15 Hungary

15.1 Summary of Coal Industry

15.1.1 Role of Coal in Hungary

Hungary uses three categories to classify its coal – hard coal (bituminous), brown coal, and lignite. Brown coal and lignite account for approximately 80 percent of the country's total coal reserves, making these the most significant indigenous energy sources (Euracoal, 2014)--used mainly in its thermal electric power plants. These plants cannot use higher quality coal and therefore, rely on the supplies of lower-quality domestic coal.

Hungarians are making efforts to convert from coal to cleaner burning fuels such as natural gas or oil. Overall production of lignite (including brown coal) declined nearly 29 percent from 2002 to 2012 (EIA, 2014). Brown coal production declined more sharply and bituminous production has ceased due to declining reserves (Steblez, 2005). Table 15-1 summarizes Hungary's coal reserves and recent production.

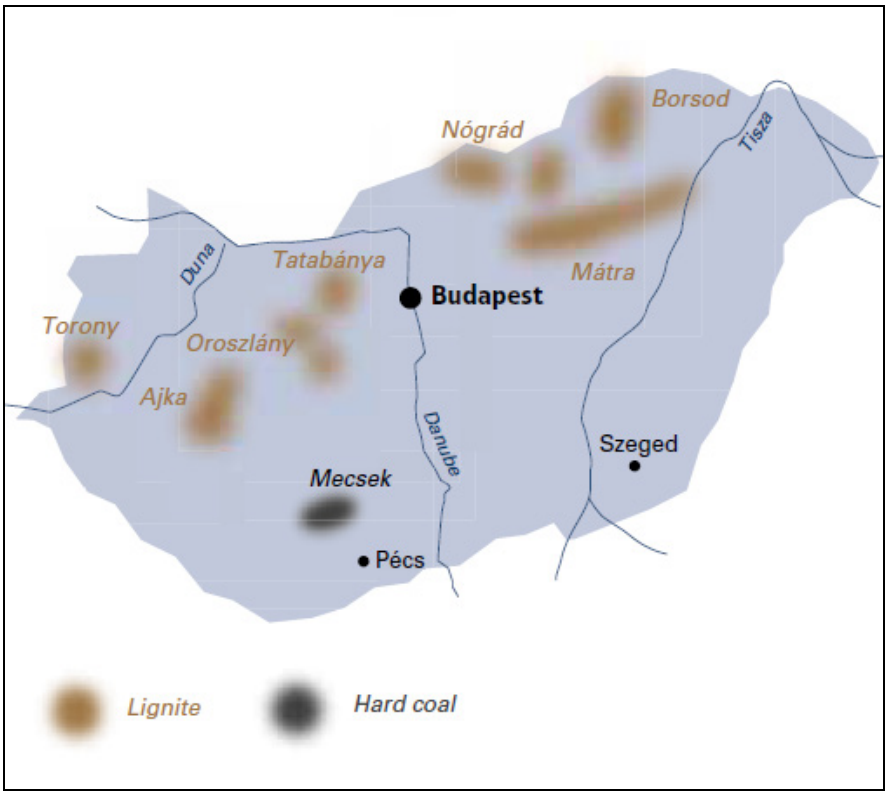
Table 15-1. Hungary's Coal Reserves and Production

Indicator	**Anthracite & Bituminous** (million tonnes)	**Sub-bituminous & Lignite** (million tonnes)	**Total** (million tonnes)	**Global Rank** (# and %)
Estimated Proved Coal Reserves (2011)	13.0	1,647.0	1,660.0	23 (0.19%)
Annual Coal Production (2012)	0	9.29	9.29	27 (0.12%)

Source: EIA (2014)

Hungary's principal bituminous coal basin is the Mecsek Basin in the Mecsek Mountains of Baranya Province (Figure 15-1). Other coalfields include the sub-bituminous/lignite coalfields of Ajka, Borsad, Matra, Nógrad, Oroszlány, Tatabánya , and Varpolata.

Figure 15-1. Hungary's Coal Basin Fields



Source: Euracoal (2014)

15.1.2 STAKEHOLDERS

As indicated in Table 15-2, Magyar Olaj es Gaz (MOL), the state oil and gas monopoly, is a prospective stakeholder in the development of Hungary's coal mine methane (CMM) industry.

Table 15-2. Key Stakeholders in Hungary's CMM Industry

Stakeholder Category	Stakeholder	Role
Natural Gas Transmission & Distribution Companies	▪ Magyar Olaj es Gaz (MOL)	Pipeline sales
Energy Companies/Power Generators	▪ MVM Group (Magyar Villamos Művek Zrt.) ▪ MÁTRA (Mátrai Erömü Zrt.)	CMM project identification and investment
Developers	▪ See http://www.epa.gov/coalbed/networkcontacts.html	Project opportunity identification and planning
Engineering, Consultancy, and Related Services	▪ See http://www.epa.gov/coalbed/networkcontacts.html	Technical assistance
Government Groups	▪ Energy Centre Hungary ▪ Ministry for National Economy ▪ Ministry for Environment and Water ▪ Hungarian Energy and Public Utility Regulatory Authority ▪ Hungarian Office for Mining and Geology	Development of energy policy, project implementation, regulatory

15.1.3 Status of Coal and the Coal Mining Industry

The coal mining industry in Hungary is privatized. No information was found quantifying the proportion of underground mines considered gassy.

15.2 Overview of CMM Emissions, Projects, and Potential

There are significant recoverable gas reserves from coal beds in Hungary (see Table 15-3).

Table 15-3. Hungary's Largest Recoverable CMM/CBM Resources

Location	Amount (million cubic meters)
Algyő	12,700
Hajdúszoboszló	1,500
Pusztaföldvár	1,700
Üllés	2,800
Szank	700
Szeghalom	800
Nagykörű	2,600
Mezősas	3,300
Kisújszállás	800
Lovászi	200
Total	**27,100**

Source: Foldessy (2006)

15.2.1 CMM Emissions from Operating Mines

Methane emissions in Hungary totaled 21.7 million cubic meters (m^3) in 2000, but are projected to decrease significantly to 1.4 million m^3 by 2015, and then remain stable through 2030 (see Table 15-4).

Table 15-4. Hungary's CMM Emissions (million cubic meters)

Emissions	2000	2005	2010	2015 (projected)
Total CH_4 Emitted	21.7	1.4	1.4	1.4

Source: USEPA (2012)

15.2.2 CMM Emissions from Abandoned Coal Mines

No information on methane emissions from abandoned mines in Hungary was found.

15.2.3 CBM from Virgin Coal Seams

Overall coalbed methane (CBM) resources in the country are estimated at 152-159 billion m^3, of which 142 billion m^3 are in the Mecsek Coal Basin. The Mecsek region is thus the target area for

CBM development. The potential of CBM was examined in Hungary in 2006 (Molnar, nd). Various factors such as coal rank, gas content, natural fracturing, history of gas emissions, proximity to guaranteed markets, and the relative dryness of coal and deep mines identify the Mecsek basin as a site for potential CBM development (Schwochow, 1997).The gas in the seams is approximately 95 percent pure, 70-90 percent of which is solid solution and sorbed, and contains 0.8 percent carbon dioxide (Foldessy, 2006).

Four drillhole tests were done between 1994 and 1995, all of which experienced fracturing by fluid carbon dioxide and failed. New projects, proposed by the University of Miskolc, would use steam gas extraction through medium radius drilling to access methane stores.

15.3 Opportunities and Challenges to Greater CMM Recovery and Use

As expressed in Table 15-5, Hungary ratified both the UNFCCC and the Kyoto Protocol, under which it has committed to a reduction of 6 percent of emissions from the base period 1985-1987 (UNFCCC, 2005). Hungary is an Annex 1 country and is eligible to host Joint Implementation (JI) projects. While there are several landfill-related and forest biomass JI projects in Hungary, there are none related to coalbed/mine methane (UNEP, 2014).

Table 15-5. Hungary's Climate Change Mitigation Commitment

Agreement	Signature	Ratification
UNFCCC	June 13, 1992	February 24, 1994
Kyoto Protocol	---	August 21, 2000

Source: UNFCCC (2014)

Hungary's Climate Change Act 2007—based on UNFCCC implementation and its Kyoto Protocol—created a framework for building the country's ability to adapt to climate change. The Act prescribed the preparation of a national climate change strategy for Hungary and in 2008, a National Climate Change Strategy (NCCS) was accepted by the Parliament (EU, nd). The NCCS contained chapters on both climate change mitigation and adaptation, and identified key objectives and actions to be implemented for 2008-2025. The Act also required the Hungarian Government adopt National Climate Change Programmes (NCCPs) every two years. The first NCCP was approved for 2009 and reviewed in 2011.

The first revision of the NCCS (the "Strategy") mandated by the Climate Change Act 2007 was anticipated to take place before the end of 2013. The revised version would extend the strategy's timeframe to 2030, with a 2050 outlook (EU, nd). As part of the revised NCCS, Hungary also intends to prepare a national adaptation strategic framework. At the time of publication, current status of the revised strategy was unknown.

15.3.1 Market and Infrastructure Factors

In the 1990s, the Hungarian government privatized the coal industry, dividing the existing coal mines into supposedly profitable and unprofitable groups. The profitable ones were contracted to power plants and have been supported by government subsidies to varying degrees in the form of

price guarantees, subsidies for fuel switching, and government responsibility for most existing liabilities. The introduction of EU regulations and requirements has not changed the landscape for these factors significantly, so continued support for standard fuel sources and systems will likely continue to impede investment in alternatives like CMM (Perger, 2009).

15.3.2 Regulatory Information

No regulatory information regarding development or sales of CMM in Hungary was found.

15.4 Profiles of Individual Mines

Márkushegyi Bányaüzem, Oroszlány Coal Basin, Oroszlány

General Information

Depth of shafts	250 m
Mining capacity	4,167 tonnes/day

General Geologic Information

Coal seam gas content range	2-3 m^3/tonne
Faults	Yes
Total methane resource	0.3-0.5 billion m^3 (coal seams)

Geologic and Mining Conditions

Rank of coal	Sub-bituminous
Depth of mining	250 m
Ash content	Coal in place, run of mine - 30.8 percent
Sulfur content	3.3 percent
Gas content	2-3 m^3/tonne coal
Mining method	Longwall
Roof control method	Caving

Source: Molnar (nd)

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