

2012

OIL & GAS SECURITY

Emergency Response of IEA Countries

GERMANY

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International
Energy Agency

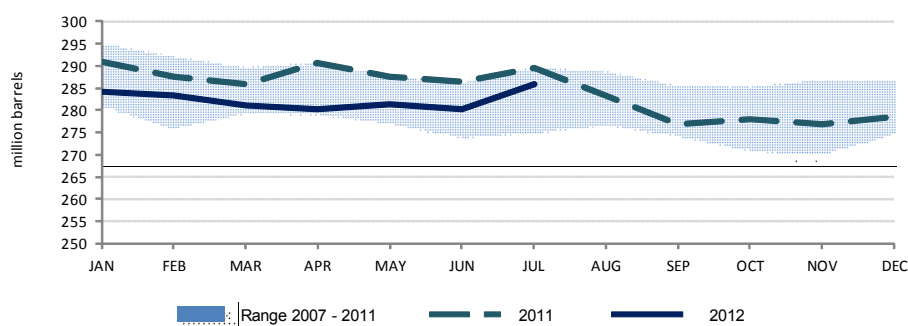
KEY FIGURES

Germany

Key Oil Data

	1985	1990	1995	2000	2005	2009	2010	2011
Production (kb/d)	130.0	102.7	76.3	85.8	113.2	90.8	76.1	79.9
Demand (kb/d)	2 650.6	2 681.8	2 882.2	2 766.8	2 620.7	2 452.8	2 469.6	2 400.1
Motor gasoline	606.8	724.0	697.6	665.1	542.4	473.2	454.3	453.7
Gas/diesel oil	1 150.6	1 107.8	1 257.1	1 163.1	1 110.0	1 065.9	1 096.1	1 050.4
Residual fuel oil	299.1	212.9	195.0	168.1	175.8	159.0	147.5	142.8
Others	594.0	637.0	732.5	770.5	792.4	754.7	771.7	753.2
Net imports (kb/d)	2 520.6	2 579.1	2 805.9	2 681.0	2 507.5	2 362.0	2 393.5	2 320.2
Import dependency	95.1%	96.2%	97.4%	96.9%	95.7%	96.3%	96.9%	96.7%
Refining capacity (kb/d)	2 172	1 507	2 317	2 275	2 323	2 418	2 466	2 466
Oil in TPES	33.7%	34.6%	38.6%	37.1%	34.3%	32.6%	32.0%	-

End-Month Total Oil Stock Levels¹ - Five Year Range



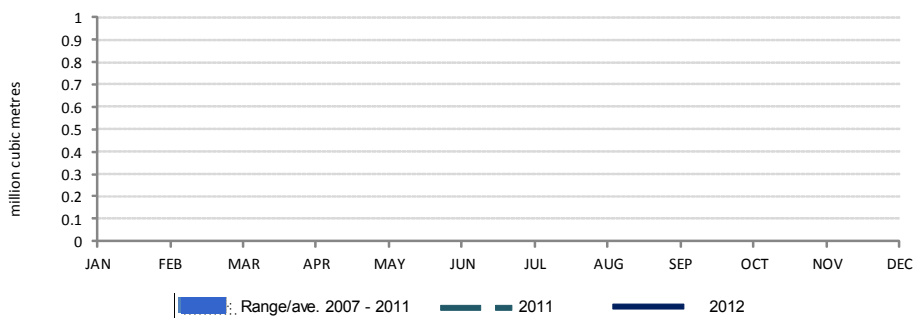
Key Natural Gas Data

	1985	1990	1995	2000	2005	2009	2010	2011*
Production (mcm/y)	22 021	18 919	21 069	22 049	19 850	14 953	13 042	11 905
Demand (mcm/y)	64 042	69 723	83 378	87 728	98 176	93 508	90 069	78 992
Transformation	12 036	15 872	15 991	15 679	22 550	20 826	24 006	-
Industry	25 152	25 123	25 555	27 227	24 433	21 183	26 174	-
Residential	16 513	17 455	27 408	29 802	36 558	36 073	27 894	-
Others	10 341	11 273	14 424	15 020	14 635	15 426	11 995	-
Net imports (mcm/y)	42 021	50 804	62 309	65 679	78 326	78 555	77 027	67 087
Import dependency	65.6%	72.9%	74.7%	74.9%	79.8%	84.0%	85.5%	84.9%
Natural Gas in TPES	13.7%	15.7%	20.0%	21.4%	23.9%	24.1%	22.3%	-

* based on monthly data submissions to the IEA.

End-Month Natural Gas Stock Levels² - Five Year Range

(Natural Gas Stock Level Data Not Available)



1 -Primary oil stocks on national territory; these exclude utility stocks and including pipeline and entrepot stocks where known.

2 -Stocks held on national territory, as reported to the IEA in monthly data submissions.

OVERVIEW

Germany has very little domestic oil and natural gas production and relies heavily on imports. It has well diversified and flexible oil and natural gas supply infrastructure, which consists of crude, product and gas pipelines and crude and oil product import terminals. Natural gas is imported into Germany exclusively by cross-border pipeline. The country has no LNG infrastructure, although some German companies have booked capacities in overseas LNG terminals.

Oil continues to be the main source of energy in Germany although it has declined markedly since the early 1970s. It now represents approximately 32% of Germany's total primary energy supply (TPES).

Natural gas consumption in Germany has declined 10% since 2006. Demand was 90 bcm in 2010, down from 100 bcm in 2005. According to government commissioned analysis, the total consumption of natural gas in Germany is expected to continue to decline over the long term. The share of natural gas in Germany's TPES is currently around 22%.

German oil stock levels are generally well above the required 90-days. Total oil stock levels in Germany were equivalent to 140 days net imports in April 2012.

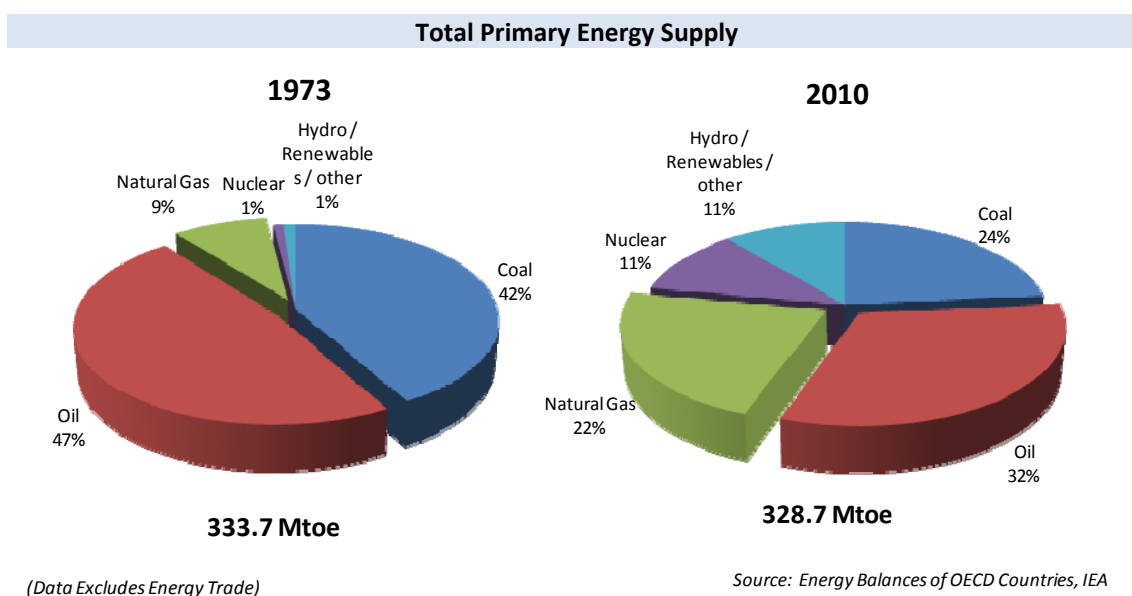
Since 1998, the German oil stockholding agency (EBV) has been solely responsible for meeting Germany's 90-day stockholding obligation. The Oil Stockholding Act stipulates that the EBV shall constantly maintain stocks of oil and petroleum products at a level equivalent to or above 90 days of net imports. There is no minimum stockholding obligation on industry, so industry held commercial stocks are held in addition to the EBV stocks.

There are several legal tools available to German authorities for natural gas emergency response. These include Ordinances that can be used to restrict the sale, purchase or use of goods, both in terms of quantity and time, or permit them only for certain priority purposes, to ensure that vital energy needs are met.

There are no compulsory natural gas storage requirements in Germany, and no state-owned storage facilities. Operators of gas storage facilities must grant other companies access to their storage facilities and auxiliary services at a fair market price. There are 47 gas storage facilities in Germany, with a total capacity 20.9 bcm. German firms also have access to natural gas storage in Haidach (Austria) which has a capacity of 2.6 bcm.

1. Energy Outlook

Total Primary Energy Supply (TPES) in Germany stood at 328.71 Mtoe in 2010, up 3.3% from 2009 but still nearly 3% lower than 2005 when Germany's TPES stood at 338.7 Mtoe. On average Germany's TPES has been in slow decline since its 1979 peak of 367.9 Mtoe despite ongoing GDP growth. Some of the recent decline in Germany's TPES may be attributable to the 2007-2008 economic crisis. However, additional explanations may include efficiency gains as reflected in factors such as energy intensity which, according to Administration figures, declined by 30% from 1990-2010.

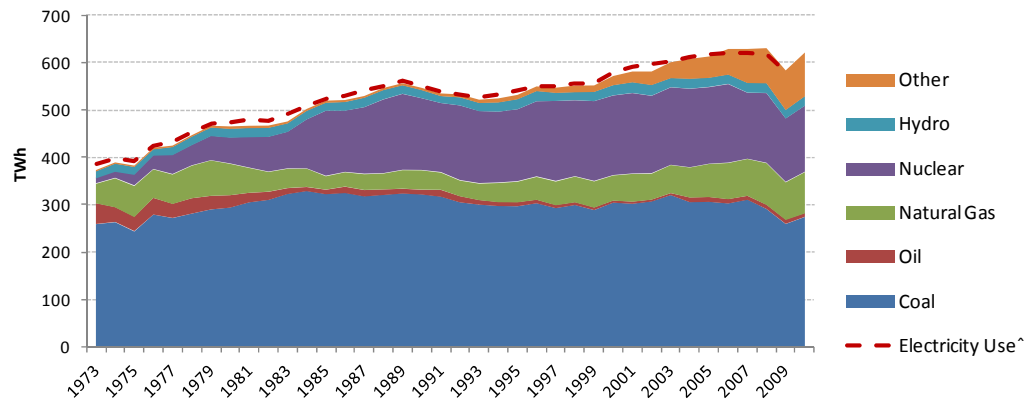


Oil continues to be the main source of energy in Germany although oil's share in the country's TPES has declined markedly since the early 1970s, from 47% in 1973 to 32% in 2010. Coal also declined significantly from 42% of TPES to 24% during the same period. Oil and coal have been replaced by a combination of natural gas, nuclear and renewables. The share of natural gas increased from 9% in 1973 to 22% in 2010, while nuclear and renewables increased from a negligible 1% each to 11% each during the same period.

Under existing government policies the trend towards an increasing share of renewables looks set to continue. The Energy Concept 2010 established a goal for Germany to increase its share of electricity generated from renewable sources to at least 35% of total consumption by 2020. Conversely, the trend towards an increasing share of nuclear in the energy mix looks set to reverse following the government announcement in 2011 of its decision to phase out all German nuclear power plants by the end of 2022.

1 Excludes electricity trade

Electricity Generation, by Fuel Source



Source: Energy Balances of OECD Countries, IEA

2. Oil

2.1 Market Features and key Issues

Oil Reserves and Domestic Production

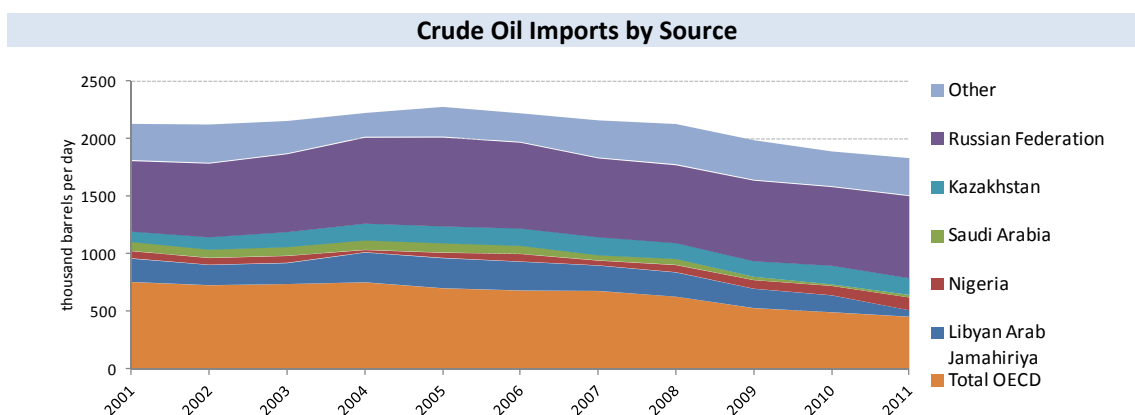
Oil remains the most significant (although declining) energy source in Germany, accounting for 32% of TPES in 2010, down slightly from 32.6% in 2009. However, Germany has very little domestic oil production – equivalent to around 2% of oil consumption – and the Administration expects that production will continue to decline at a rate of around 5% annually. According to Administration figures, German crude oil production amounted to just over 2.6mt (53 kb/d) in 2011, and 2.5mt in 2010 (around 49 kb/d), down from nearly 2.8mt in 2009 and 3.1mt in 2008.

Imports/Exports and Import Dependency

Germany's total oil imports were 2,515 kb/d in 2011 - equivalent to approximately 98% of domestic oil consumption. Imports included 1,826 kb/d of crude oil and 648 kb/d of products (279 kb/d of which is gas/diesel oil). (According to Administration figures, Germany also exports 372 kb/d of crude and products). The country has relatively well diversified crude import sources, with countries from the former USSR accounting for 50.8% of imports, another 25% coming from OECD countries (mostly European), and a further 18.2% of crude oil imports from a range of OPEC countries (notably Nigeria, Algeria, Angola and Libya). With regard to products, almost 88% of refined product imports came from OECD countries (95% of this from Europe – notably the Netherlands, Belgium, and the UK), with most of the remainder from countries of the former USSR.

Crude oil is imported into Germany through four cross-border pipelines and four main sea ports. The four cross-border pipelines – which transport oil from Russia, the Netherlands, France and Italy – had a combined throughput in 2010 of 1,298 kb/d (64.3mt). With regard to the sea ports, three are on the North Sea (Wilhelmshaven, Brunsbuttel and Hamburg), and one other (Rostock) is on the Baltic Sea. The most important oil port for Germany is Wilhelmshaven. After unloading, the oil is processed in refineries near these ports or by inland refineries connected to the ports by pipelines. Four domestic pipelines (with a combined throughput of 497 kb/d (24.6mt) in 2010) connect Wilhelmshaven, Brunsbuttel and Rostock to several refineries.

Refined oil products are also imported into Germany through four sea ports (one in Bremen plus three of those also used for crude imports) and one product pipeline. The product pipeline runs from Rotterdam and has an annual import capacity of approximately 261 kb/d (12.8mt).



Source: Monthly Oil Statistics, IEA

Oil Demand

In 2011, Germany's oil demand was 2,400 kb/d, down from 2,470 kb/d in 2010 – continuing a downward trend since 1998. The road transport sector is the largest consumer of oil in Germany. Transport consumed 49% of total oil supply in 2010, with diesel alone accounting for 28% of oil product demand (up from 15% in 1997). Industry was a distant second at 20% of total oil product demand in 2010. Its share has been relatively constant over the past decade.

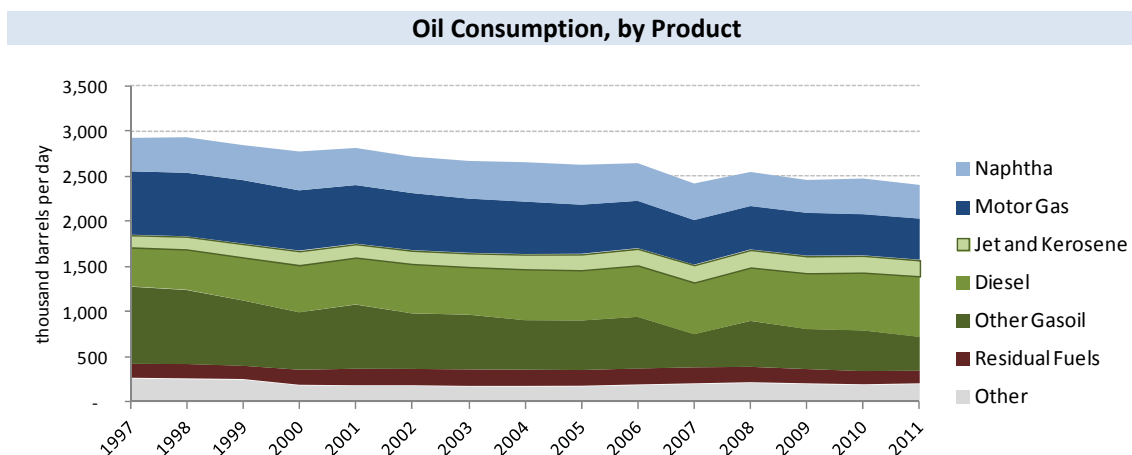
The trend of decreasing oil consumption is expected to continue, with the German Petroleum Industry Association forecasting a 14% decrease in oil consumption for the period 2010-2025. Key factors influencing the demand outlook include the promotion of biofuels and alternative fuels, energy taxation levels, and efficiency standards for buildings and cars.

Oil Demand in 2011	
	<i>kb/d</i>
LPG and Ethane	102
Naphtha	372
Gasoline	454
Kerosene	177
Diesel	674
Heating/other Gasoil	377
Residual Fuels	143
Other Products	102
Total Products	2,400

Source: IEA Monthly Oil Statistics

With a significant proportion of oil consumed by the transport sector in Germany, it is significant that the Administration has a target to reduce the final energy consumption in the transport sector by 10% in the period 2005-2020, and by 40% in the period 2005-2050. According to the *Energy Concept* paper, the Government aims to have one million electric vehicles on the roads by 2020 and six million by 2030. The Government is also developing a 'mobility and fuel' strategy that will focus on the development of new and alternative fuels and propulsion systems with the aim of establishing renewable energy in the transport sector and reducing the dependency of transportation modes on oil. A draft of the

strategy is scheduled for completion the first half of 2013.



Source: Monthly Oil Statistics, IEA

With regard to biofuels, the German government has set targets for transport fuels to meet the European target of 10% biofuels by 2020. Germany is Europe's largest biofuels producer – the country experienced rapid growth in production capacity between 2000 and 2007, incentivised by a government tax exemption for pure biofuels. The tax exemption is due to expire at the end of 2012 following the adoption of a duty on the petroleum industry to bring into circulation a minimum percentage of biofuels. Since 2010, the total biofuel quota has been set at 6.25% based on energy content. The expected end of the tax exemption has together with higher imports resulted in redundancy of some production capacity. Germany's production capacity for biodiesel in 2011 was 4.9 mt per year, well above the country's consumption rate of 2.58 mt per year.

The Administration's oil product consumption figures are inclusive of blended B7, E5 and E10 biofuels.

Taxes and Minimum Price Mechanism

The German oil market is not subject to any form of price regulation beyond the competition oversight of the Bundeskartellamt (Germany's competition authority). However, fuels sold for use on a motor vehicle are subject to an energy tax. Diesel is subject to a tax rate of 47 euro cents per litre, while gasoline is subject to a tax of 65 euro cents per litre. The tax differential between gasoline and diesel in Germany is therefore 18 euro cents per litre. This tax differential clearly favours diesel and is a contributing factor in the ongoing dieselisation of the German motor fuel market.

In the upstream market the relevant Länder authorities are exclusively responsible for authorising fossil fuel production and for imposing levies on this. The levy rates imposed by the Länder on fossil fuel production vary from 5% to 18% (as of end 2011).

Oil Company Operations

Germany has a largely deregulated and competitive oil market. There are a large number of companies operating in the German oil sector, including a large number of independents in the refining and retail sectors. The German government does not have an ownership stake in any of the companies operating in the oil sector.

In the upstream sector there are only a small number of companies conducting exploration activities or producing oil in Germany. The companies with the largest shares of indigenous output are Wintershall Holding, RWE Dea, GDF Suez E&P Deutschland, and BEB Erdgas und Erdöl.

In the refining sector there are numerous international companies with an ownership stake in German refinery capacity. In 2010 the largest refining operator in Germany was Shell Deutschland Oil with a 25.6% share of overall German refining capacity. The next largest were BP Europa (14.5%), ConocoPhillips Germany (13.9%) and Total Deutschland (11.8%). The next largest share of the refining sector is 9.8% owned by Rosneft via the joint venture Ruhr Oel (with BP). Of Germany's 14 refineries four are owned as joint ventures which, in turn, each have up to five shareholders.

In the downstream, retail fuel sector there are more than 14,300 roadside filling stations in Germany, and another 350 filling stations on the autobahns. Aral (BP) and Shell have the highest market shares (22.5% and 21% of fuel sales respectively), followed by Jet (ConocoPhillips Germany) with 10.5% and Total and Esso with 7.5% each. In addition, numerous other refinery companies and independent and medium-sized oil companies are active on the fuel market, including Avia, Westfalen and Freie Tankstellen (bft). According figures presented by the Administration, approximately 280 filling stations located on-site at supermarkets are owned by supermarket companies, and an additional 275 supermarket filling stations are owned by Jet, Total, Orlen and Shell.

Company market shares in the German retail fuel sector have remained relatively steady over the past few years. However, the number of filling stations in Germany is declining, with 475 fewer filling stations than at beginning of 2006 and approximately 1600 fewer than at beginning of 2001.

2.2 Oil Supply Infrastructure

Refining

Germany has one of the largest refining capacities in Europe and is among the largest oil refiners in the world. As of end 2011 Germany had 14 refineries with a total crude oil refining capacity of 2,364.4 kb/d (117.1 Mt/y) according to Administration figures.

The largest refinery operator in Germany (as of end 2010) was Shell Deutschland Oil with a 25.6% share of German refining capacities. The next largest operator was BP Europa SE with a 14.5% share of German refining capacities, followed by Total Deutschland with 11.8%. ConocoPhillips Germany had a 13.9% share before deciding to put its refinery in Wilhelmshaven out of operation.

The largest refinery in terms of Atmospheric Distillation capacity is Shell Deutschland's Rheinland (Godorf, Wesseling) refinery with a capacity of 321 kb/d (15.9mt/y). The next largest is the MiRO Mineraloelraffinerie Oberrhein refinery in Karlsruhe with a capacity of 301 kb/d (14.9mt/y), followed by Ruhroil's Gelsenkirchen refinery with 256 kb/d (12.7mt/y) capacity and Total's Spargau refinery with 242 kb/d (12mt/y) capacity.

German refining capacity has undergone some rationalisation in recent years. This is driven partly by changing local market conditions that have resulted in a decline in demand for gasoline and domestic heating oil. High crude oil prices and the changing structure of global refining have also created pressure on refining margins. It is unclear what impact, if any, environmental regulations (e.g. emissions ceilings) may be having on German refining sector margins relative to those in other

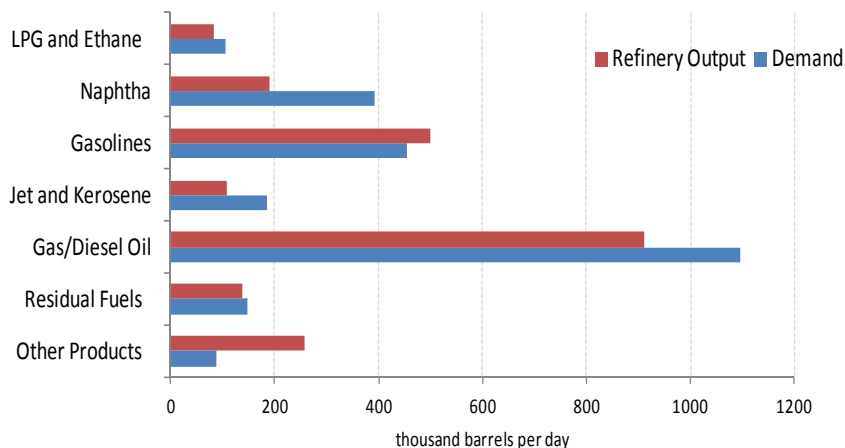
EU countries. According to the Administration refining margins in 2011 were better than in 2009 and 2010, but significantly lower than in 2004-2008, like elsewhere in Europe.

With regard to the ongoing rationalisation of German refining capacity, the most significant recent development was the decommissioning of the ConocoPhillips owned Wilhelmshaven refinery at the end of 2010 (the refinery had been largely inactive since November 2009). With a capacity of 272 kb/d (13.5 mt/y), the refinery was the third largest in Germany and chiefly produced for export. The site remains in use for storage of refined products.

The future of another refinery was called into question when production at the 100 kb/d (5 mt/y) Ingolstadt refinery was 'temporarily' halted in February 2012 as a result of Petroplus-Holding and its subsidiary Petroplus Raffinerie Ingolstadt GmbH filing for insolvency. In the meantime the Ingolstadt refinery was bought by the Gunvor Group. The refinery came on stream again at the end of August 2012.

Although total German refinery output is only slightly lower than domestic oil product demand, there are a number of imbalances which require significant imports of some products and exports of others. For example, Germany has been a net importer of diesel since 2010, and as of end 2011 has had a 138.6kb/d gas/diesel oil deficit and an overall middle distillates deficit of 315.6kb/d. There is also a naphtha shortfall of 183kb/d. Conversely, the industry had a gasoline production surplus of 67kb/d in 2011 and has been a net exporter of gasoline fuels and gasoline components since 2004. Germany's net product imports stood at 327kb/d in 2011.

Breakdown of Refinery Output vs. Demand



Demand for diesel increased by around 16% between 2001 and 2011 while demand for gasoline dropped by nearly 30% during the same period. Naphtha demand has also declined by 8.8% since 2001.

Ports and Pipelines

With regard to Germany's oil ports, three are located on the North Sea (Wilhelmshaven, Brunsbittel and Hamburg), and one other (Rostock) is on the Baltic Sea. The most important oil port for Germany is Wilhelmshaven which has three unloading facilities – two with a maximum capacity of 12,000 cm per hour and one with a maximum capacity of 16,000 cm per hour. Brunsbittel has

maximum crude capacity of 1,000 cm per hour, Rostock has maximum crude capacity of 6,000 cm per hour, and Hamburg is structured around several firms that run their own port equipment in separate inner harbours.

Germany also has four cargo ports with infrastructure for product imports. One of these, Bremen, is used solely for product imports. Several firms have anchoring berths at Bremen. Brunsbüttel has a product import capacity of 240-800 cm per hour, Rostock has product capacity of 250-1,200 cm per hour, and the arrangements at Hamburg are the same as those for crude oil.

Besides the oil ports noted above, there are a number of storages sites with an anchoring berth in German coastal and riverside towns.

Germany has four cross-border crude oil pipelines, and four domestic pipelines connecting the oil ports of Wilhelmshaven, Brunsbüttel and Rostock to domestic refineries. All the crude oil pipelines are privately owned and operated by oil companies. No substantial changes to these have occurred since 2006. The following table shows the quantities of crude oil transported in 2010, including German crude oil.

Pipeline	Abbr.	Throughput 2010 (m tons)
Brunsbüttel --- Heide		2.9
Wilhelmshaven --- Hamburg	NDO	4.2
Wilhelmshaven --- Ruhr and Rhine district	NWO	15.6
Rotterdam, Netherlands --- Ruhr and Rhine district	RRP	13.9
Lavera, France --- Karlsruhe	SPSE	6.0
Triest, Italy --- Bavaria and Karlsruhe	TAL	24.6
Russia --- Schwedt and Spergau	Druzba	19.8
Rostock --- Schwedt	MVL	1.9
Source: Bundesamt für Wirtschaft und Ausfuhrkontrolle (BAFA).		

Storage Capacity

Germany has oil tank storage capacity of around 65.7 mcm, 27.3 mcm of which is stored in caverns (as of end 2010). This is down slightly from 68.2mcm (27.2mcm in caverns) at the end of 2005. Looking at the breakdown between crude and product, 30.2 mcm of current storage capacity is for crude and 35.5 mcm is for intermediate and finished products. Refineries account for around a third of total capacity, in addition to numerous other companies active on the market. According to a survey conducted in 2011, none of the oil storage operators (excluding EBV) are planning major extensions or closures.

Germany's oil storage facilities are broadly distributed geographically.

The German Stockpiling Agency EBV is responsible for holding compulsory stocks. The Oil Stockholding Act stipulates that the EBV shall constantly maintain stocks of oil and petroleum products at a level which corresponds at least to the net imports for 90 days. EBV's storage infrastructure is included in the totals above. The agency owns 4 cavern-facilities consisting of 58 caverns in total and additionally EBV holds contracts for storing in third-party caverns. It also has stored stocks in 130 above-ground storage facilities. The caverns mainly contain crude and the above ground facilities mainly contain product.

The EBV has begun work on expanding the cavern storage facility at Wilhelmshaven-Rüstringen. It is not clear at present if this will have any effects on the use of other sites by the EBV.

2.3 Decision-making Structure for Oil Emergencies

The Federal Ministry of Economics and Technology (BMWi) has the lead responsibility within the Federal Government for contingency planning and emergency measures. The Ministry's Director-General for Energy Policy is the German delegate to the IEA Governing Board. Decisions on the release of stocks from the German Stockpiling Agency (EBV) are prepared in the Director General for Energy Policy's department and taken by the Federal Minister of Economics and Technology. Depending on the nature, cause, severity and history of an emergency, the Federal Chancellery and other selected ministries (e.g. Federal Foreign Office, Federal Transport Ministry) may also be consulted before the decision to release stock is taken. A maximum of 24 hours is required for the decision-making process under the IEA Initial Contingency Response Plan (ICRP).

The actual release of emergency stocks is authorised under the Oil Stockholding Act by means of an Ordinance issued by BMWi. BMWi has a model text for a Release Ordinance on the shelf for immediate use. In the future, Release Ordinances will be published in the *online* Federal Gazette, so it will only take three working days from a release decision until the entry into force of the Release Ordinance – and therefore until stocks can be made available to industry.

When stocks are released, the BMWi activates the National Emergency Strategy Organisation (NESO) and consults the NESO's Crisis Supply Council (KVR) on issues of implementation, such as the breakdown of the quantity released between crude oil and the individual products. The German NESO is based on close cooperation between government, EBV and industry for the purposes of crisis management. Key players include the BMWi, the Federal Office of Economics and Export Control (BAFA), EBV and supply experts from of the oil industry and trade enterprises.

The oil industry collaborates within two NESO bodies: the Supply Coordination Group (KGV); and the Crisis Supply Council (KVR). The KGV consists of seven permanent members and their deputies. Its main task is to undertake a detailed analysis of the domestic supply situation during a crisis and to propose solutions on how to cope with the situation. The KVR consists of the Chairman of the Supervisory Board of the EBV, his deputy and the chairman of the KGV. Core tasks of the KVR include advising BMWi on political decisions regarding the release of stocks and/or demand restraint measures. It also serves as a key interface with companies and business associations.

In the absence of a crisis the NESO office may coordinate regular emergency response exercises with the participation of BMWi, BAFA, EBV and KGV. Both national and international supply disruption scenarios are considered.

In case of an international coordinated stock release the EBV starts to prepare the offers for the released quantities to its member companies immediately after the decision is made public but before the Release Ordinance is published in the Federal Gazette. In this regard, the EBV confidentially notifies its members of the impending stock release and asks them to state their requests for delivery points. When the Release Ordinance enters into force (at the latest), the EBV member companies are notified about the quantities accruing to them.

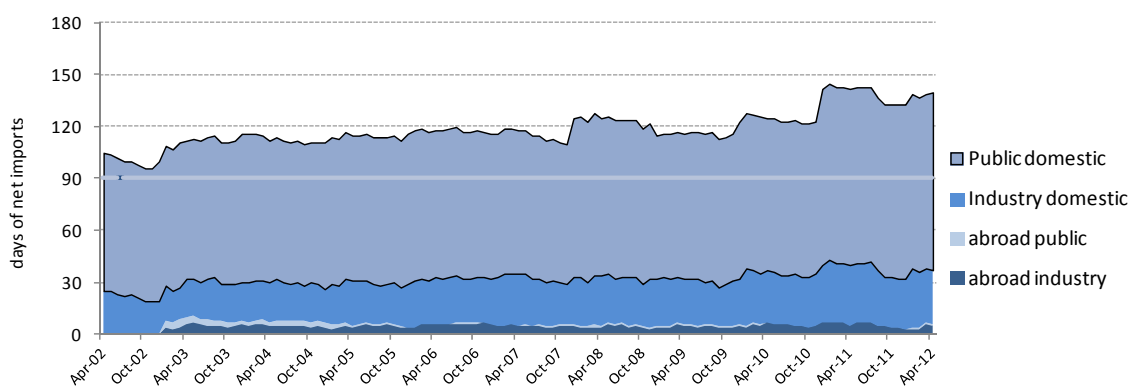
2.4 Stocks

Stockholding Structure

Germany consistently meets its 90-day IEA obligation, and generally holds storage well in excess of the obligated amount. The country's 90-day stock holding obligation for 2011 was 20,110 thousand tonnes of crude oil equivalent (ktcoe), and the actual amount of stock held as of April 2012 was 31,328 ktcoe. The amount of stock held in excess of the 90-day obligation was therefore 11,128 ktcoe – or 50 IEA days.

The majority of Germany's stocks are held by the German National Petroleum Stockpiling Agency (EBV). Since 1998, the EBV has had sole responsibility for fulfilling Germany's 90-day stockholding obligation. The Oil Stockholding Act 2012 stipulates that the EBV shall constantly maintain stocks of oil and petroleum products at a level which corresponds to a minimum of 90-days of net imports. The remainder of the stocks held in Germany are commercial stocks. There is no statutory obligation on industry to hold stocks for emergency purposes, so industry stocks are held solely for commercial purposes.

Germany's Compliance with IEA 90-day Obligation



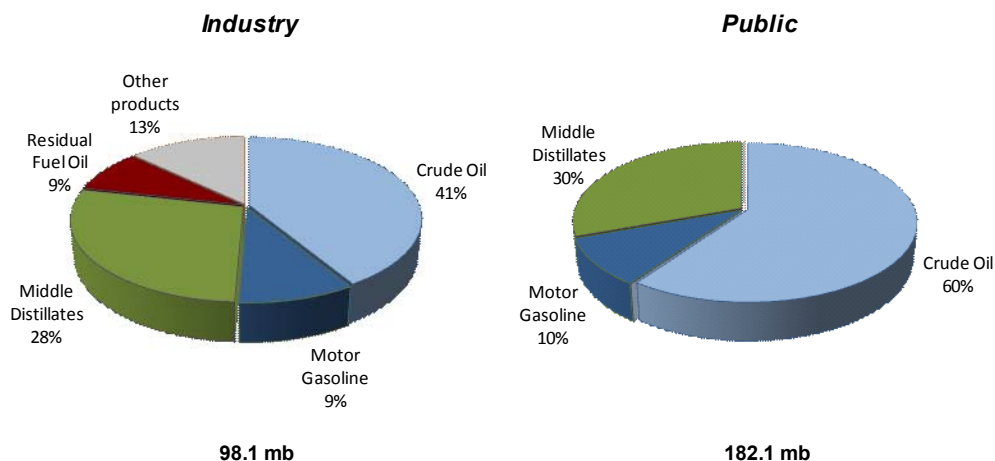
Crude or Products

The different types of stocks held by EBV are: crude oil, gasoline, diesel fuel, light heating oil and kerosene type jet fuel. The majority of above-ground EBV stocks are stored co-mingled with commercial stocks, while the storage of the agency's below-ground stocks is segregated. The following table provides a breakdown of all the stocks in terms of these products and the various types of storage sites.

	Crude	Gasoline	Diesel fuel	Light heating oil	Jet fuel
Stocks (mt)	14,8	2,1	2,7	3,8	1,1
thereof:					
- caverns	91 %	41 %	32 %	21 %	0 %
- refinery	5 %	17 %	16 %	27 %	4 %
- storage sites	3 %	37 %	50 %	43 %	94 %
- delegations	1 %	5 %	1 %	10 %	2 %

Source: Erdölbevorratungsverband (EBV). Effective Date: 30/11/2011.

Total Stocks* in Germany at end Apr 2012



* "Stocks on National Territory". These exclude utility stocks and including pipeline and entropot stocks where known.

Location and Availability

In Germany a convention of regionalisation exists in conjunction with the 90-day stockholding obligation. To meet this so-called regionalisation rule, the EBV holds stocks of finished products in each of Germany's five supply regions to ensure that it is capable of meeting a minimum of 15-days demand for each region if required. The rationale for this is to prevent logistical bottlenecks which could occur if all emergency stocks were stored centrally.

All EBV stocks are fully available at all times. This is ensured by the framework storage contract and the framework delegation contract which are the basis of all EBV stockholding contracts.

With regard to drawdown rates, the Oil Stockholding Act stipulates that it must be possible to release all EBV stocks for consumption within 90 days, in the case of petroleum products and components, and 150 days in the case of crude. In terms of the stocks held at the end of 2011, this means a drawdown rate for crude oil of more than 5,000 barrels per day is required, and a drawdown rate for oil products of nearly 5,900 barrels per day is required. Since the emergency stocks are held at various sites distributed across Germany, the individual drawdown rates can vary at different sites.

A release of EBV stocks may be permitted in order to:

- prevent an impending, or remove an existing disruption to the supply of energy;
- counteract a major supply disruption in Germany, or in one or several other EU Member States;
- meet Germany's obligations with regard to a decision by the IEA Governing Board;
- provide solidarity support for IEA Member Countries or EU Member States;
- provide an initial response in a situation of particular urgency; or
- mitigate a local crisis.

The Federal Ministry of Economics and Technology (BMWi) is required to inform the IEA and the European Commission about any release of EBV stock in a timely manner.

Stocks are offered to the members of the EBV upon their release. When allocating quantities to individual companies, the proportion of the total fees paid to the EBV by the company is taken into account. Companies are free to assign the quantities offered to them wholly or partly to other members. The time between the entry into force of the Release Ordinance and the possible delivery of released stocks owned by the EBV is three working days.

Once allocated to EBV members during a release, the stocks are sold at market prices. If the full amount of stock is not taken up on this basis, then a more flexible bidding procedure at market prices or a tender procedure is possible. This takes roughly a week.

The distribution of released EBV stock is, in principle, arranged according to the facilities and activities of the EBV members. Companies operating throughout Germany will normally be served following consultation. Since the EBV's product stocks are geographically dispersed and are mainly located in commercial tank storage facilities, stocks are directly available in all market regions.

Processing of crude oil, once released, can begin within 1-4 weeks depending on the storage modalities (whether close to a refinery or underground in caverns). To ensure this occurs in a timely manner, the EBV has pre-negotiated processing contracts with most German refiners.

In the event of a stock release, stocks held under ticket agreements can be mobilised within two days by cancelling the contract with immediate effect. Stocks held under bilateral agreements may be mobilised in the same way as other stocks. Bilateral agreements on the mutual offsetting of stocks of crude oil and oil products exist with Belgium, Italy and the Netherlands. Unilateral agreements on the offsetting of stocks of oil and oil products stored in Germany are in force with Luxembourg, Slovenia, the Czech Republic, Portugal and Croatia. There is a unilateral agreement with France on the offsetting of German stocks of oil and oil products stored in France.

Monitoring and Non-Compliance

The Federal Office of Economics and Export Control (BAFA), a federal agency of the BMWi, monitors the fulfilment of the stockholding obligation. Here, the Oil Stockholding Act stipulates that the EBV must regularly provide the BAFA with the necessary data on stocks and must provide other information as required.

The EBV reports to BAFA on a monthly basis in the form of a standardised oil questionnaire on its purchases and sales, the stocks it owns, and delegations. BAFA has the right to demand information and documentation from the EBV in order to monitor compliance with the stockholding obligation. BAFA's auditors are authorised to view and examine the operational sites and offices of the EBV, or of companies where stocks are held for the EBV, and to inspect the installations and documentation there. Administrative offences may be punished with a monetary fine of up to Euro 20,000.

Financing and Fees

The operations of the EBV are fully funded by contributions from its members. The members of the EBV are those companies which import products subject to stockholding obligations into Germany or manufacture them in Germany. From 1 April 2012, the products subject to this obligation are: gasoline, diesel fuel, light heating oil and kerosene type jet fuel.

3. Other Measures

3.1 Demand restraint

The legal basis for demand restraint measures in Germany and for various other interventions in the oil market is the Energy Security of Supply Act 1975. A declaration by the Federal Government that the energy supply is endangered or has been disrupted is normally required before demand restraint measures can be implemented. For the purposes of ensuring that demand restraint measures can be implemented as quickly as possible if needed, a draft Ordinance establishing a danger or disruption to Germany's energy supply has been prepared in advance. However, if the measures are being implemented to meet Germany's obligations under the International Energy Program (IEP), a Government declaration is not required.

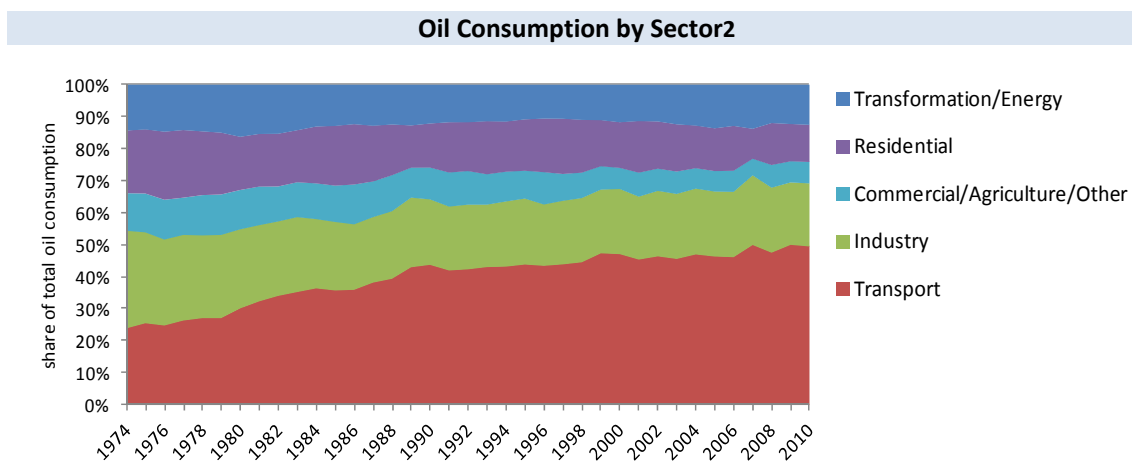
Germany has both light-handed and heavy-handed demand restraint measures that it can deploy in an emergency. In the case of a risk to, or disruption of, Germany's energy supply which cannot be properly addressed using market measures, the Energy Security of Supply Act permits a variety of far-reaching regulatory interventions. Such intervention must be proportionate to the disruption to supply, and be as light-handed as possible. Statutory ordinances can be enacted with rules on production, transport, storage, distribution, use and maximum prices of oil and oil products.

Specific demand restraint measures are implemented by Federal Government Ordinance. Draft texts have been prepared for Ordinances on: vehicle speed limits; prohibitions on the use of vehicles, aircraft and ships and boats; a ban on Sunday driving; and the prohibition of motor sports events. Implementation of an Ordinance, including the necessary Federal Cabinet decision, takes two to three weeks (although the timeline can be shortened in the event of an emergency).

Any decision to implement demand restraint measures in Germany must take the supply situation and the impact of the proposed measures on economic activity into account. Whereas calls for voluntary cuts in demand for oil products have no or little effect on economic activity, the impact of regulatory measures like speed limits, bans on driving or rationing oil products is much greater. The Administration will therefore only give consideration to demand restraint measures (particularly heavy-handed ones) in the event of a severe or long-lasting disruption to supply which cannot be handled with ordinary market mechanisms.

In the event of the activation of any of Germany's demand restraint measures, monitoring of energy savings will be carried out via the monthly statistical reports of the oil industry, and by ad hoc reviews if necessary. In the case of the Ordinances which are ready to be enacted if necessary, administrative offences would be punished by the police and, if appropriate, by other relevant authorities.

There is a strong preference in Germany for some of the emergency oil stocks to be released before considering demand restraint measures. When demand restraint measures are used, light-handed measures (such as appeals by the Federal Government to consumers, or savings in the Federal administration) will be implemented in the first instance.



Source: Oil Information, IEA

3.2 Surge Production and Fuel Switching

There is no meaningful potential to surge oil production in Germany as the country's indigenous oil production is equivalent to only a tiny fraction of its consumption. Consequently, the Administration does not have any policies in place to surge oil production by, for instance, changing or relaxing mining or environmental regulations.

With regard to fuel switching, this too has limited application in Germany. In the case of electricity, only 1.1% of gross electricity generation was based on oil products in 2010.

In the case of the transport sector, almost all of the sector's energy requirements are met using gasoline and diesel fuel. In principle, there is some limited potential for substituting fossil diesel with biodiesel in the short term. The production capacity of Germany's biodiesel manufacturers is roughly 4.9 mt per year, which is well above current domestic consumption of 2.58 mt per year.

Overall, Germany has only very limited possibilities for reducing oil consumption in the short term by fuel switching. Consequently, there are no policies or legislation available to promote short-term fuel switching in place at this time.

3.3 Others

No other emergency measures exist beyond those discussed.

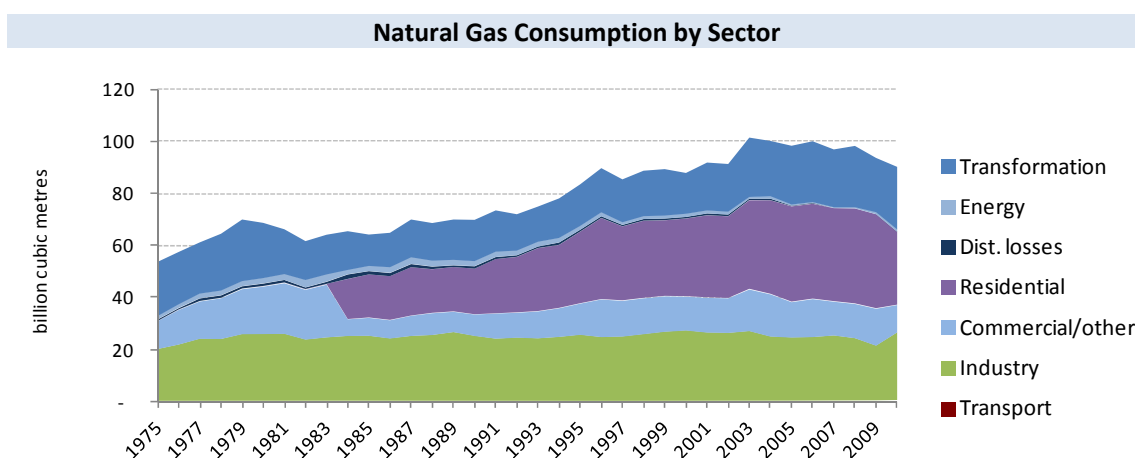
² Total Consumption (including refinery consumption), does not include international marine bunkers.

4. Natural Gas

4.1 Market features and Key Issues

Natural Gas Demand

Natural gas consumption in Germany has declined 10% since 2006. Demand was 90 bcm in 2010, down from 94 bcm in 2009 and 100 bcm in 2005. In 2010 the residential sector represented about 31% of total gas consumption, while the industry and transformation sectors represented 29% and 27% respectively. Significantly for energy security considerations, natural gas demand in the winter months is up to three times higher than in summer.



Source: Natural Gas Information, IEA

According to government commissioned analysis, the total consumption of natural gas in Germany is expected to continue to decline over the long term – although, conversely, the share of natural gas in Germany's TPES is expected to rise in the medium term (to 24% by 2025). The projected decline in total natural gas consumption is largely due to energy efficiency improvements and savings in various areas such as district heating. The Administration is expecting this decline to cancel out a likely increase in natural gas use for electricity generation.

The increase in natural gas use for electricity generation is due to the likely need for more Combined Cycle Gas Turbines (CCTGs) to provide baseload generation capacity following the decision to phase out nuclear power, and to provide back-up for renewable electricity generation. (Increased use of gas as a flexibility tool will also drive much greater volatility of demand). Gas plants are also likely to be needed to replace coal generation to meet the 55% carbon emissions reductions targets by 2030. CCGT capacity is therefore expected to more than double from 20 GW at present to 50 GW in 2030. In addition, natural gas is likely to provide an increasing proportion of domestic heating in the short term as it continues to displace heating oil.

There are a number of uncertainties underlying the demand assumptions that have the potential to undermine the accuracy of these forecasts. Key sources of uncertainty regarding natural gas demand in the medium to long-term include the proportion of nuclear energy in the electricity mix,

carbon price levels, the mid-term effects of the economic and financial crises on consumption, and the relative price of other energy sources.

Imports/Exports and Import Dependency

The share of natural gas in the country's TPES is 22% in 2010, down from 24% in 2009 and also down from nearly 24% in 2005. Approximately 86% of Germany's natural gas demand is met with imports, only 14% is produced domestically and domestic production has declined continuously in recent years.

German natural gas imports are geographically relatively well diversified. In 2010 the biggest import source was Russia which supplied 39% of natural gas imports, next was Norway on 35% and the Netherlands on 22%. Germany has no LNG infrastructure, so all of the country's natural gas imports are supplied via a number of cross-border pipelines. However, some German companies have booked capacities in overseas LNG terminals, e.g. E.ON Ruhrgas has contracted 3 bcm a year in Rotterdam, Netherlands.

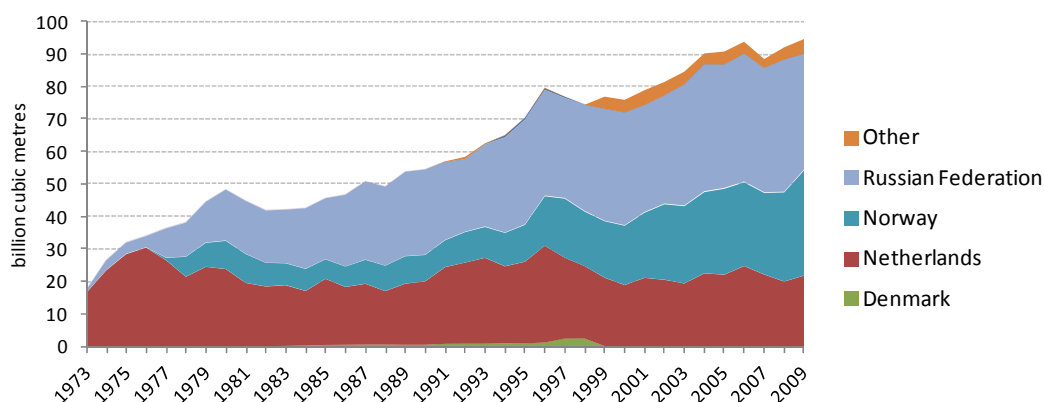
The Administration expects that LNG will become an increasingly important source of natural gas for Europe in the future, so it considers access to LNG terminals to be important. For this reason it encourages German companies to purchase regasification capacities in LNG terminals in neighbouring countries, and LNG volumes from new suppliers. E.ON Ruhrgas had plans to build an LNG terminal in Germany but there was insufficient long-term interest for it to be viable commercially. However, there is a permitted site for an LNG terminal in Germany so it remains a future possibility.

Due to its comprehensive cross-border pipeline infrastructure and its central location within Europe, Germany is becoming an important natural gas transit hub, with significant amounts of natural gas from Russia and Norway transiting the country for delivery to other markets. Over the past five years Germany has improved its gas market by implementing an entry/exit system in compliance with EU regulations, reducing the number of market areas to two, and substantially improving competition and price formation in the markets – making the market more liquid.

The volume of trade at the two German trading posts, VP NCG and VP Gaspool, has increased significantly. According to Administration figures, a total of 1000 GWh (102 bcm) of natural gas was traded in 2011– 47% more than 2010. This means that Germany's cross-border natural gas pipeline network needs to be seen in a broader European context as well as its domestic German context.

German importers have contracted around 9 TWh (922 bcm) worth of natural gas for delivery via Germany's cross-border pipeline network up to 2025 – and some existing contracts also extend past 2025. It is also assumed (by the Administration and the importing companies) that existing contracts will be extended and new ones concluded over time.

Natural Gas Imports, by Source



Source: Natural Gas Information, IEA

Domestic Natural Gas Production

According to Administration figures, production in 2010 was 12.7 bcm, down from 14.5 bcm in 2009 and 18.6 bcm in 2006.

According to Administration estimates, domestic production is expected to decline by an average of 5% per annum in coming years. However, this does not take into account possible unconventional natural gas production in the future. The legal basis for the extraction of conventional and unconventional gas is the Federal Mining Act. There are no state incentives for any form of natural gas production.

The extraction of unconventional natural gas in Germany has so far been limited to exploratory drilling. The issue of unconventional natural gas production is politically controversial in Germany – particularly with regard to drinking water and environmental protection – so public opinion is a major factor in decision-making.

Gas Company Operations

The natural gas industry in Europe consists of a production tier, three main market or trading tiers, transport system operators, and natural gas storage companies.

With regard to the production tier, there are five main companies producing natural gas in Germany. Exxon Mobil accounts for approximately 46% of indigenous production; Shell for 22%; RWE for 15%; Wintershall for 9%; and GDF for 5%. There is also a small number of natural gas importing companies including: E.ON Ruhrgas, Wingas, Shell Deutschland, ExxonMobil, Verbundnetz Gas (VNG), RWE and Bayerngas.

With regard to transport system operators, the natural gas network in Germany consists of approximately 700 grid operators, including Distribution System Operators (DSOs) and 14 Transmission System Operators (TSOs). The German natural gas network has two balancing zones or market areas (down from 19 in 2006), each of which has one of the TSOs as a 'market leader'. The 14 TSOs are responsible for network stability but not balancing. The biggest TSO is Open Grid Europe. There are no plans to try to reduce the number of TSOs because the number of balancing zones or market areas is considered the most important factor.

The natural gas market in Germany is itself made up of three main tiers. The first market tier consists of six companies which supply indigenous gas or import natural gas and supply it via high pressure pipelines to companies which distribute the gas further at a regional level. The five companies are: E.ON Ruhrgas, Verbundnetz Gas, Wingas, RWE Gas, and Gasunie. E.ON Ruhrgas covers half of Germany's natural gas demand. The other companies mentioned have shares of between 5% to 16% of total demand. Only E.ON Ruhrgas and RWE have sizable shareholdings in regional redistributors and municipal companies.

The second market tier consists of approximately 30 regional gas utilities (e.g. Gas Union, Saar Ferngas) that distribute natural gas from the first tier companies to local gas suppliers (municipal companies) and in some cases to final customers.

The third market tier is the retail market for delivery to final customers (households, commerce and industry) by local re-distributors. It should be noted that there is no clear separation between the tiers. Long-distance gas companies supply not only regional redistributors, but also municipal companies and industrial clients. Larger local gas utilities supply not only final customers, but are also active to some extent in regional redistribution.

The companies at the production tier and in the first and second market tiers are Handelsgesellschaften, or commercial companies of various types – some listed on the stock exchange. The municipal companies (Stadtwerke) active in the third tier are private-law companies, and the municipalities often hold a majority stake.

Germany also has a large number of private companies operating its 47 gas storage facilities. These have a combined working gas volume of 20.8bcm. The government does not have an ownership stake in any German natural gas storage facilities.

The complex structure of the German market poses some challenges in terms of transparency and operational efficiency, with numerous cross-cutting share holdings involving large players, regional transporters and the Stadtwerke. However, Germany has made some improvements to the market's legal framework to address this.

The competencies of the regulator have been significantly reinforced since its creation in 2005, and the implementation of the EU's Third Package has enhanced the independence of TSOs from other natural gas market activities. The Energy Industry Act has also been amended so that the operators of the transport system must now also be indirect or direct owners of the grid they operate. To the extent that the grid companies have not been sold by the integrated energy utilities to third parties, they are generally operated by a grid operator which forms a separate, independent company within the group. Furthermore – particularly at the distribution grid tier – co-operation is feasible between distribution companies, with groups of two or three companies able to collaborate in setting up a joint grid company. The Energy Industry Act also obliged gas utility companies with gas storage operations to legally unbundle their gas storage operations from the other parts of the utility.

Gas prices are not set or regulated by the German government. In terms of energy taxation, natural gas is included under the Energy tax Act, but concessions are given for natural gas used in the following ways: LPG and gas as a motor fuel; fuels in public transport; for gas consuming companies in the goods-producing sector and/or agriculture and forestry; and for use in power generation and the cogeneration of heat and power.

4.2 Natural Gas Supply Infrastructure

Ports and Pipelines

Natural gas is imported into Germany exclusively by cross-border pipeline. There are a large number of these pipelines, bringing gas from Norway, Russia, the Netherlands and to a small extent from Denmark and the UK.

Gas deliveries from Norway reach Germany via three pipelines - Norpipe, Europipe I and II - with total capacity of 54 bcm. Gas deliveries from Russia reach Germany via three pipeline networks – Nord Stream (since November 2011) with an initial capacity of 27.5bcm, Yamal with a 33bcm capacity, and the Ukraine pipeline system with total capacity of 120bcm. Some of the gas from both Norway and Russia transits Germany to other countries in Europe.

Natural gas (L-Gas) from the Netherlands is also transported to Germany via 4 main pipelines (or interconnection points).

With regard to the domestic pipeline network, there are 14 TSOs in Germany, the largest of which is Open Grid Europe. Open Grid Europe has a 12,000 km pipeline network, followed by ONTRAS, the second largest TSO, with 7,200 km.

There are three gas pipeline projects underway to further improve the security of supply of natural gas to Germany (and Europe). First, work is continuing on the Nord Stream pipeline that will increase total capacity of 55bcm by end 2012.

Second is the North European Gas pipeline (NEL) between the Netherlands and Germany which is currently under construction and will, when completed, have a capacity of 20 bcm. It will connect with the Nord Stream pipeline to bring gas to Germany and the Netherlands.

Third is the OPAL Gas pipeline which runs inside Germany from the Baltic Sea coast to Olbernhau on the German-Czech border. The pipeline is in operation and has a capacity of approximately 35 bcm and links with the Nord Stream pipeline to bring additional Russian gas to Germany and Europe.

The Natural Gas Grid



Source: IEA

Storage

Germany has 48 gas storage facilities with a total capacity 20.4 bcm. All of the gas is stored in caverns or in porous rock storage facilities and there is potential for further expansion due to favourable geological conditions. Germany's natural gas storage facilities are owned by numerous private companies (E.ON Gas Storage is the largest), and are well dispersed geographically. In addition to this storage capacity, German firms also have access to natural gas storage in Haidach (Austria) which has a capacity of 2.6 bcm.

More cavern storage facilities are in the planning stage or under construction (total additional volume of around 13.9 bcm). A porous rock storage facility owned by Storengy is also being planned in Behringen, with storage volume of 2.3 bcm and a working gas capacity of 1 bcm.

There are no compulsory natural gas storage requirements in Germany, and no state-owned storage facilities. Operators of gas storage facilities must grant other companies access to their storage facilities and auxiliary services at a fair market price.

Natural Gas Supply Security

Germany is compliant with the N-1 standard due to its high degree of infrastructure reliability, including the diversification of supply routes and substantial storage capacity. Germany's N-1 compliance is further enhanced by a requirement to have 'reverse flow' capacity at border crossing points, when needed.

In December 2010 EU Regulation no. 994/2010 was adopted on measures to safeguard security of gas supply (and repealed Directive 2004/67/EC). The Regulation includes a requirement that EU Member Countries meet the N-1 standard.

February 2012 'cold snap'

The February 2012 'cold snap' put Germany's natural gas supply infrastructure (and related electricity infrastructure) under considerable pressure. Lessons learned from this incident will provide important input for future infrastructure and emergency response policy planning decisions.

Due to extremely cold temperatures in Eastern, Central and Western Europe in February 2012, end-user demand for natural gas in South and Southwest Germany increased significantly (reaching an all-time high in some areas). At the same time that demand was rising, available gas supplies from Russia started dropping. Shortages were particularly marked in Waidhaus, a key entry point, with supplies of Russian gas up to 30% below normal.

Notably, with the exception of customers with interruptible supply contracts, there were no supply disruptions in Germany. This was largely thanks to gas storage (German natural gas storage facilities were 67.5% full at the time, with 14 bcm of available storage), diverse natural gas supply routes, and both national and international cooperation between TSOs.

To offset higher demand and reduced supplies from Russia, additional supplies of gas were sourced from Norway, the Netherlands and the UK, as well as additional LNG deliveries to European terminals. The additional supplies were sold on the spot market. Importers balanced their portfolios mainly by entering the gas in the North of Germany.

Customers in mid and southern Germany with interruptible contracts had their supply interrupted due to the high gas demand, and congestion in the German gas network in the southward direction caused by the shifting of supply from north to south. Some gas fired power stations were among the interrupted customers and this caused restrictions in the electricity networks because demand for electricity was very high at the same time. Impressively, German companies were able to maintain their substantial electricity exports to France during this period, but the interrelationship between natural gas and electricity was clearly a critical factor in this crisis.

The Administration and industry agree that the market reacted as it should during the cold snap – despite gas import reductions and increased demand. Activity rose substantially and quickly at most

hubs, leading to rises in the spot price (although gas prices generally remained lower than February oil-indexed contract prices), and customers were supplied at market prices. The flexibility provided by underground gas storage proved crucial, and gas swaps between TSOs in and between neighbouring countries also played an important role. The fast and efficient flow of information among all players including TSOs was also crucial and underpinned the markets ability to respond effectively to the situation.

4.3 Emergency Policy for Natural Gas

Strategic Gas Stocks and Drawdown

There are no compulsory natural gas storage requirements in Germany, and no state-owned storage facilities. All natural gas stocks in Germany are held by private companies for commercial reasons.

In an emergency the Federal Government has the responsibility of triggering Germany's natural gas emergency response measures by declaring a state of emergency. The lead agency for natural gas security in Germany is the Ministry of Economics and Technology (BMWi). BMWi is responsible for natural gas legislation and for emergency response coordination at the national and EU level. The regulatory authority, with responsibility for implementation of non-market based emergency response measures during a natural gas supply emergency, is the Federal Network Agency.

Regional-level aspects of natural gas emergency policy also involve the Länder (regional governments) and municipal energy suppliers. The Länder have responsibility for implementing some aspects of non-market based emergency measures in conjunction with the Federal Network Agency.

In the case of a natural gas emergency, some groups of customers are protected from interruption to their natural gas supplies. These "protected customers" represent 50-60% of demand. Protected customers are defined as households and district heating installations delivering heating to households.

Another important development with regard to gas emergency policy in Germany has been the implementation (ongoing) of EU Regulation 994/2010.

As the first step towards full implementation of the EU Regulation, the Administration completed a natural gas security Risk Assessment. The key finding of the Risk Assessment is that the security of supply situation in Germany is reliable and safe. Other results of the Risk Assessment were that the standards required by the EU regulation have been fulfilled and that the available market-based instruments are generally sufficient for securing supply. The assessment was based on a risk assumption that there will be substantial reductions of gas imports at the main network entry points during extremely cold winters.

The next step towards implementation of the EU Regulation was the development of Emergency and Preventive Action Plans.

The Preventive Action Plan will take into account: the results of the Risk Assessment; the national network development plan; and the need for Reverse Flows on some pipelines.

The main elements of the Emergency Plan are: the delineation of three crisis levels; confirmation of the competent authorities for emergency management; delineation of the responsibilities of

authorities, TSOs, gas undertakings and the identification of non-discriminatory measures; a crisis team consisting of permanent and non-permanent members; processes for cooperation and information sharing between industry and national authorities and on the national and EU level; the need for emergency response training.

Demand Restraint

As already discussed, the Energy Security of Supply Act permits the enactment of Ordinances to restrict the sale, purchase or use of goods, both in terms of quantity and time, or permit them only for certain priority purposes.

Fuel Switching

Fuel switching capacities are not included in German security of supply policy measures. Although some generators and larger industrial customers are equipped with fuel switching facilities, there is only limited information available on the overall volumetric potential of substitution effects in the case of an emergency.

There are no security of supply regulations in place promoting, restricting or monitoring fuel switching capabilities. The Administration expects companies to assume individual responsibility for back-up solutions where necessary and possible in order to obtain a higher level of security of supply for their plant.

Companies equipped with fuel switching capability would consider utilising this capacity in the case of a gas supply emergency. There would be no restrictions to switching from natural gas to other fuels.

Interruptible Contracts

Interruptible contracts are concluded with industrial clients, especially with those who have fuel-switching capacity. In terms of the quantity of gas sold, a maximum of approximately 10-20% of contracts with clients are interruptible contracts. There are no government policies to encourage the uptake of interruptible contracts.

Surge Production

There are no other gas emergency policies in place, such as encouraging the ability to surge gas production.

INTERNATIONAL ENERGY AGENCY

The International Energy Agency (IEA), an autonomous agency, was established in November 1974. Its primary mandate was – and is – two-fold: to promote energy security amongst its member countries through collective response to physical disruptions in oil supply, and provide authoritative research and analysis on ways to ensure reliable, affordable and clean energy for its 28 member countries and beyond. The IEA carries out a comprehensive programme of energy co-operation among its member countries, each of which is obliged to hold oil stocks equivalent to 90 days of its net imports. The Agency's aims include the following objectives:

- Secure member countries' access to reliable and ample supplies of all forms of energy; in particular, through maintaining effective emergency response capabilities in case of oil supply disruptions.
- Promote sustainable energy policies that spur economic growth and environmental protection in a global context – particularly in terms of reducing greenhouse-gas emissions that contribute to climate change.
- Improve transparency of international markets through collection and analysis of energy data.
- Support global collaboration on energy technology to secure future energy supplies and mitigate their environmental impact, including through improved energy efficiency and development and deployment of low-carbon technologies.
- Find solutions to global energy challenges through engagement and dialogue with non-member countries, industry, international organisations and other stakeholders.

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