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Disaster Winter 2022/23 - Fiction or soon Reality?

"We can ignore reality, but not the consequences of an ignored reality."
(Markus Reisner, Herbert Saurugg)

[Translation of the original edition in German[1] without footnotes]

This article presents a gloomy but realistic scenario for the coming winter that few people can imagine. However, it is not a prediction, but a risk assessment describing possible expectable developments. This is because an understanding of the details always results from knowledge of the whole and not the other way around [cf. Meadows (1973)], which is crucial for successful risk reduction and crisis management capacity. Despite all the care taken, there remains a high degree of uncertainty about the actual course of events with such a large number of external factors and decisions that cannot be explained rationally.

Therefore, we should use the remaining time to implement at least those measures in crisis prevention where maximum success can be achieved with minimal effort. All this in the hope that things will turn out differently, but if they do, then we are prepared. Hope alone, however, is not enough!

Those in positions of responsibility tend towards the turkey illusion or, against their better judgement, avoid the necessary education and safety communication to prepare society for a possible catastrophic winter. Mostly with the well-intentioned argument that one does not want to unsettle people. Exactly this lays the foundation for chaotic and ill-considered action, because people tend to tunnel vision in stressful situations. Excessive "hoarding purchases" are one expression of this.

Another argument is that people are now tired of the crisis and therefore do not want to be confronted with yet another issue. However, we are now facing not just one crisis, as before, but several serious ones, which can also reinforce each other. Therefore, it is becoming more difficult every day to convey the seriousness of the situation to the population without triggering overreactions. As a society, we lack the sound basis to deal with such bad news. The lack of security communication and "intellectual national defence" of the past decades is now falling on our heads.

Waiting and hoping that things won't get so bad is grossly negligent and reduces society's ability to act and cope with crises with each passing day.

For the urgently needed social crisis fitness, we now need a quick and transparent as well as honest security communication that also addresses the areas where we do not yet have answers and where uncertainties exist for everyone. The lack of security communication and diffusion of responsibility has already led to an enormous loss of trust in the administration and politics and will probably continue to increase.

As is so often the case, therefore, the opposite of good is not evil, but well-intentioned. We still have the opportunity to prepare and implement meaningful measures. Let us not wait any longer, but start, each in his own area!

1 Introduction

1.1 General

Is Europe, and thus also Austria, heading for an unimaginable catastrophic winter? Currently, there are numerous indications of this and "weak signals" [cf. Weik (20102)] that seem to be ignored as they were over 100 years ago [cf. Clark (2013)]. Are the patterns of history repeating themselves? Quite possibly. We will only know with certainty (and thus evidence, as demanded by science) in the years to come. But by then it may already be too late.

[1] https://www.saurugg.net/katastrophenwinter22

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This article attempts a systemic view and the presentation of often overlooked interrelationships, which usually happens through separate thinking in individual parts ("silo thinking"). Because from a systemic perspective, understanding the details always comes from knowing the whole, not the other way around [cf. Meadows (1973)].

The focus in this article is predominantly on energy supply and thus only on a rather limited area in the current high dynamics and uncertainty. The potentially far-reaching consequences for the economy, the financial system or for us as a society as a whole can only be discussed in passing.

1.2 Cumulative, interconnected crises

After the end of the Cold War, we experienced a very stable period with a prosperous economy from 1991 to 2008. Even before that, a more or less stable period prevailed due to the "balance of terror". This very long phase was followed by a series of crises, which were triggered in 2007 with the bursting of the American real estate bubble. While risk experts at European banks were still sure in the summer of 2008 that the American crisis could not have any significant impact on Europe, they and all of us were taught otherwise a few weeks later [cf. Renn (2014)]. Although the crash was to be expected and corresponding warnings from experts existed [cf. Taleb (20135)], these were - as so often - ignored. Instead, people gave in to the turkey illusion, which can also be observed again and again in other areas.

1.3 Turkey illusion

A turkey that is fed by its owner day after day assumes, based on its daily positive experiences (feeding and care), that the owner can only mean well for it. The turkey lacks the essential information that this care serves only one purpose: the turkey is being eaten. On the day before Thanksgiving, when turkeys are traditionally slaughtered, the turkey experiences a fatal surprise.

This metaphor is used in the systemic community as a synonym for dealing with extremely rare events with catastrophic consequences (High Impact Low Probability (HILP) events [Weik (2013)], extreme events ("X-events") or strategic shocks [cf. Casti (2012), Casti et al. (2017), Taleb (2013)]). We like to confuse the absence of evidence with evidence for the absence of such events [cf. Taleb (2013)].

2 Crises in the recent past

2.1 The Covid pandemic and its consequences

After the American real estate crisis, one crisis followed another: Financial crisis, economic crisis, sovereign debt crisis, euro crisis, refugee crisis, until a new dimension was introduced at the beginning of 2020 with the spreading Covid pandemic: cumulative, interconnected crises that occur simultaneously and mutually reinforce each other. The previous coping strategy: massive and steadily increasing state financial interventions have, however, rather postponed and accumulated the problems than solved them, which can also be observed in the very tense situation in the financial market, which could also get out of control as a result of the expected crises.

Also, in the case of the corona pandemic, people were still convinced in many areas until the beginning of March 2020 that it was none of our business. Corresponding preparations were lacking everywhere [cf. Court of Auditors (2022)], although there had been corresponding warnings for years [cf. for example German Bundestag (2013)], which were pushed aside with the usual turkey illusion.

We have been really lucky so far, because there has not been an enormous mortality rate, as was expected, which could have brought the supply to a standstill. However, just because we have been lucky so far, we should not take it as a guarantee for the future. Quite the opposite. Science continues to warn of new and more severe pandemics. Have we learned from past experience? Justified doubts may be raised here, as the most recent report of the Court of Auditors also stated [cf. Court of Auditors (2022)].

So far, there have been no serious economic upheavals or consequences, which is probably due to the very high level of funding ("whatever the cost"). However, this has often only postponed the problems into the future. A necessary and meaningful adjustment ("adjustment") has hardly taken place. Although this happened with the best of intentions, it must probably be classified as a quick-and-dirty solution.

Actionism and Quick and Dirty Solutions

A quick-and-dirty (QaD) solution focuses on the symptom and can be implemented immediately, while the fundamental solution tries to eliminate the cause of the problem. QaD solutions are usually quick to apply but make the actual problem worse in the long term, while fundamental solutions often bring significant disadvantages in the short term and only prove beneficial in the long term [cf. Ossimitz (2006)].

The consequences of other QaD solutions in the context of pandemic management are only gradually becoming visible. The massive increase in mental health problems or the increased suicide rate among children and adolescents are only a few of the serious consequences, which were not caused by the infections but as a little-noticed side effect of the Covid measures. Little noticed side effects are a typical characteristic of ignored complexity.

Lack of systemic thinking and action

One of the biggest problems of our time is our linear, simple cause-and-effect or either-or thinking. This has made us very successful over decades, but it is not suitable for dealing with complex problems [cf. for example Lotter (2020), Thurner (2020)].

Through networking and digitalisation, we have created an incredibly complex system in recent decades that is becoming increasingly vulnerable and fragile. While these global structures have contributed to affluence and economic prosperity in stable times, they become dangerous breaking points in turbulent times.

These contradictions and ambiguities are often difficult for our black-and-white thinking to deal with [cf. Meadows (2010)]. At the same time, polarisation and a social divide have increased significantly in recent years, not only due to the pandemic and the measures associated with it. A considerable role is also played by the (social) media, which thrive on agitation and exacerbation and exploit this human weakness for the negative [cf. Bregman (2021)]. These exacerbate the problems and do not contribute to the solution and are a dangerous manipulation.

Instead, we would need a both/and or networked thinking in contexts and cooperation to be able to deal with the increasing complexity and the associated consequences and side effects. This would require us to expand our thinking framework. But the both/and principle must again not lead to an "everything is possible" mentality, which would again be counterproductive. A radically new approach is therefore needed to adequately meet the new challenges, such as the development of a "meta-reason" [cf. Bauer-Jelinek (2016)]: Differentiation instead of dogma. Decision-makers are challenged to answer the questions of goal (for what?), scale of action (how much?) and loss (at what cost?) before evaluating solutions. In this way, rapid adjustments to constantly changing circumstances can be made without losing face and without being accused of being haphazard.

However, the problem already starts with our education system, which is focused on the old industrial world of work and hardly meets the requirements of the network society [cf. Saurugg (2012)].

Therefore, it does not seem surprising that it obviously takes serious crises with enormous damage to force an adjustment through pressure from outside. This is an extremely unwise approach, guided by our evolutionary imprint of "learning from harm".

What was successful in the past ("selection") could quickly come to a dramatic end in today's highly interdependent world and supply logistics. There is enough systemically based and scientifically proven knowledge on this too [see for example Bardi (2017), Casti (2012), CSH (2020), Meadows (1973), Servigne (2020), Thurner (2020)], which has nothing to do with the rising conspiracy myths or other prophets of doom. Here, too, our either-or thinking prevents us from making a correct and useful classification. We like to quickly put everything into the same corner. A dangerous short-sightedness that has not led us to ruin in the first place. Therefore, numerous parallels to the "sleepwalkers" of the 20th century can be observed right now [cf. Clark (2013)]. Are the patterns of history repeating themselves? Quite possibly.

2.2 The Ukraine war and its consequences

While there was still hope until mid-February 2022 that the pandemic could end in the near future and that a return to the pre-2020 era would be possible, this hope was abruptly dashed with the invasion of Russian troops into Ukraine on 24 February 2022 and a new dimension of escalation was reached that was previously hardly thought possible and which has pushed the continuing pandemic into the background.

While many people and those in positions of responsibility still think that this is a dispute between two states that has little concrete impact on us, reality could catch up with us more quickly than we currently think possible. For as is already becoming apparent in the summer of 2022, the European sanctions are backfiring. Many huge side effects were obviously not considered or not taken into account in the decision-making process.

The previous assumption that close economic networking could prevent wars has not only been disproved, but is also leading to global chaos in the highly synchronised and optimised logistics chains. The actual consequences are not yet foreseeable, but much points to a possible devastating catastrophic winter in 2022/23. A possible food supply crisis has already been widely publicised [cf. CSH (2022)]. This would first affect other regions of the world, especially the Middle East and Africa. The social unrest triggered by this could in turn lead to a renewed migration movement that would not arrive in Europe until 2023 or later. But the massive upheavals in the energy market will not remain without consequences either.

What does not yet seem to be generally known is that no society can survive without sufficient and affordable resources, and here primarily energy. While in the past this was often a gradual and prolonged process [cf. Bardi (2017), Casti (2012), Servigne (2020)], today it could very quickly lead to incomprehensible supraregional or even global chaos due to the very high dependencies on logistics chains [cf. CSH (2020)]. This is also because, due to the extreme business optimisations in the past decades [cf. Dueck (2015)], there are hardly any fall-back levels left to deal with such serious disruptions. A modern high-performance society that is completely dependent on a functioning energy and telecommunications supply is clearly more vulnerable than many other world regions. Many actors do not seem to be really aware of this yet, otherwise it should not have come to this.

Therefore, there is the impression that the sanctions against Russia have been carried out in the best QaD solution manner, without sufficient assessment of the side effects. Otherwise, many decisions can hardly be explained. The invasion could certainly not be accepted without consequences. But cutting oneself off from the energy supply necessary for survival and believing that such massive energy flows can be compensated for in a short time does not necessarily show expertise or foresight. Common sense should tell us that a short-term change in energy supply is not feasible for technical and infrastructural reasons. Even lofty and pompous claims do not change this. Physics is not open to negotiation. The entire European energy transition is also characterised by much wishful thinking that cannot stand up to the hard reality of physics. More on this later.

As is becoming apparent, President Putin will not shy away from using the high dependencies on Russian resources and especially energy as a weapon and means of exerting pressure against the EU. This was obviously overlooked during the sanctions and in the years before, which may also be due to the fact that there were and are apparently hardly any corresponding early warning systems. Otherwise, everything should have been done to prevent an escalation of this conflict.

A certain arrogance and turkey illusion may have played a part in ignoring early warnings [Weik (20122)]. The alarm bells should have rung in July 2021 at the latest, when the Central European gas storage facilities used by Gazprom were no longer filled as usual. It remains to be seen whether this was already a sign of war or whether the storage facilities were kept free for even cheaper gas via Nord Stream 2. That would also be a possibility.

Other warnings that were voiced years ago not to put all our eggs in one basket, but to focus on diversity both in terms of suppliers and technologies or forms of energy, were also ignored. Our one-sided dependencies were increased even further. The general sell-off of critical infrastructures also continued without serious consideration of possible negative consequences. This is never a question of blaming individual actors, as acquiescence is also complicit. In many areas, people have simply looked the other way and continue to do so in order to maximise profits.

Our enormous social vulnerability has arisen in particular from the very one-sided business optimisation and increase in efficiency as well as from very short-sighted actions. Everything that did not directly contribute to the core process was outsourced or saved as "dead capital" [Dueck (2015)]. This also became visible at the beginning of the pandemic, when there were considerable problems with the supply of important and critical goods. Has anything changed noticeably in the meantime? Rather not. More and more logistics chains are reaching their limits and a serious chain reaction is becoming increasingly foreseeable [CSH (2020)]. The current delivery problems are probably only a foretaste.

However, we could already have known from past conflicts and sanctions that sanctions have practically never achieved their goal, but have almost always caused great damage. Our willingness and ability to learn may therefore be doubted.

2.3 A realistic gas shortage situation

At the time of writing, July 2022, the Nord Stream 1 gas pipeline was undergoing maintenance and not delivering gas to Central Europe. There are fears in many quarters that supplies would not resume once maintenance was completed, but this has not happened. But there is no guarantee that it will not be interrupted at a later date. A larger amount of gas should also have arrived via the important Austrian gas hub Baumgarten at the start of maintenance. The opposite happened; the inflow was significantly reduced.

Politicians and administrators often underestimate the consequences of a possible gas shortage. Here, too, we are dealing with a highly complex system that will hardly be manageable with simple administrative interventions ("energy control"). This observation was already made, for example, after the German transnational exercise (LÜKEX 2018) "Gas shortage situation in southern Germany". Have we learned anything from this? Not really. Compared to today's real situation, the exercise scenario was still manageable and limited to individual aspects.

A foreseeable need for energy control would therefore lead to hardly foreseeable chaos, as suggested, for example, by the findings of the Swiss Security Network Exercise in 2014. The scenario at that time "only" involved a pandemic with subsequent blackout and power shortage. The 2022/23 disaster winter scenario encompasses even more dimensions that hardly anyone could have imagined together. If one had created such an exercise scenario, one would probably have been declared crazy.

3 Outlook

3.1 Disaster scenario winter 2022/23

It is generally known that predictions are difficult, especially when they concern the future. Nevertheless, we should concern ourselves with possible developments and scenarios in order to strengthen our ability and competence to act in time and to prepare for unexpected events [cf. Weik (20135)]. Of course, everything can turn out quite differently.

Based on the developments so far, we should prepare ourselves as a society for a possible gas shortage in Central Europe. However, compartmentalised and narrow-minded thinking prevents this in most areas. For now, it's summer and holiday time. Parallels to the summer of 1914 are emerging, where in July one could not yet imagine that the First World War could begin shortly.

What is often overlooked when it comes to gas supply is that it is not just about heating or cooking, as certain actors like to convey in the media. Nor is it just about industry or a recession, but far worse, a possible societal collapse.

Interconnected gas system with high dependencies

Austria - like other countries - does not have a purely national gas supply system, but is part of a European interconnected system, even if this is not highly interconnected like the electricity supply system. The national storage facilities also store gas from other countries, as they do not have their own storage facilities. Western Austria, in turn, is supplied from Germany. The whole thing is handled via an international market. The stored gas therefore does not necessarily belong to us, even if the media like to portray it that way. Of course, it could be confiscated, but that would very quickly put an end to European solidarity and threaten even greater chaos. Hungary has already demonstrated this. Today, no member state is capable of surviving on its own, a fact that is often forgotten or ignored.

If the interconnected system loses its equilibrium due to massive pressure drops, no one really knows what will happen. An unstable system generally tends towards chaos. In any case, a long recovery time would have to be expected. Gas storage facilities could even become unusable. If, for example, the pressure at the lowest level, i.e. at the household level, were to drop too low, safety valves would be triggered, whereupon every single household would have to be manually reconnected to the gas grid. This could be countered by a power disconnection, which would keep the gas grid intact and only "freeze" it, possibly causing less damage.

Not to mention that electricity, food production and the chemical industry are highly dependent on the availability of gas. If precursors or products can no longer be supplied, a supply chain collapse is imminent [CSH (2020)]. Clear distinctions between important and non-important are rarely possible and there is no technical separation that would enable such granular control.18 For example, this would mean that tonnes of milk could not be processed in dairies but would have to be disposed of.

The products of a confectionery factory would basically not be essential for survival. But if 800 flats are heated with the waste heat from the production, this has a high relevance. Just one example among many. There are also many underestimated dependencies in the pharmaceutical industry. An under-complex QaD solution can therefore quickly trigger much greater chaos, as the non-delivery of cable harnesses for the car industry from Ukraine has shown.

Electricity shortage

A possible power shortage has long been considered the most likely networked crisis. However, no one has really imagined it in this networked dimension. This is because an escalating gas shortage situation would immediately lead to a situation in which the gas-fired power plants required for electricity grid stability could no longer be adequately supplied due to the falling pressure. In the first months of 2022, up to 30 percent of electricity in Austria was provided by gas-fired power plants. In addition, Austria is a large importer of electricity in winter. Without electricity rationing ("energy steering"), a winter with too little gas would hardly be manageable.

As if that were not enough, a severe electricity shortage is already on the horizon for the coming winter in France in the summer of 2022. Here, electricity prices for the 4th quarter of 2022 have already exploded on the futures market to as much as EUR 1,800 per megawatt hour (MWh). Last year, the price was less than EUR 100.

With the current European electricity market design, which was conceived for stable times with large overcapacities, large physical load flows are now also being provoked. Electricity trading, by definition, tries to sell to where the most is paid. However, the electricity supply infrastructure was never designed for this and is already coming up against limits more and more frequently. Due to the lack of grid infrastructure adaptation, grid stability must be maintained at increasing expense ("redispatch interventions"), contrary to market wishes.

In Germany, too, a power shortage situation is emerging, which the German Federal Audit Office warned of as early as March 2021 [Bundesrechnungshof (2021)]. At that time, however, only the nuclear and coal phase-out were included in the problem assessment. Now a possible gas shortage and a possible coal shortage are also added. This is because, in addition to the last three nuclear power plants, a number of coal-fired power plants were to be shut down by the end of the year. Others had already been taken off the grid on a large scale a year earlier. At the same time, a coal embargo was imposed on Russian hard coal, which now has to be procured from Brazil or Australia.

As a result, operational safety has also decreased drastically, because no one is investing in plants that will be shut down soon anyway. On the other hand, coal, which was also imported from Russia, is now missing in many places. This must now be procured in other regions of the world and transported to Germany. This is where the next problem comes into play: due to the extreme drought, the coal can probably only be transported to the power plants on the rivers to a limited extent. Alternative delivery routes or transport capacities hardly exist.

The extreme drought and the associated low water levels have already severely limited electricity production in many countries in the summer of 2022. Run-of-river power plants can no longer produce and thermal power plants such as nuclear power plants in France or Switzerland can no longer be cooled sufficiently and must drastically reduce their production. At the same time, almost half of the French nuclear power plants are expected to be taken off the grid by the end of the year for safety reasons or maintenance.

In other countries, too, electricity production from run-of-river power plants is suffering from the extreme drought and could additionally contribute to reduced electricity production in the coming winter, as is already happening quite massively in northern Italy.

It therefore seems more than appropriate to prepare for a possible power shortage in the coming winter with far-reaching consequences. For it is not only a matter of planned, rolling power cuts ("rolling black-outs"), but of serious supply bottlenecks and failures.

3.2 Serious supply crises

On this subject in the interim report of the Swiss Security Union Exercise 2014 (SVU'14):

> *It is not the power blackout but the prolonged power shortage that emerges as the greatest challenge in the SVU'14 scenario. A total failure of certain critical infrastructures is very likely, because less electricity often does not mean that less works, but that nothing works at all. Information and communication technologies (ICT) control important systems (transport, telephony, warehousing, payment transactions, etc.). Today, nothing works without ICT, but ICT*

does not work without electricity. In this situation, diesel or other fuels are indispensable as a substitute for local electricity production.

Maintaining the basic supply of consumer goods for the population quickly becomes centralised and very difficult to achieve. Moreover, since the usual communication channels are very limited, a prolonged power shortage is not to be underestimated, but a Herculean task for all involved.

If all this were not enough, fuel supply problems should also be expected in the coming months. Not only due to the incident at the Schwechat refinery in June 2022, but also otherwise this system is already being operated at the limit in many regions.

In addition, more and more supply chains are disrupted and goods or product components are no longer available, also because in Germany, for example, there is a shortage of tens of thousands of lorry and bus drivers as well as train drivers, thus throwing entire supply chains out of balance.

Due to the momentum and feedback effects, problems in complex systems continue to escalate. This is where the exaggerated increase in efficiency of recent years comes into play, which means that there are hardly any buffers and reserves left to absorb major disruptions [Dueck (2015)]. Therefore, there is a threat of an abrupt phase transition: the thread is breaking [Bardi (2017)].

The current price increases are not only related to the exploding energy prices, but also to the demand that can no longer be met ("supply & demand"). A vicious circle that can hardly be stopped. Well-intentioned QaD solutions such as price caps or vouchers will quickly fizzle out and not solve the problem. Moreover, too much time has already been wasted on many solutions. The energy transition cannot be implemented without a massive reduction in energy demand. We have known that for a long time. In stable times, these measures would have been much easier and cheaper. Under pressure and preoccupation with permanent crisis management, this is becoming increasingly difficult. But before, the motto was: greed is cool and everything that didn't pay off in a short time wasn't implemented because the energy hardly cost anything. Now reality is catching up with us.

3.3 Social upheavals

Therefore, it is only a matter of time before there will be serious social upheavals in Europe as well. The first German municipal utility recently warned of such a development because the gas bill for new contracts will rise from the current EUR 1,500 per year to over EUR 4,700 for households from October 2022. Similar developments can also be expected for electricity bills. While the average annual price on the exchange was 3.1 cents per kWh in 2020, it has exploded to 9.7 cents in 2021 and to 19.6 cents per kWh so far in 2022.

These prices will foreseeably affect all areas of life where energy is needed - in other words, virtually everywhere. A rapid price reduction is currently not in sight, quite the opposite. As of July 2022, it is expected that it will take several years before the situation will calm down. This could still change due to a catastrophic winter in 2022. Should economic performance collapse massively, demand and thus prices will also fall. But all this is not to be wished for.

A study by the Institute of the German Economy concluded in July 2022 that the proportion of households at risk of energy poverty had risen to 25.2 percent in May 2022. An increase of around 11 percentage points in one year. In the meantime, wholesale prices have risen even more significantly. The actual costs will only reach the customers in the next few months due to the time-delayed billing. This not only raises inflation to record levels, but also has a socially explosive effect.

3.4 A possible blackout scenario

If all this were not more than enough, the described and further distortions in the European interconnected system also increase the danger of a Europe-wide power, infrastructure and supply failure ("blackout").

Since there is no generally applicable definition for the term blackout, it is important to provide one for the respective consideration. In this sense, the authors understand a blackout to mean

a sudden, supra-regional and prolonged power, infrastructure and supply failure affecting large parts of Europe or at least several countries. Help from outside is not possible.

It is seldom realised that the power supply is a European interconnected system, which is one of the most reliable in the world, but nevertheless an extremely fragile system where the balance between generation and consumption must be maintained at all times. Otherwise, the system will collapse. For years, different stress factors have been accumulating that favour

large-scale failure [Saurugg (2022)]. The stress factors previously presented here are now also being added, increasing the risk of a large-scale disruption across Europe.

In principle, there are extensive safety mechanisms to prevent such a large-scale disruption. However, these were designed for a power plant and grid situation that is becoming less and less common. In addition, there is no such thing as one hundred percent security, as the European transmission grid operators already stated in 2015 after the blackout in Turkey:

> *"A large electric power system is the most complex existing man-made machine. Although the common expectation of the public in the economically advanced countries is that the electric supply should never be interrupted, there is, unfortunately, no collapse-free power system." [ENTSO-E (2015). P. 46.]*

The assessment of whether a blackout is now really possible is quite controversial among experts. But a pandemic that would turn our lives upside down within a few days was hardly imaginable until March 2020, nor was a conventional war in the middle of Europe. Therefore, the turkey illusion is worth remembering here.

Devastating consequences of a blackout

The real danger of a blackout does not come from the power failure, but from the resulting and prolonged supply interruptions in all areas of life, which could bring our present (unprepared) society to the brink of collapse within a few days.

Even a large-scale power blackout lasting only a few hours - across several states - would already have the potential to trigger the most severe consequential damage in production and logistics, as neither the population nor the companies nor the state are prepared for such an event, as was already stated in 2010 in the study by the German Office of Technology Assessment "Gefährdung und Vulnerbarkeit moderner Gesellschaften - am Beispiel eines großräumigen und langandau-ernden Ausfalls der Stromversorgung" (Hazard and vulnerability of modern societies - using the example of a large-scale and prolonged power blackout):

> *"Due to the almost complete penetration of the living and working environment with electrically operated devices, the consequences of a long-lasting and large-scale power blackout would add up to a damage situation of special quality. All critical infrastructures would be affected, and a collapse of society as a whole could hardly be prevented. Despite this potential danger and catastrophe, society's awareness of the risks is only rudimentary. [Petermann et al. (2010)] p. 4.*
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> *"The impact analyses have shown that after only a few days in the affected area, it is no longer possible to ensure the nationwide and needs-based supply of the population with (vital) goods and services." [Petermann et al. (2010)] p. 15.*
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> *However, societal vulnerability has increased considerably in the past 10 years. The degree of preparedness has tended to decline, especially in organisations, companies, but also in the state, as fallback levels, reserves and stocks have often been saved as "dead capital" for business management considerations. Only then does a possible blackout become a completely underestimated catastrophe.*

While a power blackout in Austria could be resolved after about one to two days, at the European level it is expected to take about a week until electricity is flowing again everywhere. Austria and Switzerland can rebuild their grids much more quickly than Germany, for example, thanks to their pumped-storage power plants. Quite apart from the different size of the countries and the significantly higher coordination costs associated with it. However, the knock-on effects will last for months and longer. It is to be expected, for example, that it could take at least several days after the power blackout before mobile phones, landlines and the internet are more widely available again. This means that there will generally be no production, logistics or fuel supply until then. These are not expected to be able to restart more fully until the second week.

By then, however, 6 million people in Austria will already have nothing to eat and they will see that the supermarkets are empty or possibly even destroyed and that nothing is coming [Kleb et al (2015)]. This is particularly critical for the personnel of emergency organisations or organised aid, but also for those companies that have to start emergency production again as quickly as possible. If people are starving and in crisis at home or cannot get fuel, they will not come to work. This means that a rapid resupply of the population with vital goods and services will not succeed. This is a vicious circle that can hardly be broken.

Yet a prepared society could cope well with such a scenario: If as many people as possible could provide themselves with the most essential goods and services for at least 14 days, emergency supplies could be quickly restored. However, comprehensive and informative safety communication is still lacking [see Giebel (2012)]. On the contrary: the danger of a possible gas

shortage with all its foreseeable consequences continues to be played down. This deprives people of the opportunity to seriously consider precautionary measures in good time. Only this initial situation can lead to a real catastrophic winter in 2022.

4 Conclusions

With the invasion of Ukraine by the armed forces of the Russian Federation on 24 February 2022, the world experienced what many considered a surprising turning point in the middle of Europe. Since then, a war has been raging with a military quality that was unimaginable for most people in Central Europe. The use of mechanised formations, massive artillery deployment and the hitherto hardly known use of ballistic missiles are now part of everyday life in Ukraine.

Before that, the Covid crisis and its consequences already showed us drastically that the unexpected can happen. And when an exceptional event occurs, there is little or no time left to prepare for it. One is forced to cope with the challenge that arises with the means at one's disposal. For years, the defence policy risk assessment of the Austrian Armed Forces has rated the probability of a blackout occurring in the next few years as almost certain. The particular complexity of a blackout lies in the simultaneity and the immediate occurrence of events and damage without warning. A blackout results in an immediate, supra-regional and prolonged power, infrastructure and supply failure affecting large parts of the European continent. A blackout can be intentional (e.g. due to an attack) or triggered by grid instabilities - whatever the cause. This also includes possible consequences arising from the conflict in Ukraine. Let's keep in mind that the Ukrainian grid has been connected to our continental European grid since the first weeks of the war.

The consequences of a blackout or even a severe gas and electricity shortage would overwhelm our society as a whole. At the same time, there are many false expectations of the performance of "the state" or, more precisely, of its organs.

But the resilience of state institutions is not particularly high either, as the refugee crisis in 2015 or the pandemic that followed in 2020 have already shown [see, for example, ACA (2022)]. Resilience is not, as is often assumed, only the ability to resist, but also the ability to adapt and learn, which is often ignored. This also means dealing with events that have already occurred and, ideally, adapting before the damage is done through appropriate anticipation, i.e. anticipating possible developments. Here, however, we obviously lack crisis fitness in very many areas. The establishment of self-sufficiency of police stations or army barracks by 2024 or later, as well as the Crisis Safety Act, which has yet to be implemented, are an important start, but will not help us much in the possibly disastrous winter of 2023.

This means that we as a society, as individuals, municipalities, companies, etc. will be largely left to our own devices in such a serious, large-scale and prolonged crisis situation. Even the best-equipped and best-prepared authorities and organisations with security tasks (BOS) would not be able to do much about this. For no one can help millions of people in such an inconceivable situation. This is not to take away anyone's responsibility, because it always takes all forces and resources to be able to cope with such a crisis. However, so far, few people are really aware of this and understand it. For this reason, appropriately well-founded safety communication in the run-up to a crisis is decisive for the course of the crisis. Because crisis fitness begins in the mind and in decentralised functional units.

In the 1970s, Comprehensive National Defence (ULV) was developed as a very holistic approach to deal with the anticipated threats of the Cold War. Even if the wording has clearly become outdated, the basic idea is still fully valid and should be reactivated urgently. In addition to military (MLV) and civil (ZLV) defence, its main cornerstones are above all spiritual (GLV) and economic national defence (WLV).

The success of all these measures will essentially depend on us ourselves. If we ourselves are prepared to accept the possibility of the scenarios presented, and if we begin to take forward-looking actions in our own sphere, we will be resilient enough to be able to overcome the challenges together. That means thinking about the impossible now and preparing for it. Resilience and crisis fitness starts in our heads. Only when we accept and anticipate the future challenges will we be able to solve them, for which, however, there will not be enough time in the short term to make sound preparations for a possible catastrophic winter in 2022/23. Nevertheless, we still have to make use of every opportunity.

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Further literature and links

Numerous authors served as the basis for this comprehensive systemic view: https://www.saurugg.net/ueber-mich/literaturliste

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