

## 32 VIETNAM

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### 32.1 Summary of Coal Industry

Vietnam ranks 20th in world coal reserves (see Table 32-1). Ninety-five percent of mine production in the country is overseen by Vinacomin, the state-owned mining company and semi-regulatory entity. Through Vinacomin, the government tightly controls coal production quotas and annual exports. Government insistence that foreign companies sign a production sharing contract (PSC) with Vinacomin before initiating coal mine methane (CMM) or coalbed methane (CBM) projects has proven to be a major impediment to CMM/CBM development, even though Vinacomin itself acknowledges that without foreign technology and expertise it lacks the technology, mechanization, and infrastructure to further develop its vast coal reserves and capture and utilize CMM/CBM. Vietnam's government has outlined ambitious plans for natural gas development in its Gas Development Master Plan; however, significant development of its CMM/CBM resources will require major policy incentive changes, as well as an overall modernization of its coal mining industry.

#### 32.1.1 ROLE OF COAL IN VIETNAM

- Coal accounts for 37.5 percent of Vietnam's total primary energy consumption.
- Coal production decreased by 10.6 percent between 2007 and 2017; consumption increased by 348.0 percent during the same period and was primarily supplied by Chinese imports.
- Natural gas production increased by 39.7 percent between 2007 and 2017, while gas consumption increased by 50 percent over the same period.
- Vietnam's electricity generation in 2017 was 37.5 percent coal, 30.5 percent oil, 21.1 percent hydroelectric, 10.8 percent natural gas, and 0.1 percent renewables (BP, 2018).

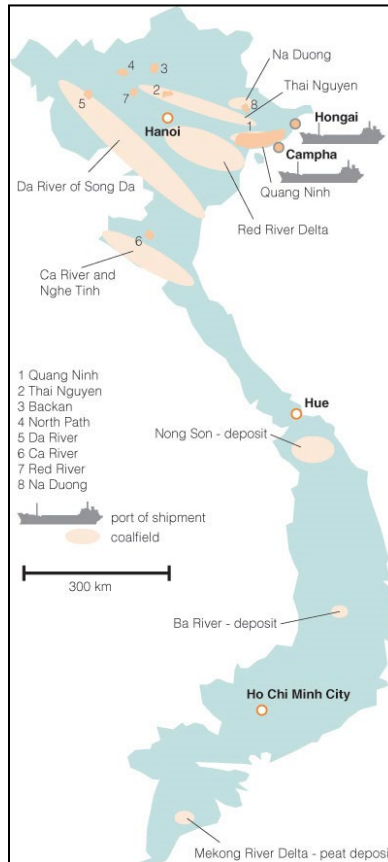
**Table 32-1. Vietnam's Coal Reserves and Production**

<b>Indicator</b>	<b>Anthracite &amp; Bituminous (million tonnes)</b>	<b>Sub-bituminous &amp; Lignite (million tonnes)</b>	<b>Total (million tonnes)</b>	<b>Global Rank (# and %)</b>
Estimated Proved Coal Reserves (2017)*	3,118	244	3,360	20 (0.3%)
Annual Coal Production (2016)**	38.5	0	38.5	14 (0.6%)

Sources: \* BP (2018), \*\*EIA (2019).

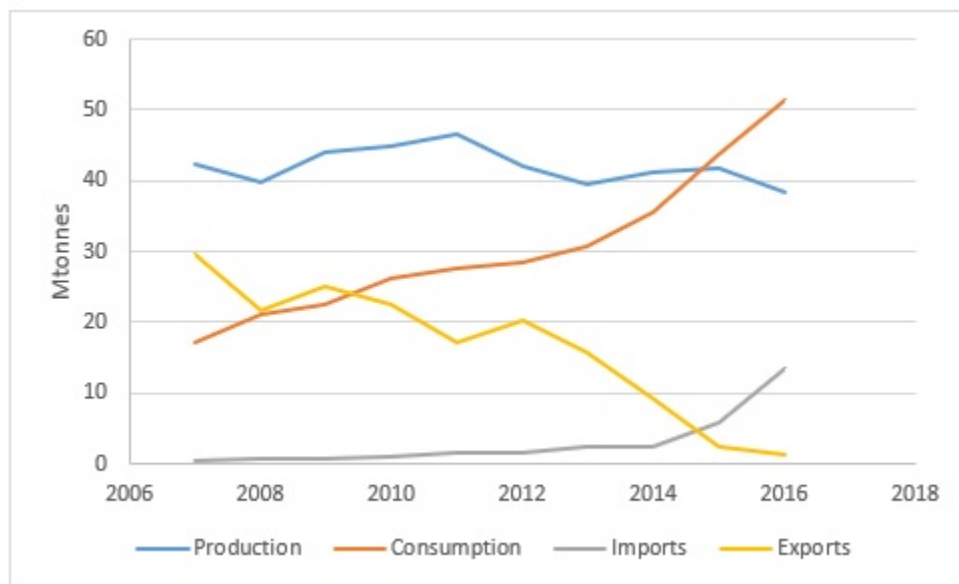
- The Quang Ninh and Red River basins in the northeast of the country are sources of the majority of Vietnam's coal production. Coal deposits cover an area of 3,500 square kilometers and lie 250–1,200 meters deep. The coal seams dip steeply, which allows half of the deposits suitable for surface mining while the other half must be mined using underground methods (Omdahl et al., 2009; Figure 32-1).

**Figure 32-1. Vietnam’s Coal Basins**



Source: Baruya (2010).

**Figure 32-2. Vietnam Coal Statistics**



Source: EIA (2019).

### 32.1.2 STAKEHOLDERS

Table 32-2 presents a summary of key stakeholders in Vietnam’s CMM/CBM industry.

**Table 32-2. Key Stakeholders in Vietnam’s CMM/CBM Industry**

Stakeholder Category	Stakeholder	Role
Mining companies	<ul style="list-style-type: none"> <li>▪ Vinacomin</li> <li>▪ Vietmindo</li> <li>▪ Dong Bac Corp.</li> </ul>	Project hosts
Universities, research establishments	<ul style="list-style-type: none"> <li>▪ Institute of Mining Science and Technology, Hanoi, Vietnam</li> <li>▪ University of Mining and Geology, Hanoi, Vietnam</li> </ul>	Technical assistance
Regulatory agencies and government groups	<ul style="list-style-type: none"> <li>▪ Vinacomin</li> <li>▪ PetroVietnam</li> <li>▪ PetroVietnam Exploration Production Corporation</li> <li>▪ Ministry of Industry</li> </ul>	Project identification and assessment support

Source: Nguyen (2018).

### 32.1.3 STATUS OF COAL AND THE COAL MINING INDUSTRY

- Vinacomin, Vietnam’s state-run coal mining company, and its subsidiaries account for 95 percent of coal production (Chuan, 2012). At the end of 2016, it was running 24 open pit and 30 underground mines (SES Professionals, 2016).
- As of February 2019, 1,500 shareholding mining companies operate in Vietnam, of which 55 percent are state-owned, 36 percent are owned by private Vietnamese companies, and 9 percent are owned by foreigners (Duane Morris, 2018).
- High mineral taxes have effectively eliminated Vietnam’s role as a traditional exporter of coal; in 2016 the government raised the tax on two principal coal types from 7 percent and 9 percent to 10 percent and 12 percent, leading to a decrease in domestic and international sales and an increase in coal imports for power production (Reuters, 2016).
- The number of thermal coal-fired power plants in Vietnam rose to 19 in 2018 and coal imports are expected to reach 85 million tonnes by 2030. The low quality of Vietnam’s coal makes it unsuitable for domestic power production and unwanted by China, its traditional export partner, leading to increasing Vietnamese domestic inventories and a 44 percent increase in Vietnamese import price per tonne since 2016. The majority of these imports come from China (Huong, 2018b).

- The lack of technology, mechanization, and infrastructure has left Vietnam's mining industry largely under-developed, resulting in low-priced, near-surface coal being mined, despite significant reserves of better-quality coal available at depth (Duane Morris, 2018).

## 32.2 Overview of CMM Emissions and Development Potential

- According to the US Environmental Protection Agency (US EPA), Vietnam currently has no CMM recovery and utilization projects (USEPA, 2016).
- The Khe Cham coal mine in Quang Ninh Province implemented a methane drainage system in 2012 to access deeper portions of the mine. Despite initial plans to install power generation units using CMM at the mine, no units have been installed as of February 2019 (GMI, 2013).

### 32.2.1 CMM EMISSIONS FROM OPERATING MINES

- The gassiest mines in Vietnam are Mao Khe, Khe Cham, Quang Hanh, and Duong Huy, which have average in-situ gas contents of 7.5 cubic meters per tonne and emit about 15.5 cubic meters per tonne of gas per day (Huy, 2012).
- There have been numerous foreign exploration initiatives into CBM development in Vietnam, particularly by Chevron and Ente Nazionale Idrocarburi (ENI), but none have followed through to implementation (Koh, 2013; ESI, 2014).

### 32.2.2 CMM EMISSIONS FROM ABANDONED MINES

- No information relating to recovery or use of CMM from abandoned mines is available.

### 32.2.3 CBM FROM VIRGIN COAL SEAMS

- Most extraction of coal has been from shallow reserves in the Quang Ninh Basin, which account for 90 percent of Vietnam's coal output (Huy, 2012). These shallow reserves do not contain appreciable quantities of methane suitable for CBM development.
- There is an estimated minimum amount of 147 billion cubic feet of CBM resources in the Hanoi Trough region of northern Vietnam, which encompasses most of Vietnam's coal fields (USGS, 2018).

## 32.3 Opportunities and Challenges to Greater CMM Recovery and Use

### 32.3.1 MARKET AND INFRASTRUCTURE FACTORS

- Despite a government push to replace coal-fired power plants with natural gas, the price per kilowatt-hour of natural gas plants at the end of 2018 was \$0.13 United States dollars, whereas the current retail price of electricity in Vietnam is \$0.07 United States dollars (Huong, 2018a).
- Vietnam has one of the highest tax rates on mining worldwide, which discourages implementation of most CMM capture projects (Duane Morris, 2018).

### 32.3.2 GOVERNMENT POLICY AND REGULATORY INFORMATION

- Vietnam is the 27th largest emitter of greenhouse gases worldwide and has seen a 550.02 percent increase in energy sector emissions since 1990 (WRI, 2019).
- Vietnam is a signatory to the United Nations Framework Convention on Climate Change Kyoto Protocol and Paris Agreement (see Table 32-3). As a Non-Annex I Party to the Kyoto Protocol, it has no national emissions targets and is eligible to host mitigation projects under the Clean Development Mechanism. As of August 2019, Vietnam hosts 274 registered Clean Development Mechanism projects; however, none are CMM recovery and utilization projects (UNEP DTU, 2019).

**Table 32-3. Vietnam's Climate Change Mitigation Commitment**

Agreement	Signature	Ratification
United Nations Framework Convention on Climate Change*	June 11, 1992	November 16, 1994
Kyoto Protocol**	December 3, 1998	September 25, 2002
Paris Agreement***	April 22, 2016	November 3, 2016

Sources: \* UN (1992), \*\* UN (1997), \*\*\* UN (2015).

- Vietnam's natural gas sector is controlled by state-owned PetroVietnam under the control of the Ministry of Industry, where CMM and CBM are treated legally as petroleum (Anh, 2014).
- Lack of relevant technical knowledge at the government level to determine the operational and financial requirements of unconventional gas production has hindered authorization of CMM and CBM projects (ESI, 2014).



[https://www.globalmethane.org/expo-docs/posters/CoalMines/CM\\_VT\\_Project\\_KheCham-from-RRR\\_FINAL.pdf](https://www.globalmethane.org/expo-docs/posters/CoalMines/CM_VT_Project_KheCham-from-RRR_FINAL.pdf).

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