

*The following member country profile is an excerpt from Chapter 4 of the publication Energy Supply Security 2014 and is not intended as a stand-alone publication.*

### CHAPTER 4: Emergency response systems of individual IEA countries

The ability of the International Energy Agency (IEA) to co-ordinate a swift and effective international response to an oil supply disruption stems from the strategic efforts of member countries to maintain a state of preparedness at the national level. Energy security is more than just oil, as the role of natural gas continues to increase in the energy balances of IEA countries. The most recently completed cycle of Emergency Response Reviews (ERRs) reflected this change by assessing, for the first time, the member countries' exposure to gas disruptions and their ability to respond to such crises. This chapter provides general profiles of the oil and natural gas infrastructure and emergency response mechanisms for 29 IEA member countries.

Each country profile is set out in the following sequence:

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# The Czech Republic

## Key data

Table 4.5.1 Key oil data

	1990	2000	2005	2010	2011	2012	2018*
<b>Production (kb/d)</b>	0.0	7.5	11.6	5.9	7.8	6.8	5.5
<b>Demand (kb/d)</b>	184.1	169.8	212.9	201.4	196.9	195.5	201.4
<i>Motor gasoline</i>	26.9	42.9	47.6	43.0	41.5	38.7	-
<i>Gas/diesel oil</i>	68.9	57.6	78.7	83.2	84.8	85.7	-
<i>Residual fuel oil</i>	41.8	16.2	9.5	4.2	3.0	2.0	-
<i>Others</i>	46.5	53.1	77.1	71.0	67.6	69.2	-
<b>Net imports (kb/d)</b>	184.1	162.3	201.3	195.5	189.1	188.7	195.8
<b>Import dependency (%)</b>	100	95.6	94.6	97.1	96.0	96.5	97
<b>Refining capacity (kb/d)</b>	0.0	186.1	198.0	198.0	198.0	198.0	-
<b>Oil in TPES** (%)</b>	18	18	21	20	20	20	-

\* Forecast.

\*\* TPES data for 2012 are estimates.

Table 4.5.2 Key natural gas data

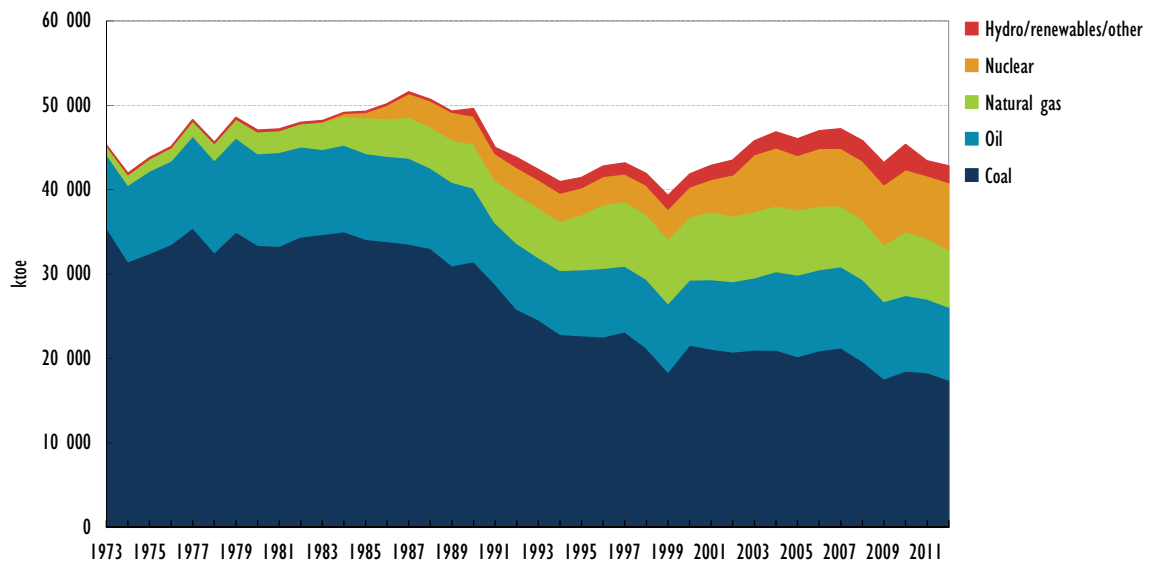
	1990	2000	2005	2010	2011	2012*	2018**
<b>Production (mcm/y)</b>	262	219	201	203	184	200	146
<b>Demand (mcm/y)</b>	6 573	9 236	9 493	9 280	8 413	8 323	8 920
<i>Transformation</i>	1 259	1 533	1 603	1 251	1 211	0	-
<i>Industry</i>	3 027	3 206	2 984	2 916	2 694	0	-
<i>Residential</i>	1 149	2 524	2 839	2 906	2 441	0	-
<i>Others</i>	1 138	1 973	2 067	2 207	2 067	0	-
<b>Net imports (mcm/y)</b>	6 311	9 017	9 292	9 077	8 229	8 123	8 774
<b>Import dependency (%)</b>	96.0	97.6	97.9	97.8	97.8	97.6	98
<b>Natural gas in TPES (%)</b>	11	18	17	17	17	16	-

\* 2012 data are estimates.

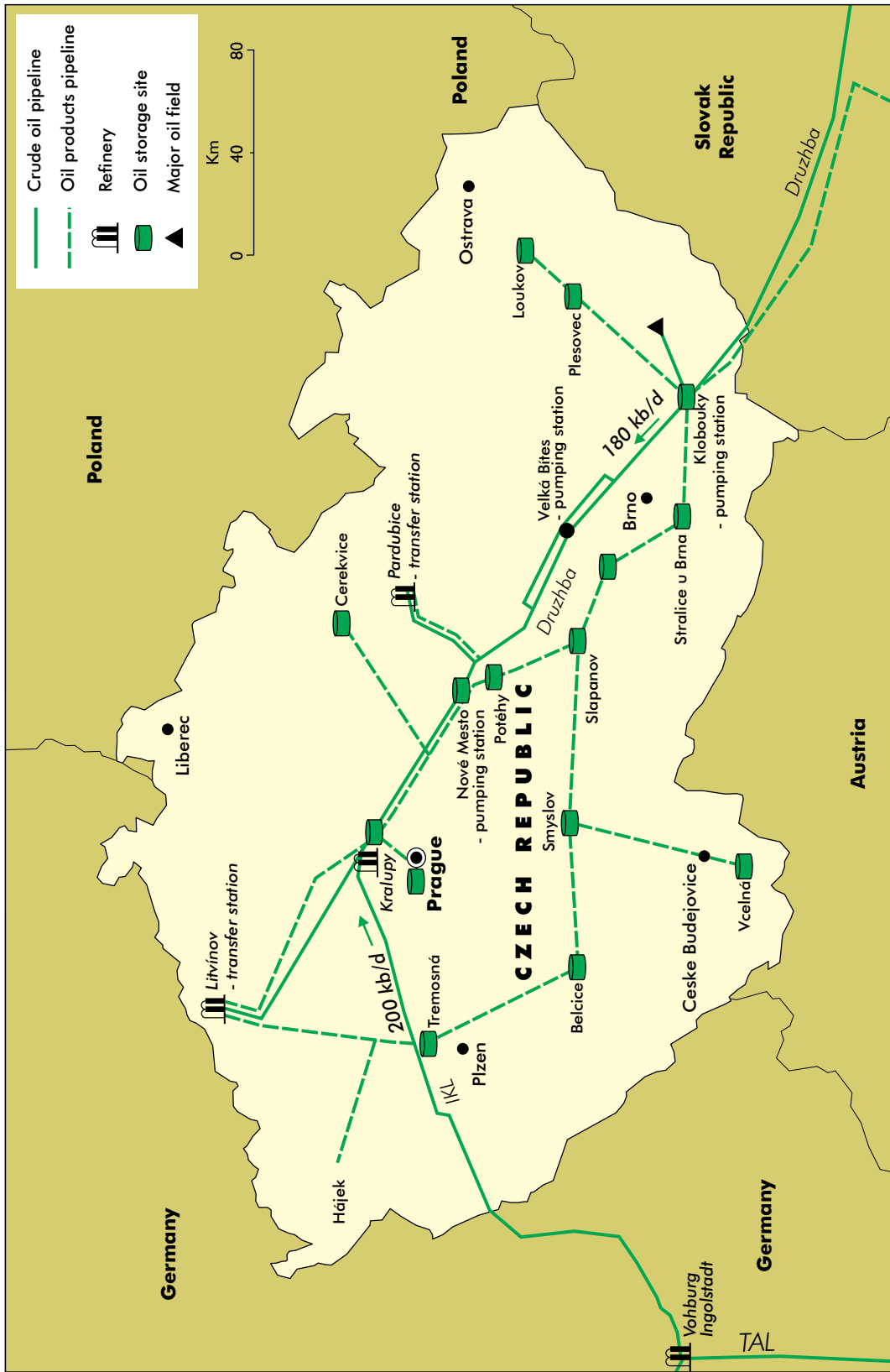
\*\* Forecast.

Note: This section on the emergency response systems of individual member countries was written by the IEA. All countries provided valuable information and comments. All opinions, errors and omissions are solely the responsibility of the IEA.

Figure 4.5.1 Total primary energy source (TPES) trend, 1973-2012

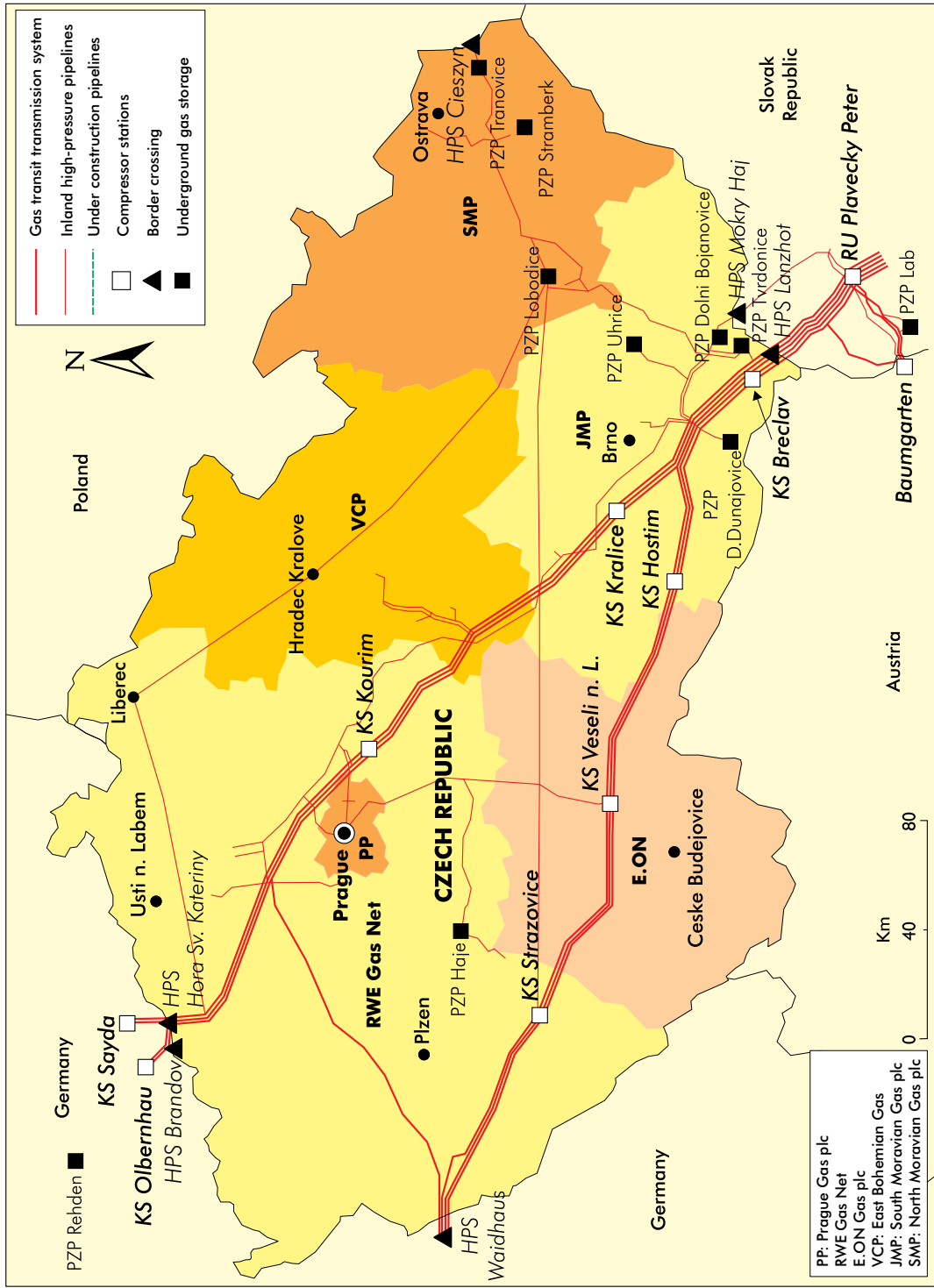


Map 4.5.1 Oil infrastructure of Czech Republic



This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

Map 4.5.2 Gas infrastructure of Czech Republic



## Country overview

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In 2012, oil represented 20% of the Czech Republic's total primary energy supply (TPES) and natural gas 16%, while coal accounted for the largest share of TPES at 39%. Over the next two decades, the country aims to reduce its reliance on coal, while at the same time maintaining its status as a net exporter of electricity by increasing use of nuclear and renewable energy. Nevertheless, natural gas will have a growing role in the country's future supply mix, and unlike oil, demand for gas will continue to rise in the coming years.

Over 96% of oil demand is met by imports, largely in the form of crude oil from countries of the former Soviet Union (FSU), particularly the Russian Federation and Azerbaijan. Roughly two-thirds of this is delivered through the Druzhba pipeline, a supply line that has experienced interruptions and reduced flows in recent years. Natural gas supplies are equally dependent on imports, and over three-quarters of the 8.3 billion cubic metres (bcm) in gas demand (2012) is met by imports from Russia. The Czech Republic also transits some 30 bcm/yr of Russian gas to other markets further west and expansion of storage and pipeline capacities will play an important role in transiting supplies through the Nord Stream pipeline project.

The Czech Republic's primary response measure in an oil supply disruption is the use of public oil stocks. The office which oversees the state's emergency reserves, the Administration of State Material Reserves (ASMR), has the mandate to cover the entire Czech oil stockholding obligation to the European Union. The chairman of the ASMR has the power to draw down public stocks held in excess of this minimum level, without needing to seek government approval. This allows the Czech Republic to respond quickly to an International Energy Agency (IEA) action or to provide loans to relieve shortages in domestic supplies.

The country benefits from having a relatively high capacity of underground commercial gas storage. However, it does not have strategic reserves or fuel-switching potential for responding to a gas crisis. Following the January 2009 gas crisis in Europe, the Czech government put in place over a short period of time and ahead of the 2009/10 winter season a response plan for dealing with a reduction in gas supplies. This plan relies on co-ordination with industry in order to optimise gas storage use and regulate demand-side measures in a crisis.

## Oil

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### *Market features and key issues*

#### **Domestic oil production**

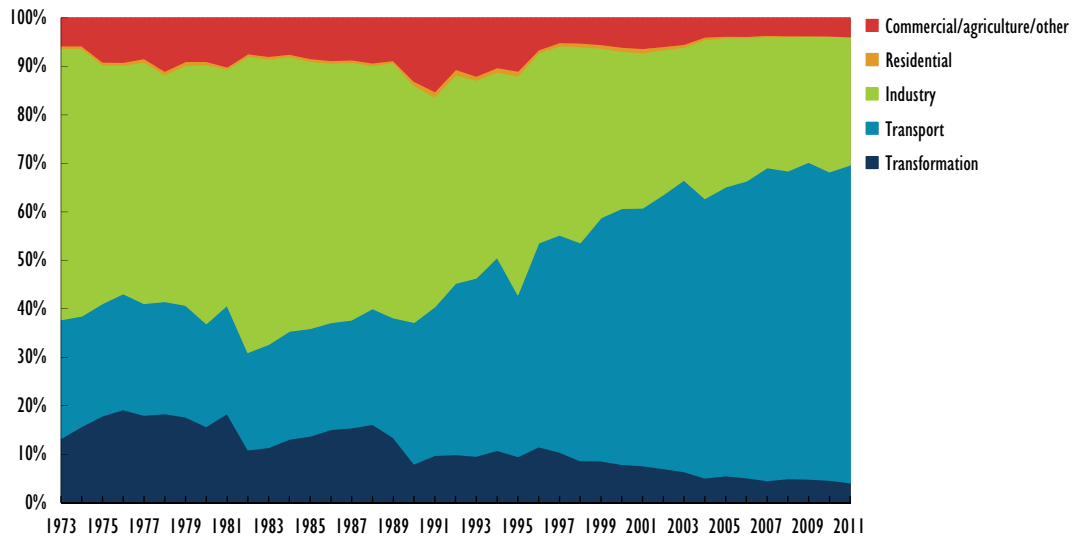
The Czech Republic does not have significant oil reserves; indigenous production of both crude and natural gas liquids (NGLs), averaging around 7 thousand barrels per day (kb/d), equates to just over 3% of the country's total oil demand. Producing fields are located in the South Moravian Region in the southeast of the country and connected by pipeline to the Kralupy refinery.

In 2012, Czech refineries processed some 7.7 million tonnes (Mt) of crude oil, or roughly 166 kb/d. Crude oil imports in the same year averaged just over 147 kb/d, supplied almost entirely by countries of the FSU. Russia is the single largest source of crude oil imports, providing nearly two-thirds of the total (91.5 kb/d in 2012), while imports from Azerbaijan have steadily grown over the past decade and accounted for 26% of total imports in 2012. The third most important supplier, Kazakhstan, provided 10.5 kb/d, or 8% of total imports in 2012.

## Oil demand

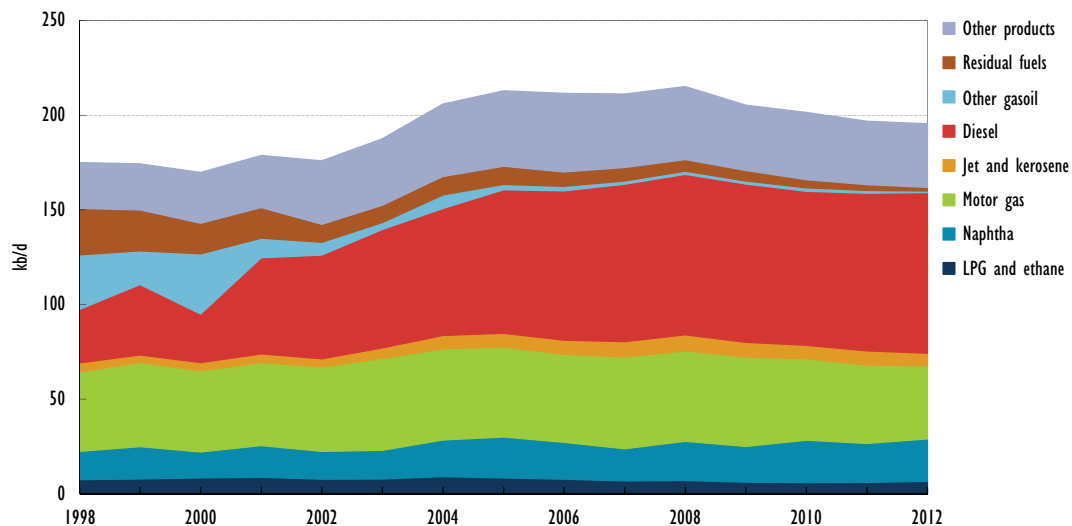
The transport sector accounts for two-thirds of all oil used in the Czech Republic. Diesel is the single largest component in the mix of oil products, representing 43% of total oil demand. Automotive diesel has a price advantage for consumers compared to gasoline owing to a lower tax rate. The accession to the European Union in 2004 is also seen as a significant contributing factor to the increase in diesel demand, as this has led to a greater number of heavy goods vehicles transiting the country.

Figure 4.5.2 Oil consumption by sector, 1973–2011



Oil demand has remained flat since 2005, a year when demand peaked following a period of steady economic growth. Demand for diesel was the driving factor for increased oil demand in the period from 2000 to 2012, when total demand increased at an average annual rate of 4.25%. While total oil demand has slightly decreased since its peak in 2005 (212.9 kb/d), demand for diesel has continued to grow and averaged +11.5% in the period from 2000 to 2012. Oil demand in the Czech Republic is not expected to grow significantly in the coming years.

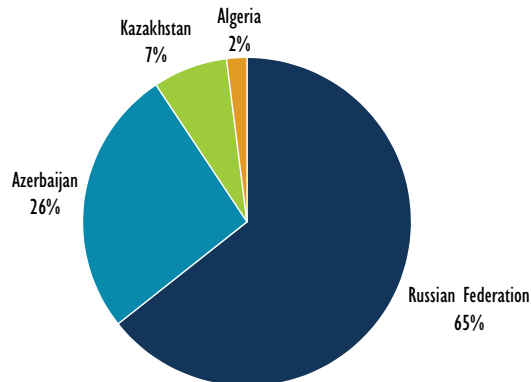
Figure 4.5.3 Oil demand by product, 1998–2012



## Imports/exports and import dependency

Roughly 97% of the Czech Republic's oil needs are met by imports. Trade in refined products has been almost entirely conducted with neighbouring IEA countries, principally the Slovak Republic and Germany. The Czech Republic imported 61.3 kb/d of refined products and domestically refined 166.2 kb/d in 2012.

Figure 4.5.4 Crude oil imports by origin, 2012



## Oil company operations

The company Moravské naftové doly (MND) operates in domestic crude oil production. MND is also involved in natural gas production and the building and operating of underground gas storage facilities.

The state-owned companies MERO and ČEPRO operate the country's crude oil and refined product pipelines and storage terminals, respectively. While financially autonomous, both companies are fully owned by the state.

Two companies operate in the Czech refining industry: Česká rafinérská, which operates the Litvínov and Kralupy refineries, and Paramo, operator of the refinery in Pardubice. Unipetrol, part of the PKN Orlen group since 2004, has full ownership of Paramo and a majority share in Česká rafinérská. The remaining shares in Česká rafinérská are held by Eni (32%) and Shell (16%).

Benzina, also fully owned by Unipetrol, is the largest operator of petrol stations in the country. The other main oil companies operating on the Czech retail and wholesale oil market include Eni/Agip, OMV, Lukoil, Sloznaft, Shell, Total and Tesco stores. ČEPRO also owns and operates a network of 192 petrol stations.

## Oil supply infrastructure

### Refining

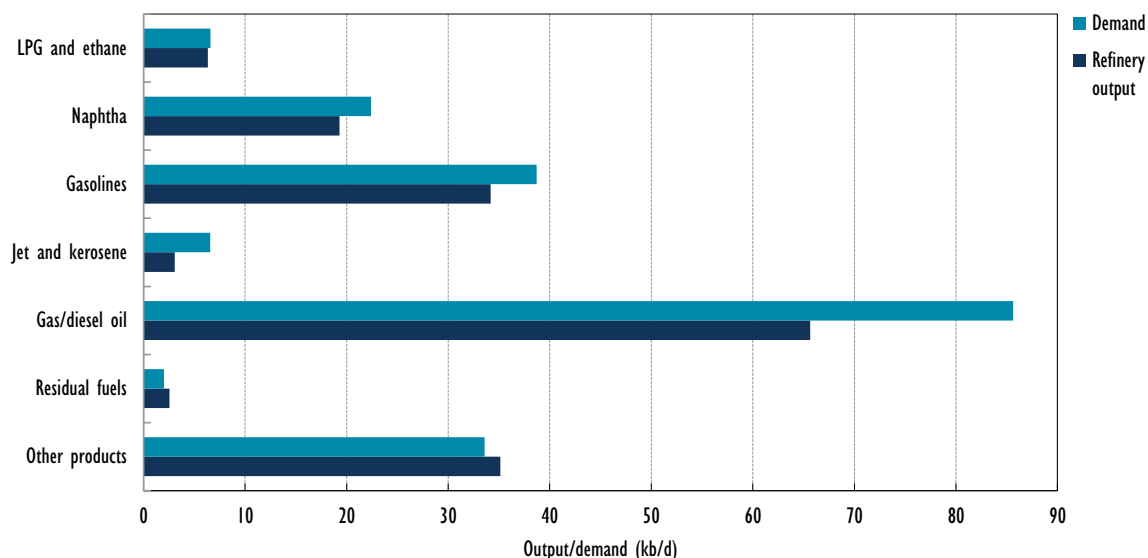
Three refineries in the Czech Republic contribute to a total crude atmospheric distillation capacity of 198 kb/d, or 9.7 million tonnes per year (Mt/year). The two main refineries, Litvínov and Kralupy, account for over 90% of this capacity. The third refinery, Paramo in Pardubice, operates only the lubricants and asphalt units since a reorganisation in 2012. There is a fourth facility located in Kolin, near the Pardubice refinery, which manufactures lubricants but has no atmospheric distillation capacity.

The Kralupy refinery processes sweet crudes (originating from Azerbaijan, Turkmenistan and North Africa, as well as from domestic fields). The Litvínov and Pardubice refineries process the heavier, more sour Russian Export Blend Crude Oil (REBCO).



The Czech Republic's domestic refinery capacity is not sufficient for meeting oil demand in the country. Refined product output from the three domestic refineries totalled 166 kb/d in 2012. With the exception of jet fuel, domestic refinery production was able to meet 80% or more of demand for each individual product. For example, domestic production of diesel was able to meet about 85% of domestic demand, while jet fuel amounted to some 40%, requiring imports to meet the remaining share.

Figure 4.5.5 Refinery output vs. demand, 2012



### Ports and pipelines

An oil products pipeline network operated by the state-owned company ČEPRO connects the main consumer regions of the country to domestic refineries. The pipeline system is also connected to the Slovnaft refinery in the Slovak Republic, which enables the import and export of oil products by pipeline. The flow direction of the product pipeline network within the Czech Republic is fully reversible.

The main crude oil supply channel is the Druzhba pipeline. Originating in Russia and transiting Belarus, Ukraine and Slovakia before terminating in the Czech Republic at Litvínov, this pipeline is able to deliver Russian and domestic crude oil to all three of the country's refineries. The Czech section of the Druzhba has a flow capacity of 9 Mt/year (180 kb/d). The flow is fully reversible on the section between Kralupy and the Slovak border.

The Ingolstadt-Kralupy-Litvínov pipeline (IKL) has a capacity to bring 11.5 Mt/year (230 kb/d) of crude oil via Germany. The IKL line connects in Germany to the international Trans-Alpine Pipeline (TAL), which has a capacity of 850 kb/d, originates in Trieste, Italy and offers the potential for diversification of imports. Approximately one-third of the Czech Republic's annual crude oil imports are typically sourced through the IKL. In 2012, MERO, the state-owned pipeline operator, became a shareholder in the TAL pipeline consortium, further increasing the relevance of this pipeline for the country's diversification of supply.

### Storage capacity

Total storage capacity in the Czech Republic is some 4.2 mcm, or 26.3 mb. This is roughly split between crude oil and refined products.

MERO and ČEPRO provide storage facilities of crude and products, respectively, for the public stocks of the ASMR, as well as for industry's commercial storage needs. In addition to these storage facilities, storage capacity among industry participants totals some 3.8 mb.

MERO's crude storage capacity at the end of 2012 was 11 mb (approximately 1.73 Mt), including 1.3 mb of storage at its facilities in Vohburg, Germany. Its central tank farm near Kralupy (Nelahozeves), which was fully modernised in 2003, offers considerable scope for more capacity expansion. In 2008 two new tanks added over 1.5 mb in capacity to the site.

ČEPRO has 17 storage sites along its product pipeline network, with a total product storage capacity of approximately 11 mb. Three-quarters of ČEPRO's storage capacity is reserved for the use of public stocks, with the remainder of the capacity available for use by all fuel trading companies in the Czech Republic. As well as stockholding, ČEPRO is a refined product trading company, which facilitates its ability to ensure necessary product stock turnover.

## *Decision-making structure*

The chair of the ASMR serves as the head of the national emergency strategy organisation (NESO) and is responsible for initiating and co-ordinating a response to an oil supply disruption. The ASMR is responsible for stockpiling and securing supply of the main resources considered essential for the protection of public interests during crises. While ASMR reserves include agricultural goods, metals and industrial materials, oil stocks account for a majority of the overall reserves held.

Act 189 of 1999 on Emergency Oil Stocks and Managing States of Oil Emergency is the legal basis for emergency policy in the Czech Republic, providing the principle statutory authority for the ASMR's role in an oil emergency.

Act 189 specifies that ASMR oil stocks must cover no less than 90 days of net imports, as required by the European Union, while also requiring that levels be no less than the amount necessary for the Czech Republic to meet its IEA stockholding requirement. The chair of the ASMR is able to draw upon stocks held in excess of the legal minimum level required by law, providing the chair with the ability to respond to domestic supply issues with loans to industry or to rapidly participate in an IEA collective action without seeking the approval of the Czech government. In a situation which would require public stocks to be drawn below this level, the chair would submit proposals to the government specifying the use of emergency oil reserves and possible demand restraint measures. However, subject to certain conditions, the chair of the ASMR can respond to an IEA collective action without governmental approval even in situations that would bring stock levels below the 90-day limit.

Within the ASMR, the Oil Security Division has the leading role in co-ordinating the NESO and liaising with industry and the IEA. The Ministry of Industry and Trade and the Czech Statistical Office also play central roles in the NESO body. The wider NESO structure includes other ministries as well as industry representatives, and meets at least once a year.

## *Stocks*

### **Stockholding structure**

The Czech Republic uses the public stocks of the ASMR to fully meet its minimum stockholding obligation as a member of the IEA and the European Union. The ASMR typically holds stocks in excess of the minimum 90 days of consumption required by law. This allows flexibility in order to facilitate stock turnover while consistently maintaining more than the minimum level.

There is no stockholding obligation on industry, but in a declared state of emergency the government has statutory powers over industry's commercially-held stocks.

### **Crude or products**

Roughly 55% of the Czech Republic's emergency reserves (the oil stocks counting towards meeting its stockholding obligation according to IEA methodology) are held in the form of refined product. The composition of ASMR stocks is legally limited to a maximum of 60% crude or semi-finished products, and at least 40% of refined petroleum products.

The ASMR total public stocks at the end of 2012 amounted to 15 mb, roughly half of which was crude oil. Of the remaining 50% made up of refined products, more than half were in the form of diesel oil.

### **Location and availability**

The ASMR does not hold storage capacity itself: volumes of public stocks are stored on behalf of the ASMR by designated storage operators and refiners. For the most part, the state-owned companies MERO and ČEPRO hold the ASMR stocks of crude and refined product, respectively. Storage capacity used for ASMR stocks must meet certain requirements regarding minimum size and drawdown rates. All volumes of ASMR crude oil and most product stocks (95%) are held in separate tanks.

While the Czech Republic does have bilateral stockholding agreements with Germany and the Slovak Republic, no stocks are currently being held under these bilateral arrangements.

Stockholding ticket arrangements are not used in the Czech Republic.

### **Monitoring and non-compliance**

The ASMR is responsible for monitoring quantities and qualities of stocks held by storage operators on its behalf. It must also report total stock levels and composition to both the Czech government and the European Commission.

Crude oil and product stocks held by MERO and ČEPRO are monitored electronically on a daily basis. The small volume of stocks held elsewhere is verified monthly on an accounting basis. Each year, one-third of the stocks is physically checked by the ASMR.

### **Stock drawdown and timeframe**

Because the ASMR typically holds stocks above the minimum level required by law, the Czech Republic is able to respond rapidly in the event of a disruption – without having to wait for government approval or an emergency declaration.

In a drawdown of public stocks, whether directed by the ASMR chair or through government approval, volumes may be either sold in a tender process or offered on loan. The ASMR posts such offers on its website and market participants are expected to address the ASMR directly. Loans are the preferred method of release, and are subject to a fee ranging from 0.9% to 1.2% of the market value of the oil. Establishing a date for the replenishment of oil stocks borrowed is an integral part of the contractual conditions, as are penalties for breach of contract. The maximum drawdown rates of public stocks are estimated to range from 125 kb/d to 185 kb/d for crude oil (depending on the pipeline used) and some 630 kb/d for finished products, well above the country's total daily oil consumption.

## Financing and fees

Public stocks are financed by the state budget. The annual financial costs of purchasing, storing and logistics and management of public emergency stocks amount to EUR 7-8/tonne.

## *Other measures*

### Demand restraint

In a severe emergency, the Czech Republic would likely use demand restraint measures in conjunction with the drawdown of public stocks.

The first step would be soft measures, such as educating the public about fuel-efficient driving techniques or calling for increased use of public transportation and carpooling.

Hard demand restraint measures available to the ASMR include limiting motor vehicle speed and imposing driving restrictions (only on certain days or for specific kinds of transportation or based on odd/even car plate numbers). In more extended disruptions, fuel rationing is also available as a policy measure; it would consist of a card system for priority users and coupon distribution to private vehicles. In a declared emergency, the government also has the power to order private companies to draw down their stocks.

Legislation assigns responsibility for ensuring compliance with these different measures to various components of the Czech government, such as the police and transportation boards, which have the authority to impose fines for violations. The ASMR, in conjunction with the Czech Statistical Office, is responsible for monitoring the effectiveness of the measures.

### Fuel switching

The potential to switch away from the use of oil to another fuel source in the short term is insignificant in the Czech Republic. The bulk of oil consumption (63%) is in the transport sector, where there is no capacity for short-term switching. It is estimated that less than 6% of the oil consumed in the industry and transformation sectors could potentially be switched to another fuel, equating to less than 4 kb/d.

### Other

Short-term surge production capacity in the Czech Republic is considered insignificant and not a potential emergency response measure.

## Gas

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### *Market features and key issues*

#### Gas production and reserves

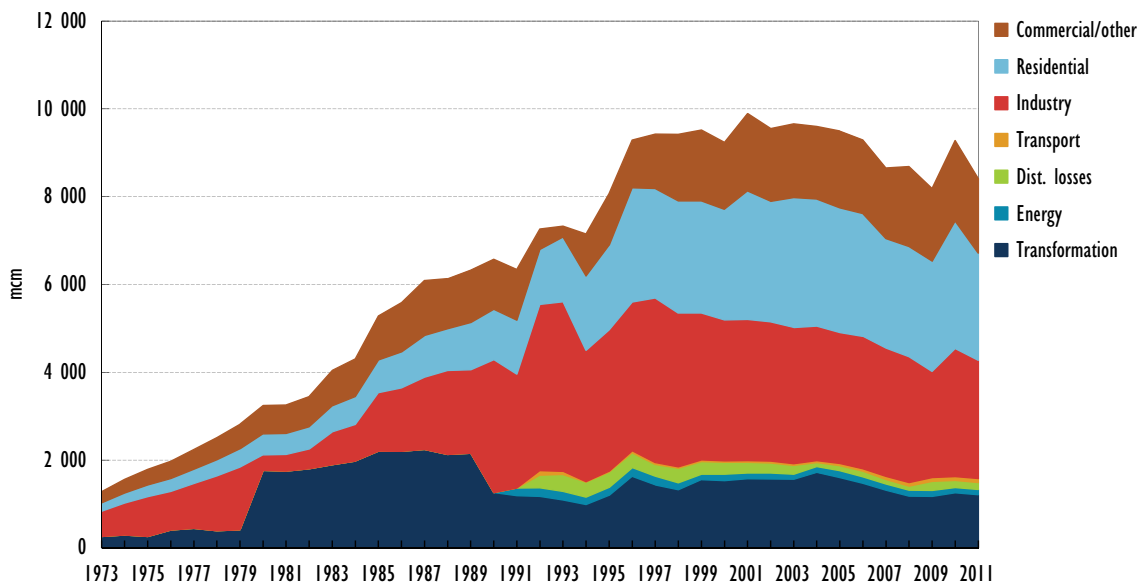
Only a small fraction of the Czech Republic's natural gas demand is met from domestic production. In 2012, some 200 million cubic metres (mcm) of gas was produced, meeting roughly 2% of demand. This is mainly produced in the South Moravian Region and, to a lesser extent, from gas taken from hard coal mines in Northern Moravia.

## Gas demand

In 2011, demand for natural gas was just over 8.4 bcm. Industry is the primary user of gas in the country, representing 32% of total consumption. Residential users make up the second largest group, representing 29% of gas use, primarily for heating. The transformation sector accounted for 14% of gas use, where gas-fired generation is mainly used for meeting peak electricity demand.

Daily gas consumption in 2011 ranged from a minimum level of 10.4 mcm/d in the summer to a peak of 50.8 mcm/d in the winter. Winter consumption typically varies within a range of 30 to 65 mcm/d because of a relatively high seasonality of gas demand. The highest daily peak was reached in January 2006, when temperatures dropped to -16.9 °C and gas consumption reached 67.6 mcm/d.

Figure 4.5.6 Natural gas consumption by sector, 1973–2011



## Gas import dependency

Historically, all gas imports came from Russia. Following efforts in the late 1990s to diversify supply, the Czech Republic began importing from Norway. In the early 2000s Norwegian gas reached a quarter of total imports, but its share in total imports has since declined. In 2008, 22% of gas imports came from Norway. Physically, all natural gas used in the Czech Republic comes from Russia owing to swap operations.

## Gas company operations

In line with the liberalisation of the natural gas market under European Directive 2003/55/EC, each of the vertically integrated companies has been unbundled. RWE Transgas, the dominant importer of natural gas into the Czech Republic, has been split into a transmission system operator (TSO), RWE Transgas Net, a gas storage operator, RWE Gas Storage, the remaining part carrying on the business of natural gas wholesales. In 2012, seven distribution system operators were selling gas to customers, with three majors serving nearly 75% of the market: RWE (33.3%), JMP Net (21.8%) and SMP Net (18.1%).

## Gas supply infrastructure

### Ports and pipelines

RWE Transgas Net, the Czech Republic's TSO, manages a domestic and transit pipeline network with three interconnection points. This is used both to transport natural gas for consumption in the Czech Republic (8.7 bcm/year) and for transit of around 30 bcm/year of Russian gas to other end-user markets further west. Transit gas arrives at the incoming transfer stations of Lanžhot and Olbernhau and departs from the outgoing transfer stations in Waidhaus and Hora Svaté Kateřiny.

Linked to the pipeline construction of Nord Stream (through the Baltic Sea from Russia to Greifswald, Germany) and OPAL (connecting Nord Stream, through Germany, to Hora Svaté Kateřiny), the Gazelle pipeline project, which became operational in January 2013 with a capacity of 30 bcm/year, connects Hora Svaté Kateřiny to Waidhaus. This could potentially lead to a shift of transit flows through the Czech Republic, moving amounts of Russian gas that currently enter the country at Lanžhot (after transiting through Ukraine) to the Olbernhau entry point.

An interconnector between Poland and the Czech Republic became operational in April 2012.

### Storage

There are three storage system operators (SSOs) in the Czech Republic: RWE Gas Storage, MND and SPP Bohemia. Between them, the three companies own and operate eight underground storage facilities in the country. The Dolní Bojanovice site is used exclusively for supplying the Slovak market. At the same time, a storage facility in Slovakia, at Láb, is used for supplying the Czech market.

The gas industry has recently finished projects to expand gas storage; capacity at three of the country's eight underground storage sites has been raised to a total of 3.5 bcm (from a previous total of 2.9 bcm) and the total withdrawal capacity increased from 56.2 mcm/d to 65.6 mcm/d. This compares to the country's winter consumption range of 30 to 65 mcm/d and a single day record high of 67.6 mcm/d. When completely full, storage is able to supply peak demand for approximately 50 days.

### Emergency policy

The Czech Republic maintains a high degree of natural gas supply security through a combination of several measures, including using long-term supply contracts, having a relatively high capacity of underground commercial gas storage, and requiring transmission and distribution system operators to comply with the safety standards of the supply infrastructure. It seeks to improve security of supply through capacity extensions at a number of storage facilities and increased flexibility in its gas network, including reversibility of gas flows throughout the transmission system and expanding interconnectors to neighbouring countries.

Following the January 2009 gas crisis in Europe, the Czech government put in place, over a short period of time, a response plan for dealing with a reduction in gas supplies. This relies on co-ordination with industry in order to optimise gas storage use and regulate demand-side measures in a crisis. This plan sets measures and actions to be taken during the periods of early warning and sets emergency crisis levels.

## Emergency response measures

There are no emergency reserves of natural gas in the Czech Republic, as all storage is used for commercial purposes.

The early warning system established in 2009 requires transmission and distribution system operators and all gas traders to report any indications of potential disruption to supplies. In the event of a disruption to gas supplies, crisis severity levels would be used to determine the level of restrictions or cut-offs to end-users. Customers are divided into groups according to the volume and type of consumption (e.g. gas used for heating or production; the importance of use for ensuring functioning of the state). Disruptions would be rated on their level of severity, determining the degree to which specific consumer groups would have their supplies restricted or stopped. There are five levels of consumer groups for which supplies would be reduced and another five levels in which supply cut-offs would be imposed. The last consumer group consists of small businesses and households and would be supplied in all but the most severe of disruptions.

There is no programme in place in the Czech Republic to encourage or otherwise require users of gas to switch to other fuel sources in the event of a gas supply disruption. The potential for short-term switching from gas to other fuel is limited. In the transformation sector, most gas-fired power stations are used to meet peak electricity demand and do not have the capacity to switch fuel sources.