

2010

OIL & GAS SECURITY

Emergency Response of IEA Countries

LUXEMBOURG

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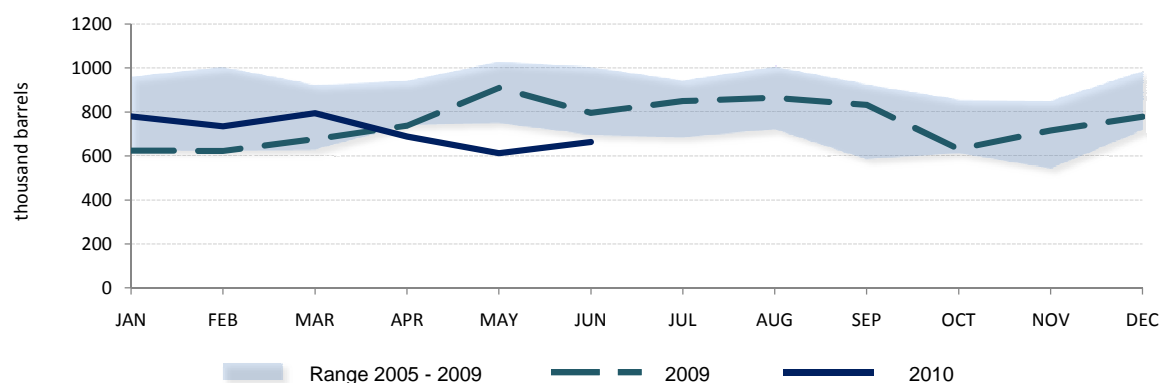
International
Energy Agency

Luxembourg

Key Oil Data

	1985	1990	1995	2000	2005	2007	2008	2009
Production (kb/d)	-	-	-	-	-	-	-	-
Demand (kb/d)	22.0	33.1	37.0	47.6	63.8	60.8	60.5	51.3
<i>Motor gasoline</i>	7.0	9.5	11.9	13.4	11.3	10.0	9.5	9.0
<i>Gas/diesel oil</i>	10.7	15.5	18.5	26.3	42.6	41.0	41.2	38.2
<i>Residual fuel oil</i>	1.6	4.3	1.8	0.1	0.1	0.0	0.0	0.0
<i>Others</i>	2.7	3.8	4.9	7.7	9.9	9.7	9.9	4.1
Net imports (kb/d)	22.0	33.1	37.0	47.6	63.8	60.8	60.5	51.3
Import dependency	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Refining capacity (kb/d)	-	-	-	-	-	-	-	-
Oil in TPES	35.8%	48.2%	59.0%	69.8%	66.7%	63.9%	65.6%	-

End-Month Total Oil Stock Levels¹ - Five Year Range

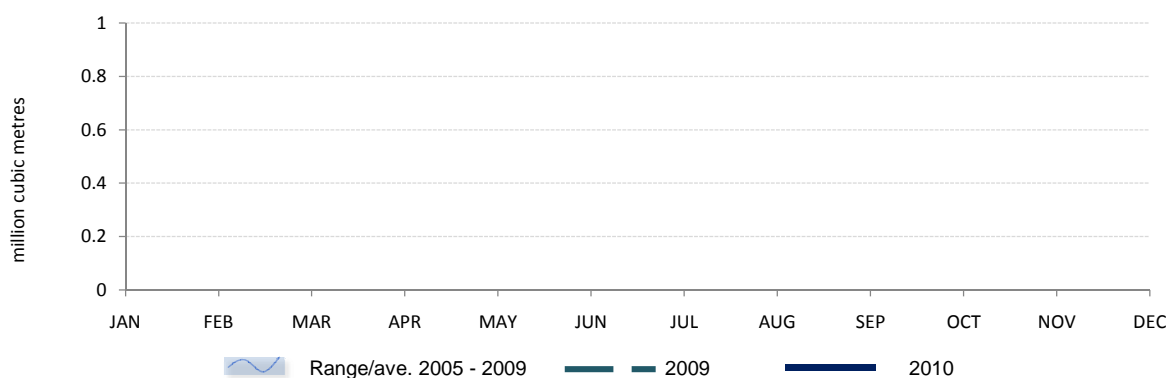


Key Natural Gas Data

	1985	1990	1995	2000	2005	2007	2008	2009 *
Production (mcm/y)	-	-	-	-	-	-	-	-
Demand (mcm/y)	347	492	636	755	1 339	1 367	1 255	1 268
<i>Transformation</i>	1	11	47	54	597	556	470	-
<i>Industry</i>	171	320	378	464	475	542	474	-
<i>Residential</i>	175	162	209	237	267	269	311	-
<i>Others</i>	-	- 1	2	-	-	-	-	-
Net imports (mcm/y)	347	492	636	755	1 339	1 367	1 255	1 268
Import dependency	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Natural Gas in TPES	11.0%	14.0%	20.5%	23.7%	29.4%	31.0%	29.2%	-

* based on monthly data submissions to the IEA.

End-Month Natural Gas Stock Levels² - Five Year Range



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

Oil and gas dominate Luxembourg's total primary energy supply mix, accounting for over 95% of the total. With no domestic oil or gas production, Luxembourg is fully dependent on imports. In the case of oil, this is entirely in the form of refined products as there are no refineries in the country. Oil consumption is concentrated in the transport sector (88%) and primarily in the form of diesel oil. Some 45% of total natural gas usage is by the transformation sector, where gas accounts for over 90% of the country's electricity generation.

A large majority of Luxembourg's oil demand comes from cars and trucks crossing its borders to refuel, as lower VAT and excise duties on transport fuels compared to neighbouring countries make fuelling in Luxembourg more attractive. Moreover, Luxembourg maintains a maximum price-setting mechanism which limits retailer's abilities to set prices for oil products sold to consumers.

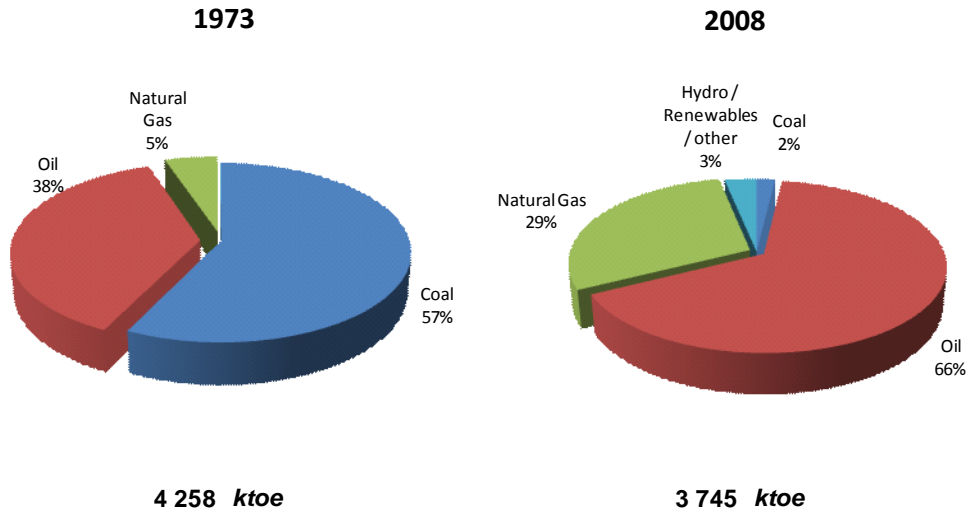
Luxembourg's primary response measure in an oil supply disruption is the use of oil stocks. Oil importers are required to hold a minimum stock cover of 90 days of deliveries to the domestic market, and the Minister of Economic Affairs and Foreign Trade has the legal ability to direct the drawdown of these stocks. However, more than 85% of Luxembourg's IEA minimum stockholding obligation is met by stocks held in neighbouring countries, primarily in the form of tickets, due to limited domestic storage capacity. At the same time, more than half of the storage capacity in Luxembourg is likely to close by 2013, requiring an even greater portion of stocks to be held abroad. Without action, the country will face serious risks in its domestic oil supply chain, making normal fuel deliveries logistically difficult and becoming more vulnerable to disruptions caused by events such as labour strikes or weather conditions which hinder fuel deliveries by road or rail. The Luxembourg government is in the process of reviewing its oil stockholding regime in order to address this challenge.

As Luxembourg has no natural gas storage and no substantial line pack in its transmission grid, there is little supply flexibility within the country to compensate for lost gas supplies. Legislation places the responsibility on the industry for assuring the security of gas supplies, through public service obligations. Network operators, suppliers and wholesale customers have obligations to guarantee the security of supply to end consumers and assure that networks are well maintained.

1. Energy Outlook

Oil and gas dominate Luxembourg’s total primary energy supply mix, accounting for over 95% of the total. Prior to the mid-1980s, coal dominated the fuel mix, but restructuring in the iron and steel industry led to the virtual elimination of the fuel’s use. Nearly all of the country’s energy needs are met by imports. Around 3% of TPES in 2008 came from domestic renewable sources, mostly biofuels for transport and other biomass-based fuels, as well as small quantities of hydro and wind power.

Total Primary Energy Supply



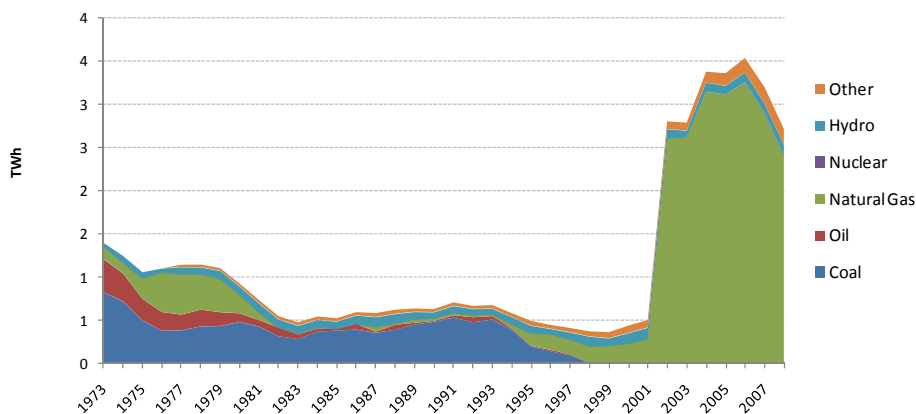
*Data excludes electricity trade.

Source: Energy Balances of OECD Countries, IEA

Overall TPES rebounded in the late 1990s, with the expansion of both oil and gas use. The increased oil usage is entirely due to growth in demand in the transport sector, while the growth in gas demand has been driven by the use of gas for power generation. Since its peak in 2005, overall energy demand in Luxembourg has declined, primarily reflecting a decrease in oil demand.

Roughly two-fifths of Luxembourg’s electricity needs are met with domestic power generation. Natural gas is the principle source of fuel for this domestic generation, representing over 90% of the country’s total domestic electricity generation.

Electricity Generation, by Fuel Source

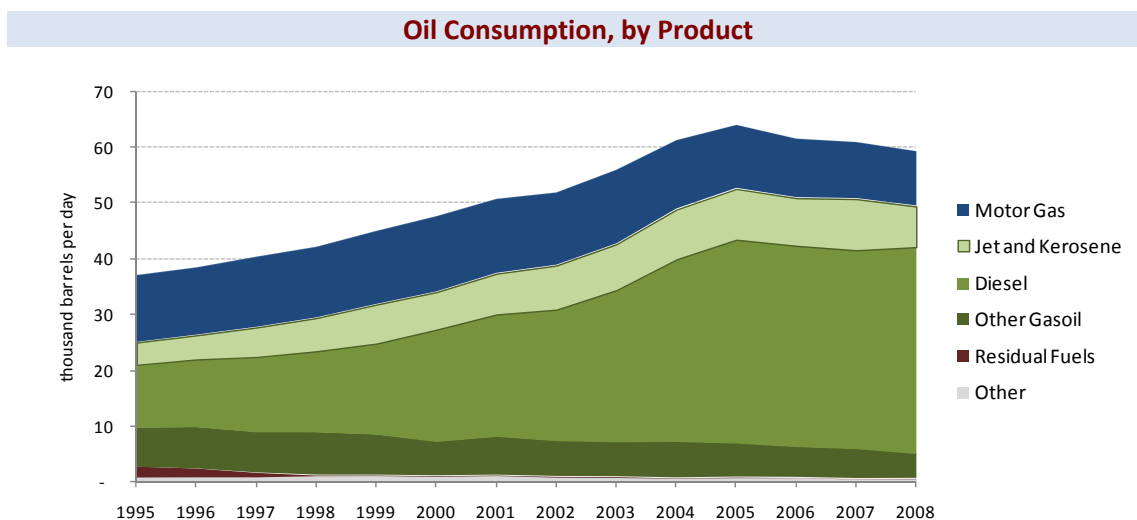


Source: Energy Balances of OECD Countries, IEA

2. Oil

2.1 Market Features and Key Issues

Luxembourg has no indigenous oil production and no domestic refinery. Thus it is fully import dependant, with all oil imports coming in the form of refined products.



Oil demand in 2008 was just over 59 thousand barrels per day (kb/d). This is a decrease from the 64 kb/d in 2005, a year when oil demand peaked after a period of strong demand growth. Transport diesel is the single largest component of the country's oil demand, equating to over 37 kb/d in 2008.

Oil use has grown ever more concentrated in the transport sector, representing nearly 88% of total oil demand in 2008, compared to 62% in 1990 and 73% in 1995.

A large majority of Luxembourg's demand for oil is attributed to cars and trucks coming from across its borders. As transport fuels in Luxembourg cost less than in the neighbouring countries because of lower taxes on gasoline and diesel fuel, foreign motorists and truckers often cross the border to fill their tanks. This group also includes commuters, representing around 46% of the country's workforce, that enter the country daily from Belgium, France and Germany.

Oil Demand, kb/d			
	2000	2008	% change
LPG and Ethane	0.8	0.3	-55.5%
Gasoline	13.4	9.7	-27.8%
Kerosene	6.7	7.3	8.2%
Diesel	20.1	37.1	84.0%
Heating/other Gasoil	6.2	4.5	-27.3%
Residual Fuels	0.1	0.0	-65.0%
Other Products	0.2	0.3	16.4%
Total Products	47.6	59.2	24.4%

Source: Monthly Oil Statistics, IEA

Taxes and maximum price mechanism

Luxembourg raised its excise duties on diesel in 2008, to EUR 0.302 per litre, in line with the EU directive setting minimum levels of taxation on energy products (2003/67/EC). This puts Luxembourg's excise duties on diesel closer to Belgium's (EUR 0.32/litre), while still significantly below those of France and Germany (EUR 0.43 and EUR 0.47/litre, respectively), which maintain levels well above the European minimum. At the same time, Luxembourg's

VAT, at 15%, remains below the rate of all three of its bordering countries (21%, 19.6% and 19%, respectively, in Belgium, France and Germany in 2008).

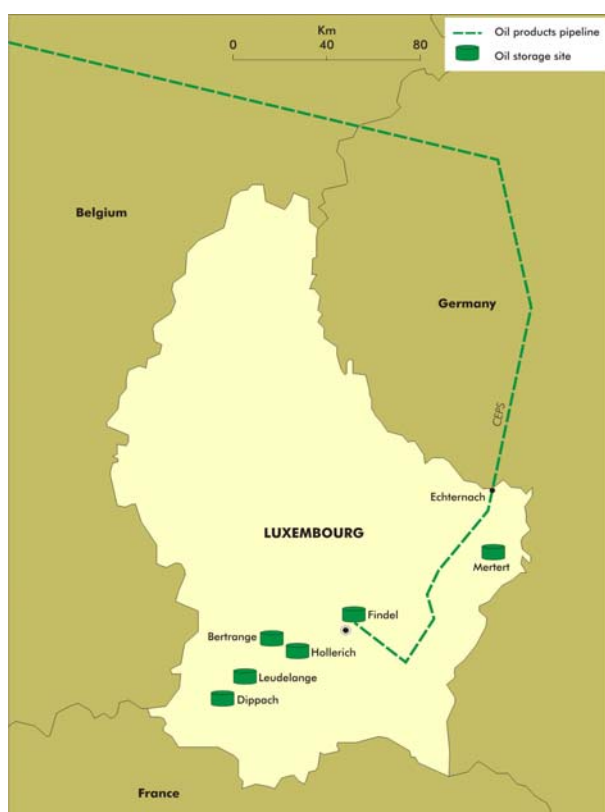
Luxembourg also maintains a price-setting mechanism for oil products through a signed agreement with oil importing companies. This sets a maximum price for oil products sold to the end-consumer, including gasoline, automotive diesel, heating oil and liquefied petroleum gas (LPG). The pricing formula is based on the published price of oil products (Platt's Antwerp CIF product prices), to which the government adds a standard cost of transport from Antwerp to Luxembourg, a standard distribution margin covering the costs and profits of the importers and the filling stations, and the cost of compulsory storage. The Luxembourg government decides when to change the maximum price according to market price variations in Antwerp, and there is a four-day delay between the time prices are quoted and the time retailers are able to adjust to a new maximum rate.

Imports/exports and import dependency

Luxembourg is 100% import dependant, as there is no domestic oil production. With no domestic refinery, all oil imports are in the form of refined products. They essentially come from refineries located in Antwerp in Belgium (roughly three-quarters of total imports), 255 km from the city of Luxembourg. The rest comes from Germany (16%), France (8%) and the Netherlands (4%). Although the most commonly used method of transport is by road (nearly 40%), a significant proportion of oil products reaches Luxembourg by rail and barge. Only aviation kerosene supplied to the country's airport at Findel is transported by pipeline.

Oil Company Operations

There are eleven companies operating on Luxembourg's oil market, including three distributors (Q8-Calpam, Petro-Center – selling under the ESSO and Mobil brand and Gulf) and eight retailers (Aral, BP, Q8, Delek, Chevron, Esso, Shell, Lukoil and Total), which operate a total of 240 filling stations in Luxembourg.



2.2 Oil Supply Infrastructure

Refining

There are no refineries in Luxembourg.

Ports and Pipelines

The only pipeline in the country is a branch of the Central Europe Pipeline System (CEPS) which supplies aviation kerosene to the country's airport at Findel. The portion of the CEPS in Luxembourg runs a length of 36 kilometres and is constantly filled with about 700 m³ of fuel. There are no pumps installed along the line in Luxembourg, which has a theoretical flow capacity of 96 m³ per hour, or some 15 kb/d, with average flow of around 9.4 kb/d.

Storage capacity

Oil Storage Capacity, by Storage Site

Storage site	Gasoline		Distillates		Jet Fuel		Total Products	
	m3	kbbbl	m3	kbbbl	m3	kbbbl	m3	kbbbl
Bertrange	40,761	256	52,372	329	-	-	93,133	586
Dippach	-	-	12,400	78	-	-	12,400	78
Findel (airport)	-	-	-	-	10,000	63	10,000	63
Hollerich	-	-	17,252	109	-	-	17,252	109
Leudelange	-	-	5,600	35	-	-	5,600	35
Mertert	21,800	137	36,000	226	-	-	57,800	364
Total	62,561	393	123,624	778	10,000	63	196,185	1,234

Source: Luxembourg Administration

There are six main storage facilities used by oil companies in Luxembourg to supply the domestic market. These have a total combined capacity of just over 196 thousand cubic metres, or 1.23 million barrels.

The largest of the storage sites, Bertrange, and the nearby site of Hollerich, have operating permits which are set to expire in 2012/2013. These two sites have more than half of the country's storage capacity. If the permits are not renewed, total capacity to store diesel and heating oil will fall to 340 thousand barrels. In terms of 2008 demand, distillate storage capacity would decline from 19 to 8 days of demand cover. For gasoline, this would fall from 41 to 14 days of demand cover.

2.3 Decision-making Structure for Oil Emergencies

Emergency response policy is under the responsibility of the Ministry of Economic Affairs and Foreign Trade. Within the Ministry, the Directorate for Energy is responsible for maintaining and implementing emergency response measures in an oil supply disruption and for supervising the guidelines companies are required to follow with regards to security of natural gas supplies. Its responsibilities also include collecting data and monitoring the domestic oil and gas markets, the maximum oil price mechanism and industry's compulsory oil stockholding.

In the event of an oil supply emergency, the Minister for Economic Affairs and Foreign Trade has the legal authority to take a decision on emergency measures "if oil products supply is endangered". This can be either by means of decrees or by notification to individual companies, which could regulate imports, trade and consumption of oil products.

2.4 Stocks

Stockholding Structure

All oil stocks in Luxembourg are held by oil companies and are typically co-mingled with commercial stocks.

All oil importers are obliged to maintain stocks of petroleum products equivalent to at least 90 days of deliveries into domestic consumption during the previous calendar year. This

applies to each of the three categories covered by the EU compulsory stockholding obligations (gasoline, distillates and fuel oil).

Crude or Products

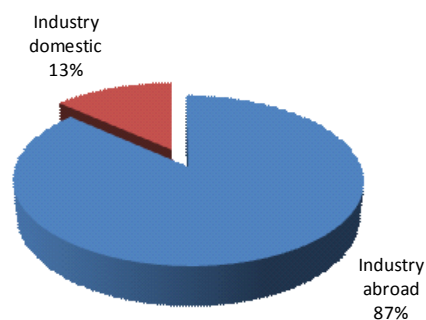
Since the country has no refining capacity, all compulsory stock obligations must be held in the form of finished products.

Location and Availability

Over 85% of Luxembourg's IEA minimum stockholding obligation is met by stocks held outside the country, in other EU countries with which Luxembourg has a bilateral agreement. Luxembourg has bilateral agreements with Belgium, France, Germany and the Netherlands.

Most of these stocks are held in the ARA (Amsterdam, Rotterdam and Antwerp) area. For the most part, these stocks are held in the form of short-term ticket agreements.

Total Emergency Reserves, by Location, 2008



Source: Monthly Oil Statistics

Monitoring and Non-compliance

Oil importers are required to submit reports to the authorities, by the 15th of each month, stating their stock levels at the beginning of that month. In verifying the accuracy of a company's reported stock levels, police and customs authorities may check levels at any time, on request of the Minister for Economic Affairs and Foreign Trade. Infringements are punishable by either imprisonment of up to two years or a fine, or both.

Stocks held outside Luxembourg must be certified by the government of the country in which they are held in order to be counted towards meeting the company's stockholding obligation.

Stock Drawdown and Timeframe

In the event of an oil supply disruption, the Minister for Economic Affairs and Foreign Trade has the legal authority to draw down compulsory industry stocks. The Minister is empowered to authorise participation in an IEA response and the law does not fix a threshold for activating emergency measures. A decision to draw down stocks is expected to take 2-3 days. This would be organised by means of Ministerial decrees as a general measure, or by individual notification to stockholding companies.

The release and pricing of compulsory stocks onto the market would be implemented by an Emergency Committee, set up at the time, consisting of government officials, oil company executives and consumer representatives.

The physical delivery of stocks to market after the decision for release is expected to take one week. The monitoring mechanism to ensure that companies draw down sufficient stocks to meet IEA requirements would be the standard oil market statistics, completed by companies on a weekly basis instead of the usual monthly basis. For further verification, customs officers could monitor the physical drawdown of oil stocks.

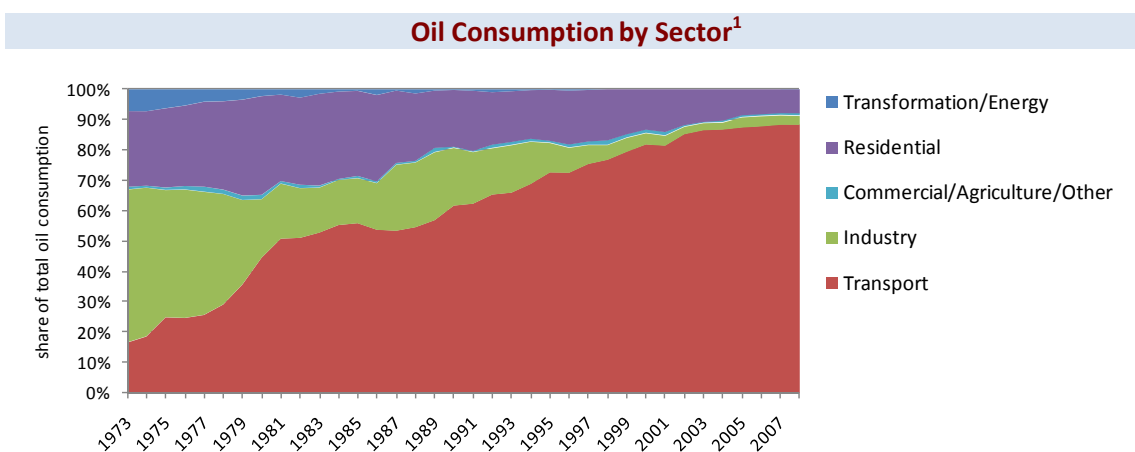
Financing and Fees

Importers subject to stockholding obligations recoup the costs of compulsory oil stocks by passing them on to consumers through market prices. The government of Luxembourg sets a maximum price on gasoline, automotive diesel, heating oil and LPG. The pricing formula includes a fee to cover the cost of compulsory storage, amounting to EUR 5.95 per kilolitre for gasoline and EUR 6.45 per kilolitre for distillates.

3. Other Measures

3.1 Demand Restraint

Luxembourg legislation allows for the regulation of oil product sales, purchases, transportation and consumption in times of supply disruptions and empowers the Minister for Economic Affairs and Foreign Trade to decree the measures, which can be applied to the general population or targeted to specific sectors or companies.



Source: Oil Information, IEA

As the transport sector makes up the vast majority of oil consumption in Luxembourg, most demand restraint measures would likely be targeted at the use of transport fuels. Given the size and location of Luxembourg, such measures must take account of regional concerns.

A common Benelux guideline exists for oil demand restraint which the Luxembourg government could rely upon for co-ordinating measures such as reducing speed limits or restricting driving. These common Benelux guidelines provide four levels of co-operation in an emergency situation implying demand restraint measures:

Information

- Information campaigns in order to promote reduced heating, illumination and car use.
- Speed limitation in residential areas and reinforced control and regulations.

Consultation

- Decision to set standards for heating and illumination.

¹ Total Consumption (including refinery consumption), does not include international marine bunkers.

- Speed limitations on country roads.

Co-ordination

- Speed limitation on motorways.
- Driving bans.
- Limited opening hours for filling stations.
- Limited deliveries to consumers.
- Limited deliveries to retailers.
- Introduction of tickets for consumers.

Uniformity

- Closing of the filling stations on determined days.

An information campaign could be started immediately after an ad hoc decision. Other light-handed measures, such as limiting speeds on roads and reduced home-heating, could be implemented within two days after consultation with other Benelux countries.

More severe measures, such as speed limitations on motorways, driving bans and reduced deliveries, would have to be co-ordinated at the Benelux level and eventually with other neighbouring countries. In this case, administrative preparations and decisions would take about one week. The timetable from implementation of decisions to full operation would be rather brief and the first volumetric effects would be measurable after two weeks.

3.2 Fuel Switching

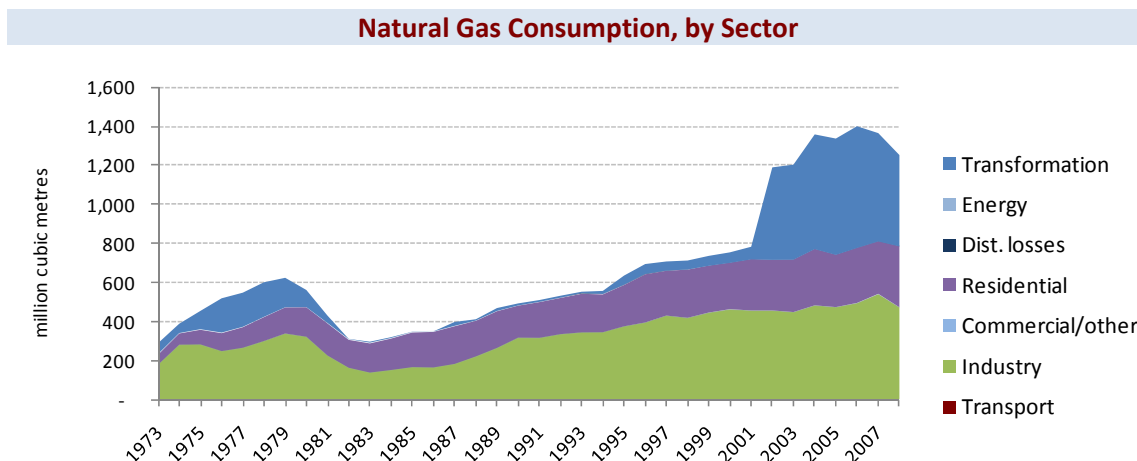
There is no scope for short-term switching away from oil use as an emergency response measure. Opportunities to switch away from oil to other fuels, such as using natural gas instead of fuel oil in the production of electricity, have already occurred. Oil is no longer used in Luxembourg's transformation sector.

3.3 Others

With no domestic crude oil production, surge production is not an available response measure.

4. Natural Gas

4.1 Market Features and Key Issues



Source: Natural Gas Information, IEA

From 1990 to 2006, demand for natural gas increased from just under 500 million cubic metres (mcm) to just over 1 400 mcm, an average annual rate of 6.8%. The 350 MW Twinerg combined-cycle gas turbine plant alone uses one-third of all natural gas in Luxembourg. Since the plant was commissioned in 2002, the transformation sector has accounted for some 40-45% of all gas used in the country. Manufacturing and households represent around 35% and 20%, respectively, of gas consumption. Roughly half of all households are supplied with gas.

Natural gas is the principle source of fuel for the electricity generated in Luxembourg, providing over 90% of total inputs to electricity generation.

Luxembourg has no indigenous gas production and therefore relies on imports to supply all of its domestic requirements. Norway is the source of roughly half of all gas imports, while imports from Russia account for around a quarter of the total. Spot purchases at the Zeebrugge hub in Belgium provided some 12% (2006).

Gas Company Operations

In 2008 there were eight companies authorized to supply natural gas to end customers in Luxembourg, including four integrated distribution system operators (DSOs).

The company SOTEG owns and operates the transmission system, and it supplies the majority of the market. It purchases most of its gas under long-term contracts, but also on the spot market of the Zeebrugge hub in Belgium. There is for the moment no real wholesale market for gas in Luxembourg, and SOTEG supplies all gas to the country's four DSOs. SOTEG is owned by the State (21%), E.ON (20%), ArcelorMittal (20%), Cegedel (19%), Saar Ferngas (10%) and the state-owned SNCI fund (10%).

Since 2004, SOTEG is also involved in electricity, and it sold 3.3 TWh in 2007. In a move to consolidate Luxembourg's energy sector, in 2009 SOTEG merged with Cegedel, the electricity

incumbent, and the German gas supplier Saar Ferngas to form a new cross-regional energy player, Enovos International S.A.

4.2 Natural Gas Supply Infrastructure

Ports and Pipelines

Luxembourg's natural gas pipeline network is not designed for transit. It does not have a compressor station and thus depends on the compressors of Belgium and Germany and has no substantial line pack. It consists of 380 km of transmission system network and some 2 300 km of distribution system network. The transmission network interfaces with four distribution systems and directly with some large industrial customers.

The Natural Gas Grid



There are four entry points to the gas network with a total theoretical maximum capacity of 10.3 mcm per day (or 430 000 Nm³/h); two from Belgium (Petange, with a maximum capacity of 3.8 mcm/d and Bras, 1.4 mcm/d), one from France (Audun, 0.5 mcm/d) and one from Germany (Remich, 4.6 mcm/d). In 2007, the maximum capacities of these entry points were reached at all but the Petange entry point, where the maximum rate in the year reached roughly 60% of its maximum capacity.

In 2007, 53% of gas imports entered the country through the German entry point, 46% through the Belgian entry points (Bras: 32.8%, Petange 13.4%), and 1% through the French entry point.

Storage

There is no natural gas storage in Luxembourg.

4.3 Emergency Policy for Natural Gas

Luxembourg's work related to the security of natural gas supplies is set out in guidelines for companies operating on its domestic gas market, under the Law on the Organisation of the Natural Gas Market of 1 August 2007. The Ministry of Economic Affairs and Foreign Trade is responsible for monitoring the general state of the networks and interconnections as well as the security of supply.

Suppliers must guarantee supply to end-users in times of supply disruptions and extreme weather conditions, including under exceptionally high demand for gas during very cold periods (statistically recorded every 20 years). The law also obliges the system operators to invest in grids in order to ensure their security and safety, and to guarantee transporting and distributing gas in extreme weather conditions.

The law sets a public service obligation on gas suppliers, requiring them to contribute to the overall supply of the domestic market during a disruption. This includes participating in solidarity with the other suppliers to maintain a steady supply to network operators. In this way, spare supply from the other suppliers may be utilised when any one of the four suppliers to the national market faces difficulties during defined periods of extreme circumstances.

In addition to the grid code, the system operators must develop a five-year network development plan and update it every two years. To limit the impact of supply disruptions on end users, they have concluded interruptible contracts with several large users. In 2007, these covered 18% of gas use. By sector, 35% of industrial customers have interruptible contracts, and so have 15% of public distribution customers.

The single largest user, the Twinerg CCGT plant (which accounts for one-third of the country's gas use), is not interruptible. The plant is fully integrated into the Belgian power production park and the plant's capacity of 350 MW is divided between Belgium's Electrabel for the Belgian grid (150 MW), and Luxembourg's two electricity transmission system operators, SOTEL and Cegedel (100 MW each). Luxembourg contractually receives close to 40% of its electricity from the Twinerg CCGT plant. Power produced by the plant is only indirectly linked to the public power grid in Luxembourg by means of re-imports assured via the German power grid. If the plant's natural gas supply is cut off, Electrabel is obliged to provide backup electricity.

As Luxembourg has no natural gas storage and no substantial line pack in its transmission grid, there is little supply flexibility within the country to compensate for lost gas supplies. With four entry points, there is the potential to compensate for reduced flows through one of these by increasing supply through the others. However, with over half of the country's gas supplied through the German entry point, a significant reduction to capacity at this point would be difficult to compensate from the other directions.

Strategic Gas Stocks and Drawdown

There is no natural gas storage in Luxembourg.

Demand Restraint

There is no demand restraint program in place in Luxembourg in order to rapidly reduce gas use in the short term, during a gas supply disruption.

Fuel Switching

There is no program in place in Luxembourg in order to encourage or otherwise require users of gas to switch to other fuel sources in the event of a gas supply disruption.

INTERNATIONAL ENERGY AGENCY

The International Energy Agency (IEA), an autonomous agency, was established in November 1974. Its mandate is two-fold: to promote energy security amongst its member countries through collective response to physical disruptions in oil supply and to advise member countries on sound energy policy.

The IEA carries out a comprehensive programme of energy co-operation among 28 advanced economies, each of which is obliged to hold oil stocks equivalent to 90 days of its net imports. The Agency aims to:

- 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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