1**	75.7**	406.8**	49 (0.0032%)*
Annual Coal Production (2012)	0.254	0	0.254	56 (0.022%)

Sources: *EIA (2013a); **SAQ (2013)

13.1.2 STAKEHOLDERS

Potential stakeholders in Georgia's coal mine methane (CMM) industry are listed in Table 13-2.

Table 13-2. Key Stakeholders in Georgia's CMM Industry

Stakeholder Category	Stakeholder	Role
Coal Producing Enterprise	▪ Georgian International Energy Corporation (GIEC)	Project host State Partnership Fund
Developer	▪ Georgian International Energy Corporation (GIEC) ▪ See http://www.epa.gov/coalbed/networkcontacts.html	Project opportunity identification and planning
Engineering or Consultancy Services	▪ See http://www.epa.gov/coalbed/networkcontacts.html	Technical assistance
Universities and Research Centers	▪ National Academy of Sciences of Georgia ▪ Georgia National Science Foundation ▪ Tbilisi State University ▪ Ministry of Education and Science - Mining Institute	Technical assistance
Other	▪ KazTransGaz-Tbilisi ▪ OPIC	
Government Groups	▪ Ministry of Energy ▪ Ministry of Environmental Protection and Natural Resources	Licensing and permitting

13.1.3 STATUS OF COAL AND THE COAL MINING INDUSTRY

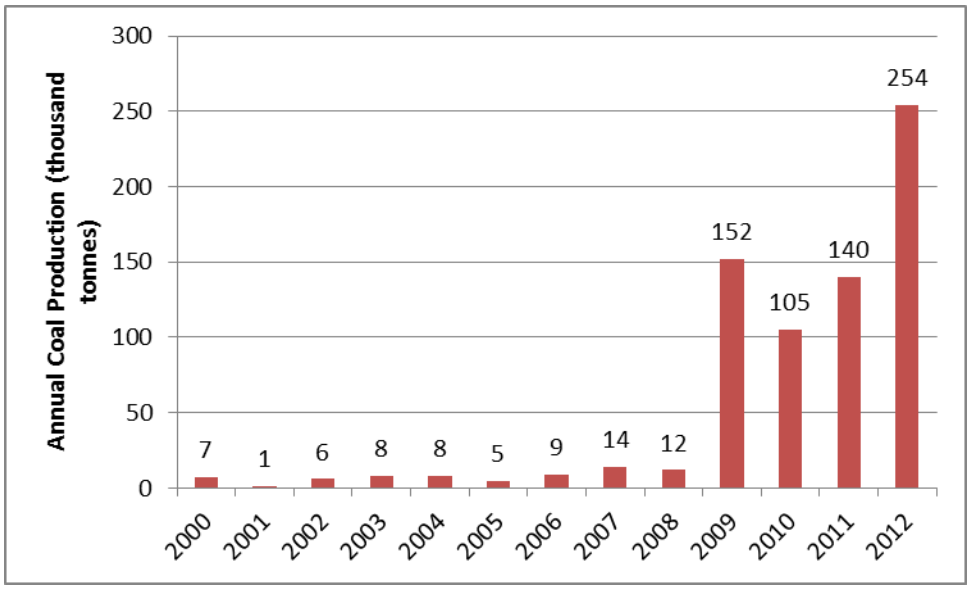
Coal mining in Georgia is made difficult by the depth of the coal seams, the locations of deposits in mountainous areas and, in some areas, the relatively high methane content (14+ cubic meters [m^3] per tonne) of the coal. Insufficient financing of mines in the late 1990s to early 2000s (as State subsidies dried up because of the country's economic crisis), a lack of markets, and costly extraction, led to minimal production at that time. The Georgian government has prioritized the revitalization of the coal mining sector, in the hope of providing much needed jobs and some economic resurgence in the Tkibuli-Shaori and Akhaltsikhe regions (UNFCCC, 2009).

The only underground mine currently producing coal in Georgia is the Mindeli mine in the Tkibuli-Shaori coalfield. The mine, operated by Saknakhshiri LLC, resumed coal extraction in 2008 after a 15-year break. In partnership with the Georgian International Energy Corporation (GIEC), the mine's flooded tunnels have been pumped dry and restored, shaft development projects have taken place, mine buildings have been refurbished, and the mine railway line has been repaired. The total

cost for the redevelopment of the mine came to more than $10.8 million (GEL20 million) (GIEC, 2010).

Coal from the project currently supplies cement factories in Kaspi and Rustavi, but Saknakhshiri LLC plans to increase current coal production to accommodate two thermal power plants with generation capacities of 160MW and 300MW, which are to be constructed by GIEC. To meet the coal demand, Saknakhshiri intends to improve coal extraction in current shafts to 0.850 to 0.9 million tonnes (Mmt) per year and construct a new mineshaft to accommodate an additional 2-3 Mmt per year (Figure 13-2). The coal improvement project is under technical review and a feasibility study is underway for the establishment of reserves to support a new mineshaft (SAQ, 2013). Saknakhshiri also holds a license for coal extraction from the Vale coalfield near Akhaltsikhe, in southern Georgia, estimated to have coal reserves of more than 75 Mmt available for open cast mining.

Figure 13-2. Georgia Coal Production (thousand tonnes)



Sources: UNFCCC (1999); EIA (2013a)

An operating open-cast mine is located at Tvarcheli, in the breakaway republic of Abkhazia. Produced coal from this mine is used to supply iron and steel works in Rustavi.

13.2 Overview of CMM Emissions and Development Potential

The Global Methane Initiative (GMI) International CMM Projects Database currently has no record of any active CMM projects in Georgia (GMI, 2014). One feasibility study, sponsored by the U.S. Trade and Development Association (USTDA), was carried out on the possible development of a CMM drainage and utilization project in the Tkibuli-Shaori coal field.

13.2.1 CMM Emissions from Operating Mines

Limited data is available on Georgia's CMM emissions. Table 13-3 shows data available from Georgia's Second Communication to the United Nations Framework Convention on Climate Change

(UNFCCC). 18.79 million m^3 of CMM are estimated to have been emitted in 1990, at which time coal production was 956,000 tonnes per year.

Table 13-3. Georgia's CMM Emissions (million cubic meters)

Emission Category	2000	2005*	2010*	2015* (projected)
Underground coal mines – ventilation emissions	0.139			
Underground coal mines – drained emissions	0			
Total liberated (= sum of all above)	0.139			
Recovered & Used	0			
Total emitted (= Total liberated – recovered & used)	0.139	0.235	0.246	0.280

Source: UNFCCC (2009), *USEPA (2012)*

Coal production operations at the Mindeli mine are being ramped up after being idle for almost 20 years. Production is expected to exceed 200,000 tonnes per year in the near future and when longwall operations are active it is planned to produce 1 Mmt of coal per year. At that time, CMM emissions would be expected to reach their 1990 levels. CMM is not currently drained from the mine, either by in-seam boreholes or via gob drainage. Methane is diluted in ventilation air and carried to the surface where it is emitted to the atmosphere. A March 2010 explosion, which killed four miners and was attributed to a build-up of methane, illustrates the need for improved methane drainage at the mine (Georgian Times, 2010).

13.2.2 CMM Emissions from Abandoned Coal Mines

There are a few abandoned mines in the Tkibuli-Shaori coalfield, but there are currently no methane recovery projects operating or planned in Georgia.

13.2.3 CBM from Virgin Coal Seams

Georgia does not currently produce CBM from virgin coal seams. A USTDA feasibility study evaluated the possible development of a CMM project at the Tkibuli-Shaori and potential CBM extraction from the coalfield. The coal in this area is found in nine distinct layers that vary in thickness from 1 to 10 m, at depths of 500 – 1,500 m. Total coal thickness ranges from 20 to 50 m and in some places exceeds 75 m. Gas contents range from 6-20 m^3 per tonne and gas-in-place for the field is estimated to be 11.5 billion m^3 (ARI, 2009). The feasibility of CBM drilling is also been studied in the Vale coalfield in southern Georgia. Possible reserves for this area have not yet been estimated.

13.3 Opportunities and Challenges to Greater CMM Recovery and Use

Georgia ratified the United Nations Framework Convention on Climate Change (UNFCC) in 1994 (Table 13-4) as a non-Annex I Party and since then has been actively engaged in the fulfillment of its obligations under the Convention. The government supports the implementation of any projects

and programs that will lead to the reduction of greenhouse gas (GHG) emissions, facilitate the drawing of additional environmentally sound investments and transfer the country to a sustainable development pathway (MEP, 2009).

Table 13-4. Georgia's Climate Change Mitigation Commitment

Agreement	Signature	Ratification
UNFCCC	NA	July 29. 1994
Kyoto Protocol	NA	June 16, 1999

Source: UNFCCC (2014)

13.3.1 Market and Infrastructure Factors

Georgia currently operates with a severe energy deficit, producing less than six percent of its domestic fuel requirements from its own resources (USTDA, 2008). 98 percent of Georgia's oil and natural gas supplies are imported. In 2010, Georgia produced 51.4 thousand tons of oil and 11.1 million m^3 of natural gas. Georgia's proven oil and gas resources are modest, according to the Energy Charter Secretariat (EnCharter, 2012). The country's 15 oilfields have confirmed reserves of about 8.3 million tons but larger oil reserves are assumed to exist. The oil potential of the Black Sea shelf is estimated at 70 million to 1.3 billion barrels. (Energy Charter, 2012). Other indigenous energy supplies are limited primarily to hydropower and traditional biomass for residential heating (Energy Charter, 2012; EIA, 2013b).

The majority of oil and natural gas has historically come from Russia since Georgia is an important transit country. To reduce dependency on Russia, Georgia began turning to the Caspian fields for natural gas supply after 2000, and the South Caucasus Pipeline began delivering natural gas to Georgia in 2007. Total capacity on the pipeline is 8 billion m^3 per year (EIA, 2013b).

The Georgian government is looking to further diversify its energy base and is encouraging the continued redevelopment of the coal industry, along with potential development of thermal power stations near coalfields. Georgia also has sizeable hydropower capacity, which is a growing component of its energy supplies. The Ministry of Energy has announced plans to rehabilitate older hydropower plants, and build new ones to increase generation capacity (EIA, 2013b).

Utilization options for produced methane include on-site electricity generation or direct use by local residents, a policy in line with the government's recent push to supply gas to rural areas. But CMM will have to compete with hydroelectric power and other renewable energy resources such as geothermal energy (currently used for district heating) and wind power.

13.3.2 Regulatory Information

Georgia does not have any specific laws or regulations pertaining to CMM extraction. Potential issues concerning ownership of drained methane from coal mines or coal areas may arise due to the fact that the government has awarded conventional oil and gas licenses that overlap with coal mining areas.

13.4 Profile of Individual Mines

Coalfield data for the Mindeli and Dzidziguri mines is presented in Table 13-5, with a general profile of the Tkibuli-Shaori coal field shown in Table 13-6.

Table 13-5. Tkibuli-Shaori Coal Properties

Mine	Coal Property				
	Ash content (%)	Moisture Content (%)	Sulfur (%)	Volatile Material (%)	Heat Capacity (calories)
Mindeli	37-43	14.0	1.0-1.5	39.5-42.2	4,200-4,600
Dzidziguri	29-35	14.5	1.0-1.5	40-42.8	4,100-4,500

Source: ARI (2009)

Table 13-6. Tkibuli-Shaori Coal Field Profile

Tkibuli-Shaori Field - Mindeli and Dzidziguri Mines			
Mine Status	Active	**Operator/Owner**	Saknakhshiri LLC
Mine Area	47 km^2	**Coal Field**	Tkibuli-Shaori
Mining Method	Room and pillar / Longwall	**Location**	50 kms NE of Kutaisi, Imereti region
Reserves (coking coal)	330 Mt	**2006 VAM volume**	0.139 million m^3
No. of seams mined	9	**2006 Drained CH_4 volume**	0
Depth of seams	500-1,500 m	**2006 Utilized CH_4 volume**	0
Annual coal production capacity	500,000 + tonnes	**Utilization method**	None

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