

Report on National Economic Supply 2013–2016



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Swiss Confederation

Federal Department of Economic Affairs,
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Federal Office for National Economic Supply FONES

2016

Summary

The task of Switzerland's National Economic Supply (NES) framework is to prepare market intervention measures to secure the country's supplies of vital goods and services if the private sector is no longer able to do so independently. This report offers a review of core activities over the past four years, an overview of where action is currently required, and a look ahead to the challenges of the future.

During the period under review from 2013 to 2016, NES re-evaluated the risks facing supply processes, conducted an in-depth examination of its strategic direction, and analysed the effectiveness and readiness for use of its instruments and measures. As part of this work, monitoring systems for a number of supply processes were formalised, the range of measures was expanded, and preparations in relation to existing measures driven forward. The reform of the National Economic Supply Act ran in parallel to this work.

The Federal Council acknowledged the Report on National Economic Supply 2013–2016 on 2 December 2016.

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1 Introduction

Sensitive supply chains

As an import-dependent, globally networked country, it is essential that Switzerland has access to vital goods in the energy, foodstuffs and therapeutic products sectors. Advances in the division of labour world-wide are resulting in production and distribution in these sectors becoming increasingly concentrated. To ensure reliable supplies, our country therefore relies on smoothly functioning supply chains. These are, in turn dependent upon increasingly complex logistics, and information and communication systems. Conflicts in countries of origin, technical problems with key infrastructures and extreme weather events and natural disasters can significantly affect goods flows. This presents challenges for Switzerland in ensuring supplies.

NES mandate

The National Economic Supply (NES) organisation ensures that supply disruptions and shortages that the private sector cannot remedy on its own do not have serious consequences for Switzerland. To this end, in the event of crisis NES ensures the availability of important goods and services that are essential to the functioning of the Swiss economy or of vital importance to the population. In addition to certain basic foodstuffs, energy and therapeutic products, these specifically include supply infrastructures related to logistics, power grids, and information and communication technologies, as well as the services that are based on them. Securing these supply-critical goods, infrastructures and services requires effective instruments of contingency planning and crisis management on the part of NES. This means that the measures that have been prepared must be feasible and geared to current challenges.

This Report on National Economic Supply shows how NES responds to constant shifts in operating conditions. It offers a review of core activities over the past four years, an overview of the current status of preparations, and a look ahead to the challenges of the future.

Purpose of the report

The report is part of the four-year NES strategy process (Figure 1). This begins in the first year with a comprehensive assessment of risk and vulnerability as a basis for the review in the second year of the strategic orientation of NES planning. In the third year, the fitness for purpose and feasibility of measures and instruments are then examined in the context of this strategic direction, before the strategy process concludes in the fourth year with the Report on National Economic Supply.

NES strategy process

Figure 1: NES strategy process



2 Mandate and strategy

2.1 NES mandate and reform of the National Economic Supply Act

NES mandate

Under Article 102 of the Federal Constitution, the federal government has the task of ensuring that the country is supplied with essential goods and services if the economy is no longer able independently to fulfil its supply function in the event of severe shortages. It takes preventive action so that it is able to do this. Furthermore, in exercising its powers in this regard, it may depart from the principle of economic freedom if the circumstances so require.

The measures focus on goods and services which are essential to the economy or to the population. These themselves depend on the availability of certain resources, such as materials or labour. Furthermore, sufficient supplies of goods can be ensured only if the private sector also has access to the inputs or services that are essential to its production and supply processes, such as power, IT and telecommunications, and logistics. The NES supply model shows the link between supply processes, on the one hand, and resources and inputs, on the other.

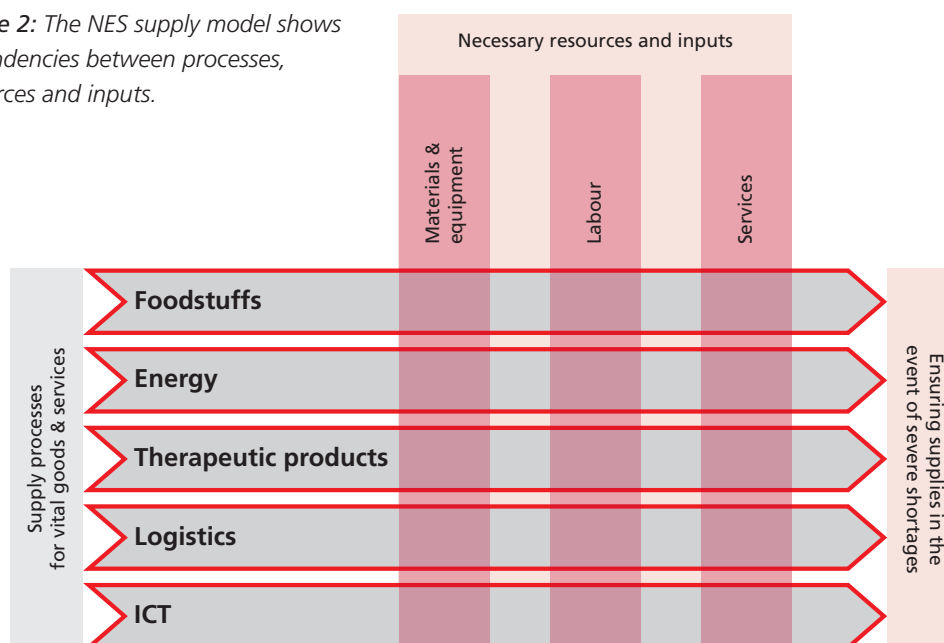
In the event of a supply shortage, NES supports the private sector with targeted measures to close the supply gaps that have arisen. The nature and intensity of this intervention are determined by the probable duration and expected extent of the supply shortage. The focus is on relieving short and medium term disruption to supplies in specific sectors. In doing so, NES also makes an important contribution to critical infrastructure protection (CIP) in Switzerland.¹ It is not the task of NES to institute structural policy measures to ensure supplies to Switzerland in the long term; this is the responsibility of the competent offices and departments at federal level.

NES operates at all times according to the principle of subsidiarity. Under the Federal Constitution, supplying the country with goods and services is essentially a matter for the private sector. The system thus requires a public-private partnership approach. Under the terms of its remit, NES thus intervenes only if economic actors are no longer able to fulfil their supply function themselves.

Private sector first

¹ Federal Gazette 2012 7715

Figure 2: The NES supply model shows dependencies between processes, resources and inputs.



Reform of National Economic Supply Act

Ensuring supplies of vital goods and services necessitates effective instruments to plan for and manage severe shortages. This means that the measures that are in place must be practicable and adapted to the prevailing challenges. To the extent permitted by law, NES has continually adapted its broad range of proven supply crisis measures to reflect these challenges. This legal foundation itself was modified by the reform of the National Economic Supply Act (NESA) in 2016. The changes were not revolutionary: the new NESA does not aim for any fundamentally new approach to security of supply, but rather builds on a tried-and-tested framework. It pursues three primary objectives: to modernise the law, to make NES instruments more dynamic, and to strengthen the resilience of supply services.

More modern

The old NESA dated back to 1982, and the world has changed markedly in the intervening years in terms of technology, the economy, and society. The language and structure of the old law have now been brought up to date. Originally, it distinguished between disruption to supply as a result of military threats, and other severe shortages. This distinction has become obsolete, because there is little difference in the instruments designed for one case or the other. This means that, in the future, NES action will no longer be geared to specific scenario such as conventional power political or military threats. Instead it will prepare in general terms to counter threats that result in considerable disruption to the country's supplies, irrespective of the root of those threats. The sole criterion for NES intervention will be an actual or impending severe shortage that the private sector is no longer able to counter itself. In terms of legal detail, this shift in perspective requires the entire NESA to be restructured, and it is this that prompted its complete reform.

The fast pace of economic processes demands a swifter response to disruptions in supply. The range of NES instruments must thus be modified accordingly.

More dynamic

Change was required along two axes: first, provision was made to move the timing of intervention forward. Under the new NESA, the Federal Council no longer has to wait until there is a severe nationwide shortage, meaning that significant economic damage has already been done. Rather, it can act as soon as such disruption becomes imminent. The second change was to ensure that, in the event of intervention, the effect of action is felt more quickly. The execution of NES measures has therefore been expedited by simplifying and shortening appeal procedures.

The revised Act provides for targeted preparations to be undertaken even under normal circumstances. These will help to make crucial supply systems and infrastructures more resilient in the event of crisis. Such action must be geared to the needs of the economy. Specific technical and organisational precautions will therefore make key infrastructure operators and service providers an integral part of NES contingency planning in the future. In certain sectors identified as particularly critical from the NES perspective, businesses can be obliged to take preventive action. Even under normal circumstances, major competitors in some sectors have concluded industry agreements under which they will cooperate to manage any supply crisis. The new NESA now gives NES the legal foundation on which to declare this type of private-sector agreement binding upon all companies within the sector concerned.

Building resilience

The reform project proposed by the Federal Council in its Dispatch of 3 September 2014 was well received by the National Council and the Council of States, which subsequently passed the revised National Economic Supply Act in their final votes on 17 June 2016. It is scheduled to enter into force in mid-2017.

The most important legal foundations:

■ Article 102 of the Federal Constitution:

¹ The Confederation shall ensure that the country is supplied with essential goods and services in the event of the threat of politico-military strife or war, or of severe shortages that the economy cannot by itself counteract. It shall take precautionary measures to address these matters.

² In exercising its powers under this Article, it may if necessary depart from the principle of economic freedom.

■ National Economic Supply Act (SR 531)

■ Ordinance on the Organisation of National Economic Supply (SR 531.11)

■ Ordinance on Preparatory Measures for National Economic Supply (SR 531.12)

■ Ordinance on the General Principles of Strategic Stockpiling (SR 531.211)

■ For a full overview in German, French or Italian, please visit: www.admin.ch/ch/d/sr/53.html

2.2 Strategy

In 2014, NES undertook an in-depth review of its strategic orientation and amended it in line with current requirements so that it can continue to fulfil the remit laid down in the NES Act.

NES focuses on ensuring supplies of vital goods and services in the foodstuffs, energy, therapeutic products, logistics and ICT sectors. For each of these supply processes, the strategy can be divided into two phases: prevention and intervention (see Figure 3).

The strategy defines targets not just for the intervention phase during a supply shortage, but also for ordinary circumstances. During this prevention phase, supply processes should be made more resilient to avoid state intervention for as long as possible. NES helps certain companies and sectors to improve their preparations, and in doing so encourages information-sharing between the actors concerned. At the same time, it prepares public-sector action for the intervention phase.

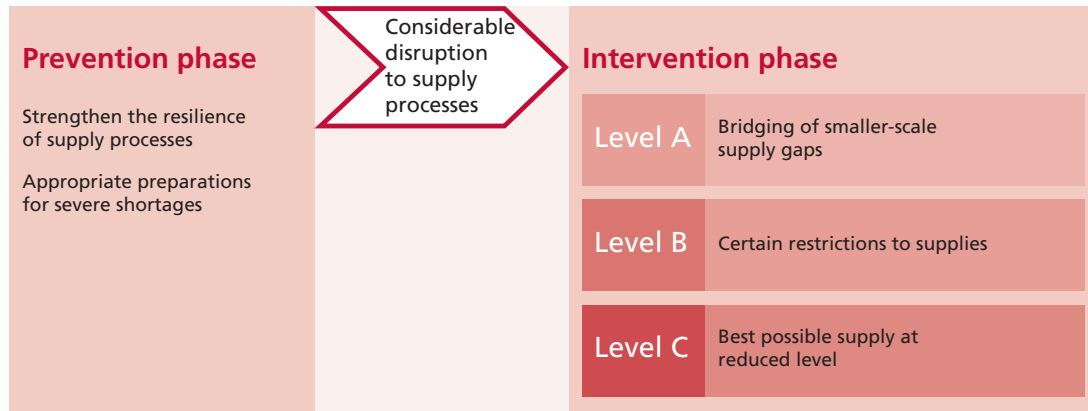
Prevention
phase

The intervention phase involves three different levels of objectives, depending on the severity of the supply shortage. The more serious a shortage becomes, the more far-reaching the intervention in the economy and the instruments used.

Intervention
phase

At the first level, the aim is to guarantee supplies by bridging gaps in the supply of certain goods and services. According to its plans, NES should be able to ensure that demand for vital goods is met for at least three months (level A). Great importance is therefore attached to strategic stockpiling. As ordered by the federal government, various sectors keep stocks of crucial goods, such as foodstuffs, mineral oil, therapeutic products and fertilisers, which can be released into the market where necessary.

Figure 3: NES supply objectives



If supplies cannot fully be guaranteed for more than three months, the second level of intervention is to introduce accompanying measures to reduce demand (level B). These might, for example, ban the use of certain goods or services, or restrict their sale.

If it is no longer possible to satisfy demand in the case of a severe and persistent shortage, the third level of intervention comes into play, in which the population is supplied with a reduced level of vital goods and services (level C). The primary objective here is to ensure that the goods or services that remain available are distributed as fairly as possible according to need.

The NES strategy sets out specific supply targets for vital goods and services (foodstuffs, energy, therapeutic products, logistics and ICT), with objectives for both the prevention and the intervention phases. The general idea is to remain at the lowest possible level of intervention and to keep state action to the minimum, in accordance with the principle of subsidiarity.

NES takes a cross-sectoral approach. In other words, it coordinates preventive action between the various sectors of the economy. Its primary focus here is on the stability of the system as a whole, beyond the boundaries of individual sectors. The necessary infrastructures and services must also be in place to ensure Switzerland's supplies in the event of a severe shortage. These include, for example, logistics systems for goods transport, information and communication infrastructures so that information can be exchanged between the economic actors concerned, and electricity transmission grids. In its work, NES must focus on the interfaces between these sectors, and on the dependencies between key supply processes and the resources that they require.

Cross-sectoral approach

With the current strategic orientation of NES activities, industry does not constitute a supply process in itself. Rather, the Industry unit must guarantee that the necessary industrial resources and inputs, such as materials and equipment (primary materials, energy, and semi-finished and finished goods), and labour, are available to these supply processes. The unit is currently working on a new strategic direction and on reviewing and potentially modifying its structure.

**Public-private
sector
cooperation**

NES is characterised by a close working relationship between the private and public sectors. The private sector is key not only in ensuring supplies, but also in managing severe shortages. The role of NES is only secondary. In the event of a contingency, NES cannot replace the private sector, neither does it seek to. Rather, it merely supports the private sector until it is once again able independently to fulfil its role as supplier. Contingency planning is coordinated by the Delegate for National Economic Supply, who must by law come from the private sector. This person heads the entire NES organisation on a part-time basis. The various units of the NES framework integrate some 250 experts from all crucial sectors of the Swiss economy, as well as representatives from other federal offices and other organisations. These honorary team members contribute their specialist knowledge and contact networks, discuss the current supply situation in Switzerland, and participate in the preparation and implementation of the measures that have been determined. They are supported and coordinated by the Federal Office for National Economic Supply FONES, which represents the public-sector side of this cooperation model.

The private sector and the population should be aware of NES action on their behalf, which should be perceived positively as the federal government's contribution to strengthening security of supply in Switzerland. The FONES is therefore broadly networked. In preparing for crises and in taking the action that has been determined, it works alongside experts from and representatives of the cantons and communes, and coordinates contingency planning with the relevant federal offices and industry associations. Where necessary, the individual sectors may be charged with executing NES measures.

**Networked
at all levels**

Although NES strategy, tools and measures have a domestic focus, international cooperation is particularly important to security of supply in the import-dependent, globalised Swiss economy. NES thus fosters the exchange of information and experience with other states and international organisations, such as the International Energy Agency (see Section 6).

3 Economic context

Trend towards concentration

3.1 Global trends

The international division of labour is well developed and, despite having lost pace, will continue to increase in the long term. Closer ties between national economies also intensify interdependencies. Global competition is compelling companies to join forces in production and distribution. This is particularly true of sectors of relevance to the national supply. Entire supply chains for certain products are dominated by large global agricultural groups. Meanwhile, oil refining is increasingly taking place in the Middle East and Asia. The production of important active agents for therapeutic products, as well as disposable medical items, is concentrated in Asia. This is resulting in vital supply processes becoming increasingly dependent on major international conglomerates and a small number of production locations, as well as on other countries and economic areas.

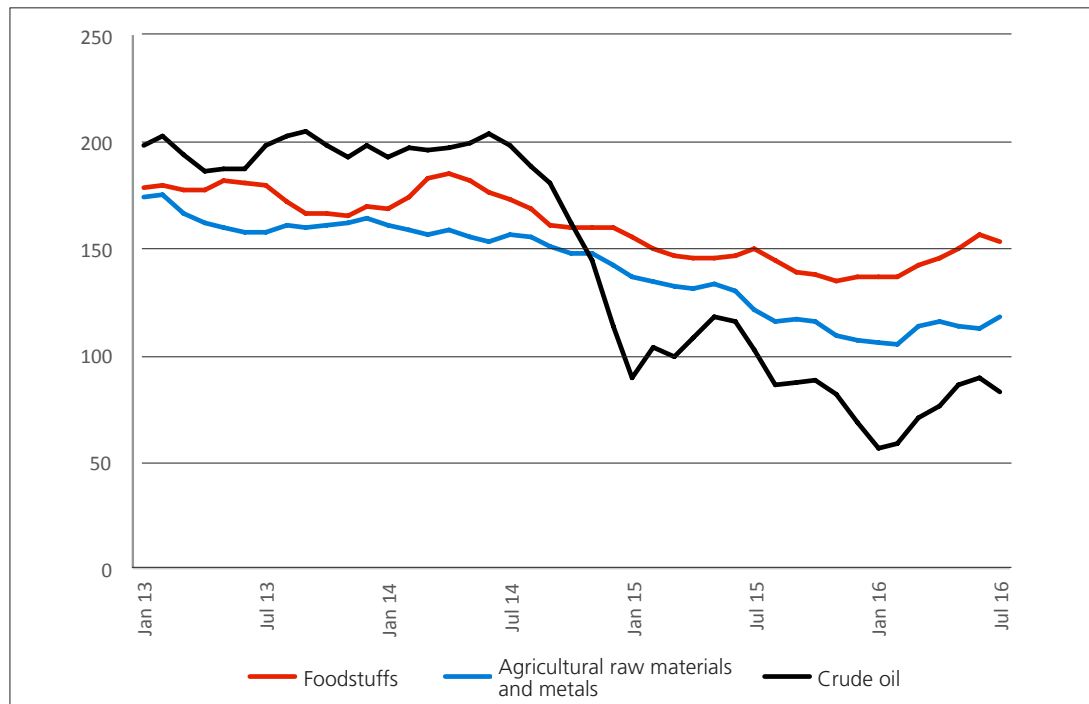
The European economy as a whole has recovered only slowly since the financial crisis of 2007 and the global economic crisis which followed. Despite a whole raft of savings programmes in the countries concerned, the problem of high sovereign debt persists. In 2014, things were further complicated by the outbreak of conflict in East Ukraine, to which Western countries responded by imposing economic sanctions on Russia. EU foreign trade with Russia declined sharply as a result. Then, in June 2016, there was a renewed increase in market volatility following the Brexit vote in the UK.

Euro crisis

The US economy recovered relatively quickly from the crisis and has largely returned to normal. By contrast, economic growth in Brazil, Russia and China has slowed markedly over the past four years. It seems that the strong recovery in China's industrial sector will soon be consigned to history, as the Chinese economy is currently undergoing structural change towards a much larger service sector. The

Falling commodity prices

Figure 4: Price trend for selected raw materials, 2013–2016 (indexed: 2005 = 100)



Source: data from (IMF Primary Commodity Prices), chart by FONES

country's demand for raw materials has been lower in recent years than many suppliers had expected, pushing prices down. Commodity exporters such as Brazil and Russia are suffering under this trend, and from the collapse in the oil price, in particular (see Figure 4).

The USA banned the export of crude oil in the wake of the 1973 oil crisis. It took 41 years for the US government to relax the ban, and oil exports re-started under certain conditions in 2014. The evolution of extraction methods (and hydraulic fracturing, or 'fracking', in particular) sent the country's production of crude oil and natural gas soaring to an all-time high in 2013. According to industry statistics, just one year later output in the USA exceeded that of Saudi Arabia to make it the world's largest oil producer. In recent years fracking, rising output volumes from existing producers and the emergence of new oil-producing countries have meant a steady increase in the supply of oil on the global market, despite weak demand. This has resulted in a marked collapse in the price to a level which, according to experts, makes extraction unprofitable in certain producing countries. Analysts are therefore talking of a price war on the oil market as each producer seeks to secure long-term market share.

Development of global trade

In common with commodity prices, global foreign trade volumes have also been very volatile in recent years. Following an historic drop in 2008 and 2009, they initially recovered well, but from mid-2011 onwards recorded only very low growth that was well below the average of past decades. Merchant shipping around the world has felt the impact of this trend very keenly. There has been overcapacity in

the sector since the financial and then the economic crisis, which weighed increasingly on prices in the years that followed. Since then, like others, Swiss ships have been facing major challenges. In February 2016 the Baltic Dry Index, which tracks prices for shipping dry goods around the world and is also regarded as a leading indicator of world trade, fell to its lowest point since its launch in 1985.

Switzerland is affected primarily by monetary trends in Europe. The Swiss National Bank introduced negative interest rates in December 2014. Then, at the beginning of 2015, it abandoned the exchange rate floor of CHF 1.20 per euro, resulting in rapid appreciation in the franc. As expected, exports declined in favour of imports, although at first there were signs of a general decline in foreign trade. While this had more or less tracked global trade up to 2014 – with poor growth since 2011 – 2015 saw a significant contraction. Exports fell by 2.6 percent in nominal terms, imports by as much as 6.8 percent. However, this was attributable first and foremost to falling prices. Imported goods, in particular, became cheaper, with the decline in commodity prices a factor here. In real terms, exports were down by 0.9 percent and imports by only 0.1 percent.² Foreign trade has been rising again since the beginning of 2016. Volumes on the Swiss logistics market followed a similar trend. Having risen by 3 percent in 2013,³ they plateaued in 2014 at 0.1 percent, before contracting by 0.8 percent in 2015.⁴ Thus, 2015 brought a temporary slowdown in goods flows on both the domestic and international markets, although they are likely to continue growing in the long term.

Impact on Switzerland

² *Swiss foreign trade statistics*
(www.aussenhandel.admin.ch)

³ *Logistikmarktstudie 2015 [study of the Swiss logistics market, German only]*

⁴ *Logistikmarktstudie 2016 [German only]*
(www.logistikmarkt.ch/de/logistikmarktstudie)

3.2 The supply situation in Switzerland

Many global markets have been more volatile since the global financial and economic crisis broke in 2007. There was no change in this situation in the past four years. It has become more difficult to forecast global trends. This uncertainty has also impacted on the Swiss economy, but to date has not had any direct effect on the supply situation in Switzerland. Indeed, from the supply perspective the situation on the global commodity markets has actually eased in the short term. That said, the long-term trend towards the geographical concentration of production is becoming more pronounced in the majority of sectors. The dependency on international flows of goods that this involves makes supply processes more vulnerable.

Foodstuffs

The supply situation with foodstuffs is currently very good in Switzerland, with domestic agricultural output satisfying around two-thirds of consumption. Intensive use is made of the available cultivatable land. In volume terms, Switzerland accounts for only around one percent of agricultural imports world-wide, although imports per capita are one of highest of any country. This is due primarily to the relatively high population density in Switzerland, as well as its limited useful agricultural land owing to its topography and climate. Certain basic foodstuffs, such as rice, durum wheat and palm oil, are imported in large quantities, as are feedstuffs (primarily soya). In the event of poor domestic harvests of grain or potatoes, Swiss food suppliers turn to imports to make up the shortfall. In the case of foods of animal origin, Switzerland's average gross self-sufficiency level⁵ stood at 99.75 percent for the period from 2010 to 2013, but the corresponding

figure for plant-based foods was just 43.8 percent because it is heavily weather-dependent. The net self-sufficiency level, which is adjusted for imported feedstuffs, was an average of 54.4 percent for the 2011–2014 period. Switzerland therefore depends on imports to secure supplies of plant-based foods (grain, fruit and vegetables, oil seed and vegetable oils) in particular, but also those of agricultural inputs (feedstuffs, fertilisers and seeds). According to the Agricultural Report 2015, the amount of the country's arable land – which is required to produce plant-based foodstuffs – remained stable compared with the previous year.

Energy

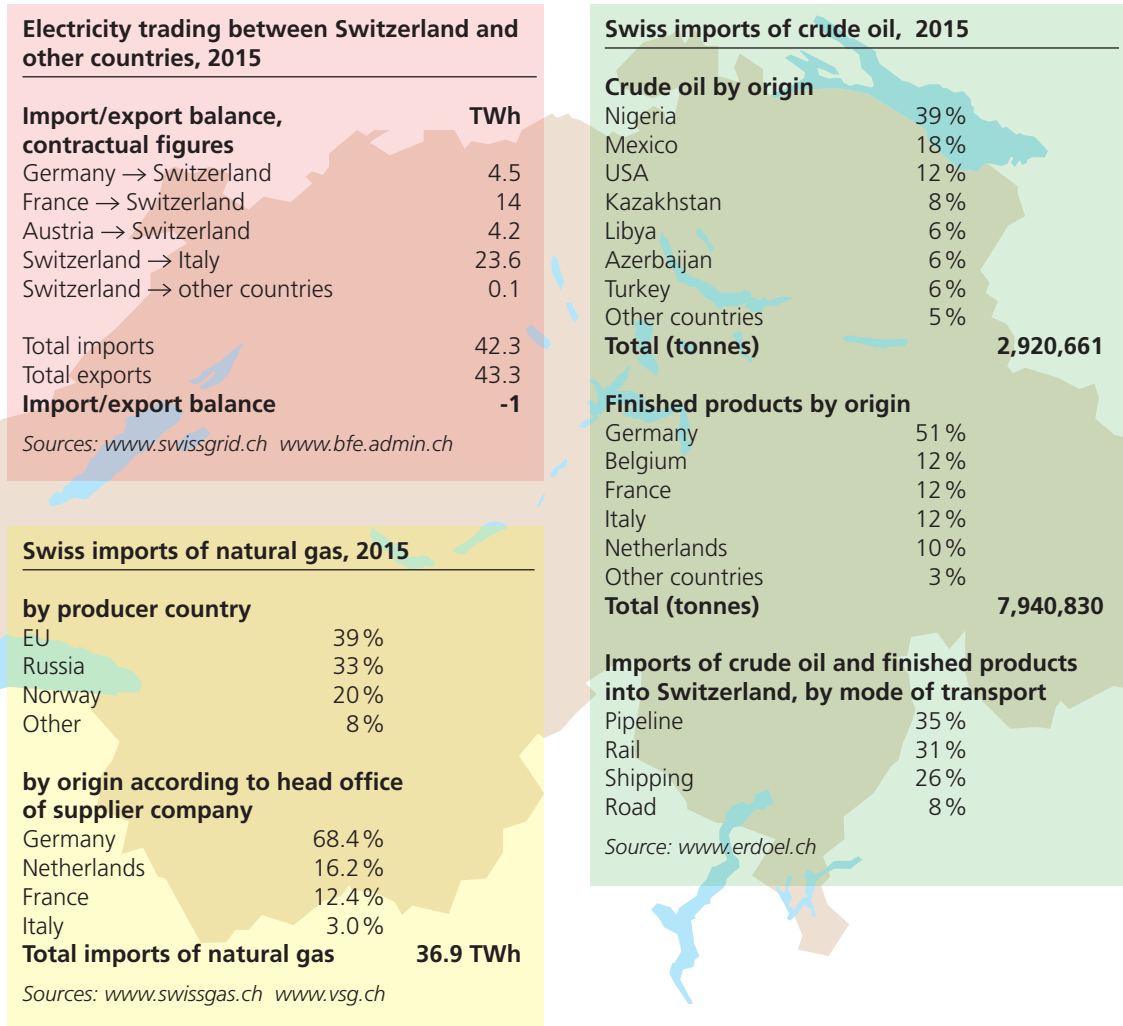
With a share of just under 52 percent of final energy consumption, mineral oil is the most important source of energy in Switzerland in volume terms. In many areas, no other source of energy can be used as a substitute within a reasonable period of time. It also serves as an input in the production of a whole range of goods. This makes mineral oil a critical good in supply policy terms. Switzerland does not have any oil reserves of its own, and must import all of its needs. A further factor is that many of the world's largest reserves are located in politically unstable regions. The global oil market has seen supply expand in recent years, for example as new reserves are tapped. This has resulted in fluctuating prices (see Section 3.1). It cannot be ruled out that low prices will persist in the medium term. The current supply surplus is no reason to put concerns about security of supply aside, however. With this in mind, Switzerland is supplied with oil from a range of sources in the form of both mineral oil products and crude oil. Diversifying sources and delivery routes reduces the risk of a supply shortage. Switzerland's only remaining refinery in Cressier (NE) processes the imported crude into finished products, which meet around 25% of domestic demand. The refinery in Collombey (VS) halted pro-

Oil: diversified imports

Dependent on global agricultural trade

⁵ Also includes foodstuffs of animal origin produced on the basis of imported feedstuffs.

Figure 5: Swiss energy figures, 2015



duction indefinitely at the beginning of 2015. The origin of Switzerland's imported crude varies considerably from year to year. In 2015, it came primarily from Africa, North and South America, and Central Asia (see Figure 5), reaching Switzerland via a pipeline from the Mediterranean port of

Fos-sur-Mer in France. The remainder of the mineral oil products consumed in Switzerland are imported from the EU (see also Figure 5). At present, these European refineries purchase their crude oil mainly from the CIS, the Middle East, and north and west Africa.

Gas: integrated in to the European transport network

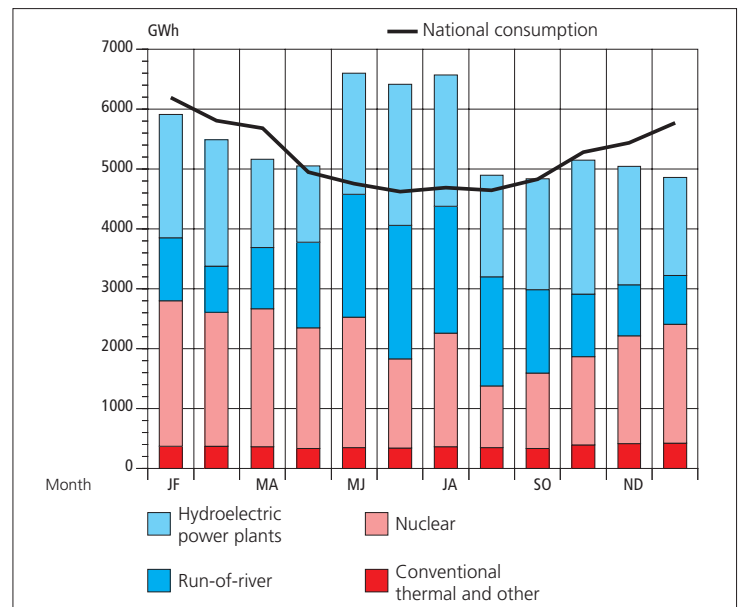
Natural gas accounts for around 13 percent of Switzerland's final energy consumption. It is particularly important in the heating market and in the manufacturing sector. Switzerland imports all of its supplies. Until a few years ago, gas was imported mainly on the basis of long-term supply contracts with major suppliers from neighbouring countries. These companies could offer a broad network of different producing countries, transport routes and storage facilities. In recent years, the short-term spot market has also gained in importance. Swiss natural gas imports are therefore diversified and cover a wide geographical area. Approximately two-thirds comes from the EU and Norway, and around a quarter from Russia. The proportion of Russian gas has risen steadily over the past four years. Despite this, the domestic gas sector does not have any direct contracts with Russia, instead buying its gas via European intermediaries (Germany, the Netherlands, France and Italy). Supply on the global market has expanded considerably in recent years, in particular through the extraction of unconventional gas.⁶ In liquid form, this source of energy is easy to transport, making it possible for local markets to join together into a combined globalised market. This makes supplies more secure because they become less dependent on the pipeline. That said, the Swiss gas market is a free one only for certain market participants. For example, certain major consumers are able to select their gas suppliers on a largely free basis, and to import gas directly. The corresponding rules are laid down in an industry agreement between the gas sector and major industrial customers. The gas market is likely to open up further in the future, however. The Swiss Federal Office for Energy (SFOE) is currently working on legislation on gas supplies.

⁶ Natural gas that can be extracted from wells in sufficient quantities only if additional technologies are used, either because it is not present in the rock as a free gas, or because the reservoir rock is not sufficiently porous. It is thus the extraction method that is unconventional, not the gas itself.

Electrical energy plays an increasingly crucial role in technologically advanced countries such as Switzerland, and it is almost impossible to find a substitute source of energy within a reasonable period of time. In the summer, domestic production is sufficient to cover average domestic consumption. Imports are nonetheless required in the winter owing to higher demand and the lower volumes produced by run-of-river generation facilities and

Seasonal fluctuations in electricity supplies

Figure 6: Monthly power generation shares and national consumption in calendar 2015



Source: Swiss electricity statistics 2015 (D/F), www.bfe.admin.ch

renewable energies such as solar. Despite this, the nation is much less dependent on electricity imports than it is on imports of oil or gas, exporting more than it imports on a cumulated annual basis. Broken down according to type of power station, annual average domestic electricity generation figures for 2015 were as follows: 60 percent hydroelectric (35 percent storage power and 25 percent run-of-river), 33 percent nuclear, 4 percent conventional thermal, and 3 percent various other renewables. While a large proportion of the electricity needed in the higher-demand winter months is generated by nuclear power stations, run-of-river facilities are used more in the summer, when water volumes are greater and maintenance is being conducted on the nuclear stations. In the second half of 2015, blocks I and II at the Beznau nuclear power station were offline for a long period owing to unplanned work. At the same time, a persistent dry spell meant that river water levels were much lower than the long-term average. As a result, electricity generation by run-of-river and nuclear power stations was less than in previous years (see Figure 6).

Therapeutic products

Production of specialty drugs

Switzerland has an efficient chemical and pharmaceutical sector. Forced by the small size of the domestic market to focus on international sales, it exports around 95 percent of its output. Customers in EU countries account for approximately half of this turnover. On the other hand, around 80 percent of pharmaceutical imports come from the EU, while the Eastern European and Far Eastern shares of the total are also growing. In addition to most of the raw materials for the chemical and pharmaceutical industry, vital drugs such as insulins, various antibiotics and vaccines must also be imported. Switzerland concentrates primarily on the production of

specialty drugs and niche products. Single-use bulk goods, such as masks, gloves and catheters, are imported mainly from the Far East, but also from Europe and the USA. The country is supplied with disinfecting agents from its own production as well as via imports, principally from the EU.

Logistics

Raw materials, semi-finished and finished goods find their way to the right place at the right time only thanks to sophisticated logistics systems. Many strategic goods reach consumers via specific logistics chains tailored to the type of good in question. Often, these involve a variety of modes of transport, such as both road and rail. It is thus crucial to have well-functioning trans-shipment platforms between these different modes of transport. In Switzerland, smooth goods flows would be impossible without the ports on the Rhine, marshalling yards on the railways, and the country's numerous combined transportation terminals (CT terminals).

Interdependent infrastructures

The roads bear the largest share of the tonnage carried by both cross-border and domestic Swiss freight transport. The railways and shipping along the Rhine are also important elements of the national supply network, however. They ensure that Switzerland has good links to the ARA ports,⁷ those in northern Germany, and various economic centres throughout Europe. In the transport of strategic goods, the railways and the Rhine are generally used to cover longer distances, while the roads take over the final-stage distribution. This is true in particular of the mineral oil supply chain, as well as to all goods that are transported in containers. Logistics systems depend on reliable power grids and on a stable ICT infrastructure.

⁷ The sea ports of Amsterdam, Rotterdam and Antwerp.

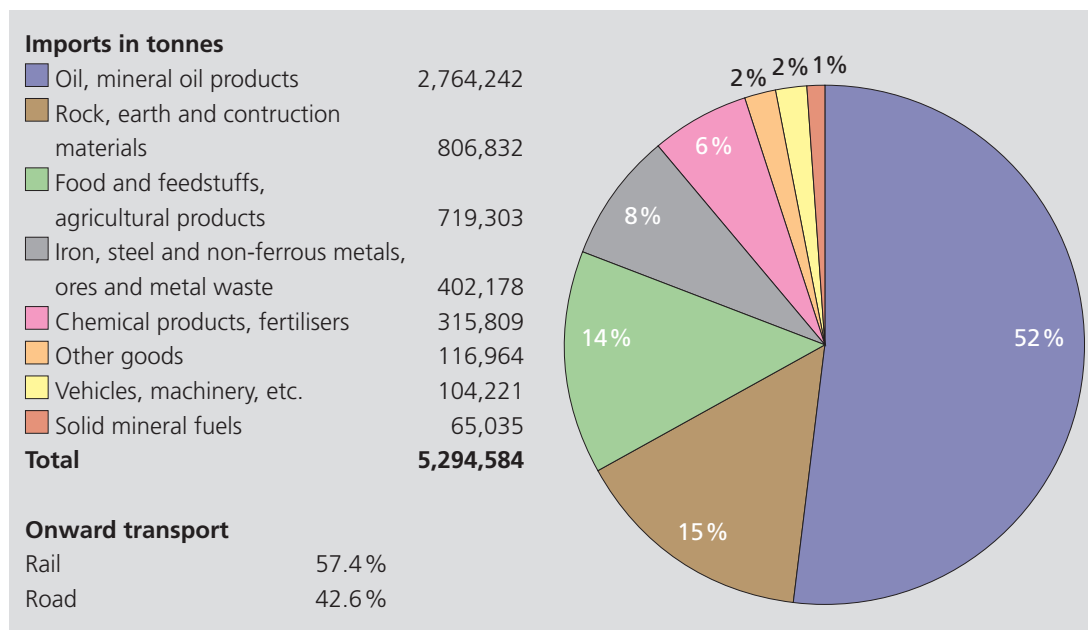
Reliant on internet connections

Information and communication technologies

According to rankings published in the WEF Global IT Report 2015, Swiss companies are the most intensive users of ICT anywhere in the world. The report also ranks countries according to the quality of the ICT infrastructure. Switzerland is in tenth place. The league table factors in the availability, security and speed of data streams. The use of ICT in strategic supply-related sectors – and therefore dependency

on these technologies – is on the rise. We are also seeing convergence in technologies that were once independent of each other. In the future, television and telephone (both landline and mobile) will all be internet protocol (IP) based. The number of ICT systems that are connected to public internet is also growing steadily. IP connections must therefore be regarded as strategic in the supply context.

Figure 7: Swiss Rhine ports in 2015: goods imports by ship, and modal split of onward transport by land



Source: Jahresbericht der Schweizerischen Rheinhäfen 2015 [annual report of the Swiss Rhine ports] Available in German only from <http://www.port-of-switzerland.ch/>

4 Risks to supply processes

Contingencies such as natural disasters, conflicts in regions of the world with rich natural resource deposits, widespread outages in key communications, logistics and power networks, etc. can pose major supply policy challenges to the affected economic sectors and to public-sector bodies alike. The failure of a dominant supplier of important basic goods or commodities can quickly lead to supply shortages around the world. A regional natural disaster can also have national or even global consequences. It is therefore vitally important to NES to have a breadth and depth of knowledge about the risks to security of supply in Switzerland, so that the country can prepare for contingencies which begin far beyond its sphere of influence.

4.1 The supply process for foodstuffs

Import of key raw materials and other agents

Supplies of foodstuffs depend on imports in two respects. Firstly, imports are required to meet Switzerland's needs. These may be consumed directly or processed into other products. These imports are necessitated by the country's climate and topography, which mean that it does not have enough useful agricultural land to meet food demand from domestic output alone under normal circumstances. Secondly, this domestic output itself depends on supplies of agricultural raw materials and other agents from abroad. Strikes, ICT or electricity outages, and interruptions to mineral oil supplies or the logistics chain, especially at sea ports and along the Rhine, may lead to shortages in such goods. Drought, flooding, local contamination, pathogens and export restrictions on political grounds combine with the lack of cultivable land around the world to create the risk of temporary interruption to supply streams from key producer countries, or from entire producer regions.

Since foodstuffs are largely substitutable, in the short term disruption in the supply of individual product groups can generally be compensated for by alternatives. A combination of concurrent contingencies might result in significant shortages, however. Domestic output is important to secure supplies in the event of a crisis. It is thus essential to maintain cultivable land to be able to produce food. This is particularly true of Switzerland's best arable soils, also referred to as crop rotation areas. The sectoral plan for this high-grade agricultural land is therefore extremely important in the event of a crisis. Furthermore, output relies heavily on imported inputs, with the result that the failure of a monopoly supplier or producer country would pose a challenge for imports of seed, pesticides and fertilisers.

4.2 The supply process for oil

Attacks or war, as well as extreme weather events and unplanned business closures can jeopardise the availability of mineral oil products in Europe and Switzerland. Unplanned stoppages to refinery output, for example as the result of accidents or strikes, hit supplies particularly hard if they happen at the same time as logistical problems. Logistics, meanwhile, can be disrupted by damage to important pipelines or to restrictions to shipping on the Rhine owing to excessively high or low water levels. Disruption to electricity supplies and the failure of ICT networks are further contingencies which can contribute to supply shortages. After all, the end user needs electricity to be able to use oil, for example to pump petrol at a fuel station or to operate the circulation pump in an oil-fired heating system. All in all, restrictions to mineral oil imports are more likely than a global shortage, but the duration and scope of any shortfall will be significantly less in the case of a regional import shortage. It would generally require a combination of damaging events in the supply chain to cause a severe shortage in Switzerland.

Dependence on electricity and transport disruption

Transitgas pipeline a cluster risk

4.3 The supply process for natural gas

As is true of oil, the availability of natural gas in Switzerland can be adversely affected by conflict such as political power struggles in producer or transit states, as well as by natural disasters or technical problems with transport infrastructures such as pipelines. Since Switzerland does not have any significant domestic storage capacity, the situation would become critical were imports to be halted. In this context, the Transitgas pipeline represents a certain cluster risk, but also an opportunity. This pipeline system carries three-quarters of Switzerland's gas consumption. However, in view of its key importance to gas supplies for neighbouring countries, foreign gas suppliers also have a guaranteed interest in feeding the pipeline, even in times of crisis. Electricity is also crucial to the delivery and consumption of natural gas. Although it is generally still possible to transport gas without using electricity, certain sections of the high-pressure network, distribution facilities and gas usage itself depend on electrical power. Gas supply logistics are complex, rely on ICT networks, and transport products over long distances. Consequently, conflicts or environmental factors in extracting countries can impact on the international supply chain. That said, interruptions to imports from individual producer countries, or infrastructure failures, have to date not had any significant effect on gas supplies in Europe or Switzerland. Thus, in reality, a supply shortage is unlikely unless there is a combination of different events, such as an extended spell of particularly cold weather and the concurrent failure of considerable sections of the gas infrastructure.

4.4 The supply process for electricity

Electricity is crucial to all processes which sustain human life. The supply situation depends on domestic output, the transmission infrastructure, the distribution grid and imports. All four of these elements are vulnerable to environmental factors such as extreme weather or natural disasters, as well as to disruption caused by humans, such as accidents or sabotage. In the event of disruption, the limited capacity of the transmission grid means that Switzerland cannot simply import as much electricity as it needs. The growing use of stochastic renewable energies⁸ as part of the European energy mix further exacerbates this problem, since this as-needed approach to energy generation to cover regional consumption peaks requires additional storage capacities, as well as a smoothly functioning international electricity market, including reserve generation capacity. Where this approach is taken, it creates additional redundancies in the event of disruption, but also makes the system more complex and increases the overall load on the grid. The safety margins in the Swiss power grid are designed for normal operation and not for crisis situations. The initial step towards opening up the electricity market has now divided responsibility for the security of Switzerland's electricity supplies between a large number of different suppliers. It is therefore essential that the parties concerned agree on a clear division of roles, and that they coordinate their activities closely. The SCADA systems⁹ for electricity generation, transmission and distribution present a further risk. These allow users to monitor and control physical processes in distant infrastructures. That said, Switzerland has a robust system in place to supply the nation with electrical energy.

Limited import options and high capacity utilisation

⁸ Stochastic sources of energy such as wind and solar power are those whose contributions to the grid at any given time cannot be predicted.

⁹ Supervisory Control And Data Acquisition systems.

4.5 The supply process for therapeutic products

Market concentration and production stoppages

Switzerland's production of therapeutic products is efficient, and the country has an effective distribution system. Despite this, recent years have seen an increase in supply bottlenecks affecting drugs such as antibiotics, vaccines and medications to treat cancer. There are many reasons for this: the production of active agents has been moved to Asia (China and India), there have been production stoppages, and inventories of finished products have been tight. With operating stocks kept low at hospitals in particular, the market is often unable to absorb short-term supply shortages. This results in the greater use of compulsory stocks. To enable the NES system to respond earlier to potential shortages, an obligation to report impending supply shortages was introduced on 1 October 2015. This requires holders of marketing authorisation¹⁰ to report (potential) shortages in the supply of critical drugs.

Greater demand in a pandemic

In addition to supply shortages, the outbreak of a pandemic would also result in an imbalance between supply and demand. In a scenario like this, it is assumed that up to 25 percent of the population would fall ill within 12 weeks. It is also unlikely that vaccines would be available in the early stages. There would therefore be a sharp rise in demand for antiviral drugs, protective masks, surgical gloves and disinfecting agents, as well as antibiotics to treat secondary infections. Hospitals in particular, but also retirement and care homes, in-home care services, doctors and others would depend on the availability of additional drugs and medical products. Throughout Switzerland, direct deliveries to customers account for around 20% of pharmaceutical companies' sales. The remaining approximately 80% reaches hospitals, pharmacies, drugstores and medical practices via pharmaceutical wholesalers, with just five such companies occupying the lion's share of the market. The loss of one of these wholesalers

thus also poses a threat, because the remaining companies will be unable immediately and fully to close the resulting gap. Where necessary, deliveries would have to be prioritised according to the importance of the product concerned and the available transport capacity.

4.6 The supply process for logistics

Logistics processes depend to a considerable degree on the availability of the various sources of energy. Fuels, in particular, are essential to transportation by road and air, and rail transport would be impossible if electricity supplies were to be disrupted. Warehousing and trans-shipment logistics also rely on electricity.

Reliance on energy

The just-in-time principle requires efficient logistics and transport processes, which in turn demand that each link in the supply chain functions smoothly. Logistics processes are thus heavily dependent on sub-processes such as production, purchasing, warehousing, order-picking, handling, distribution, and customs clearance, etc. Disruption to one of these sub-processes, such as the failure of a particular resource, can interrupt the logistics process as a whole. Furthermore, logistics processes generally depend on the availability of properly qualified staff, such as drivers. Short-term staff shortages as the result of a pandemic, for example, can cause the whole process to falter.

The volume of goods being transported will increase over the long term. Passenger and freight traffic often share the same infrastructures, placing them under ever-greater strain. This trend can increase the risk of severe disruption in these means of transport.

¹⁰ Any company authorised by Swissmedic to distribute medications.

Reliance on ICT

Complex logistics processes involve different means of transport crossing international borders, not to mention a number of different companies. Today it is possible to plan and execute these processes only thanks to the information and communications infrastructures that support them. Efficiency gains, traceability requirements and the need for goods to be available at all times place great demands on ICT systems. Alongside shortages in energy supplies, the failure of ICT services poses the greatest risks to logistics processes.

4.7 The supply process for ICT

Risk from technical monocultures

ICT processes can be disrupted by technical faults, bug-ridden software, incorrect operation or targeted attacks. This can have wide-ranging implications. Certain software and hardware providers have global market shares of between 60 and 90 percent in some sectors, such as the market for desktop

computer operating systems. With this concentration in the hands of a few market leaders (referred to as the software monoculture), there is a risk that system failures as the result of an attack, for example, might potentially affect large sections of both the private and public sectors.

Power outages also pose a major risk to the ICT supply process. Even short interruptions to electricity supplies can disrupt ICT infrastructures and lead to the suspension of ICT services. Communications service providers, in particular, depend on an uninterrupted supply of power to all infrastructures that connect the sender (provider) and recipient (customer), such as telecommunications centres, data centres, local junction boxes, mobile communications stations and subscriber lines. It is almost impossible to maintain these infrastructures with emergency power supplies, meaning that communications services cannot be guaranteed in the event of a power outage.

Reliance on electricity

4.8 NES intervention, 2013–2016

Date	Contingency	NES action
Spring 2016	Shortage of an antibiotic owing to production stoppages	Temporary reduction in the prescribed volume of compulsory stocks to be held by two manufacturers of the antibiotic concerned
January 2016	Shortage of a veterinary drug	Temporary reduction in the prescribed volume of compulsory stocks of the drug concerned
Autumn 2015	Production is halted at the Cressier mineral oil refinery, with a concurrent reduction in transport capacity via the Rhine (see the 'Cressier 2015' example on the next page).	Temporary reduction in the prescribed volume of compulsory stocks of petrol, diesel and heating oil Measures to encourage transportation by rail
December 2014 – April 2015	Shortage of antibiotics owing to the loss of one manufacturer (technical production problem) and delivery problems	Release of compulsory stocks (on the orders of the FONES) Recommendations on use and substitution circulated to hospital pharmacies and infectious disease experts

Example of intervention: Cressier 2015

Switzerland experienced a temporary shortage of mineral oil in the autumn of 2015. This was caused by a number of unusual events that all happened at the same time. The first of these was a technical defect in a heat exchanger at the Swiss refinery in Cressier, which resulted in an unplanned stoppage of several weeks. At the same time, a persistent dry spell had left the water level in the Rhine very low, and shipping was running at only reduced capacity. There were therefore limits to the availability of Switzerland's most important import route (in volume terms) for mineral oil products. The low water level also meant that the German national rail operator, Deutsche Bahn, was handling high volumes of unplanned goods shipments within Germany, thereby making it more difficult to import oil by rail. All mineral oil products remained available in the rest of Europe, however. NES was notified by the Mineral Oil Products, Rail Transport and Rhine Shipping sub-units. The energy and transport units then analysed the situation in detail. As a result of this, two measures were adopted:

- The temporary use of compulsory stocks alleviated the imminent acute shortage in the supply of mineral oil products (see Section 5.5).
- The OTRAL organisation, which is in charge of transport logistics in extraordinary situations (see Section 5.3) was brought in, and its mineral oil products unit ensured that the available transport capacity for these products was coordinated as effectively as possible. It was thus able to organise additional deliveries in dedicated trains from abroad, and from the ports on the Rhine.

This action made it possible to secure the availability of mineral oil products in Switzerland in the short and medium term. Consumers did not experience any shortages in the supply of mineral oil products while the refinery was shut down.

5 Instruments and measures

5.1 Instruments for the systematic monitoring of the supply situation

Background

The enormous degree to which the economy is interconnected, and the great speed of modern supply processes, demand an immediate response to threats. It is crucial that NES recognises disruption and shortages in good time, as this is the first step towards resolving supply problems successfully.

Degree of preparation and need for action

A proper monitoring system is vital in evaluating the electricity supply situation in Switzerland and in identifying any energy shortages in good time. On behalf of NES, Swissgrid began in 2013 to establish such a system, known as MOSES. It processes a variety of information, such as nationwide consumption, available energy reserves in Switzerland and Europe, and available transport capacity. This is used to produce a situation report to which Swissgrid experts add their own analysis before it is provided to NES. Should the supply situation become critical, the detail in which the data is analysed and the frequency of the report can be amended in line with NES needs.

There has regularly been disruption to supplies of therapeutic products in recent years. On 6 June 2014, the Federal Council thus instructed the FONES to set up an information and coordination platform for vital human medicines. The aim of this platform is swiftly to determine disruption to supplies and, if the private sector is unable to rectify the situation itself, to evaluate appropriate action to ensure that the necessary drugs continue to reach the patients who need them.

The platform was implemented by the NES Therapeutic Products unit, in collaboration with the federal agencies concerned¹¹ and other stakeholders.¹² Furthermore, an obligation to report disruption in supplies of vital human medicines was introduced with effect from 1 October 2015 on the basis of Art. 57 NESA. The active agents that are subject to the reporting obligation are listed in the appendix to the corresponding Ordinance. These are critical compounds for which there are no or only limited substitutes, and which have been affected by a supply shortage over the previous three years.

The reporting obligation is being introduced in two stages. In the first phase, the pharmaceutical industry will report supply shortages in or interruptions to deliveries of the listed critical human medicines to the Therapeutic Products unit. Incoming information will be viewed by the FONES and analysed by a multidisciplinary committee of specialists within the Therapeutic Products unit, in order to draw up targeted action that is appropriate to the situation at hand, and to minimise supply problems. This analysis is also intended to ensure that the decision-making process at the level of the authorities and the healthcare organisations concerned is as short as possible. The online platform went live in June 2016. Since then, reports have been submitted by means of an electronic form. Thanks to the online platform, hospitals and drugs wholesalers are now also able to submit voluntary reports about supply shortages. The second phase will begin on 1 January 2017, and involves monitoring stock levels for selected products. It will also be possible to conduct statistical analysis of supply shortages via the platform.

¹¹ Federal Office of Public Health (FOPH), Swissmedic, Central Military Pharmacy

¹² The cantons, Interpharma, Intergenerika, scienceindustries, Swiss Association of Public Health Administration and Hospital Pharmacists, the H+ association of public and private Swiss hospitals, clinics and care institutions, and VIPS, the union of pharmaceutical companies in Switzerland

Monitoring
electricity
supplies

Monitoring
supplies of
therapeutic
products

Monitoring the availability of ICT services

ICT is repeatedly affected by disruption, both minor and major. Providers of telecommunications services must report these incidents promptly to the Federal Office of Communications OFCOM in accordance with certain technical and administrative regulations. The ICT unit relies on such reports for its contingency planning, and to be able to act in good time. Under a May 2014 agreement with OFCOM, information on all disruptions to ICT services that are subject to the reporting requirement is immediately made available to the FONES.

Monitoring the supply situation is one of the ongoing tasks that NES must perform in all of the areas which fall within its authority. In the future, monitoring will become even more systematic. Once this is in place, and based on the new NESA (see Section 2.1), it will be possible to draw up specific resilience-building measures which will be deployed at the prevention phase, before a contingency has occurred.

5.2 Securing information and communication technologies

Background

Fundamental importance of ICT

Information and communication technologies (ICT) are essential to the functioning of our economy in itself, and to the operation of vital supply infrastructures such as power grids and logistics systems, etc. In view of their enormous importance, NES regards ICT systems as vital infrastructures.

The objective of NES is to institute the appropriate measures to ensure that ICT failures which have serious implications for supply infrastructures, and thus for the economy, not only remain a rarity, but are also resolved swiftly.

Degree of preparation

With this objective in mind, the ICT unit has developed a new strategy over the past four years. It is based on the realisation that ICT is not only a critical supply process in itself, but also provides a critical resource for other supply processes.

In the implementation of this new strategy, the FONES and OFCOM have defined the following ICT services as strategic in supply terms:

1. Access to emergency call services
2. The public telephone service
3. Data transmission via public networks (the internet), as well as access to the corresponding services
4. The transmission of radio and television services

The strategically important companies which supply these ICT services have also been identified. Working with these companies, the ICT unit has examined five measures to mitigate impending availability problems:

1. Appeal to end users (to conserve bandwidth)
2. Prioritise communications services
3. Limit the bandwidth available to users
4. Limited, provider-independent mobile network access
5. Increase the transmission power of mobile communications antennas.

The appeal to end users is intended to encourage them to refrain voluntarily from non-essential usage. The aim of prioritising communications services and restricting bandwidth per user is to create more transmission capacity for essential services in the event of limited availability. Ensuring limited, provider-independent access to the mobile network is intended to allow a small number of privileged mobile users

to overcome the failure of individual mobile communications systems by using other providers' infrastructures. Finally, increasing the transmission power of mobile communications antennas should temporarily offset the failure of individual antennas. These five measures should thus secure the availability of ICT services in the future.

Action areas and outlook

Over the next four years, action will be needed in particular to flesh out and to prepare the proposed measures for ICT, and to strengthen the resilience of the ICT resources required for other supply processes. Preparing action on the ICT front will involve reviewing and, where necessary, establishing the appropriate legal foundations, defining working processes between NES and the federal agencies concerned (specifically OFCOM), and ensuring that the measures are adopted by the sector itself.

5.3 Securing logistics

Background

It is extremely important to the Swiss economy that goods flow smoothly through the system. National logistics services can be influenced directly by national government action. As Switzerland also depends on properly functioning cross-border freight traffic, international logistics are also factored into NES deliberations. If vital logistics services are not sufficiently available in a crisis, it is the job of the Transport unit to support the logistics sector so that it is once again able to ensure transport for the volumes of goods that are required.

To this end, the Transport unit promotes the coordination of logistics services along the supply chains for vital goods, i.e. between a number of different companies. It also develops action programmes, especially for specific means of transport, and creates the legal foundations which facilitate the transport of vital goods along the main logistical routes via key transport nodes and, where necessary, enable the appropriate priorities to be set.

Coordination and prioritisation of goods

National Strategy to Protect Switzerland Against Cyber-Risks (NCS)

The FONES contributes its specialist expertise to the analysis of critical supply processes as part of work to implement the NCS. The Federal Council has mandated the FONES to conduct ICT vulnerability assessments in 14 of a total of 28 critical sub-sectors. The Federal Office for Civil Protection FOCP is handling the other 14 sub-sectors. ICT vulnerability assessments document critical supply processes, point out where these depend on ICT resources, and investigate their vulnerability in ICT terms in the face of a variety of threats.

Starting in 2014 and running through to the end of 2017, the FONES has conducted or will conduct vulnerability assessments of the following critical sub-sectors: those supplying natural gas, oil and electricity, the chemical and pharmaceutical industry, the MEM sector, information technology, communications, foodstuffs, water, waste water, aviation, rail transport, shipping and road transport. It will then propose the relevant measures to improve resilience.

Industry agreements

Degree of preparation

Under the principle of subsidiarity, the federal government should not act until companies in the logistics sector have exhausted their potential to cooperate with each other. That is why the Transport unit supported the establishment of the OTRAL organisation. The acronym represents the German for 'organisation of transport logistics in extraordinary situations'. The thinking behind OTRAL was to coordinate processes to optimise goods carriage and thereby increase transport capacity. This nonetheless requires companies to be prepared to cooperate closely in the event of a crisis. The form that this cooperation should take is laid down in industry agreements. The following OTRAL groups were formed during the period under review.

- OTRAL Mineral Oil Products is intended to coordinate logistics in the event of supply bottlenecks affecting mineral oil products that are the result of problems with the related logistics services. The OTRAL Mineral Oil Products group encompasses rail transport companies, rail infrastructure operators, and the operators of tank facilities at the Swiss Rhine ports, which work together on the basis of an industry agreement concluded in 2015.

- OTRAL Terminal coordinates the trans-shipment of goods and containers at Switzerland's primary logistical nodes in the event of supply bottlenecks. The terminal operators signed the corresponding industry agreement in 2016.

Cooperation between the FOT and FEDRO

The Transport unit takes on a subsidiary role in dealings not only with the private sector, but also with other federal agencies. Certain process flows have been agreed between NES and the Federal Office of Transport FOT, and the Federal Roads Office FEDRO. Based on the legal foundations which apply to these offices, such agreements provide for measures such as the temporary extension of working hours for train and truck drivers, an increase in the total tonnage that trucks can carry, and deviations from the ban on driving trucks at night and on

Sundays. Furthermore, it has been agreed with the Directorate General of Customs that customs opening hours will be extended in the event of supply shortages.

Based on the NES, the Transport unit has developed the following measures:

- In a crisis, prioritising rail transport enables track capacity to be provided quickly and as needed to transport strategic goods.

- From the logistical perspective, prioritising goods trans-shipment at terminal facilities ensures that optimum use is made of the trans-shipment capacity remaining (in a crisis) at the Swiss Rhine ports, marshalling yards and combined transportation terminals.

Action areas and outlook

The NES system and – where they are involved directly – the other federal agencies are familiar with the measures that have been described here, and are able to implement them promptly in the event of a contingency. However, the companies that are affected by these measures currently do not have sufficient information about what is expected of them. For example, prioritising trans-shipment at goods terminals affects not only their operators, but also countless other users of terminal services, such as forwarding and transport companies. In the event of a contingency, the latter should be informed quickly of these measures, so that they can act abroad to ensure that non-priority goods are not shipped to the terminals in the first place.

The financing facility used to guarantee loans for ocean-going vessels expires in 2017. The Federal Council has instructed the FONES to draw up a comprehensive report about Switzerland's fleet policy going forward. It will then have to decide whether – and if so, how – a sufficient fleet of ocean-going vessels under the Swiss flag can be ensured in the medium and long term.

Information for companies

Loan guarantees for ocean-going ships

5.4 Stockpiling

Background

Switzerland is heavily dependent upon imports, so maintaining reserves of certain goods is a very important precautionary measure in ensuring security of supply. If an unforeseen crisis means that the market is no longer able to satisfy demand for vital basic goods, reserves which may be released as needed are a valuable instrument for NES. The federal government does not hold such reserves itself. Instead, it delegates this function to companies which not only manage the inventories, but also manufacture or trade in the goods which are subject to strategic stockpiling. This means that the reserves are embedded in the distribution network and can be dispatched quickly if needed. Various instruments are used to maintain reserves, the most important and best-known of which is the system of compulsory stocks.

Compared with other means of holding reserves, the compulsory stocks system is the one which is of the greatest importance to NES in terms of inventory volume. Under this system, the federal government defines the goods that are subject to compulsory stockpiling. It also defines the level of such stocks, by setting the period for which inventories should satisfy average domestic consumption (demand coverage). Goods which are subject to

the stockpiling system include certain basic foodstuffs, fertilisers, fuel and therapeutic products. All companies which import a set minimum quantity of such goods, or which are their initial distributors on the Swiss market, are obliged to conclude a compulsory stock agreement with the FONES. These agreements set out the good in question, the quantity, the quality, and the location at which the stocks are to be held. Some 300 companies currently hold compulsory stocks for NES purposes. At the present time, the value of these stocks amounts to around 2.1 billion Swiss francs (see Appendix 8.3).

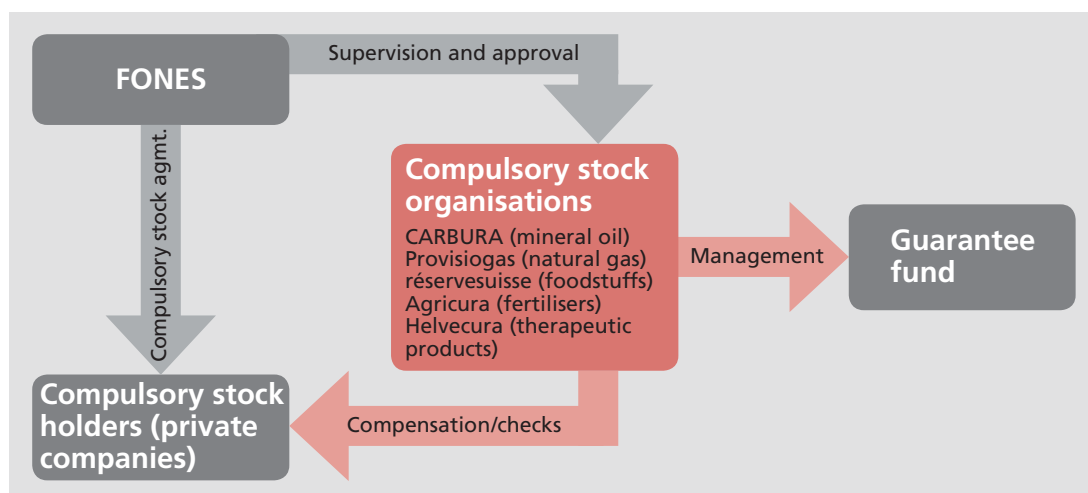
Under the compulsory stocks system, the affected sectors of the economy have the option of setting up independent support organisations under private law, known as compulsory stock organisations (see Figure 8). Such organisations currently exist for liquid fuel (CARBURA), food and feedstuffs (réservesuisse), therapeutic products (Helvecura) fertilisers (Agricura) and, since October 2015, for natural gas (Provisiogas). Compulsory stock organisations may set up guarantee funds on the basis of the NESAs to cover the costs of storage. Companies which import goods which are subject to compulsory stockpiling or which distribute them for the first time in Switzerland pay a contribution to the guarantee fund. Guarantee funds are administered by the compulsory stock organisations and are used to cover the costs and price risks incurred by the companies concerned as a result of holding com-

Importance of stockpiling

Compulsory stocks

Compulsory stock organisations

Figure 8: Compulsory stock organisations



Strategic stocks as determined by NES:		
	Product	Demand coverage ¹⁴
Foodstuffs	Sugar	3 months
	Rice	4 months
	Cooking oils and fats	4 months
	Coffee	3 months
	Common wheat for human consumption	4 months
	Durum wheat for human consumption	4 months
	Common wheat for dual use	3 to 4 months
	Carbohydrate-rich feedstuffs	2 months
	Protein-rich feedstuffs	2 months
	Nitrogen fertilisers	1/3 of the requirement for one growing season ¹⁵
	Raw materials for yeast production:	
	– molasses and beet-sugar syrup	1 month
	– Mono-ammonium phosphate, phosphoric acid	1 month
– Ammonium sulphate, ammonia	1 month	
Energy	Petrol	4.5 months
	Kerosene	3 months
	Diesel	4.5 months
	Heating oils	4,5 months
	Natural gas for dual-fuel systems (in the form of extra light heating oil) ¹⁶	4.5 months
	Uranium fuel bundles	Sufficient to recharge 3 reactors ¹⁷

pulsory stocks. The compulsory stock organisations also conduct compulsory stock agreement compliance checks on behalf of the federal government. In its capacity as the supervisory authority, and bearing in mind Switzerland's international obligations, the FONES ensures that the level of contributions to the guarantee funds is appropriate, and that the funds are being used for their intended purpose.

Complementary stocks

In addition to compulsory stocks as required by the federal government, NES can also enter into agreements with individual companies that they will stockpile other vital goods on a voluntary basis. This 'complementary'¹³ arrangement is an appropriate means of holding stocks of strategic goods for which there is only very low demand under normal

circumstances, or which are offered by only a small number of suppliers. Examples include certain medications or raw materials for yeast production. In contrast to the compulsory stock system, companies are not forced to enter into a contract with NES. However, should they decide to conclude an agreement about complementary stockpiling, they are subject to the same obligations as apply under the compulsory stockpiling system.

There are other forms in which stocks are held in addition to complementary and compulsory stockpiling. These include 'secure supply agreements', which permit contracts to be entered into with producers, warehouse operators and service companies to hold reserves of specific goods. Mini-

Other means of maintaining stocks

¹³ 'Stockpiling on a voluntary basis' was the term used prior to the revision of the National Economic Supply Act.

Strategic stocks as determined by NES:		
	Product	Demand coverage ¹⁴
Therapeutic products	Antibiotics used in human medicine:	
	– Commercially available packaged doses	3 months
	– Active agents	2 to 3 months
	Antibiotics used in veterinary medicine:	
	– Single animal treatment	2 months
	– General (herd) treatment	2 months
	Neuraminidase inhibitors	Treatment for 25% of the population; prevention for health staff for 40 days
	Strong analgesics and opiates	3 months
	Haemostatics	1–3 months
	Insulin	2 months
	Blood bags	3 months
	Respiratory masks	(under review)
Surgical masks	(under review)	
Surgical gloves	(under review)	
Vaccines	(to be established from 2017 onwards)	
Industry	Plastics: ¹⁸	
	– Polyethylene (PE), various additives	81 t
	– Polystyrene (PS)	90 t
	– Polyethylene terephthalate (PET)	120 t

Source: FONES, Report on Strategic Stockpiling 2015, www.bwl.admin.ch > Documentation

minimum reserves offer a further instrument. Here, the federal government is able to force companies to maintain minimum levels of stock for a limited or indefinite period. For example, in the event of an impending pandemic, the government is able to order that minimum stocks of disinfecting agents be held (see Section 5.7). A further form of stock-

piling involves inventory levels being determined by industry agreements. For example, electricity supply companies have undertaken to keep electricity pylons in stock to secure the transmission network, and to support each other in the event of a crisis.

¹⁴ Demand coverage is expressed either as the target volume determined by the federal government, or as the length of time for which average demand must be met, in accordance with federal government requirements.

¹⁵ The remaining two-thirds are to be covered by reserves held with producers, importers, merchants, etc. and by the residual nitrogen in the soil.

¹⁶ Extra light heating oil is stored as a substitute for natural gas. It can be used for 4.5 months to supply gas consumers who have dual-fuel systems.

¹⁷ Strategic stocks are sufficient for one recharge each of three of Switzerland's five nuclear power stations.

¹⁸ The current level is given here instead of demand coverage.

Financing compulsory stocks

The federal government enables companies to finance their strategic complementary and compulsory stocks on preferential terms by acting as guarantor for the relevant loans. Should the holder of compulsory stocks subsequently become insolvent or enter into composition proceedings, the federal government will repay the loan to the bank and, in return, become the owner of the goods. In this capacity, the FONES concludes agreements with the banks, examines guarantee applications, approves them, and where necessary takes action to avoid loss to the state as far as possible in the event of insolvency. The federal government has not sustained any losses from compulsory stock guarantees in recent years.

Costs of holding compulsory stocks

The costs of holding compulsory stocks include compensation to companies from the guarantee funds, as well as the administration costs of the compulsory stock organisations. Over the past 20 years, the volumes of foodstuffs and energy held under the compulsory stock system have been reduced significantly, and the range of goods that must be held has been streamlined. This has considerably reduced costs. Since 2013, certain compulsory stocks of therapeutic products have been increased, and new products added. The additional costs incurred as a result were low in comparison with the reductions that had been achieved in the other two areas, however. Aggregate expenditures in connection with strategic stockpiling have declined sharply in recent years, and the current very low level of interest rates is also helping to keep costs down. Importers and initial distributors of goods subject to the compulsory stock system generally pass on their own costs in the sale prices for their products.¹⁹

Degree of preparation

In 2015, the FONES drew up a Report on Strategic Stockpiling in Switzerland.²⁰ It contained a detailed account of changes in reserves, as well as the current level of readiness. The most important changes in stock levels over the past four years can be summarised as follows:

- Where mineral oil is concerned, compulsory stock levels for diesel and kerosene have been increased and those for petrol and extra light heating oil have been increased. Demand coverage remains the same. The plan to eliminate all compulsory stocks of heavy heating oil was completed in 2015. These changes reflect market trends and were needed to bring stocks into line with the demand coverage determined by the federal government.

- For technical and economic reasons, stocks of extra light heating oil are kept as a substitute for natural gas. In the event of a shortage, owners of dual-fuel systems²¹ can be obliged to switch to heating oil, thereby easing supplies of gas to other users.

- In the therapeutic products segment, strong analgesics and opiates were included in the compulsory stockpiling system in 2013. Antifungal agents and tuberculostatics have now been added to the existing range of antibiotics for human use.

Information on the value of goods held as compulsory stocks can be found in Appendix 8.3 to this report.

Changes to compulsory stocks

¹⁹ These costs amount to approx. 13 Swiss francs per capita per year (see Appendix 8.3).

²⁰ Available on the FONES website: www.bwl.admin.ch > Documentation

²¹ Systems which can be operated using both heating oil and natural gas. Dual-fuel systems currently account for around a third of Switzerland's total consumption of natural gas.

Optimisation of compulsory stocks

Action areas and outlook

The instruments of strategic stockpiling are likely to remain unchanged over the next few years. Any adjustments – specifically in demand coverage for individual goods – will be made only on a case-by-case basis:

■ There may be further adjustments to the volumes of mineral oil products that are held to cope with the probable rise in demand for diesel and the fall in demand for petrol and heating oil. With the creation of additional local tank capacity, compulsory stock volumes for kerosene may be increased over the next few years to ensure the required level of demand coverage.

■ As part of work on the Report on Strategic Stockpiling 2015, it was found that more in-depth analysis is required of the rationale behind compulsory stocks of many foodstuffs. There have been shifts in consumption patterns, as well as in domestic production and the proportion of food that is imported. For example, Switzerland now imports less durum wheat (semolina), but more pasta. The selection of goods, as well as their quantities, will have to be reviewed on the basis of comprehensive risk assessments.

■ In the therapeutic products segment, efforts have begun to build up compulsory stocks of selected vaccines. The corresponding addition to the Ordinance entered into force on 1 October 2016. Stocks of respiratory and surgical masks, as well as surgical gloves, are also to be increased or established so that Switzerland is prepared in the event of a pandemic. The FONES is working with the Swiss Conference of the Cantonal Directors of Public Health, the FOPH and the cantons to identify ways of achieving target levels over the next few years. Furthermore, in cooperation with the *Blutspende SRK Schweiz* blood donation service and providers, stocks of blood bags are to be increased so that they cover three months' supply.

■ The range of plastics of which compulsory stocks are held is currently under review owing to structural changes in the plastics industry.

5.5 The use of strategic stocks

Background

If important basic goods which are subject to stockpiling become unavailable via the market, and if the private sector is unable to offer alternatives, holdings of compulsory stocks may be officially released. This enables the holders of compulsory stocks to place on the market the goods that they have been holding in reserve. In the event of a severe shortage, as described in the NESAs, compulsory stocks will be released by means of an ordinance issued by the EAER. This will result in considerable volumes of compulsory stocks being made available over a longer period. It takes several days before such an ordinance can be enacted. Thus, to respond to sectorial shortages of foreseeable duration, NES can permit limited volumes to be issued from compulsory stocks without the need for an ordinance. This rapid-response measure involves specific short-term amendments to the contracts with individual holders of compulsory stocks.

Degree of preparation

Over the past four years several different sectors have experienced disruption to supplies that has necessitated recourse to compulsory stocks. The following examples demonstrate that this is a practical, workable and effective instrument of NES:

■ In the autumn of 2015, the FONES authorised the mineral oil sector to call up compulsory stocks of diesel, petrol and heating oil. Production at the Cressier refinery had been suspended temporarily owing to a technical fault, and the low water level in the Rhine meant that shipping capacity was limited (see Example of intervention: Cressier 2015, Section 4.8).

Examples of the use of compulsory stocks

■ In the therapeutic products segment, medication has repeatedly been called up from the stocks to fill supply gaps in recent years. The shortages affected antibiotics, in particular, with supplies of certain preparations regularly becoming tight throughout Europe as a result of suspended production and batch recalls. It is common in the therapeutic products sector for only a small number of companies to offer a particular medication. The sudden loss of a producer thus cannot (immediately) be offset by increased output by other market participants. The shortage in one brand of medication also created shortages of preparations with a similar range of indications. The use of compulsory stocks nonetheless meant that Swiss hospitals could be supplied with the drugs they require.

Implementing IEA requirements

As a member of the International Energy Agency (IEA), Switzerland is under an obligation to support the emergency measures determined by the IEA (see Section 6). The country is able to fulfil this obligation at all times, thanks to rapidly available stocks of mineral oil products, as well as demand-side measures.

Action areas and outlook

To continue responding to the supply situation in the future, NES is maintaining its efforts to optimise the use of compulsory stocks and make the system as fit as possible for its intended purpose. NES expects more short-term, time-critical interventions in the therapeutic products segment, in particular. To identify potential shortages in key therapeutic products as early as possible, the reporting obligation for vital human medicines was introduced as a preparatory measure with effect from 1 October 2015 (see Section 5.1).

5.6 Import promotion programmes

Background

If the release of compulsory stocks is not enough to offset supply problems with vital goods, or if no compulsory stocks are held of the goods that are in short supply, the import of these goods may be encouraged in cooperation with the federal offices concerned, and the Swiss Federal Customs Administration in particular. Such programmes to promote additional purchasing options include expanding tariff quotas, simplified customs procedures, and the temporary suspension of legislation limiting imports. NES is also able to support transport and logistics processes for imports in the event of a crisis (see Section 5.3).

Degree of preparation and need for action

The customs regulations that may be suspended in times of crisis to encourage imports depend on the nature and scope of the supply problem, and must be assessed on a case-by-case basis. From the administrative perspective, import promotion programmes are effective and relatively quick to implement, but they do intervene heavily in the market. Merchants and retailers, as well as the customs authorities, are affected directly by this action. In the event of a contingency, the federal government must take decisions on the type, structure and practical implementation of intervention. NES investigations into the feasibility of import promotion programmes can be summarised as follows:

■ In the foodstuffs segment, in close cooperation with the Federal Office for Agriculture import promotion programmes offer an effective means of countering supply crises. Restrictions and other barriers to trade and thus imports of agricultural goods can be suspended for a time, for example, and customs duties on certain products can be reduced temporarily.

**Import
promotion
not possible
for all goods**

- Import promotion programmes are of limited use in securing energy supplies. In the event of disruption to supplies of oil, it might be possible to relax certain restrictions and thus make it easier to import. It is nonetheless worth remembering that targeted state support for imports of additional oil products at a time when the IEA had ordered the release of compulsory stocks could hardly be reconciled with the organisation's fundamental ethos of solidarity. Furthermore, in view of the technical limits to transport and transformer capacity, even in a crisis it would not be possible to import additional electricity or gas at levels in excess of what can already be brought in via the market as it stands.

- The term 'therapeutic products' covers both medication and medical products. In the case of medical products, bilateral agreements mean that Switzerland forms part of the large EU market, with its free movement of goods. This affords a certain protection against disruption in supplies. By contrast, in the case of medication national licensing conditions impose narrow restrictions on any import promotion programmes. Upon application from a company that has a product licensed in Switzerland, pursuant to the Therapeutic Products Act, Swissmedic may approve temporary imports of foreign packs of the identical drug. Such approval would be granted if competitors were unable to close the supply gap, and the lack of the drug might have serious consequences for patients. Here, the new online platform will help to identify problems with medication supplies at an early stage (see Section 5.1).

5.7 Production management

Background

Production management is a highly complex and intrusive measure on the part of NES to increase the supply of hard-to-obtain goods. Targeted incentives may be used to promote the production of certain goods in the event of a crisis. Furthermore, the NES provides a means, via ordinance, of managing the nature and quantity of products which are to be produced or manufactured, and prioritising their designated use.

Degree of preparation

- Production management is intended for level C as described in the strategy (see Section 2.2) – in other words for persistent severe shortages of foodstuffs. The adjustment that is required to domestic agricultural output can be calculated with the aid of the DDSS²² model, taking into account the available goods and input factors. The objective of optimising output in this way is to increase Switzerland's level of self-sufficiency.

Managing agricultural output

- Based on experience with the H1N1 flu pandemic in 2009, NES has prepared minimum stocks of disinfecting agents, and also included polyethylene granulate for the production of the associated plastic bottles in the range of goods of which compulsory stocks must be held (see Section 5.4). Both are intended to help cover the strong demand for hand sanitizers in the event of a pandemic.

Managing disinfecting agent production

- In the event of a broad-based, acute energy crisis affecting fossil fuels, demand for wood for heating purposes would be several times higher. In a level A situation, demand could be met by existing stocks, which are sufficient for around two years. At level B, additional usage would be recommended. At level C, the recommendation would become an official order.

Higher wood usage

²² *Distributed Decision Support System – a computer-based system to support decision-making about food-stuffs supplies in the event of a contingency*

Action areas and outlook

Foodstuffs planning

■ Following in the tradition of the 1990 foodstuffs plan, an analysis of the potential of Switzerland's useful agricultural land was conducted in 2015. This found that optimising domestic output remains crucial to dealing with severe shortages. If the conditions laid down in the analysis are fulfilled in reality, Switzerland would be able to supply the minimum calories required by the population from its own output. Imports would nonetheless be essential to optimise quality (the basket of goods) and quantity (foods that are higher in calories). Expert knowledge is required to optimise production appropriately in the event of a contingency. The DDSS model will therefore also be used to plan foodstuffs supplies in the future.

Implementation guide for wood

■ Work on measures for wood in level B and C situations is well advanced. A practical guide that would be put into effect in the event of a crisis was finalised in 2016. Its implementation will be tested in 2017 using a sample scenario, and any necessary adjustments made.

5.8 Restrictions on consumption

Background

If major supply gaps continue to exist despite supply management programmes, the NES strategy also provides for demand-side action. This is intended to ensure the controlled distribution of the goods that remain. Depending on the severity of a supply crisis, a range of instruments may be deployed, in accordance with the principle of proportionality.

■ The first level of the strategy provides for appeals to the population to reduce their consumption, for example in the event of an impending shortage of electricity. This is a relatively simple way of reducing consumption. An important aspect of such a measure is raising public awareness of the national crisis, and thereby motivating people voluntarily to consume less.

Appeals to reduce consumption

■ Restrictions on sales will also be imposed at an early stage. If there are fears that a temporary shortage will lead to consumers stockpiling goods for their own use, the sales outlets concerned can be forced to limit the quantity that an individual may purchase in a single sale. Although this measure cannot prevent multiple purchases, it can help to calm the situation – and consumers – somewhat.

Sale restrictions

■ The power industry is itself responsible for managing power outages caused by technical faults. By contrast, NES is responsible for managing long-term power shortages. These occur where a lack of generation, transmission and/or import capacity means that the supply of electricity is unable to satisfy demand for several weeks or months at a time. NES crisis management measures provide for restrictions on certain types of electricity usage, the introduction of quotas for major consumers and – as a last resort – shutting down the grid for certain periods. Both preparatory work and the management of electricity shortages require close cooperation between NES and the electricity sector. In the event of a crisis, the sector is responsible for executing the contingency plans (see OSTRAL).

Electricity management

Switchover of dual-fuel systems

■ In the event of a shortage in supplies of natural gas, the federal government can order on a non-contractual basis that dual-fuel systems be switched over to heating oil. This enables the consumption of natural gas to be reduced significantly within a short time.

Quotas

■ If all of the aforementioned instruments prove insufficient to ensure supplies in the event of a contingency, demand for vital goods can be cut indirectly by introducing quotas for supplies. Quotas would mean that providers (merchants, importers and producers) would not be able to release all of their stocks on to the market at the same time, but would have to comply with quantity restrictions set by the federal government. This would constitute massive intervention in the free market. Provision is made for quotas for therapeutic products (Tamiflu, respiratory masks and exam gloves) and energy supplies (kerosene, natural gas and electricity).

Rationing

■ Rationing is the highest level of demand-side intervention in the market. Under this system, each consumer is given the right to buy a particular quantity of a particular good within a limited period of time. Rationing may be introduced in the event of severe, long-lasting supply problems with food-stuffs, as well as with petrol and diesel. It is an administratively complex measure which is imposed at very high cost to the economy, and takes a long time to prepare. NES has prepared the basis on which rationing might be introduced. This would have to be amended and further refined in response to a specific crisis.

Degree of preparation and need for action

Recent years have provided NES with a number of opportunities to review and amend the strategies and plans that it had prepared for restrictions on consumption.

■ Instruments for managing power shortages were subject to a review as part of the Swiss government's National Security Network Exercise (NSNE) in 2014. This review once again confirmed the view that, although switching off the grid or parts thereof are an effective means of saving electricity, at the same time it causes enormous problems for users, and considerable damage to the economy. It may therefore be used only as a last resort. Rather, the necessary savings should be achieved by other means which are much less problematic. For example, restrictions on electricity usage or the introduction of quotas for major consumers (see OSTRAL) might be sufficient to ease the situation. NES work with regard to electricity supplies is thus now focused on preparing these upstream measures.

NSNE 2014

■ NES is working on measures to introduce quotas for large single-fuel systems in the event that a non-contractual order to switch over dual-fuel systems is not sufficient to manage a shortage of natural gas. These quotas would further cut gas consumption by reducing the volume of supplies to these systems and/or the times at which supplies are available. A strategy for this new measure was completed at the beginning of 2016. The next stage is to draw up the implementation guide.

Natural gas quotas

Organisation of electricity supplies in extraordinary situations (known by its German acronym OSTRAL)

NES requires expertise from the private sector to prepare and implement electricity management measures such as quotas for major consumers and occasional grid switchoffs. The federal government thus entrusted the execution of these measures to the VSE association of Swiss electricity companies,

which founded OSTRAL for this purpose. As an organisation set up by the private sector, OSTRAL operates on the basis of public law and is supervised by the NES Energy unit. For a detailed description of OSTRAL, please visit www.ostral.ch

Managing heating oil

■ The measures in place to manage disruption in supplies of heating oil were amended in the wake of a nationwide feasibility test in 2011, and investigations conducted since then. To make these measures easier to implement, further simplifications have been made to the process for gathering the consumer reference data used to calculate heating oil allocations.

Ration cards

■ To date, plans for rationing involved the cantons issuing ration cards. Alternatives to this system have recently been examined at the request of certain heads of the cantonal offices for national economic supply. Having evaluated a number of options, NES decided that cards would be issued by post in the event of a contingency.

5.9 Securing drinking water supplies in an emergency

Background

Under the Ordinance on Securing Drinking Water Supplies in Emergencies (ODWE), in the event of a contingency Switzerland's water companies must supply as much water as is possible under the circumstances. For the first three days, consumers are responsible for ensuring their own supplies. Experience and exercises have nonetheless shown that most end users do not have sufficient emergency supplies of their own, and rarely have suitable containers that they can use to fetch drinking water from outside their homes.

Degree of preparation

This situation prompted NES to work alongside the SMS association of Swiss mineral springs and soft drink producers to make additional preparations. The sector has drafted a declaration of intent in this regard, which involves providing each person in the affected population with nine litres of mineral water for the first three days of a crisis. In the future, the water company/commune/region concerned will be able to trigger the order for this water and then distribute it.

Declaration of intent from the SMS

Action areas and outlook

Working alongside representatives of the cantons and the Federal Office for the Environment, NES has examined the need for a material revision of the ODWE. Having conducted a survey among the cantons, a working group was set up to draft a concept that will serve as a basis for a new ordinance.

Revision of ODWE

6 International cooperation

International
Energy Agency

Background

The FONES fosters a variety of international contacts. The closest relationship is that with the International Energy Agency (IEA). By becoming a member in 1974, Switzerland made an commitment under international law to play an active part in implementing the measures determined by the IEA in the wake of the 1973 oil crisis, including the creation of compulsory stocks at national level. As an IEA member, Switzerland may, for example, be required to take action as part of a campaign coordinated by the IEA (for example by releasing its compulsory stocks) to counter a shortage of oil on the international markets in good time.

Together with the SFOE, the FONES represents Switzerland on the Governing Board of the IEA at the IEA headquarters in Paris. The FONES is also represented in the Standing Group on Emergency Questions (SEQ) and the Standing Group on the Oil Market (SOM) working groups, which report to the Governing Board and meet several times a year. The SOM tracks trends on the international oil markets to help IEA members to respond swiftly and effectively to changes to market conditions. The SEQ handles all of the precautions which are presently deemed sensible at international level to be able to intervene quickly if there is the threat of a supply shortage, and to avoid potential negative economic consequences.

Within the Partnership for Peace (PfP), NES is involved in the civil emergency planning (CEP) programme of NATO's Euro-Atlantic Partnership Council. CEP is intended, among other things, to coordinate and harmonise NATO member and partner countries' operational capabilities in the field of civilian emergency response planning. The involvement of NES concentrates on the Industrial Resources and Communications Services Group (IRCSG) and on the Joint Health, Agriculture and Food Group (JHAFG). These activities permit NES to foster contact with the Swiss mission in Brussels, which in turn is able to convey NES interests to the chairpersons of the various working groups, as well as to representatives of selected member and partner states. Furthermore, the working groups serve to raise awareness among partners of NES resources and programmes, and also offer support with issues relating to contingency planning and crisis management. They also provide a platform for information-sharing for the purposes of benchmarking and updating the individual countries' preparations.

Partnership
for Peace

For these reasons, the FONES also fosters knowledge-sharing in direct, bilateral contact with other states which face similar security of supply problems to Switzerland, or which have similar experience or instruments.

IEA Country Review

Degree of preparation

At five-year intervals, the IEA conducts reviews of its member countries' capacity to cope swiftly with a shortage in oil supplies. These country checks take place as part of a two-day Emergency Response Review (ERR) in the capital of the country concerned. In Switzerland's case, NES representatives demonstrated to the IEA the means and measures that the country has in place to cope efficiently with any crisis in supplies of oil, natural gas and electricity. At the end of each ERR, the IEA draws up recommendations for the government in question, which is then required to examine them, and to implement them as far as it is able. Switzerland's most recent ERR took place in Bern in April 2016.

Involvement in selected PFP committees

As part of the Partnership for Peace, over the past four years representatives of the FONES have participated in selected CEP Planning Boards & Committees, specifically the IRCSG. The JHAFG had been dormant for some time before it gained renewed impetus in 2015 with a new chairperson. Switzerland took this opportunity to present to a plenary session its efforts to secure supplies of therapeutic products. The stockpiling of medicines, in particular, attracted great interest in this connection.

Bilateral exchange

The FONES has fostered closer bilateral contact with Belgium, Israel, Japan and the United Arab Emirates (UAE) over the past four years. Discussions on stockpiling and on preventive action in the therapeutic products segment were held with Belgium and Israel, while Japan and the UAE were particularly interested in Switzerland's system to secure supplies of foodstuffs. The network of relationships between Switzerland and Germany was also strengthened further, as provided for in the bilateral agreement on reducing barriers to cross-border freight traffic. Meetings with the relevant German contacts were

held in 2014 and 2016. As part of this there was an increase in valuable knowledge-sharing on NES projects, specifically those involving risk and vulnerability assessments. In addition, the FONES was able to observe a major exercise by its Finnish partner organisation concerning a shortage of electricity in Lapland. This involved switching off electricity supplies to an entire town and then restoring it by means of a self-contained start²³ at the power station concerned.

Action areas and outlook

The FONES has agreed to continue serving on the CEP working groups as far as it is able. It will have particular responsibility for stockpiling issues. At the same time, it will continue to use its contacts selectively to exchange additional information on risk assessments and management strategies that is of use to Switzerland. A particular area of focus in the future will be closer coordination with our neighbouring countries.

Partner support

²³ A self-contained start means that a power station is started up without an external electricity supply, i.e. independently of the power grid. Not all power stations are capable of this.

7 Conclusions

Faster and more flexible

Over the past four years, NES has done a great deal to adapt to constantly changing operating conditions and new risks. As a result, threats can now be identified at an earlier stage, and action taken more swiftly. The range of measures has also been expanded accordingly. There is still plenty to be done, however. NES will have to continue adapting to developments in the future. Based on the NESAs, this will not only mean drawing up new measures where necessary, but also subjecting existing efforts to a critical review, and optimising them as appropriate.

Interdisciplinary cooperation

Supply processes face risks that are increasingly difficult to predict. The shortage of mineral oil products in the autumn of 2015 (see Section 4.8) showed how a whole range of different factors can combine to produce a supply problem. This particular intervention highlights how important it is for NES to cooperate across a range of different areas to identify complex risks and to bridge supply gaps in good time. Thus, work in the future should focus even more closely on specific supply processes, while at the same time involving all units within the NES system. NES will also have to work more closely and effectively with other federal offices and private-sector companies. NES action should be even more closely coordinated with the actors concerned, and be publicised among as broad an audience as possible. This will support smooth implementation in the event of a crisis.

Formalised monitoring systems have improved the early-stage identification of impending supply crises in the therapeutic products, electricity and ICT segments. Monitoring of the supply situation affecting other processes should also become more systematic. A good basis of data will enable NES to put effective resilience programmes into action in the future.

Given that supply bottlenecks are generally difficult to forecast, preparations must be made before they occur, when supply processes are running smoothly. The new NESAs makes it possible to set binding requirements to make supply processes more resilient. The measures in question should be evaluated in close cooperation with the economic actors concerned. In the future, NES should increasingly concentrate at the prevention phase on supporting resilient supplies of vital goods and services.

Influence at an early stage

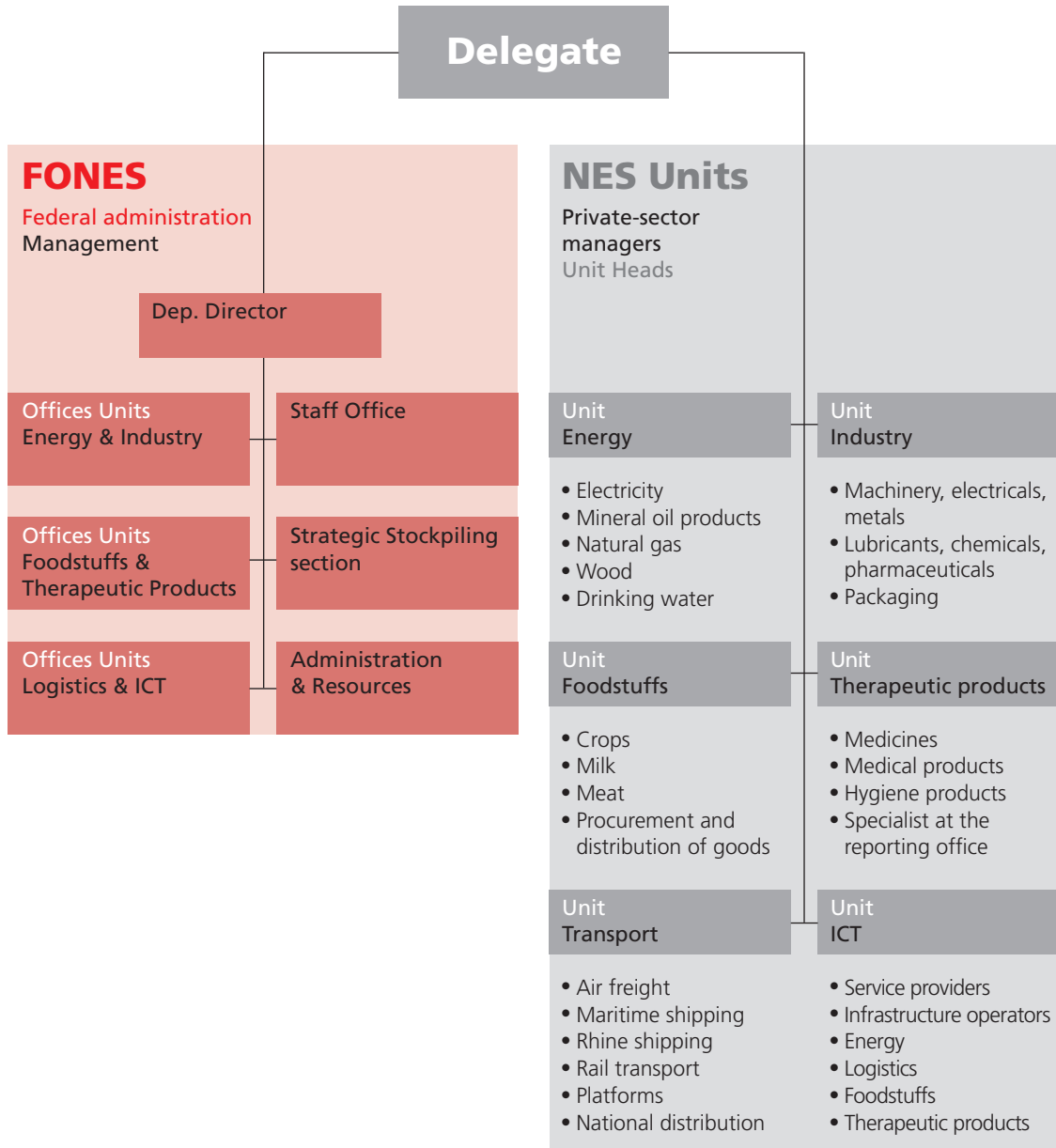
Resilience-building measures

8 Appendix

8.1 Abbreviations

CEP	(NATO's) Civil Emergency Planning programme
CIS	Commonwealth of Independent States
DETEC	Department of the Environment, Transport, Energy and Communications
EAER	Federal Department of Economic Affairs, Education and Research
FONES	Federal Office for National Economic Supply
FOPH	Federal Office of Public Health
IEA	International Energy Agency
NES	National Economic Supply
NESA	National Economic Supply Act
ODWE	Ordinance on Securing Drinking Water Supplies in Emergencies
OFCOM	Federal Office of Communications
OSTRAL	Organisation of electricity supplies in extraordinary situations (German acronym)
OTRAL	Organisation of transport logistics in extraordinary situations (German acronym)
SFOE	Swiss Federal Office of Energy
SRC	Swiss Red Cross

8.2 National Economic Supply organisation chart



8.3 Additional data on stockpiling

The values of goods (as at end-2015) held in compulsory stocks are listed below for each product group:

Compulsory stocks	CHF millions
Foodstuffs: ²⁴ sugar, rice, cooking oils/fats, grain, coffee, sources of carbohydrate, sources of protein, nitrogen fertilisers	536
Energy: ²⁵ petrol, kerosene, diesel, heating oil ²⁶	1,549 ²⁷
Therapeutic products: ²⁸ antibiotics for human and veterinary medicine, neuraminidase inhibitors, strong analgesics and opiates	27
Total	2,112

Complementary stocks	CHF millions
Foodstuffs: raw materials for yeast production	
Energy: uranium fuel bundles	
Therapeutic products: haemostatics, neuraminidase inhibitors (Swiss packs), insulin, blood bags, respiratory masks, surgical masks, exam gloves	
Industrial goods: polyethylene and additives, polyethylene terephthalate, polystyrene	
Total	116

The costs of holding compulsory stocks include compensation to companies from the guarantee funds, as well as the administration costs of the compulsory stock organisations (see Section 5.4).

Costs of holding compulsory stocks		
Year	Total in CHF millions	Per capita in CHF
1995	307	43
2000	164	23
2005	126	17
2010	116	15
2015	105	13

Source: FONES, Report on Strategic Stockpiling 2015, www.bwl.admin.ch, Documentation

²⁴ The values given for foodstuffs are market prices

²⁵ The values given for oil products correspond to the values for additions to and withdrawals from compulsory stocks, calculated according to a standardised method, excluding mineral oil tax.

²⁶ Including compulsory stocks of extra light heating oil as a substitute for natural gas.

²⁷ Values for mineral oil products are based on volatile market prices (e.g. end-2013: CHF 4.1 billion/end-2014: CHF 2.4 billion)

²⁸ The values given for therapeutic products are cost prices.

8.4 Overview of measures²⁹

Measures relating to the supply of foodstuffs

- Secure supplies of drinking water
- Release of compulsory stocks of foodstuffs, feedstuffs and fertilisers*
- Import promotion programmes
- General sale restrictions at the point of sale
- Food rationing
- Production management

Measures relating to the supply of energy/oil

- Release of compulsory stocks of petrol, heating oil, diesel and kerosene*
- Release of compulsory stocks of mineral oil products, as ordered by IEA*
- Accompanying measures
- Quotas for kerosene
- Rationing of petrol and diesel
- Management of heating oil

Measures relating to the supply of energy/gas

- Appeal to reduce gas consumption
- Non-contractual switch away from natural gas
- Release of compulsory stocks of heating oil as a substitute for natural gas*
- Management of single-fuel gas systems

Measures relating to the supply of energy/electricity

- Stockpiling of emergency electricity pylons
- Restrictions on electricity consumption
- Quotas for electricity
- Grid shut-downs
- ICT resilience measures in the electricity sector

Measures relating to the supply of energy/wood

- Higher wood usage

Measures relating to the supply of therapeutic products

- Release of compulsory stocks of therapeutic products*
- Release of compulsory stocks of polyethylene granulate*
- Minimum stock levels for disinfecting agents
- Quotas for Tamiflu®
- Quotas for masks and gloves
- Prioritisation of distribution

Measures relating to logistics

- Suspension of ban on Sunday and night-time journeys
- Adjustment of train drivers' working hours
- Adjustment of truck drivers' working hours
- Increase in total permitted weight for trucks
- Extension of customs opening hours
- Subsidiary transport insurance
- Prioritisation of rail transport
- Prioritisation of goods trans-shipment at terminals
- International network of country officers and port agents
- Use of Rhine shipping
- Use of Swiss maritime fleet
- OTRAL mineral oil products
- OTRAL terminal

Measures relating to the supply of ICT

- Contingency planning for telecommunications
- Measures to strengthen the resilience of telecommunications

²⁹ For a detailed description of individual measures, please consult the 2015 report on measures taken and planned, available in German and French from www.bwl.admin.ch, Documentation

* Stockpiling is a separate measure, independent of the release of compulsory stocks. For reasons of clarity, this list does not include normal stockpiling among the measures given. An overview of stockpiling measures can be found in Section 5.4 of this report.

Publication details

Published by: Federal Office for National Economic Supply FONES

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12.2016

