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:

**Key data**
- Key oil data, 1990-2018
- Key natural gas data, 1990-2018
- Total primary energy source (TPES) trend, 1973-2012

**Infrastructure map**

**Country overview**

**OIL**
- Market features and key issues
  - Domestic oil production
  - Oil demand
  - Imports/exports and import dependency
  - Oil company operations

- Oil supply infrastructure
  - Refining
  - Ports and pipelines
  - Storage capacity

- Decision-making structure

**Stocks**
- Stockholding structure
- Crude or products
- Location and availability
- Monitoring and non-compliance
- Stock drawdown and timeframe
- Financing and fees

**Other measures**
- Demand restraint
- Fuel switching
- Other

**GAS**
- Market features and key issues
  - Gas production and reserves
  - Gas demand
  - Gas import dependency
  - Gas company operations

- Gas supply infrastructure
  - Ports and pipelines
  - Storage

- Emergency policy
- Emergency response measures
### Key data

**Table 4.25.1  Key oil data**

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Production (kb/d)</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Demand (kb/d)</td>
<td>335.7</td>
<td>362.0</td>
<td>359.6</td>
<td>335.9</td>
<td>324.1</td>
<td>310.8</td>
<td>286.7</td>
</tr>
<tr>
<td><em>Motor gasoline</em></td>
<td>96.4</td>
<td>91.8</td>
<td>94.0</td>
<td>79.0</td>
<td>73.3</td>
<td>66.1</td>
<td>-</td>
</tr>
<tr>
<td><em>Gas/diesel oil</em></td>
<td>107.3</td>
<td>111.0</td>
<td>102.3</td>
<td>106.8</td>
<td>114.9</td>
<td>113.5</td>
<td>-</td>
</tr>
<tr>
<td><em>Residual fuel oil</em></td>
<td>49.6</td>
<td>55.6</td>
<td>57.5</td>
<td>55.0</td>
<td>43.0</td>
<td>39.3</td>
<td>-</td>
</tr>
<tr>
<td><em>Others</em></td>
<td>82.3</td>
<td>103.6</td>
<td>105.7</td>
<td>95.0</td>
<td>93.0</td>
<td>92.0</td>
<td>-</td>
</tr>
<tr>
<td>Net imports (kb/d)</td>
<td>335.7</td>
<td>362.0</td>
<td>359.6</td>
<td>335.9</td>
<td>324.1</td>
<td>310.8</td>
<td>286.7</td>
</tr>
<tr>
<td><em>Import dependency (%)</em></td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Refining capacity (kb/d)</td>
<td>428.0</td>
<td>427.0</td>
<td>434.0</td>
<td>442.7</td>
<td>442.7</td>
<td>442.7</td>
<td>-</td>
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<tr>
<td>Oil in TPES** (%)</td>
<td>30</td>
<td>29</td>
<td>27</td>
<td>27</td>
<td>28</td>
<td>26</td>
<td>-</td>
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</table>

* Forecast.
** TPES data for 2012 are estimates.

**Table 4.25.2  Key natural gas data**

<table>
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<tr>
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<tr>
<td>Production (mcm/y)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Demand (mcm/y)</td>
<td>616</td>
<td>805</td>
<td>820</td>
<td>1 564</td>
<td>1 303</td>
<td>1 130</td>
<td>1 302</td>
</tr>
<tr>
<td><em>Transformation</em></td>
<td>235</td>
<td>297</td>
<td>255</td>
<td>818</td>
<td>544</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td><em>Industry</em></td>
<td>287</td>
<td>344</td>
<td>375</td>
<td>481</td>
<td>486</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td><em>Residential</em></td>
<td>39</td>
<td>86</td>
<td>51</td>
<td>85</td>
<td>78</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td><em>Others</em></td>
<td>55</td>
<td>78</td>
<td>139</td>
<td>180</td>
<td>195</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Net imports (mcm/y)</td>
<td>616</td>
<td>805</td>
<td>820</td>
<td>1 564</td>
<td>1 303</td>
<td>1 130</td>
<td>1 302</td>
</tr>
<tr>
<td><em>Import dependency (%)</em></td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
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<tr>
<td>Natural gas in TPES (%)</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>-</td>
</tr>
</tbody>
</table>

* 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 4.25.1  Total primary energy source (TPES) trend, 1973–2012
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 4.25.2 Gas infrastructure of Sweden

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.
Country overview

In 2012, Sweden’s total primary energy supply (TPES) was made up of oil (26%) and gas (2%). With coal representing 4% of TPES, Sweden has the lowest share of fossil fuels in the energy supply mix among International Energy Agency (IEA) member countries. This is a significant difference from the mid-1970s, when fossil fuels made up three-quarters of Sweden’s energy supply, and is the result of a concerted effort to move away from the use of oil towards developing nuclear and renewable energy sources. Sweden’s energy policy seeks to further increase its share of renewable energy sources and plans to provide half of all energy, and 10% of all transport needs by 2020. Sweden’s use of fossil fuel is also to be further reduced by fully eliminating their use for heating purposes by 2020 and by having a vehicle fleet in Sweden that is “independent” of fossil fuels by 2030. Under this policy, demand for both oil and natural gas is anticipated to decline from its current levels.

Oil demand in Sweden was nearly 310 thousand barrels per day (kb/d) in 2012. Although Sweden is fully dependent on imports to meet its domestic oil demand, it is a net exporter of refined oil products. Overall oil demand will likely decline in the coming decade, but demand for oil within the transport sector is expected to grow.

The consumption of natural gas in Sweden totalled 1.3 billion cubic metres (bcm) in 2011, all supplied via a single interconnector with Denmark. While natural gas plays only a minor role in Sweden’s TPES, its role in the energy supply of southern and western Sweden is much more substantial, accounting for around 20% of the area’s total energy use. Around 30 large consumers, including combined heat and power (CHP) plants, account for roughly 80% of total gas demand in the country, while households and other small consumers, numbering over 33,000, account for 2% of the total.

The Swedish Energy Agency (SEA), under the Ministry of Enterprise, Energy and Communications, has the main responsibility for both oil and natural gas emergency response policy. Sweden fulfils its oil stockholding requirements to both the IEA and the European Union by placing minimum stockholding obligations on industry and major consumers. During a disruption of supply and as a contribution to an IEA collective action, Swedish authorities would reduce the minimum obligation, thereby granting operators permission to draw stocks below the minimum level.

In a natural gas crisis, supplies to protected customers (i.e. households) would be safeguarded while the physical balance of the gas system would be maintained by restricting or discontinuing supplies to non-protected customers in a crisis. System operators are obliged to have in place crisis plans for dealing with emergency situations, including a strategy for reducing supplies to customers.

Oil

Market features and key issues

Domestic oil production

Sweden has no indigenous oil production and is thus 100% dependent on imports. While Sweden depends fully on imports to meet domestic oil demand, the country is a net exporter of refined oil products. In 2012, Swedish refineries processed some 20.6 million tonnes (Mt) of crude oil, or roughly 413 kb/d. The total product output from refineries was 21.4 Mt, or 434 kb/d.
Oil demand

Oil product demand in Sweden averaged nearly 330 kb/d in 2011. The vast majority of this was consumed in the transport (66%) and industry (21%) sectors. Total oil use has declined at an annual average rate of nearly 1% since 2000. The decline in oil demand has been driven by trends to switch away from oil, for example replacing fuel oil and gasoil used for heating with district heating and heat pumps. The largest decline in oil use has been in the industry sector, which has moved towards greater use of electricity and biofuels.

While overall oil consumption has been on the decline, demand in the transport sector has continued to increase gradually, rising at an annual average rate of 0.6% over the period from 2000 to 2010 (the latest year for which consumption by sector is available).
At the same time, the mix of transport fuels has shifted substantially towards a greater share of diesel. The relatively rapid transition from gasoline to diesel in road transportation can be largely attributed to EU regulations regarding CO\textsubscript{2} emissions for new cars (which favour diesel engines) and growth in the use of heavy goods vehicles. Demand for diesel grew at an annual average rate of 4.7% from 2000 to 2011, compared to a decline in demand for motor gasoline (-1.2% per year) over the same period.

Total oil demand is expected to continue to decline in the coming years at an annual average rate of -0.4%. This rate would infer oil demand of around 315 kb/d by 2020. At the same time, demand for diesel is expected to continue to rise, reaching over 110 kb/d by 2020, compared to just under 80 kb/d in 2011.

**Imports/exports and import dependency**

In 2012, Sweden imported 20.6 Mt of crude oil, or an average of roughly 416 kb/d, primarily from the Russian Federation (42%), Norway (25%) and Denmark (15%). Additionally, Sweden imported some 0.4 Mt of feedstocks in 2012. Russia’s share in Sweden’s total crude imports has risen significantly over the past decade, having represented less than 10% of total crude imports in 2000.

As refining output exceeds domestic demand, Sweden is a net exporter of refined products. In 2012, product exports averaged 275 kb/d compared to product imports of 137 kb/d. This was mostly made up of reciprocal trade of the main products with Denmark, Norway and the United Kingdom.

**Figure 4.25.4  Crude oil imports by origin, 2012**

![Crude oil imports by origin, 2012](image)

**Oil company operations**

Three companies operate refineries in Sweden, with Preem AB operating the country’s two largest refineries; together they represent about 80% of the country’s total distillation capacity. St1 operates the third largest refinery, located in Göteborg, which was formerly operated by Shell until its acquisition by St1 at the end of 2010. Nynas Refining also operates two smaller refineries specialising in bitumen and lubricants.

The Swedish oil retail market is dominated by four companies; Preem, Statoil, QK-Q8 and St1 (with retail stations branded Shell), which together accounted for roughly three-quarters of the market. Companies operating on the Swedish oil market are represented by the Swedish Petroleum and Biofuels Institute (SPBI).
Oil supply infrastructure

Refining

Sweden’s five refineries have a total crude distillation capacity of roughly 435 kb/d. The largest of these, the refinery at Lysekil (Preem), has a crude capacity of 210 kb/d. Three of these refineries (Preem, St1 and Nynäs Refining) are located in Göteborg and together account for 45% of the country’s total crude capacity. The fifth refinery (Nynäs Refining) is located south of Stockholm, at Nynäshamn.

Sweden introduced environmental classifications in 1991 which divided diesel into three classes, Mk3, Mk2 and Mk1. Mk3 followed the European diesel standard, EN 590, while Mk2 and Mk1 held more stringent requirements on specific parameters. Mk2 was a fuel specification that some of the refineries could produce with minor upgrades, while Mk1, with a sulphur content of less than 5 ppm (parts per million), required significant upgrades in all five refineries. Within a few years Mk1 became the major diesel fuel used in Sweden, and in 2012, about 98% of the diesel fuel sold was of Mk1 quality.

The Preem refinery at Lysekil underwent major upgrading over the past decade in order to produce greater volumes of sulphur-free gasoline and diesel oil. This has positioned Preem as the largest supplier of Mk1 diesel in the Swedish market.

Sweden applies an energy tax on diesel which is differentiated according to its classification; since 1 January 2011 the environmental tax on Mk1 is EUR 0.17 per litre, compared to EUR 0.20 per litre for Mk2 and EUR 0.21 per litre for Mk3. Additionally, a CO\textsubscript{2} tax is levied at a constant rate for all three classifications, at EUR 0.33 per litre. At the same time, motor gasoline has an energy tax of EUR 0.34 per litre and a CO\textsubscript{2} tax of EUR 0.27 per litre.

Figure 4.25.5  Refinery output vs. demand, 2012

Ports and pipelines

Sweden has three main ports for importing crude oil and the refinery feedstocks necessary to supply the country’s refineries. The combined total capacity of these ports is roughly 450 kb/d, with the individual port capacities commensurate with the capacities of the refineries they serve.
Imports of refined products flow primarily through six main ports, three of which are in the Stockholm area. The six ports have a total combined capacity to import over 190 kb/d of refined products.

Because of Sweden’s small market and sparse population, the oil distribution infrastructure relies on road distribution rather than pipelines. Around 800 road tankers carry out secondary distribution to consumers and retail outlets.

**Storage capacity**

Sweden has approximately 30 coastal and inland storage facilities with a combined total oil storage capacity of 15.2 million cubic metres (mcm), or nearly 96 million barrels (mb). Major depots are located in Göteborg, Lysekil, Gävle, Stockholm, Norrköping and Malmö, with a total storage capacity of nearly 65 mb (10.3 mcm). These facilities play an important role in the domestic distribution of oil products from domestic refineries and import terminals. The remaining storage capacity (31 mb) is spread over 22 storage sites located around the country.

**Decision-making structure**

The Minister of Enterprise, Energy, and Communications is responsible for oil and natural gas emergency policy in Sweden. The Swedish government states that its energy policy should be built on the same foundations as wider energy co-operation in the European Union, i.e. ecological sustainability, competitiveness and security of supply. It considers its key areas of work to be security of supply, improving the efficiency of energy use, promoting renewable energy and efficient energy technology.

Sweden’s response to an oil supply crisis would be the lowering of the compulsory stockholding requirements set on industry. Specific demand restraint measures have not been prepared and would not be part of an initial response. However in a severe and long-lasting crisis, Swedish authorities would likely consider light-handed measures to supplement the use of compulsory industry stocks.

The SEA, under the Ministry of Enterprise, Energy and Communications, has the main responsibility for emergency response. Within the agency, the Central Office of Security of Energy Supply team is the core of Sweden’s national emergency strategy organisation (NESO). In normal times, 12 to 15 people work in the core NESO; this can be expanded in times of crisis to include relevant expert staff from both inside and outside the SEA. Close co-operation with industry is a key element in the Swedish NESO and the industry is represented in the regular work of the NESO by the SPBI. Other players, such as independent oil consultants and institute researchers, interact with the NESO team when appropriate.

During a crisis, the NESO would analyse the situation and provide recommendations to the Ministry of Enterprise, Energy and Communications regarding possible response measures. In the case of an IEA collective action, ministry officials would consult with the energy minister and, based on the outcome, draft a formal decision to be adopted by the government at its weekly meeting, or potentially at an extraordinary meeting of ministers. Once approved, the SEA would be responsible for immediate implementation of the agreed response plan.
Stocks

Stockholding structure
Sweden meets its stockholding requirements to both the IEA and the European Union by placing compulsory stockholding obligation (CSO) on oil industry participants. Compulsory stocks are commingled with commercial and operational stocks.

Sweden bases the industry CSO on deliveries to the domestic market of the main refined product categories (i.e. motor gasoline, kerosene, diesel and fuel oils). In addition to importers and domestic refiners, major consumers of these fuels (defined as consuming annually over 50 000 m³ or roughly 314 kb), such as manufacturers and CHP plants, are subject to the stockholding requirement.

Crude or products
Subject to approval from the SEA, companies can meet their CSO for oil products with substitution by either crude oil or another product (when this is determined by the SEA to provide the same level of security).

Location and availability
Ticket arrangements are allowed, both domestic and abroad, according to specific rules set out in SEA regulations. Such arrangements must be granted by the agency beforehand and formalised by a contract covering a period of no less than three months and no more than one year. Bilateral agreements for stockholding abroad are subject to a maximum of 30% of an organisation’s total stockholding requirement for each stock category. Sweden has formal bilateral agreements with Denmark, Estonia, Finland, Ireland, the Netherlands and the United Kingdom. Stocks held in those countries on behalf of a Swedish company must be owned by the Swedish company or by a company in the country involved.

Total stocks in Sweden at the end of 2012 were 28 mb. This figure includes some 3.6 mb of oil held by major consumers to meet their CSOs.

Monitoring and non-compliance
Companies subject to CSOs must report monthly to the SEA, indicating the amount of fuel stocks held at the end of the previous month, as well as their location and method of storage. The SEA is entitled to inspect the stocks held under the obligations, and can also examine the accounts and other documents relating to company stockholding operations.

Any company failing to maintain compulsory stocks must pay the state a special storage penalty charge. This penalty charge corresponds to the estimated capital cost of the product for one month, plus a surcharge of 60% for failing to meet the requirement.

Stock drawdown and timeframe
The authority to alter the industry stockholding obligation rests with the Swedish government. This would be a decision taken by all ministers, based on a draft government decision presented by the energy minister, either at a regularly scheduled weekly meeting or potentially at an extraordinary meeting of ministers. Depending on the circumstances, a government decision on whether to authorise the lowering of the CSO can be expected to take 7 to 14 days.
Immediately following the government decision, the SEA would decide the maximum stock draw of relevant stocks for each company as well as other specific conditions. The government and agency decisions would normally be distributed to oil companies the same day. Each individual company would be left to make the commercial decisions on how to deal with the volumes of oil no longer bound by stockholding obligations.

**Financing and fees**

No financial support is given to oil companies or large consumers which are subject to compulsory stockholding obligations. Thus costs are implicitly passed on to final consumers in market prices.

**Other measures**

**Demand restraint**

In a severe and long-lasting crisis, Swedish authorities would likely consider light-handed measures to supplement the use of compulsory industry stocks. The SEA would advise the government on possible measures to be implemented in the crisis while the government would take the final decision on the measures deemed appropriate. The SEA has the overall responsibility for the implementation of energy demand restraint measures, with the 2007 Ordinance (2007:1153) serving as the legal basis. This provides the SEA with the ability to implement a variety of light-handed demand restraint measures. Stronger measures such as rationing would first require parliamentary approval.

In a crisis, Swedish authorities would begin by focusing on an information campaign to encourage oil saving, while assigning fuel savings to all governmental agencies in order to set an example for the general public. Administrative instruments, such as speed reductions and Sunday driving bans, could be used in order to strengthen demand restraint measures. Economic instruments, such as modifying fuel taxes or subsidising alternative travelling options, could also be contemplated, while a rationing system would be considered as a policy option of last resort.

As in other IEA countries, the transport sector makes up the single largest share of oil consumption in Sweden and would therefore be the most likely sector to be targeted for demand restraint measures.

**Fuel switching**

Short-term fuel-switching capacity in Sweden is considered inconsequential and there are no incentives or policy options to incite such switching in an oil crisis. Sweden uses only a small portion of its oil for power generation. In instances where oil is used, this is primarily for peak production hours and when regular power production is shut down. In the case of an oil crisis, no environmental regulations would be altered to allow for greater use of fuel switching.

**Other**

With no domestic production, short-term surge production is nonexistent in Sweden.
Gas

Market features and key issues

Gas production and reserves
Sweden has no indigenous production of natural gas.

Gas demand
Domestic gas consumption in Sweden totalled around 1.3 bcm in 2011, compared to over 1.5 bcm in 2010, a consumption peak year. In 2011, 43% of total gas use was consumed in the transformation sector and 37% in the industry sector, which includes non-energy use. The residential and commercial sectors each accounted for another 6% and 10% respectively, while the remainder of gas use was in the transport sector (4%).

Natural gas plays only a minor role in Sweden’s energy supply; in 2012 it represented 2% of TPES and only 1% of total electricity generation. However, the role of natural gas in the energy supply of southern and western Sweden is much more substantial. In the 30 municipalities in Sweden which have access to natural gas supplies, natural gas accounts for around 20% of total energy use on average.

Roughly 80% of total gas use is consumed by 30 large consumers. This includes nine cogeneration plants (CHP for district heating) which account for 55% of all gas use in the country. Around 2% of total gas use in Sweden is by smaller consumers (i.e. households); these are considered protected customers and number around 33 000 consumers.

Sweden’s daily gas consumption typically ranges between 6 and 7 million mcm/d in the winter, compared to around 1.2 mcm/d in the summer. On the basis of the European standard of a 1-in-20 year exceptional cold winter causing peak demand, Sweden’s maximum daily gas demand is calculated at 7.8 mcm.

Figure 4.25.6  Natural gas consumption by sector 1973-2011
Gas import dependency

Sweden has no indigenous production of natural gas and is thus 100% import dependent. All natural gas supplies come from Denmark via a single interconnector in the southwest of the country. As Sweden is at the end of the gas supply line from Denmark, there is no transit of natural gas through Sweden.

Gas company operations

The company Swedegas is the owner and operator of the transmission system and storage facility, as well as being responsible for maintaining physical balance within the system.

There are five distribution system operators (DSOs) in Sweden, the largest being E.ON Gas Sverige. There are only five traders selling natural gas for use in the Swedish gas network. The largest players are DONG, E.ON Försäljning Sverige and Göteborg Energi. The Swedish gas market requires that at each withdrawal point there be a party that has financial liability for ensuring that the gas system is balanced. Typically, it is the traders who are responsible for balancing the gas, but traders may also buy this service from others. There are four balance-responsible parties for the Swedish market: E.ON Gashandel, DONG Energy, Göteborg Energi and Modity Energy Trading AB.

Gas supply infrastructure

Ports and pipelines

The Swedish transmission system for natural gas begins at Dragør in Denmark, crosses the Öresund via the Öresund pipeline to Klagshamn south of Malmö, from where the trunk pipeline heads northward to Stenungsund. The technical capacity of the Öresund trunk line is 8.4 mcm/d while the technical capacity of the entry point of Dragør is 7.8 mcm/d.

The Swedish natural gas network consists of approximately 620 km of transmission lines and roughly 26,000 km of distribution lines. Branch pipes lead off from the trunk pipeline to various consumption areas. There are 39 metering and control (MC) stations connected to the branch lines, where the gas is metered and the pressure reduced. Local distribution systems are then connected to the MC stations. These systems distribute the gas to the end consumers.

The terminal at Nynäshamn, south of Stockholm, receives liquefied natural gas (LNG) and has been in operation since mid-2011. This port has a maximum capacity to supply 6 mcm/d; however it is not connected to the gas transmission system in the southwest of Sweden.

Storage

There is only one small storage facility in Sweden which is used for meeting peak demand. Located at Skallen, in southern Halland, it is a lined rock cavern with a total working capacity of 8.8 mcm and a maximum withdrawal capacity which varies from 0.6 to 0.9 mcm/d, a variation which depends on the pressure in the storage facility and the trunk pipeline. The withdrawal capacity corresponds to 10% to 20% of the gas requirement of the Swedish market under winter conditions.

Sweden has no storage to provide for seasonal swings in natural gas demand. This is primarily provided for with the assistance of storage facilities in Denmark (at Stenlille).
Emergency policy

Swedish emergency response policy for natural gas is based on the European Regulation No 994/2010. The 2005 Natural Gas Act gives powers to the system-balancing authority to order system operators to increase or reduce the input or off-take of gas flows and to restrict or discontinue the transmission of natural gas to customers. This provides the statutory powers for physically balancing the domestic gas network in times of crisis.

The 2006 Natural Gas Ordinance establishes responsibilities under the Natural Gas Act. Since 2013, the role of system-balancing authority has been appointed to the TSO, Swedegas.

The Natural Gas Ordinance also sets the circumstances under which supplies to protected customers are to be safeguarded. This is defined as being in at least the following cases: a partial disruption of supplies for up to 24 hours; disruption of supplies during the winter period (running from the beginning of December to the end of February); and disruption during periods when temperatures are 4°C to 5°C less than the normal winter temperatures (1 in 20 winters).

Sweden defines protected customers as all households and small consumers connected to the gas distribution network. Approximately 33,000 customers fall under this definition and collectively these consumers account for 2% of total natural gas consumption in Sweden.

Emergency response measures

Means for responding in a crisis include the use of line pack, maximising the input of biogas supplies into the network, and drawing on available volumes in storage. Swedish authorities estimate that these measures could maintain supplies to the entire Swedish gas market during a total cut-off lasting less than 24 hours during high demand. However, disconnecting large users of natural gas remains the most important way of safeguarding supplies to protected customers in a gas crisis. In this case, supplies to protected customers are estimated to be maintainable for one month in the case of high demand, and for several months in the case of low demand.

A total of about 60 large natural gas consumers can potentially be cut off from supplies very rapidly in an emergency, the equivalent of nearly 85% of total gas demand in Sweden. Large CHP units, which constitute almost half of all gas demand in Sweden, have the capacity to quickly switch from natural gas to gasoil. Large industries, representing another quarter of total gas demand, also have the capacity to switch to other fuels, primarily fuel oil. There are no requirements for gas users with fuel-switching capability to keep specific stocks of alternative fuels.