

ABBL Energy savings guidelines for the banking sector

April 2023 Version



Association des Banques et Banquiers, Luxembourg
The Luxembourg Bankers' Association
Luxemburger Bankenvereinigung

Member of :



UNION DES ENTREPRISES
LUXEMBOURGEOISES



European
Banking
Federation

Purpose

The purpose of the present document is to provide ABBL members with clear guidance on implementing energy savings measures. In the wider context of the energy crisis that has been unfolding since 2021, the Luxembourg Government has called for a nation-wide collective effort to reduce energy consumption and thereby relieve some of the demand on the electricity grid.

These recommendations have been produced by the ABBL for its members with the expert support of a specially created task force on energy, gathering facility and corporate real estate managers.

These guidelines are meant to evolve as a living document. Their content is subject to change through future iterations to include further information and recommendations based on the evolution of the crisis, as well as feedback received by industry players or public authorities.

Although the ABBL has taken reasonable precautions to ensure that the information contained herein is complete and correct, this guidance does not constitute legal advice and neither the ABBL nor any of its contributing members can be held responsible for any errors or omissions. In case of doubt, members are invited to seek the advice of a competent professional.

Table of contents

1	Background.....	4
1.1	Origin of the crisis.....	4
1.2	EU Policy response.....	5
1.2.1	REPowerEU	5
1.2.2	European Commission proposal for an emergency intervention	6
1.3	2023 and beyond.....	8
1.4	The situation in Luxembourg.....	9
1.4.1	National energy savings strategy	9
1.4.2	Risk preparedness.....	10
1.4.2.1	Natural gas.....	10
1.4.2.2	Electricity	13
2	Recommended actions	19
2.1	Short-term energy saving measures.....	19
2.1.1	Heating and air conditioning.....	19
2.1.2	Electronics.....	21
2.1.3	Lighting.....	21
2.1.4	Staff awareness.....	22
2.1.5	Other measures	22
2.2	Preparing for energy shortages	23
3	Next steps	25
	About the ABBL.....	25
	References	26
	Data sources	29

1 Background

1.1 Origin of the crisis

The current energy crisis Europe is facing in 2022 is the first of its kind in the frame of the transition to cleaner energy production. The crisis has been unfolding since mid-2021 when fossil fuel prices began soaring due to the post-pandemic economic rebound and a sudden, significant increase of global electricity demand.¹ Disruptions on the supply side, such as slower gas production in Norway and the UK due to COVID-19, lower yields from renewables due to droughts and low wind levels, as well as voluntarily withheld gas supplies from Russia, led to skyrocketing energy prices in Q4 2021.

That is due to the pricing mechanism of the EU energy market, known as “marginal pricing” or “pay-as-clear market”.² Under that mechanism, the price for power generation on the spot market is based on the marginal costs of the power plant required to generate the last incremental unit of electricity. While this system favours investing in renewables since they operate with negligible marginal costs, abnormally high prices for natural gas now dictate the cost of energy in Europe.

The energy market in Europe was already tense in the winter of 2021. It was then further aggravated by the Russian invasion of Ukraine in February 2022. Despite Western sanctions, natural gas has remained the main chokepoint for Europe. In 2021, Russian gas supplies accounted for about half of the EU’s gas imports.³ Since then, these imports have dwindled by more than half due to Russian gas flows being squeezed. Some EU Member States like Lithuania or Estonia have halted their imports unilaterally.

Research conducted by the IMF shows the European energy sector should be able to cope with a reduction of gas imports from Russia up to 70% provided it has access to alternative suppliers while also dealing with a reduced demand from electricity consumers.⁴ To face the upcoming energy shocks in the next winters, significant collective efforts will be needed.

1. IEA, “Electricity Market Report - January 2022.”

2. European Commission, “Action and Measures on Energy Prices.”

3. IEA, “How Europe Can Cut Natural Gas Imports from Russia Significantly within a Year.”

4. Flanagan et al., “How a Russian Natural Gas Cutoff Could Weigh on Europe’s Economies.”

1.2 EU Policy response

1.2.1 REPowerEU

In the wake of Russia’s invasion of Ukraine in late February, the European Commission proposed the REPowerEU plan in March 2022 in a bid to make Europe no longer energetically dependent from Russia by 2030. The plan – essentially a package containing legal acts, guidelines and strategies – was officially adopted on May 18, 2022. It is based on four main pillars:

- Committing to voluntary EU-wide energy savings
- Diversifying supply sources of oil and gas
- Accelerating the rollout of renewable energy sources
- Financing new infrastructures for the transit of natural gas and hydrogen

Under REPowerEU, an Energy Platform was established as a mechanism to ensure energy security by allowing to aggregate gas demand at EU level and optimise existing transport and storage infrastructures with gas producers.⁵ This key step would facilitate the EU’s goal to increase its gas imports from non-Russian suppliers. These include the United States of America by way of delivering 15 billion cubic meters (bcm) of liquified natural gas (LNG) in 2022, but also other countries such as Egypt, Israel and Norway. The Commission is also prospecting other potential suppliers to further reduce dependence on Russian gas.⁶

EU Aggregate gas storage levels in %		
Year	1 Nov	2 Jan
2023	***	83.5
2022	94.9	52.9
2021	77.0	73.2
2020	95.0	87.5
2019	97.3	69.5
2018	86.8	63.7
2017	88.8	62.6
2016	89.9	69.4
2015	83.8	72.5
2014	93.6	69.2
2013	85.3	71.9

Europe’s alternate sourcing strategy paid off. By mid-September, gas storage levels in the EU had reached an aggregate fill level of 86%, which is very close to normal levels reached in years prior to the energy shock. The EU Gas Storage Regulation adopted in June 2022 set the objective for Member States to reach gas storage levels of 80% by November 1st, 2022.⁷ By that date, all Member State sat the exception of Latvia and Hungary had storage levels well above 90% of their capacity.

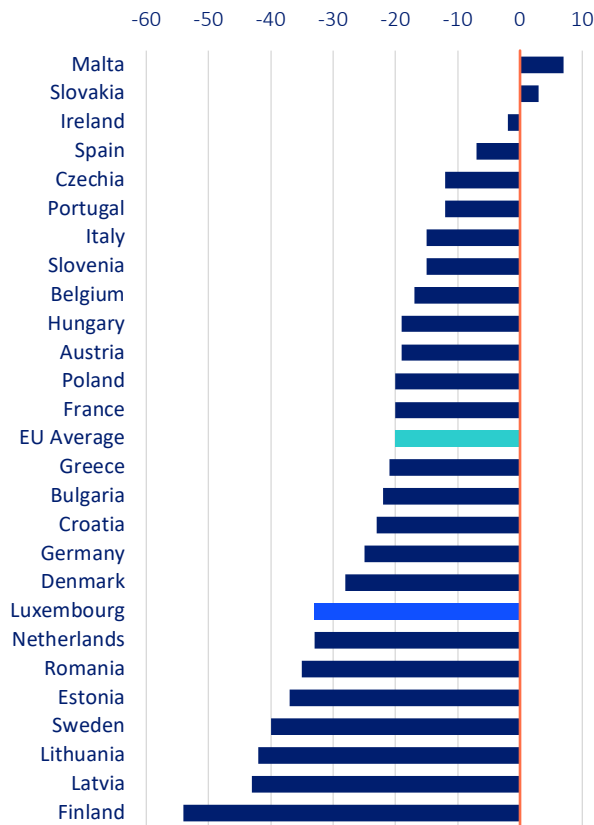
The EU’s gas stocks were almost 84% full in early January 2023, much higher than their 10-year average in the same period (69%). While these figures bode well for the Union’s policy response to the crisis, European solidarity will still very much be needed to cope with dwindling supplies of natural gas in the winters to come.

Source: Gas Infrastructure Europe

5. European Commission, “EU Energy Platform.”
 6. European Commission, “Strategy for an EU External Energy Engagement.”
 7. Regulation (EU) 2022/1032

EU Natural gas consumption

Change in inland consumption, in %
2022 vs 2017-21 (August-November)



Source: Eurostat

Piling up gas stocks was the first aspect of the short-term response to the energy crisis. Member States also committed to reduce their own consumption of natural gas by 15% in the period from August 2022 to March 2023 compared to the preceding 5-year average. A new regulation was adopted under the REPowerEU package to formalise this voluntary savings target.⁸ It also gives the Commission the power to declare a 'Union Alert' which would allow it to impose a mandatory reduction of gas consumption on all Member States, for example in situations of extreme demand for gas or in case of severe gas shortages.

Eurostat data shows the Union had largely attained the 15% mark between August and November 2022. While a few Member States consumed more gas than in previous years, such as Malta or Slovakia, other countries like Finland or Latvia used much less gas and reached savings higher than 40%. As a result, consumption of natural gas fell by 20.1% on average in the EU during that period.

On 28 March 2023, the Council of the EU agreed to extend the Member States' voluntary 15% gas demand reduction target until March 2024.

1.2.2 European Commission proposal for an emergency intervention

During the 14 September 2022 State of the Union, the European Commission adopted a proposal for an emergency intervention.⁹ The proposed regulation would set two targets:

1. Member States would be required to adopt 'sufficiently ambitious' measures to lower the overall energy consumption by all consumers.
2. A mandatory target would be introduced to reduce energy consumption during 'selected peak hours' covering at least 10 hours of each month where prices are expected to be highest.

8. Council Regulation (EU) 2022/1369

9. European Commission, "Questions and Answers on an Emergency Intervention to Address High Energy Prices."

The proposal also ambitions to recover excessive profits generated by fossil fuel businesses as a result of exceedingly high energy prices, but also those amassed from power generators with low marginal costs. The recovered funds would be channelled back to electricity consumers which are particularly vulnerable to high energy prices.

1.2.3 Directive (EU) 2022/2557 on the resilience of critical entities

On 14 December 2022, a new European Directive on the resilience of critical entities (CER Directive) was published in the EU Official Journal.¹⁰ This directive effectively overhauls the previous EU legal framework which only provided for the identification and protection of critical infrastructure in the energy and transport sectors.¹¹

Instead, the new directive establishes a framework that addresses the resiliency of a wider range of entity types that are critical for the functioning of the EU internal market. To account for the interdependencies between sectors and Member States borders, the CER Directive has incorporated further sectors such as healthcare, digital infrastructure, and public administration, but also financial services:

- Credit institutions¹²
- Operators of trading venues¹³
- Central counterparties¹⁴

The Directive sets new obligations for in-scope critical entities to enhance their resilience. For Member States, it also sets rules for the supervision of critical entities and the enforcement of the aforementioned obligations by Member States, and establishes common procedures for cooperation among Member States and the exchange of information.

Financial entities are already subject to a comprehensive legal framework on prudential requirements, including operational risks and business continuity. The CER Directive acknowledges this and exempts financial institutions from complying with its resiliency requirements to avoid unnecessary administrative burden.

10. Directive (EU) 2022/2557

11. Council Directive 2008/114/EC

12. As per the definition set by the Capital Requirements Regulation.

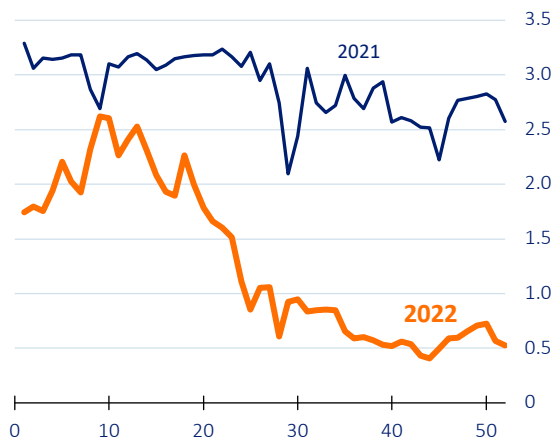
13. As per the definition set by Directive (EU) 2014/65/EU.

14. As per the definition set by Regulation (EU) No 648/2012.

The CER Directive requires national competent authorities to identify all relevant critical entities for the sectors included in the Directive’s scope by 17 July 2026. In Luxembourg, this task falls to the High Commission for National Protection (HCPN).

1.3 2023 and beyond

EU weekly natural gas imports from Russia, bcm



Source: Bruegel Datasets

The EU has been successful in weathering the storm in 2022 thanks to several beneficial factors. Even though Russian gas supplies were cut significantly, some 60 bcm were still provided by pipeline to the EU. At the same time, importing LNG was easier for the EU during 2022 thanks to a lower demand from China, mostly due to its COVID-induced lockdowns and resulting slow economic growth. China’s LNG orders might jump back to their normal levels in 2023, which would tighten gas markets even further. A recent report of the International Energy Agency (IEA) forecasts a 27 bcm gap in the supply-demand for gas in 2023, assuming the Russian Federation turns off the tap for good.¹⁵

The EU has a few options to fill such a gap between supply and demand (at least partially) and keep its gas reserves full come next winter. Faster improvements in energy efficiency are needed, meaning that more buildings should be renovated, appliances should be replaced by more efficient ones and smart thermostats should continue to be installed. Permitting timelines for wind and solar power generation should also be simplified and shortened to accelerate the deployment of renewable energy projects. Efforts should continue to electrify heat using heat pumps, both in homes and industries.

The EU may find further gas supplies in the southern hemisphere. Incentivising reductions in gas flaring and methane leaks in African countries may free up an additional 4 bcm of gas which may in turn be transported to the EU using existing pipelines. The IEA’s final recommendation is to continue encouraging behaviour changes to further drive down the EU’s natural gas consumption. Savings campaigns are here to stay as this crisis will take years to be fully resolved, but finding new ways to incentivise more responsible behaviours may prove challenging.

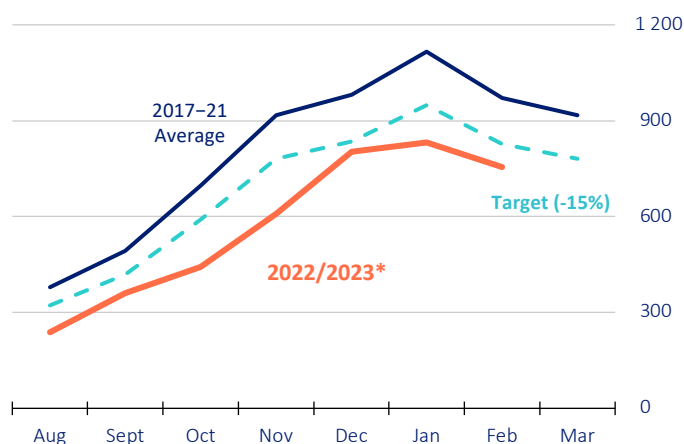
15. IEA, “How to Avoid Gas Shortages in the European Union in 2023.”

1.4 The situation in Luxembourg

1.4.1 National energy savings strategy

The Luxembourg Government kickstarted its own national strategy on 1 August 2022 with the objective of reducing demand for natural gas by 15% between August 2022 and March 2023. To achieve this, a list of measures has been circulated to achieve energy savings in publicly owned buildings and spaces. For the general public, a national awareness-raising campaign was launched in early September to encourage residents to reduce their energy consumption.¹⁶ The Chamber of Commerce and the Chamber of Skilled Trades and Crafts collaborates with the Klima-Agence to maintain an advisory service as well as a hotline to help businesses in Luxembourg reduce their energy consumption.¹⁷

Natural gas consumption in Luxembourg, GWh



Source: Ministry of Energy and Spatial planning

*Preliminary data

Since the launch of the national strategy, Luxembourg's Ministry of energy has been providing monthly updates on the achieved energy savings. Preliminary data shared by the Ministry shows the country has managed to cut down its gas consumption by about 30% on average between August and December 2022. Gas consumption remains tied to the weather conditions. Exceptionally mild autumn temperatures allowed to achieve greater savings in the earlier months¹⁵, while December's colder temperatures allowed for 18% savings.

In November and December 2022, the Ministry of Energy updated two of its key documents concerning the Luxembourg energy infrastructure and its preparedness to risks of supply security. New sub-sections have been added in an updated version of the ABBL's guidelines to showcase some of the key elements of these plans. Additionally, the Government stepped up its efforts to help households cope with high energy prices and to accelerate the transition to renewable energy, the renovation of buildings and the installation efficient heating solutions using renewed subsidies.¹⁸

16. Klima-Agence, "Présentation de La Campagne Nationale de Réduction de La Demande d'énergie Zesumme Spueren – Zesammenhalen."

17. The Chamber of Commerce – Hotline +352 42 39 39 700 – Email energie@houseofentrepreneurship.lu
The Chamber of Skilled Trades and Crafts – Hotline +352 42 67 67 550 – Email energie@cdm.lu

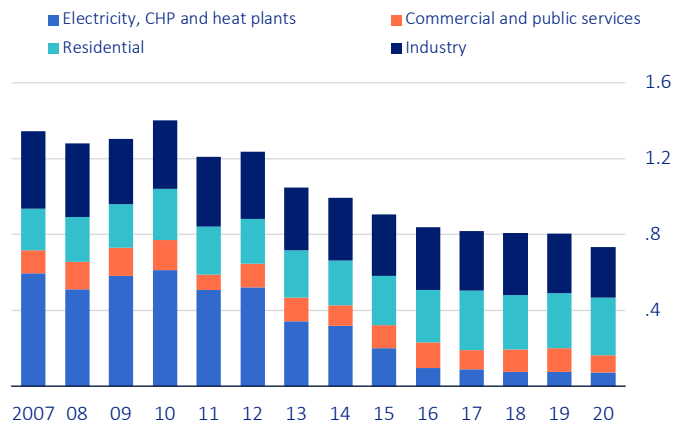
18. The Luxembourg Government, "High Energy Prices: Measures to Help Households and the State of Play of Efforts to Reduce Energy Consumption."



1.4.2 Risk preparedness

1.4.2.1 NATURAL GAS

Natural gas consumption in Luxembourg by sector, bcm



Sources: STATEC, IEA

Given that Luxembourg does not have any domestic gas production (excepted small amounts of biogas), all its natural gas is imported. Nearly all of it is supplied by Norway and the Russian Federation and enters Luxembourg’s territory via three entry points. About ⅔ of Luxembourg’s imported natural gas flows from Belgium through Bras and Pétange while the rest enters from Germany via Remich, for a total technical capacity amounting to 268,000 Nm³/h.¹⁹

No storage facilities or compressor stations exist within Luxembourgish borders. The majority of the gas network in Luxembourg is operated by Creos as the sole transmission system operator (TSO) and main distribution system operator (DSO). In the south of the country, the distribution of gas is managed by SUDenergie and the Dudelange municipality. Since 2015, Creos and Fluxys, Belgium’s gas TSO, have been working in tandem as a common Belgium-Luxembourg gas market.²⁰ The imported gas is largely used to heat Luxembourgish homes and commercial buildings and for industrial processes. Only 10% of it is used to generate power.²¹

Emergency response with regards to natural gas is regulated by the modified Law on the Organisation of the Natural Gas Market of 1 August 2007. It requires system operators to take all necessary preventive measures to limit the degradation of the security and effectiveness of the gas transportation and distribution network. It also temporarily allows the Luxembourg government to take action to safeguard the supply of natural gas in case of a sudden crisis on the energy market. EU legislation defines 5 crisis levels with regards to the security of natural gas supplies at national- and European-level depending on the gas supply conditions.²²

19. Normal cubic metres per hour

20. Creos, “Intégration réussie des marchés gaziers belge et luxembourgeois: Une première en Europe.”

21. IEA, “Luxembourg 2020: Energy Policy Review.”

22. Regulation (EU) 2017/1938

National and regional/EU crisis levels regarding natural gas supply security

National crisis levels	
Early warning	Reliable information suggests the likely occurrence of an event leading to a significant deterioration of the natural gas supply situation and the possible activation of the alert and emergency crisis levels.
Alert	The gas supply situation is significantly deteriorated following a gas supply disruption or an exceptionally high demand for gas. In this situation the market is still able to manage with the disruption or high demand without the need of intervening using non-market-based measures.
Emergency	The gas supply situation is significantly deteriorated following a gas supply disruption or an exceptionally high demand for gas, and all market-based measures that could have implemented were insufficient to balance out supply and demand for gas. Intervention using non-market-based is necessary, particularly in order to safeguard gas supplies for protected customers*.
Regional/European crisis levels	
EU-level alert	A Council Regulation ⁸ adopted as part of the REPowerEU package gives the European Commission the power to declare a 'Union Alert' which would allow it to impose a mandatory reduction of gas consumption on all Member States to safeguard the security of gas supplies within the EU.
EU-level emergency	The Commission may declare a regional or Union emergency at the request of Member States and coordinate the actions of national competent authorities to manage the disruption in natural gas supply.

A national emergency plan, as required under EU regulation, also sets out several measures to be implemented as a response to each crisis level.²³ Even though no crisis level has been activated as of February 1st 2023, the energy ministry is already applying some of the measures which would normally be used to manage an 'early warning' situation:

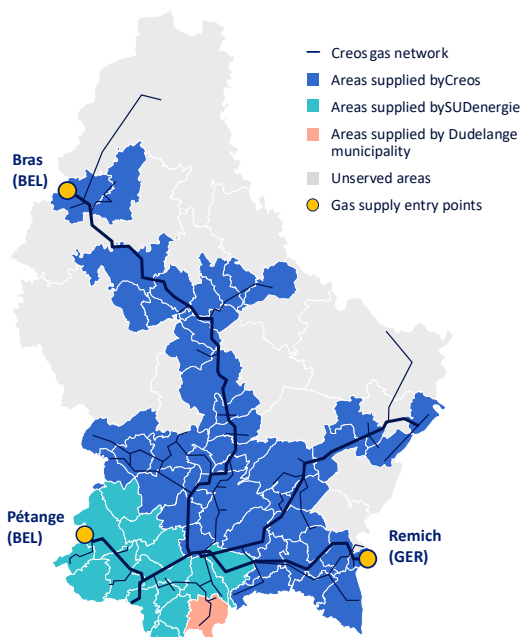
- Daily monitoring of the gas supply security (in coordination with the TSO)
- Weekly follow-ups with Belgian TSOs and DSOs
- Awareness-raising campaign on reducing natural gas consumption

Load-shedding is another one of the measures set out in the emergency plan. It consists of a deliberate reduction of energy supply in a part or parts of an energy distribution system to preserve its integrity. For natural gas, this involves restricting or suspending the supply of gas to all or some of its consumers by transmission or distribution system operators. It is one of the last-resort measures that would be considered only where all other actions to manage natural gas supply and demand have proven either insufficient or ineffective.

23. Ministry of Energy and Spatial Planning, "Plan d'urgence relatif à la sécurité d'approvisionnement en gaz naturel du Luxembourg."

The formal procedure for gas load-shedding in Luxembourg is detailed in a plan laid down by Creos.²⁴ As a general principle, system operators are expected to safeguard the uninterrupted supply of natural gas to ‘protected customers’, i.e., households, essential social services and certain SMEs. The same applies to the use of load-shedding which would affect protected customers last.

Luxembourg natural gas network



Sources: Geoportail, Creos, International Energy Agency (IEA)

Load-shedding may be initiated to respond to exceptional crisis situations that would compromise the Luxembourgish or European gas systems. There are two types of such situations:

- Urgent situations which call for rapidly effective, though unselective actions, and
- Anticipated situations which allow for a planned and selective response.

It is worth noting that Luxembourg is exempted from the N-1 standard that otherwise applies under EU legislation.²² It is used to estimate whether a country’s “gas infrastructure has sufficient technical capacity to satisfy its total gas demand in the event of a disruption of the single largest infrastructure during a day of exceptionally high demand”.²⁵

The IEA estimates that a supply disruption in the Bras entry point (the largest of the three) could not be entirely compensated by gas imports from the two remaining entry points. That would leave Luxembourg with few options other than load-shedding in case of a disruption of this magnitude.²¹

These circumstances may arise from an insufficient gas supply to meet the demand from Luxembourg customers, but also following a technical failure in the natural gas network, including in one of the three entry points. The load-shedding procedure may be coordinated by the TSO or one of the DSOs depending on the origin of the crisis. DSOs initiate local load-shedding if the triggering event occurs on their part of the gas network, while the TSO coordinates load-shedding when an event affects the entire national gas network.

24. Creos, SUDenergie, and Ville de Dudelange, “Plan de délestage des réseaux de gaz naturel du Grand-Duché de Luxembourg.”

25. Rodríguez-Gómez, Zaccarelli, and Bolado-Lavín, *Is The Gas N-1 Standard Of The EU Regulation A Good Indicator Of The Security Of Gas Supply Of A Country?*

Priority levels for natural gas load-shedding in Luxembourg

Priority	Offloaded	Users
N4	First	Non-residential clients directly connected to the transmission system operator (TSO)**
N3	Second	Non-residential clients with an installed or subscribed capacity greater to 2 MWh/h and an annual consumption greater than 1 GWh/h
N2	Third	Power and cogeneration plants
N1	Last	Protected clients* School buildings Non-residential clients with an installed or subscribed capacity lower or equal to 2 MWh/h and an annual consumption lower or equal to 1 GWh/h

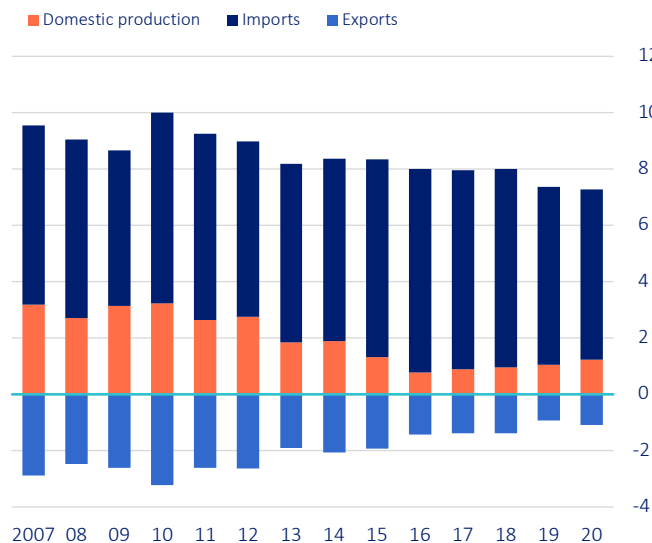
* Residential clients purchasing natural gas for their private domestic consumption, essential services (health care services, essential social services, emergency and security services) and urban heating plants providing necessary heating to protected clients

** Excluding protected clients, school buildings, and power and cogeneration plants

Sources: Creos, Ministry of Energy and Spatial planning

1.4.2.2 ELECTRICITY

Electricity supply sources in Luxembourg, TWh



Source: STATEC

The vast majority of Luxembourg's electricity supply is imported, mostly from Germany (66% in 2021). Since the closure of the Twinerg combined cycle gas turbine in 2016, which generated power and heat by burning natural gas, most of the domestic power production comes from renewable energy sources. In 2020, Luxembourg's domestic electricity production reached 1.2 TWh, with more than a third of that generated from biofuels and waste (37%), followed by wind power (29%) and natural gas (21%). This figure excludes the output of Vianden's pumped storage hydropower plant which directly feeds into the German power grid.²¹

The electric infrastructure in Luxembourg is divided in 7 grids:²⁶

- A national transmission grid operated by Creos (as Luxembourg’s TSO)
- 5 distribution grids are operated by 5 DSOs:
 - Creos
 - Electris
 - Sudstrom
 - the City of Diekirch
 - the City of Ettelbruck
- A high-voltage industrial grid operated by SOTEL supplying industrial customers and parts of the national railway

The national transmission grid is connected to the Amprion (Germany’s TSO) grid via two 220 kV interconnection lines for a total import capacity of 2,000 MVA. This large capacity allows Luxembourg to maintain its peak electricity demand in the event one of the transmission lines would become unavailable, which satisfies the N-1 criteria.²⁷ Luxembourg is also part of the Pentilateral Energy Forum (Penta) alongside France, Belgium, Germany, Austria, Switzerland and the Netherlands, covering 40% of EU electricity generation²⁷. Penta’s objective is to strengthen the internal energy market and security of supply.

Luxembourg assessment of national crisis scenarios

Scenario	Rating
Cyberattack on business-critical ICT infrastructures	Major
Physical attack against critical assets	Major
Loss of ICT tools or telecommunications infrastructure	Major
Large impact industrial or nuclear incident	Major
Solar storm	Minor
Multiple failures caused by extreme weather situation	Minor

Member states are required by EU law to establish risk-preparedness plans to lay down measures to respond to various crisis scenarios affecting their electricity grids.²⁸ Luxembourg updated its national plan in December of 2022. It identifies six crisis scenarios that are particularly relevant for Luxembourg based on their likelihood and potential impact.²⁷ Regional crisis scenarios were also identified by Penta countries based on cross-border dependencies. The most critical regional scenarios also revolve around damages on key electrical assets from possible cyber or physical attacks or resulting from extreme weather events.

26. Creos et al., “Electricity System Defence Plan of the Grand Duchy of Luxembourg.”

27. The Luxembourg Government, “Luxembourg risk preparedness plan for the electricity sector.”

28. Regulation (EU) 2019/941

In both national- and penta-level assessments, fuel shortages were rated as minor risks. However, it should be noted that any scenario may potentially lead to an electricity crisis and trigger appropriate steps including, without being limited to, load-shedding and manual disconnections.

Under **normal circumstances**, the power system operates within a range of expected conditions. System operators and public authorities continue to develop and deploy preventive steps to ensure the grid's resilience and adequacy. However, an **early warning** notification would be triggered if reliable evidence were detected indicating that a significant deterioration of the electricity supply situation may occur. The system may continue to run normally, but additional measures would be deployed to assess and mitigate the detected risk. A crisis management cell may be activated at this stage if there are concerns the risk may have broader repercussions than a compromised electricity sector.

Should that risk materialise, the situation would escalate to an electricity **crisis situation**, which EU law defines as a present or incoming situation of electricity shortage or where it would be impossible to supply electricity to customers.²⁸ Such a situation would trigger the activation of a crisis cell and appropriate emergency plans to mitigate the crisis and restore the system's normal conditions. A **post-crisis** phase would follow to ensure the system has been stabilised. Luxembourg's risk preparedness procedures and measures have been structured around these aforementioned steps.

- **Prevention:** This procedure applies in preparation to all types of crisis scenarios and prior to specific knowledge regarding a concrete incident which might cause an electricity crisis. The electricity systems continue to operate under normal conditions.
- **Early warning:** When there is an imminent concrete risk that a specific type of crisis may occur, the 'early warning' procedure is activated to prevent that crisis.
- **Crisis:** The third and last procedure is activated to prepare for an unavoidable crisis scenario and mitigate its effects and fallout.

As of the 1st of April 1st 2023 the 'Prevention' procedure is active.

Luxembourg's risk preparedness plan also identifies the three relevant bodies involved in the operational management of such an electricity crisis. The government, particularly the Minister for Energy, and the public authorities would act as the decision-makers.²⁹ System operators (the TSO and DSOs), which are responsible for the security of supply and the reliability of the electricity system, would proceed with technical measures to restore its balance through their system defence plan. Final customers also play an important role as they determine the demand for electricity through their activities and may therefore be invited or obliged to temporarily reduce their consumption.

29. Namely, the High Commission for National Protection (HCPN), the Government commissioner for energy and the Luxembourg Regulatory Institute (ILR)

Measures deployed by the three bodies to face an electricity crisis in Luxembourg²³

	Government	System operators	Final customers
Prevention	<ul style="list-style-type: none"> • Biannual report on security of supply • National cybersecurity strategy 	<ul style="list-style-type: none"> • Short-term and long-term monitoring of security of supply • Elaboration of network development plans to guarantee the adequacy of power systems • Short-term adequacy forecasts by the TSO, including regular demand and production previsions on weekly, 2-day ahead, day ahead, intraday, 15-minutes and real-time schedules 	***
	<ul style="list-style-type: none"> • National effort to reduce electricity consumption by state and municipal actors, businesses, and households. 		
Early warning	<ul style="list-style-type: none"> • Coordination with German counterparties • Activation of the CERR* to continuously assess the situation • Notification to the European Commission • Obligatory use of emergency generators by certain consumers (e.g., data centres) to reduce grid demand, notified 1-7 days in advance • Obligatory demand reduction by certain consumers (esp. state and municipal actors) 	<ul style="list-style-type: none"> • Voluntary demand reduction by launching savings appeals to consumers using StroumMonitor, a new electricity monitor developed by Creos³⁰ • Reduce/halt maintenance and infrastructure works • Modification of the grid topology (e.g., by changing the interconnection of lines in substations) to avoid unacceptable loadings of assets that may cause outages 	***

30. Creos, "StroumMonitor."

	Government	System operators	Final customers
Crisis	<ul style="list-style-type: none"> • Activation of a crisis cell and an operational cell • Activation of the emergency response plan for an outage of energy supply** • Notification to the European Commission and competent Member States authorities 	<ul style="list-style-type: none"> • Load frequency control and system protection schemes • Temporary violation of the (N-1) security criterion • Activation of the TSO's business continuity plan • Activation of the system defence plan²⁶ • Switching part of the system load to the Elia grid (in case of disconnection from the Amprion grid) • Activation of the system restoration plan 	<ul style="list-style-type: none"> • Activation of business continuity plans

* Cell for the evaluation of the risk of an outage of energy supply

** This emergency plans sets out the crisis management bodies, preventive and protective measures, and the alert procedures in case of an emergency

Creos and Luxembourg's DSOs have established a national defence plan for the country's electric system²⁶ in accordance with EU law, to determine the procedure for disconnecting electricity customers.³¹ This would be the very last measure the TSO and/or DSOs would proceed with in case of a severe emergency justifying the activation of the defence plan. Disconnecting customers follows a similar pattern to that of natural gas load-shedding where customer categories would be consecutively disconnected based on pre-established priority levels. High-voltage consumers (mostly industrials, though the full list of these customers remains confidential) would be disconnected first using monthly rotations in 5 batches of customers.³²

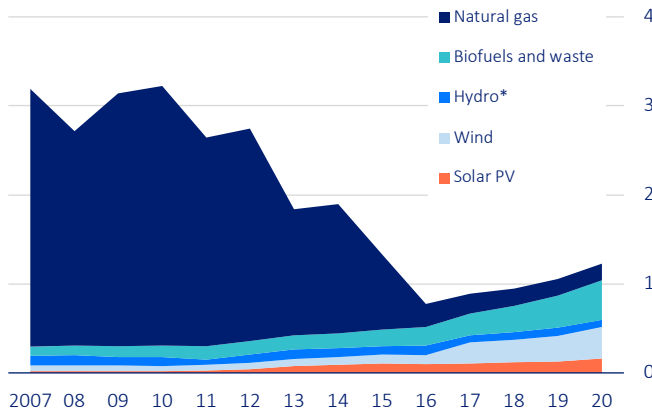
Medium and low voltage consumers that are connected to 65/20 kV transformers would be concerned in a second stage. This includes most, if not all, ABBL members. The industrial sector accounted for 47% of Luxembourg's demand for electricity in 2021, or about 3 TWh, making it unlikely for system operators to cut off any non-industrial customers.³³ Should it ever be necessary, low and medium voltage customers would also be disconnected in consecutive batches, no more than two hours at a time.²⁶ How these batches are organised, and in which order they would be disabled, is less clear.

31. Commission Regulation (EU) 2017/2196

32. Creos. "Plan de défense."

33. STATEC, "Final Energy Consumption According to the Different Uses and Energy Forms."

Electricity generation by source in Luxembourg, TWh



Sources: STATEC, IEA

*excluding Vianden's pumped storage hydropower plant

In this system, critical infrastructures are the last electricity user category that would be disconnected from the grid. Luxembourg law defines such critical infrastructures as any part of a system that is essential to safeguard the territory's and its population's vital interests and essential services. The HCPN is responsible for determining which infrastructures are to be considered as critical.

Priority levels for electricity disconnection in Luxembourg

Priority	Disconnected	Consumers
N3.2	First	High voltage consumers (≥ 65 kV) except SEVESO-classified* → Monthly rotation of 5 batches and with flexible allocation by mutual agreement
N3.1	Second	High voltage consumers (≥ 65 kV) classified according to the SEVESO Directive**
N2	Third	Low and medium voltage consumers (< 65 kV) → 65/20 kV transformers with no connected critical infrastructures using a rotational disconnection
N1	Last	Critical infrastructures as defined in the law of July 23 by the High Commission for National Protection

* Excluding critical infrastructures as identified by the High Commission for National Protection

** Directive 2012/18/EU: locations where dangerous substances are present in one or more installations

Sources: Creos, Ministry of Energy and Spatial planning, High Commission for National Protection, Official Journal of the European Union

2 Recommended actions

The following proposed actions should be screened and assessed for their technical feasibility by each institution, taking account of the specificities of each of their managed buildings and facilities. Facility and real estate managers are generally the best qualified personnel to determine which of these action points may be implemented.

2.1 Short-term energy saving measures

To face the urgency of the upcoming energy crunch in the 2022 winter, the Luxembourg government asked corporates to take appropriate measures early to reduce their energy consumption. Banks are not exempt of the collective effort needed to relieve the demand for natural gas and electricity and, in turn, avoid adverse scenarios that would involve energy rationing. However, if deployed at scale across businesses in Luxembourg, several simple yet effective measures will have an immediate effect on energy demand.

Technical staff should track progress on implemented measures to determine their effectiveness in reducing overall energy consumption.

2.1.1 Heating and air conditioning

Indoor temperatures should be adapted so as to consume as little energy as possible. According to the IEA, lowering the thermostat by 1°C can save up to 7% of energy usage for heating purposes.³⁴ For the heating season, the Klima-Agence and the French Environment Protection Agency (ADEME) recommend the following temperatures thresholds for corporate facilities:

- 20°C for occupied spaces, the minimum required by the Inspectorate of Labour and Mines (ITM)³⁵
- 16°C for unoccupied spaces to the extent possible
- Lower temperatures should be considered for locations remaining unoccupied for 2 or more consecutive days.

The energy efficiency of each building or facility should be taken into account when considering temperature adaptation measures. The effectiveness of these measures is therefore subject the thermal insulation of buildings.

34. IEA, "Playing My Part: How to Save Money, Reduce Reliance on Russian Energy, Support Ukraine and Help the Planet."

35. Inspection du Travail et des Mines, "ITM-SST 1814.1 Installations de ventilation et de conditionnement de l'air."

Given the long-term nature of this energy crisis, it is also recommended to increase allowed room temperatures during warmer seasons to alleviate energy consumption from HVAC cooling (up to 26°C). Air conditioning should only be used when ambient temperatures exceed a certain threshold (e.g., 25°C).

Heating/air conditioning-related energy consumption may be further optimised by redirecting employees so as to maximise floor and space utilisation, to the extent possible, and thereby centralise heating/air conditioning needs. Such measures may however pose significant logistical challenges and are unlikely to be deployable across all managed buildings and facilities.

Doors and windows should remain closed in heated spaces to avoid heat leakage. The same should be applied for air-conditioning. In order to ventilate, where feasible, it is more effective to ventilate by opening windows for a full 5 minutes rather than to leave a window ajar for several hours. Supplementary heat sources, such as space heaters, should be avoided altogether

For organisations operating on-site servers, incremental increases in maximum allowed temperatures in server rooms should be considered, taking account of their servers' technical specifications and existing ventilation systems. Close cooperation with IT personnel is recommended to ensure such raises in maximum temperatures would not jeopardise the continuous functioning of servers. Modern server with higher energy classes can operate safely in environmental temperatures up to 27°C.³⁶ Current industry best practice is to maintain server room temperatures around 24°C.

Further actions may be deployed to optimise heating-related energy consumption.

- Reducing the run time of ventilating units according to actual needs while ensuring relative humidity does not fall below 30%. Certain facilities and materiel may require maintaining higher relative humidity rates
- Limiting the consumption of hot domestic water by shutting off water heaters used for hygienic purposes
- Exception: Temperatures and water heating for office changing rooms and shower facilities should remain unchanged

36. ASHRAE, Thermal Guidelines For Data Processing Environments, 5th Ed.

2.1.2 Electronics

Several measures can be adopted to reduce the energy consumption of electronics within premises to a minimum.

- Displays, projectors, as well as dynamic displays used for advertising or internal communication purposes and other non-essential audio-visual systems in common areas should remain turned off as often as possible. At a minimum, these should only be kept on during peak employee traffic periods.
- To the extent possible, common electronic office equipment (e.g., printers, displays, projectors, etc.) should be turned off outside of office hours
- Likewise, computers and related electronic accessories should be turned off after use
- Organisations should encourage more digital sobriety (e.g., avoiding using multiple and oversized computer monitors)
- The use of individual printers should be prohibited

2.1.3 Lighting

Outside of office hours, both outdoor and indoor lighting of buildings and facilities should be kept at a bare minimum to comply with safety regulations (e.g., emergency lighting). A recent public initiative to reduce light pollution provides useful guidance on the subject.³⁷

- Lighting equipment used for aesthetic purposes should be switched on as little as possible. Current sector best practice involves keeping such equipment off between 10 p.m. and 6 a.m.
- Certain facilities and equipment, such as ATMs, may be kept lit during night time to remain accessible to their intended users.
- Corporate car parks should only be lit from sunset until one hour after closing time. Such lighting should remain off until one hour before activities start.
- Indoor lighting of branches should be turned off one hour after closing time at the latest. Lights may be switched on again one hour before operations begin. Likewise, branches lighting equipment for aesthetic purposes should be kept off as much as possible

Lighting during office hours should be optimised to fit actual personnel needs and unoccupied spaces should remain unlit. Illuminance levels should be optimised as well without falling below minimum requirements (e.g., 500 lux for offices).³⁸ Presence and motion detectors may help to further minimise energy waste by automatically turning lights off in unoccupied spaces. Eventually, the replacement of light bulbs with more efficient ones (e.g., LEDs) should also be considered.

37. The Luxembourg Government. "Mémorandum d'entente relatif à la réduction de la pollution lumineuse."

38. Inspection du Travail et des Mines, "ITM-CL-55.2 Éclairage des lieux de travail."

Cleaning and maintenance staff, particularly those intervening outside of office hours, should be provided clear instructions aligned on the organisation's adapted lighting policy.

To ensure consistency with these actions, and in alignment with the City of Luxembourg's own planned measures, winter lights and other holiday-related illuminations should be avoided.³⁹

2.1.4 Staff awareness

For short-term measures to remain effective, staff members must also be educated on the costs of wasted energy. Personnel must be made aware and regularly informed of their organisation's policies to reduce energy consumption. Communications including good practices, such as those listed above, should be frequently circulated with personnel members.

Internal communications should emphasise the fact that the energy-saving policies have been adopted as part of a benevolent intent to positively contribute to urgent society-wide energy reduction efforts, as opposed to a strategy to reduce general expenses at bank level.

2.1.5 Other measures

- Organisations which outsource some of their operations to third parties should engage with their service providers to ensure similar energy saving measures are applied on their side.
- Similarly, organisations which operate company canteens and/or cafeterias should engage with their catering service providers to optimise the energy efficiency of such services.
- Other equipment such as kitchen appliances (e.g., dishwashers) should also be operated with resource efficiency in mind. The use of private appliances (e.g., coffee machines, kettles, etc.) in offices should also be limited or even prohibited.
- Where appropriate, safe and reasonable, organisations should take measures to encourage personnel to use stairs instead of elevators to travel between floors.

39. Ville de Luxembourg, "Energy-Saving measures adopted by the City of Luxembourg."



2.2 Preparing for energy shortages

While power outages and gas shortages are not expected in the short-term (as of April 1st, 2023) as a direct result of the energy crisis, it is nevertheless good practice to explore fall back solutions and to test out contingency measures. As the Ministry of Energy put it, “final customers bear responsibility for their own preparation for a possible interruption of supply by means of business continuity plans”.²⁷ These are generally formalised in the form of a business continuity management system. Countermeasures to various disrupting scenarios are generally explored based on their likelihood and impact. These risk assessments are usually updated once a year, and risks of power outages have been raising due to recent uncertainties on European energy security. Following the first publication of these guidelines, the ABBL reached out to its members to gather some of the best practices currently being applied in the banking sector. These are laid down below to provide inspiration to some of the smaller organisations in Luxembourg which might not yet have formalised their business continuity and resiliency plans.

Organisations should first identify their critical activities, i.e., those which should remain operational without interruption or which should be brought back online as fast as possible in the event they were disrupted. Organisations should then determine the way to ensure the resilience of these activities in the event of a severe disruption. Other employees may then be dispatched to the remaining available facilities or, where possible, allowed to work from home until the disruption is resolved. When resorting to homeworking as a temporary solution, organisations should take due account of cross-border workers and the respective tax tolerance thresholds they must comply with.⁴⁰ Resident employees are not subject to these limitations and may therefore be requested to work from home first.

Where possible and useful, back-up generators may be implemented to maintain power to an organisation’s facility. Uninterruptible power supplies are often used alongside to ensure a seamless transition from the power grid to these generators, at least for the most important electronic equipment. However, the generators’ runtime will depend on the fuel reservoir’s capacity. Larger tanks allow for a few days of uninterrupted activity but will eventually need to be filled up again. Organisations may look to further optimise their consumption by cutting off non-essential services (e.g., electric vehicle charging stations) to allow generators to run longer if needed. Such back-up systems are particularly critical for organisations maintaining their own on-site servers. These generators and no-break systems should be regularly tested for their effectiveness in a crisis scenario. Banks often maintain a steady supply of spare parts to deal with possible technical failures of their back-up energy supply systems.

40. See our related [guidance on tax and social-security considerations regarding cross-border homeworking](#) for more information.

On the other hand, gas-heated buildings leave little flexibility in case of a shortage of the fuel. If the TSO or the DSOs were to proceed to a load-shedding that would affect such a building, the organisation may have to resort to fall back solutions, especially if they are no longer able to comply with indoor temperature thresholds. Some banks in Luxembourg leverage their available real estate assets to maintain their own fall-back sites. For instance, banks managing local branches may redirect both advisers and clients to other nearby agencies, should one of these branches be temporarily compromised. Likewise, if a bank's main sites were jeopardised, these agencies may also be used to relocate some of its personnel. However, smaller organisations may have to turn to recovery sites maintained by external providers to ensure the continuity of their activities in case of a disruption.

An escalation process should also be established to determine how to respond to incidents affecting technical infrastructures, the physical safety of employees or the security of IT systems, based on their gravity. Major incidents justifying an escalation may then trigger the activation of a crisis unit, which would convene to decide on appropriate actions to respond to the incident, and whether the organisation's business continuity plan and/or disaster recovery plan should be activated. Communication plans should also stand ready to inform all relevant stakeholders of the emergency, fast.

Given the high share of cross-border employees in the banking sector, ABBL members should also monitor the energy situation in the neighbouring countries. On November 30th 2022, the French Prime Minister issued a circular to all departmental prefects regarding the government's plan to manage risks of power outages. It laid down that schools affected by a load-shedding manoeuvre shall remain closed for half a day.⁴¹ If that were to occur, some cross-border employees commuting from France may have to revise their homeworking schedules.

41. Gouvernement de la République française, "L'État se mobilise pour sécuriser le passage de l'hiver."

3 Next steps

The ABBL will continue to engage with its members and policymakers to update these recommendations following the evolution of the energy crisis. Long-term measures to increase energy security within organisations, and thereby accelerate the roll-out of energy transition plans of our Members, may constitute a future update of this guide as well.

About the ABBL

The ABBL is the largest professional association in the financial sector, representing the majority of financial institutions as well as regulated financial intermediaries and other professionals in Luxembourg, including law firms, consultancies, auditors, market infrastructures, e-money and payment institutions. This makes us truly representative of the diversity of the Luxembourg financial centre, placing us in a unique position, able to give the entire sector a voice at both national and international level.

We provide our members with the intelligence, resources, and services they need to operate in a dynamic financial market and in an increasingly complex regulatory environment. We facilitate an open platform to discuss key industry issues and to define common positions for the entire sector.

References

- ASHRAE. *Thermal Guidelines For Data Processing Environments*. 5th ed. ASHRAE, 2021.
- Commission Regulation (EU) 2017/2196 of 24 November 2017 establishing a network code on electricity emergency and restoration. OJ L 312 54–85.
- Council Directive 2008/114/EC of 8 December 2008 on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection. 2008 OJ L 345 75-82
- Council Regulation (EU) 2022/1369 of 5 August 2022 on coordinated demand-reduction measures for gas. 2022 OJ L 206 1-10.
- Creos. “Intégration Réussie Des Marchés Gaziers Belge et Luxembourgeois: Une Première En Europe.” Press release, October 1, 2015. <https://www.creos-net.lu/en/actualites/actualites/article/integration-reussie-des-marches-gaziers-belge-et-luxembourgeois-une-premiere-en-europe.html>.
- Creos. “Plan de Défense.” Accessed December 9, 2022. <https://www.creos-net.lu/entreprises/electricite/plan-de-defense.html>.
- Creos. “StroumMonitor.” Accessed January 5, 2023. <https://www.creos-net.lu/index.php?id=771>.
- Creos, Electriss, Sotel Réseau, Sudstroum, Ville de Diekirch, and Ville d’Ettelbruck. “Electricity System Defence Plan of the Grand Duchy of Luxembourg.” *Creos*, November 30, 2022. <https://www.creos-net.lu/entreprises/electricite/plan-de-defense.html>.
- Creos, SUDenergie, and Ville de Dudelange. “Plan de délestage des réseaux de gaz naturel du Grand-Duché de Luxembourg.” *Creos*, October 19, 2022. <https://www.creos-net.lu/entreprises/gaz-naturel/professionnels-dso/plan-de-delestage.html>.
- Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC. OJ L 197 1–37.
- Directive (EU) 2022/2557 of the European Parliament and of the Council of 14 December 2022 on the resilience of critical entities and repealing Council Directive 2008/114/EC. OJ L 333 164–198
- European Commission. “Action and Measures on Energy Prices.” Accessed December 9, 2022. https://energy.ec.europa.eu/topics/markets-and-consumers/action-and-measures-energy-prices_en.
- European Commission. “EU Energy Platform,” April 7, 2022. https://energy.ec.europa.eu/topics/energy-security/eu-energy-platform_en.

European Commission. “Questions and Answers on an Emergency Intervention to Address High Energy Prices.” Press release, September 14, 2022.

https://ec.europa.eu/commission/presscorner/detail/en/QANDA_22_5490.

European Commission. “Strategy for an EU External Energy Engagement.” Accessed December 9, 2022.

https://energy.ec.europa.eu/topics/energy-strategy/strategy-eu-external-energy-engagement_en.

Flanagan, Mark, Alfred Kammer, Andrea Pescatori, and Martin Stuermer. “How a Russian Natural Gas Cutoff Could Weigh on Europe’s Economies.” *IMF Blog* (blog), July 19, 2022.

<https://www.imf.org/en/Blogs/Articles/2022/07/19/blog-how-a-russias-natural-gas-cutoff-could-weigh-on-european-economies>.

Gouvernement de la République française. “L’État se mobilise pour sécuriser le passage de l’hiver.”

Press release, December 1, 2022. <https://www.gouvernement.fr/actualite/mobilisation-de-letat-pour-securiser-le-passage-de-lhiver>.

IEA. “Electricity Market Report - January 2022.” IEA, January 2022.

<https://www.iea.org/reports/electricity-market-report-january-2022>.

IEA. “How Europe Can Cut Natural Gas Imports from Russia Significantly within a Year.”

IEA (Press release), March 3, 2022. <https://www.iea.org/news/how-europe-can-cut-natural-gas-imports-from-russia-significantly-within-a-year>.

IEA. “How to Avoid Gas Shortages in the European Union in 2023.” IEA, December 2022.

<https://www.iea.org/reports/how-to-avoid-gas-shortages-in-the-european-union-in-2023>.

IEA. “Luxembourg 2020: Energy Policy Review.” IEA, March 2020.

<https://www.iea.org/reports/luxembourg-2020>.

IEA. “Playing My Part: How to Save Money, Reduce Reliance on Russian Energy, Support Ukraine and Help the Planet,” April 2022. <https://www.iea.org/reports/playing-my-part>.

Inspection du Travail et des Mines. *ITM-SST 1814.1 Installations de ventilation et de conditionnement de l’air*. 2011.

Inspection du Travail et des Mines. *ITM-CL-55.2 Éclairage des lieux de travail*. 1997.

Klima Agence. “Présentation de la campagne nationale de réduction de la demande d’énergie Zesumme Spueren – Zesammenhalen”, September 8, 2022.

<https://www.klima-agence.lu/en/presentation-de-la-campagne-nationale-de-reduction-de-la-demande-denergie-zesumme-spueren>.

Ministry of Energy and Spatial Planning. *Plan d’urgence relatif à la sécurité d’approvisionnement en gaz naturel du Luxembourg*. October 19, 2022. <https://gouvernement.lu/dam-assets/documents/actualites/2022/10-octobre/19-turmes-plan-urgence/lu-plan-durgence-gaz-naturel-version-20221019-final.pdf>.

Regulation (EU) 2017/1938 of the European Parliament and of the Council of 25 October 2017 concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No 994/2010. OJ L 280 1–56.

Regulation (EU) 2019/941 of the European Parliament and of the Council of 5 June 2019 on risk-preparedness in the electricity sector and repealing Directive 2005/89/EC. OJ L 158 1–21.

Regulation (EU) 2022/1032 of the European Parliament and of the Council of 29 June 2022 amending Regulations (EU) 2017/1938 and (EC) No 715/2009 with regard to gas storage. 2022 OJ L 173 17–33.

Rodríguez-Gómez, Nuria, Nicola Zaccarelli, and Ricardo Bolado-Lavín, eds. *Is The Gas N-1 Standard Of The EU Regulation A Good Indicator Of The Security Of Gas Supply Of A Country?*, 2018.
<https://www.pipeline-conference.com/abstracts/gas-n-1-standard-eu-regulation-good-indicator-security-gas-supply-country>.

The Luxembourg Government. “High Energy Prices: Measures to Help Households and the State of Play of Efforts to Reduce Energy Consumption.” Press release, January 4, 2023.
https://gouvernement.lu/en/actualites/toutes_actualites/communiqués/2023/01-janvier/o4-turmes-cdp.html.

The Luxembourg Government. *Luxembourg risk preparedness plan for the electricity sector in accordance with article 10 of the Regulation (EU) 2019/941 of the European Parliament and of the Council of 5 June 2019 on risk-preparedness in the electricity sector and repealing Directive 2005/89/EC.* December 7, 2022.
<https://gouvernement.lu/dam-assets/documents/actualites/2022/12-decembre/09-securite-approvisionnement-electricite/riskpreparednessplan-lu-update20221207.pdf>.

The Luxembourg Government. “Mémorandum d'entente relatif à la réduction de la pollution lumineuse et à la promotion d'un meilleur éclairage sur le territoire de la commune de Clervaux”. April 25, 2022.

Ville de Luxembourg. “Energy-Saving measures adopted by the City of Luxembourg,” September 21, 2022. <https://www.vdl.lu/en/city/projects-and-commitments/environment/energy-saving-measures-adopted-city-luxembourg>.

Data sources

Eurostat. "Supply, Transformation and Consumption of Gas - Monthly Data." Data set, n.d.

https://ec.europa.eu/eurostat/databrowser/view/nrg_cb_gasm/default/table?lang=en.

Gas Infrastructure Europe. "Aggregated Gas Storage Inventory." Data set, n.d. <https://agsi.gie.eu/>.

IEA. "Reliance on Russian Fossil Fuels in OECD and EU Countries." Data set, March 23, 2022.

<https://www.iea.org/data-and-statistics/data-product/reliance-on-russian-fossil-fuels-in-oecd-and-eu-countries#schedule>.

Institut Luxembourgeois de Régulation. "Electricity Generation." Data set. STATEC, January 7, 2023.

[https://lustrat.statec.lu/vis?lc=en&pg=0&fs\[0\]=Topics%2C1%7CTerritory%20environment%20and%20energy%23A%23%7CEnergy%23A4%23&fc=Topics&df\[ds\]=ds-release&df\[id\]=DF_A4203&df\[ag\]=LU1&df\[vs\]=1.0&pd=2015%2C2021&dq=A.A01.&ly\[rw\]=SPECIFICATION&ly\[c\]=TIME_PERIOD&vw=tb](https://lustrat.statec.lu/vis?lc=en&pg=0&fs[0]=Topics%2C1%7CTerritory%20environment%20and%20energy%23A%23%7CEnergy%23A4%23&fc=Topics&df[ds]=ds-release&df[id]=DF_A4203&df[ag]=LU1&df[vs]=1.0&pd=2015%2C2021&dq=A.A01.&ly[rw]=SPECIFICATION&ly[c]=TIME_PERIOD&vw=tb).

Institut Luxembourgeois de Régulation. "Electricity Imports and Exports by Country." Data set. STATEC, January 2, 2023.

[https://lustrat.statec.lu/vis?lc=en&pg=0&fs\[0\]=Topics%2C1%7CTerritory%20environment%20and%20energy%23A%23%7CEnergy%23A4%23&fc=Topics&df\[ds\]=ds-release&df\[id\]=DF_A4208&df\[ag\]=LU1&df\[vs\]=1.0&pd=2015%2C2021&dq=A.A01.&vw=tb](https://lustrat.statec.lu/vis?lc=en&pg=0&fs[0]=Topics%2C1%7CTerritory%20environment%20and%20energy%23A%23%7CEnergy%23A4%23&fc=Topics&df[ds]=ds-release&df[id]=DF_A4208&df[ag]=LU1&df[vs]=1.0&pd=2015%2C2021&dq=A.A01.&vw=tb).

Institut Luxembourgeois de Régulation. "Renewable Electricity Generation by Process." Data set. STATEC, January 10, 2023.

[https://lustrat.statec.lu/vis?lc=en&pg=20&fs\[0\]=Topics%2C1%7CTerritory%20environment%20and%20energy%23A%23%7CEnergy%23A4%23&fc=Topics&df\[ds\]=ds-release&df\[id\]=DF_A4401&df\[ag\]=LU1&df\[vs\]=1.0&pd=2015%2C2021&dq=A.A01.&vw=tb](https://lustrat.statec.lu/vis?lc=en&pg=20&fs[0]=Topics%2C1%7CTerritory%20environment%20and%20energy%23A%23%7CEnergy%23A4%23&fc=Topics&df[ds]=ds-release&df[id]=DF_A4401&df[ag]=LU1&df[vs]=1.0&pd=2015%2C2021&dq=A.A01.&vw=tb).

STATEC. "Final Energy Consumption According to the Different Uses and Energy Forms." Data set, January 1, 2023. [https://lustrat.statec.lu/vis?fs\[0\]=Topics,1|Territory environment and energy%23A%23|Energy%23A4%23&pg=0&fc=Topics&lc=en&df\[ds\]=ds-release&df\[id\]=DF_A4302&df\[ag\]=LU1&df\[vs\]=1.0&pd=2015,2021&dq=A.A01...](https://lustrat.statec.lu/vis?fs[0]=Topics,1|Territory%20environment%20and%20energy%23A%23|Energy%23A4%23&pg=0&fc=Topics&lc=en&df[ds]=ds-release&df[id]=DF_A4302&df[ag]=LU1&df[vs]=1.0&pd=2015,2021&dq=A.A01...)

[https://lustrat.statec.lu/vis?fs\[0\]=Topics,1|Territory environment and energy%23A%23|Energy%23A4%23&pg=0&fc=Topics&lc=en&df\[ds\]=ds-release&df\[id\]=DF_A4302&df\[ag\]=LU1&df\[vs\]=1.0&pd=2015,2021&dq=A.A01...](https://lustrat.statec.lu/vis?fs[0]=Topics,1|Territory%20environment%20and%20energy%23A%23|Energy%23A4%23&pg=0&fc=Topics&lc=en&df[ds]=ds-release&df[id]=DF_A4302&df[ag]=LU1&df[vs]=1.0&pd=2015,2021&dq=A.A01...)

The Luxembourg Government. "Geoportal" Data set, n.d.

<https://map.geoportail.lu/theme/energie?version=3&zoom=11&X=697763&Y=6381304&lang=fr&rotation=0&layers=266-269-1494&opacities=1-1-0.5&bgLayer=blank>.

Zachmann, Georg, Giovanni Sgaravatti, and Ben McWilliams. "European Natural Gas Imports." Data set. Bruegel, January 24, 2023. <https://www.bruegel.org/dataset/european-natural-gas-imports>.

Contact

Thomas COLLIN

Officer -Sustainability/CSR

Sustainability & Conduct Department

Tel.: +352 46 36 60-1

Email : thomas.collin@abbl.lu

ABBL a.s.b.l.

12, rue Erasme

L-1468 Luxembourg

P.O. Box 13, L-2010 Luxembourg

Tel.: (+352) 46 36 60-1

mail@abbl.lu

www.abbl.lu

R.C.S. Luxembourg: F352

EU Transparency register : 3505006282-58

Member of :

