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### Crisis scenarios Strasbourg-Kehl 2050

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# Crisis scenarios Strasbourg-Kehl 2050

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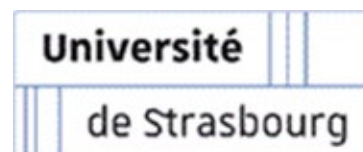
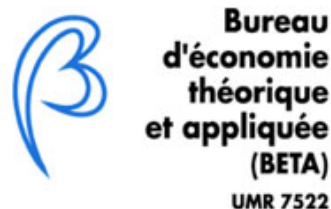
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## 1 Introduction

The scenarios presented here are the result of a collective exercise in prospective fiction that took place on the 4th of July 2024 in Kehl (Germany) as part of the European pilot project entitled IMMER (Increasing Municipal Mobility and Energy Resilience). This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101094455.

The collective effort in crafting these narratives resulted in three distinct scenarios titled "Tsunami 2050", "Blackout 2050", and "Collapse 2050". This exercise involved approximately thirty representatives from key local stakeholders, including businesses, ports, energy producers, mobility operators, public authorities, and academics.

The process was preceded by a series of preliminary interviews with these stakeholders in the weeks leading up to the main event. The plausibility of these scenarios is grounded in the current concerns and fears of these stakeholders. Specifically, there are significant questions regarding the mid- and long-term stability of energy infrastructures, as well as the mobility of goods and people.

## 2 Blackout 2050



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The exercise was preceded by a series of preliminary interviews with several of these stakeholders in the weeks leading up to it. The plausibility of this scenario is based in particular on the current fears of these players. In particular, questions are being raised about the mid- and long-term stability of energy infrastructures and the mobility of goods and people as a result of the climate crisis. In addition, the risks of hacking and terrorist action are growing. Finally, actions resulting from hybrid warfare cannot be ruled out.

### **D-30 to D-1: Worrying signs**

In the spring of 2050, the fragility of energy and mobility infrastructures is becoming increasingly apparent. The climate crisis is impacting energy production and distribution in particular, but also road, rail and river transport. The economic, political and social context is deteriorating, and the geostrategic situation is tense.

### **Day zero: Friday 13 May 2050**

An unidentified organisation is targeting several key points on the electricity grid in France and Germany. Sabotage teams manage to infiltrate several power stations and detonate high-impact explosive charges. Major distribution points are also sabotaged and cyber attacks are carried out simultaneously to maximize the destructive impact. Overnight, the entire system becomes totally inoperable.

A state of emergency is declared as uncertainty over the supply of electricity grows.

Communication systems are out of order and information is no longer circulating, with the immediate effect of bringing the public authorities to a virtual standstill.

### **The weeks that follow**

With the regional electricity system shut down, cooling systems are no longer functioning, rapidly rendering perishable foodstuffs unfit for consumption. Money is rapidly disappearing from circulation, leading to extreme levels of hoarding. Weapons and essential or survival products become more precious than money. The blackout leads to a reversal of value chains, and as money loses its value, exchanges of goods become the norm for obtaining goods. The barter economy emerges as the most appropriate exchange model.

Against a backdrop of unprecedented crisis, the food shortage becomes a crucial challenge in the space of just a few days. Populations are driven to the brink of starvation, forced to consume any food they can find to ensure their survival. The health situation deteriorates rapidly, with drinking water supplies severely compromised. This factor is exacerbating the state of a health system already weakened by the widespread power cuts. Access to hospital facilities becomes virtually impossible, while the number of patients continues to grow. Faced with a shortage of medicines, the mortality rate is soaring and some patients are becoming unmanageable. Against

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this alarming backdrop, a mass exodus begins. City dwellers, in search of vital resources, leave the urban centers or converge on the Rhine. The river becomes a favorite fishing ground, offering a source of food that does not need to be preserved. This migratory phenomenon testifies to the urgency of the situation and the survival instinct that now drives the population.

Crime is soaring, with a worrying upswing in criminal activity, with looting becoming commonplace. This unprecedented crisis leads to profound social changes, the struggle for survival becoming a daily reality for everyone. The social fabric is rapidly disintegrating, giving way to a hostile environment marked by daily scenes of violence. The atmosphere is heavy, imbued with the negative emotions that have come to characterize this decaying society. Faced with a shortage of energy, the inhabitants are forced to rethink the way they travel. Non-motorized means of transport make a comeback. The streets, once dominated by motor vehicles, are now bursting with cyclists and pedestrians. Even more surprisingly, horses are returning to the urban landscape, bringing to mind an era thought long gone. This shift towards alternative modes of transport bears witness to the forced adaptability of a population faced with a major energy crisis. It also highlights the colossal challenges facing society in maintaining a form of mobility in this new world without electricity.

### **One year later...**

In 2051, energy, and in particular electricity, remains a scarce commodity (with residents not connected to the grid and frequent power cuts).

The absence of electricity has different consequences depending on the seasons. In winter, heating becomes difficult, leading to deaths from the cold. In summer, the inability to cool homes leads to heat-related deaths.

The few infrastructures that have been reactivated produce a very limited amount of energy. Communication channels are still largely out of use, making telephones, computers and televisions obsolete. Alternative solutions for generating small amounts of energy are beginning to emerge: some people produce their own energy by pedalling, a few solar panels have been recovered and put back into service, etc.

The idea of using gas from Russia is also being considered, although the political consequences of this decision for the region are difficult to predict. The question of the intervention of the world's major powers, notably China and Russia, also remains uncertain. It is difficult to determine whether they will be prepared to help Europe or whether they will prefer to invade the region to control its strategic position at the heart of Europe.

Local communities, formed in the months following the blackout, have developed and are now the norm. Society is being organized at local level, which remains the easiest level at which to share information. People are organizing themselves to rebuild a society, although living standards are extremely low due to limited resources, and in some parts of the region conditions are dramatic. The will to rebuild a society is there.

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Life expectancy has fallen sharply, medicines are in short supply and access to care remains limited. The risks of large-scale contagion from various infections circulating within communities are increasing every day. The fear of a pandemic is omnipresent, as populations are aware that the lack of medicines makes them particularly vulnerable to microbes.

After a year, inflation is very high, making all goods particularly expensive, because production was interrupted during the blackout and has not yet resumed. When it comes to clothing, for example, people are repairing what they have, and patchwork has become the only way of continuing to dress themselves. Food resources remain scarce, and the crops planted on the outskirts of the towns are still not enough to feed the entire population. A black market has developed for food products and weapons of all kinds, which are now highly prized.

Survival has become everyone's main objective, erasing the pre-crisis rhythm of life, divided between work and holidays. The entire population is now working full-time to survive. People continue to travel, but the state of the roads is deteriorating, making the bicycle, which has been widely used over the past year, less and less suitable. Some are choosing to move to the countryside to grow vegetables and cereals to support themselves. While waiting for the first harvests, they pick berries. Others moved closer to rivers to fish, adding a source of protein to their limited diet. Eating habits are evolving so that they no longer depend on traditional means of preservation, as refrigerators are still out of use.

There has been a loss of knowledge transfer and training, with the closure of schools and all training facilities. However, despite the priority given to survival, the resumption of education for younger children is beginning to be considered. The teachers still present in the area are thinking about ways of restarting the transfer of knowledge and training for children. Hopes for reconstruction remain high, because over the last few decades, society has been able to cope with numerous crises and adapt. The majority of survivors are convinced that solutions will be found to rebuild after the great blackout of 2050.

The region is facing an unprecedented demographic upheaval. The blackout could lead to a radical transformation of the region's demographic landscape, according to experts. The extreme living conditions imposed by the situation could act as a powerful selection factor within the population. "We are potentially witnessing a form of natural regeneration of humanity," explains a demographer speaking on condition of anonymity. "Only the most resistant individuals will survive, which could, paradoxically, lead to the elimination of certain chronic diseases such as diabetes. However, demographic projections remain extremely uncertain. There are two opposing scenarios: on the one hand, harsh living conditions could lead to a significant decline in the population. On the other, the lack of contraception could lead to an unexpected demographic boom. "It's impossible to predict population trends with any certainty," admits one local official. "We're sailing in troubled waters, between a possible demographic collapse and a potential explosion in births."

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## Lessons from the future

A prolonged blackout is a much-feared scenario because it paralyses all aspects of society. Communication systems cease to function, making the transmission of information impossible. Governments, deprived of their means of communication, become powerless and threaten to collapse. Society as a whole is profoundly affected: essential infrastructures, public services and everyday lifestyles are turned upside down. Without electricity, the consequences are felt in all areas, from health to food safety and social relations. In short, the blackout leads to total disorganization, jeopardizing people's survival and well-being, and revealing the extent to which dependence on energy is key to maintaining order and stability.

Having imagined this situation in 2050 and its consequences in 2051, the measures that seem appropriate to put in place in the coming years are as follows.

1. The main short-term problem is organizing emergency resources and ways of communicating with the population when all digital resources are out of order. As companies are currently very dependent on electricity-powered technologies, action to reduce this dependence would be beneficial in the event of a crisis impacting the energy production system. To do this, simulate a prolonged power cut or a cyber-attack that renders the communication network unusable, to see how it would be possible to operate without digital tools and thus be able to ensure communication and minimal activity in the event of a crisis.
2. In order to be able to continue working and producing in the event of a prolonged power cut, we can propose a day without computers in each company, to be set up at a certain frequency in order to develop habits and networks of people who can be mobilized in the event of a crisis.
3. To be more responsive and resilient in systemic terms, we need to be less specialized. As far as energy is concerned, various proposals emerged. Building smart grids now is one of the ideas discussed. Turning to decentralized energy production infrastructures - which do not require human intervention - redundancy of energy systems. A key element appears to be the diversification of energy supply sources. Having different energy production systems running on different raw materials (gas, uranium, oil, solar, wind, etc.) is one way of ensuring a certain level of energy supply in the event of a crisis. The development of renewable energy units which would supply the system in normal times but which would have the capacity to supply more energy in the event of demand. This could lead to the creation of excess energy capacity.
4. Increase investment in local initiatives. In particular, the construction of networks of people who are key to local and regional resilience. In the event of a crisis, the local level appears to be the most crucial for the populations affected. It is therefore essential to strengthen crisis management capabilities at local level. A local authority must know how to react, protect its population and ensure its long-term survival.

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5. The state is currently facing the challenge of its credibility in crisis management. A key issue in this is the often distant decision-making process, which does not always take the specific circumstances on the ground into account. Since decision-makers are usually not directly confronted with the crisis, decisions may often be less well-suited to the situation – in contrast to mayors and local organizations working on-site. A stronger involvement of local actors in the decision-making processes, as well as targeted provision of resources and training, could contribute to noticeable improvements.

6. Sharing agricultural knowledge could be an essential element of resilience. To achieve this, we need to ensure that every inhabitant has access to a growing area. Having access to basic agricultural knowledge could make our highly service-oriented societies less dependent on imports, while at the same time promoting and preserving ancestral knowledge. This approach would promote self-sufficiency and strengthen the ability of communities to survive and prosper in difficult conditions. By disseminating this knowledge, we could build a more resilient and sustainable society in the face of future challenges.

7. To develop a more resilient healthcare system, it is crucial to secure means of communication, even in the absence of conventional resources such as electricity. This means using robust, autonomous technologies, such as satellite communication networks or low-power radio systems, to guarantee continuous communication. In addition, back-up solutions, such as portable solar generators and long-life batteries, can keep intelligent systems operational during a blackout. The creation of an intelligent system must also include data backup protocols and manual procedures to ensure continuity of care, supported by autonomous medical devices and renewable energy storage infrastructures.

The measures proposed here are not only a means of avoiding disaster, but also of responding as effectively as possible to the consequences of a similar crisis. These two visions of resilience are complementary. Despite the negative consequences mentioned by the participants, it was emphasized that such a scenario could also have positive aspects. For example, CO<sub>2</sub> emissions could be considerably reduced, which could ultimately reduce the frequency of natural disasters linked to climate change.



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### 3 Tsunami 2050



The exercise was preceded by a series of preliminary interviews with several of these stakeholders in the weeks leading up to it. The plausibility of this scenario is based in particular on the current fears of these stakeholders. This extreme scenario is not impossible and the collapse of mountain section has already occurred several millennia ago in the Alps; moreover, the probability of such an event is increasing with global warming, which is weakening the permafrost inside the peaks.

#### **D-30 to D-1: Worrying signs**

Months or even weeks before the river tsunami strikes, the scientific measuring stations of the research institutes and meteorological services are already recording a clear melting of the permafrost and serious cracks in the structure of the glaciers. When the first ice caps break off (around 2 to 3 days before the tsunami reaches Strasbourg-Kehl), high-ranking politicians at national level in Switzerland, Germany and France are informed by the research institutes and civil protection authorities that the disaster is bound to happen. As soon as the first signs of a major mountain collapse appear, photos, videos and reports are disseminated via social media. This information is picked up by the news channels and made available to an even wider audience.

Hours before the catastrophic wave reaches our conurbation, panic quickly sets in, due to the news being widely disseminated by the media. Many of the inhabitants of Strasbourg and Kehl think only of fleeing - generally to nearby areas that are considered safe because they are sig-

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nificantly higher than the banks of the river. The people of Strasbourg rush to the Vosges foothills, or even further afield if they had relatives able to shelter them in the Vosges or other regions. Residents of Kehl do the same, heading for Freiburg im Breisgau or the Black Forest.

### **Day zero: Friday 13 May 2050**

The anarchy generated by this panic causes most of the communication routes to be blocked, making the situation even worse. Furthermore, some flooded areas make the roads impassable, trapping some fugitives. Energy infrastructures such as power stations are affected, bringing most rail transport to a halt. Traffic lights are also failing, further disrupting road traffic - even in areas not directly affected by the flooding. Part of the radio network is out of action, disrupting communications, including mobile phones: people are no longer able to communicate with each other, and the public authorities are having difficulty disseminating safety instructions. As the production and trade are highly dependent on telecommunications (internet, AI...), ordinary economic life collapses. Soon enough, food supplies are in short supply. Among the other networks affected, the water network is disrupted, as treatment plants go out of service and distribution is disrupted, with at least two consequences: drinking water shortages for the population and pollution of land and river water downstream.

### **The weeks that follow**

Some of the flooded industrial facilities are creating secondary disasters and adding chemical pollution to the environment - and even radioactive pollution, as the dismantling facilities at the Fessenheim plant have been affected and there is still radioactive material on site that has not been sent to national reprocessing/storage sites such as La Hague or the facilities in Meuse and Haute-Marne. As far as industrial safety is concerned, we'll know more when the inventory of the damage has been completed, but for the time being mistrust reigns, which is increasing panic among the population.

Essential public services are largely affected: hospitals, police, various municipal services, etc. In an atmosphere of panic reinforced by institutional chaos, selfish and cynical behavior is on the rise among the population. The safety of people and property deteriorates rapidly. The population naturally turned to the nearest authorities (Town Hall, Prefecture, Regierungsbezirk, etc.), which were momentarily overwhelmed by the scale of the crisis. The self-organization of local residents makes it possible to minimize many of the individual and collective tragedies, but only very partially to resolve the countless problems that have arisen. Cross-border solidarity, which should be a key element in the response to the joint disaster, is not working very well in the short term.

What's more, the Rhine is technically becoming a hermetic border for local residents, which has a major impact on the thousands of cross-border commuters who normally cross it every day, separating families and so on.

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## **One year later...**

In 2051, a large part of the population of the Strasbourg-Kehl conurbation (the survivors) found refuge in communes in the region that were not been affected by the disaster. Makeshift camps were set up. Motivation and commitment were strong at first, but after a year, a certain weariness sets in and the refugees feel abandoned. Now that the town centers have been partially destroyed, the question of reconstruction arises. Some people suggest that former picturesque tourist areas should not be rebuilt identically. Can't we build something new on top of the rubble of the old, and thus increase future resilience by building higher (a city 5m higher) and differently (with new architecture)? The overall economic situation has deteriorated as the tsunami has continued its course towards the central Rhineland and Holland.

Many areas other than the Upper Rhine are affected, including populated and industrialized areas. In financial terms, reconstruction has been made difficult because insurance and reinsurance companies (particularly in Switzerland) are unable to fulfil their role. The aid that has poured in from the rest of the world has sometimes harmed more than it helped. Reconstruction policies are being implemented, bearing in mind that the population of Strasbourg has been partially relocated towards the Vosges mountains.

In addition to government intervention and European aid, inter-municipal cooperation appears to be crucial. Inland waterway logistics are picking up, but only to a very limited extent. Supply remains seriously disrupted for most goods, and we are relying heavily on short distribution channels, at least in the short term. The conurbation's energy supply needs to be completely overhauled as a matter of urgency, and many new solutions are being considered - solutions that will undoubtedly shape the future.

The rebuilding of communication routes (roads and railways) is also leading to a rethinking of the entire system to ensure greater resilience. The question of reindustrialization is being debated. Because of the scale of the losses, the insurance industry is having to rebuild and even reinvent itself.

## **Lessons from the future**

Having imagined this situation in 2050 and its consequences in 2051, the measures that seem appropriate to put in place in the coming years are as follows.

1. Carry out a complete review of territorial weaknesses in the event of a serious crisis such as this tsunami. GIS (Geographic Information System) documents need to be produced, with risk mapping. Precise evacuation plans for residents potentially at risk need to be drawn up, and there needs to be communication on the subject.

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2. Thinking about the relationship between geographical scales. External aid, such as that from Europe (RescEU) and the rest of the world, must be better coordinated and managed locally. There is a risk that cross-border cooperation will be ineffective if it is not seriously thought through before the disasters strike.
  3. Crisis management must be the subject not only of in-depth studies but also of training exercises. Local authority staff are the first to be involved, but this does not mean that the population at large should not be prepared/educated, especially young people... because they are the ones who will be living in the future.
  4. The use of modern technologies, such as computer modelling or artificial intelligence, in crisis management should support crisis management in all phases (before, during and after the crisis).
  5. Whatever the form, the documents to be made available to the population (crisis manuals) must be adapted to the various categories: residents, public authorities, factories, businesses, etc.
  6. Implement ecological measures now to minimize the effects of future disasters such as major floods and associated pollution: reforestation, replanting hedges, water expansion areas such as polders, etc. Tighten up the regulations applicable to industry.
  7. When it comes to town planning, check that all precautions have been taken.
  8. Crisis management needs to be part of a common body of knowledge, but an institution like the EU is a central player in devising and disseminating basic ideas in this area. At the same time, the exchange of best practice between states should be encouraged - and the Upper Rhine area is a model for this.
  9. Sociologically, finding a way to strengthen the sense of solidarity.
  10. Politically, to improve multi-level coordination, because crisis management involves both local governance to a very large extent and many resources that are organised nationally (or at Land level in Germany).
  11. At cross-border level, set up joint warning systems. This is not only useful in the event of a crisis, but also now, because it forces us to think about the interfacing of national systems and the exchange of ideas.



The exercise was preceded by a series of preliminary interviews with several of these stakeholders in the weeks leading up to it. The plausibility of this scenario is underpinned by growing concerns about the impact of human activity on nature. In particular, human intervention in hitherto preserved ecosystems and the gradual thawing of the polar ice caps raise questions about the potential release of unknown viruses. These pathogens, imprisoned for millennia in isolated environments, could emerge with unpredictable health consequences. Rapidly changing climatic conditions increase the likelihood of such events, making the scenario of the appearance of an unknown virus not only plausible, but increasingly likely.

### **D-30 to D-1: Worrying signs**

In 2050, the Earth is already in a state of exacerbated vulnerability. The global economic crisis is dragging on, with growing inequalities driving an insurmountable gap between rich and poor. Politically, tensions between major powers such as the United States, China and Russia are reaching alarming levels. Wars are breaking out sporadically, accompanied by a migratory crisis to which Western governments, themselves experiencing issues, are struggling to respond. The social climate is one of anger, frustration and despair. Against this tense backdrop, the appearance of a virus of unknown origin in South America goes almost unnoticed.

It was only through videos posted on social networks that the world began to catch a glimpse of the growing threat. Individuals in the streets of small Amazonian towns are seen, clearly suffering from some kind of "rage". They are screaming, convulsing and relentlessly attacking anyone in their vicinity. This extreme and violent behavior is reminiscent of images of chaos,

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but its veracity is initially questioned. Many believe it to be fake news, fabricated to destabilize Western governments already on the brink of collapse. Yet the videos continue to multiply.

The experts are beginning to debate. Could this virus really be a mutant form of rabies? Some think it's a form of food poisoning, others evoke conspiracy theories, but the World Health Organization (WHO) is stalling, refusing to jump to conclusions. Meanwhile, behind the scenes, the virus is gaining ground. It is spreading rapidly through the affected populations, evolving until it becomes transmissible through saliva, making every human interaction potentially fatal.

Health systems in South American countries are overwhelmed. Governments try to conceal the scale of the disaster, but the truth emerges: the virus affects people in unpredictable ways, creating uncontrollable outbreaks of violence. The elites of some of the affected countries, including senior government officials, contract the virus. The governance of these nations collapses, creating a power vacuum that precipitates further chaos.

Scientists are out of their depth. No treatment appears to be effective. Experimental therapies failed, and vaccines were developed as a matter of urgency, but the results were catastrophic. The virus, nicknamed "Lyssavirus50", became the obsession of the alternative media. In the space of a few weeks, the situation worsened: the first reliable information revealed that cases are appearing in Europe, Africa and Asia. The world's population is waking up to an unprecedented health disaster, but it may already be too late.

The economic, political and social context is deteriorating and the geostrategic situation is tense.

### **Day zero: Friday 13 May 2050**

13 May 2050 is a day to remember. On that day, a global crisis erupted. What had previously been regarded as a conspiracy, an effect of disinformation, became a terrifying reality. The major news channels began to broadcast unbearable images from international airports over and over again. In Frankfurt, one of the world's major air hubs, the situation is spiraling out of control.

In Hall 2 of the airport, a video that has gone viral shows a group of passengers clearly affected by the virus. They are roaming the corridors, screaming and attacking anyone who comes near them. The violence is so brutal, so immediate, that many Internet users at first claim it is staged. But journalists on the scene quickly confirmed the authenticity of the video. Scenes of absolute chaos are repeated in airports around the world. Passenger flows, already colossal, become unmanageable. People, terrified, fight to escape from areas considered to be infected.

The symptoms of the virus are now well known: anxiety, confusion, hallucinations, fear of water and fresh air, but above all, unpredictable hyperviolence. Individuals attack their own family, friends and strangers, without any apparent logic. In airport lobbies, the first victims of

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this chaotic behavior are beginning to pile up. The authorities, overwhelmed, try to react, but the security forces come up against unexpected resistance. Some police officers leave their posts, refusing to face the threat. Security measures disintegrate. In Frankfurt, passengers break through the roadblocks, rush into the streets and the city begins to panic.

Shops, particularly pharmacies and food shops, are taken by storm. The fear of running out of resources, coupled with the behavioral amplification caused by terror, is leading to irrational behavior. Shelves are being emptied at an unprecedented rate. Hospitals, already saturated, can no longer cope with the waves of patients, and the authorities are considering, out of desperation, calling in the army. But even the military, aware of the uncontrollable nature of the threat, are reluctant to put themselves on the front line. The first cracks in the social fabric appear, as Frankfurt becomes the focus of a global crisis.

### **The weeks that follow**

The first few weeks that followed are marked by a rapid infrastructure collapse. The major cities, once connected by a dense public transport network, come to a standstill. Subways, buses, trains: everything stops. With no fuel in service stations, travel becomes impossible. It's not just the fear of the virus that is paralyzing people, but the total lack of transport and resources. The once crowded streets empty out, and an eerie silence descends, disturbed only by the sporadic cries of infected people still at large.

The population is divided into four distinct groups. The symptomatic infected, wandering and violent beings, are immediately ostracized. The asymptomatic infected, on the other hand, represent a more insidious danger, as they can transmit the virus without showing any visible signs. Those known as "at risk" - individuals who have been in contact with infected people - live in fear, dreading the appearance of the first symptoms every day. Finally, the uninfected, those who have been in contact neither with the infected nor with the virus, form a minority who try to protect themselves by all possible means.

The authorities, powerless, decide to take extreme measures. Quarantines are imposed in the worst-hit towns. Some areas are isolated behind barricades, sadly reminiscent of the confinements of the Covid-19 pandemic years, but this time the threat is much more direct and brutal. Armed militias are springing up in the deserted streets. These groups form spontaneously to protect the last remaining medical establishments, but also to prevent the looting that is becoming commonplace. Weapons, hitherto restricted to certain fringes of society, appear in the hands of ordinary citizens. Fear and mistrust turn cities into silent battlefields.

A state of emergency is declared in several countries, giving the forces of law and order greater powers. But the number of police and military available is decreasing daily, many having deserted or succumbed to the violence of the infected. Those who remain are forced to use disproportionate violence to maintain a semblance of order, which only makes the situation worse.

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Abuses of power multiply, and the very concept of the 'rule of law' collapses. Whatever trust remained between citizens and the state is eroding.

Energy infrastructures, in particular electricity, are no longer being maintained. In some regions, such as the Upper Rhine, electricity grids break down, plunging millions of homes into darkness. Refrigeration systems break down, and within a few days most perishable products are unfit for consumption. Faced with this food crisis, money quickly loses its value. Basic necessities - food, water, medicines, weapons - replace money in trade. Bartering becomes the norm. Supermarkets, looted in the first days of panic, are now empty, and hunger is driving people to desperate measures.

The Rhine, usually used for trade and transport, becomes a focal point for survivors. Whole families leave the urban centers, hoping to find food by fishing, or escape routes on boats. But the chaos extends to the water too: pleasure craft and commercial vessels are taken over by armed groups. Scenes of anarchy unfold along the riverbanks, and makeshift rafts tragically run aground, taking with them entire families trying to escape the nightmare of the cities.

Crime is exploding. The authorities no longer have the means to crack down on the growing number of crimes, ranging from simple theft to violent attacks on survivors. With resources running out, conflicts for control over the last food and energy reserves are multiplying. The omnipresent fear of the virus does not prevent the emergence of new social hierarchies based on brute force and the ability to seize the most precious goods. In a world where the rules of civilization are disappearing, only the strongest and most organized survive.

The situation becomes untenable in the urban centers, and many survivors choose to flee to the countryside, hoping to find some form of self-sufficiency or simply food. Those who remain in the city try to organize themselves into small self-sufficient communities, barricading their buildings and helping each other to survive using the means at hand. Urban gardens are springing up constantly, but they are not enough to feed the starving population.

The social fabric, once complex and interconnected, is being torn apart. Schools, universities, businesses - everything that made up the structure of daily life - is gradually disappearing. People now have just one objective: to survive. And to do that, everyone is fighting with the means at their disposal. In this period of brutal transition, violence has become the norm, and every day dozens of lives are sacrificed to the brutality of a collapsing world.

### **One year later...**

A year has passed since the collapse of society. The great metropolises, once vibrant with life and technology, are now nothing but empty husks, their skyscrapers torn apart by weather and riots. Silence reigns, disturbed only by the sound of a few survivors wandering around, looking for food or shelter. The virus, the rage that turned everything upside down, seems to have died out. The infected have all succumbed, their bodies rotting in the deserted streets. But the price was terrible: around 90% of the world's population perished.



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The survivors are a tiny fraction of the human race. Many of them had close brushes with death, but never succumbed to the disease. These virus-resistant individuals intrigue the few remaining doctors and biologists. Rudimentary studies, conducted with paltry resources, are attempting to identify the factors common to these survivors. Is there genetic protection? Specific eating habits? Or just a stroke of luck? These questions are haunting our minds, but they remain unanswered, especially as the scientific infrastructure has been destroyed.

Life is now organized around small local communities, often cut off from the rest of the world. Self-sufficiency has become the norm. Groups of survivors grow their own food, make their own tools and try to recreate a semblance of order. Electricity has become an inaccessible luxury. A few pedal-powered generators and solar panels salvaged from ruined roofs provide energy, but this is not enough to re-establish life as it was before. The self-management model has emerged out of necessity, but it is not without its flaws.

Social tensions, once channeled by governments and laws, resurface violently. In small communities, democratic organization works well at first, but criticism soon emerges. Some people feel that decisions are too slow and that the redistribution of resources is unequal. Conflicts erupt, often for trivial reasons but revealing the deep rifts that continue to divide human beings. Resources, as rare as they are precious, become the object of covetousness. Armed groups form, battles erupt, and violence resurfaces.

Some survivors try to migrate. Loaded down with stolen food, salvaged fuel and gleaned medicines, they wander the ruined roads. But these roads have become dangerous places, infested with criminals and bandits. Gangs, born of post-pandemic chaos, rule certain territories, imposing their law by force. With no official government to oppose them, these criminal factions thrive. The absence of centralized power has left a vacuum that the gangs fill, terrorizing small local communities and appropriating their resources.

Survival is mainly organized around local exchange systems. Money no longer has any value; only weapons, food and medicines still count. A black market is developing around these products, but the criminality generated by this system makes any attempt at trade dangerous. The value of weapons has soared, as each community seeks to protect itself against looting and attacks.

Life expectancy has fallen dramatically. Medical care is virtually non-existent, and medicines are in short supply. With no access to hospital infrastructure and faulty cooling systems, infections - both viral and bacterial - are wreaking havoc. Diseases that were once eradicated are reappearing, taking advantage of the weakened state of malnourished and poorly treated populations. Each new epidemic raises fears of a new pandemic, because the survivors know that they are particularly vulnerable without access to modern treatments.

The closure of schools and educational institutions leads to a massive loss of knowledge. The transfer of knowledge comes to an abrupt halt, and children grow up in a world where formal learning no longer exists. A handful of surviving teachers are trying to revive basic education for the youngest children, but immediate priorities such as survival are taking over. Yet hope

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persists. Some groups are thinking of ways to rebuild a society, even if the task seems titanic. They are convinced that, despite everything, humanity will be able to rise again.

However, a radical demographic transformation is underway. Experts cannot predict with certainty whether the population will continue to decline or whether, on the contrary, the disappearance of contraception could trigger an unexpected baby boom. What is certain is that the crisis of 2050 will leave an indelible mark on humanity, both in terms of population and social structure.

### **Lessons from the future**

Having imagined this situation in 2050 and its consequences in 2051, the measures that seem appropriate to put in place in the coming years are as follows.

1. Companies need to anticipate digital system failures. It seems crucial to develop analogue alternatives, such as low-power radios and satellite communication networks. Regular simulations of power cuts or cyber-attacks will make it possible to test the resilience of infrastructures and guarantee minimal communication in the event of a crisis.
2. To prepare people to function without digital tools, a "digital-free week" could be introduced in every workplace. This would make it possible to develop non-digital skills and strengthen human collaboration networks, thereby ensuring business continuity in times of crisis. This educational approach could be initiated at primary school level.
3. It might be useful to set up a "know-how database" at local level, stored on analogue media so that it can be accessed at any time (such as microfilm), which would bring together multi-purpose skills essential to collective survival. This directory will provide access to vital knowledge in the event of a power failure. At the same time, an inventory of local skills should be compiled to facilitate the efficient redistribution of tasks in times of crisis. This would enable "task shifting" between citizens, ensuring the flexibility and resilience of the local workforce. This inventory should be regularly updated to reflect population movements and the acquisition of new skills.
4. Investment should be made in local and renewable energy sources. These infrastructures, which are autonomous and decentralized, must be capable of operating in times of crisis without human intervention. The creation of energy overcapacities would make it possible to supply energy in times of increased need.
5. Crisis management should be partly decentralized to enable local actors to react quickly. Mayors and local organizations must be trained in crisis management, and resources must be allocated to them so that they can take decisions adapted to local realities.

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6. Each housing unit should be able to produce its own food. Basic agricultural knowledge could be disseminated among the population to reduce dependence on imports and agri-food industries. This would strengthen the self-sufficiency and resilience of communities.

7. It seems imperative to promote consumption practices that limit environmental degradation and the spread of zoonoses. Encouraging frugality, such as reducing meat consumption, and raising people's awareness of environmental issues would help minimize the risk of future pandemics.

## **5 Conclusion**

This exercise outlined a comprehensive approach to enhancing resilience and crisis management at local and regional levels. The key points and recommendations are detailed hereafter.

### **Crisis Preparation and Communication**

In the event of a crisis, such as a prolonged power cut or cyber-attack, it is crucial to have alternative communication methods. Companies should simulate power cuts and cyber-attacks to test their resilience and develop analogue alternatives like low-power radios and satellite communication networks. Implementing a "digital-free week" in workplaces can help employees develop non-digital skills and strengthen human collaboration networks, ensuring business continuity during crises<sup>1</sup>

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### **Energy Infrastructure and Diversification**

To enhance energy resilience, diversifying energy supply sources is essential. This includes investing in decentralized energy production infrastructures that do not require human intervention, such as smart grids, renewable energy units (solar, wind), and ensuring redundancy in energy systems. Building excess energy capacity through various energy production systems can guarantee a stable energy supply during crises<sup>1</sup>

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### **Local Resilience and Crisis Management**

Local level crisis management is critical. Investing in local initiatives, such as constructing networks of key people, is vital for regional resilience. Local authorities must be equipped to react quickly, protect their populations, and ensure long-term survival. This involves strengthening crisis management capabilities at the local level, including training and resource allocation for mayors and local organizations<sup>1</sup>

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## **Healthcare System Resilience**

Developing a resilient healthcare system involves securing communication means even without conventional resources like electricity. Using robust, autonomous technologies such as satellite communication networks or low-power radio systems, and backup solutions like portable solar generators and long-life batteries, can keep intelligent systems operational during blackouts. Data backup protocols and manual procedures should also be in place to ensure continuity of care<sup>1</sup>

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## **Territorial Weaknesses and Risk Mapping**

Conducting a thorough review of territorial weaknesses using Geographic Information System (GIS) documents and risk mapping is necessary. Precise evacuation plans for residents at risk should be drawn up, and there should be clear communication on these plans. External aid, such as from Europe (RescEU), must be better coordinated and managed locally to avoid ineffective cross-border cooperation<sup>1</sup>

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## **Training and Education**

Crisis management should be the subject of both in-depth studies and training exercises. Local authority staff and the general population, especially young people, need to be prepared and educated. Technologies like computer modelling and artificial intelligence should support crisis management in all phases<sup>1</sup>

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## **Ecological Measures and Urban Planning**

Implementing ecological measures such as reforestation, replanting hedges, and creating water expansion areas can minimize the effects of future disasters. Tightening regulations applicable to industry and ensuring all precautions are taken in town planning are also crucial. Promoting consumption practices that limit environmental degradation and the spread of zoonoses, such as reducing meat consumption, can help minimize the risk of future pandemics.

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## **Multi-Level Coordination and Solidarity**

Improving multi-level coordination between local governance and national resources is essential. Encouraging the exchange of best practices between states and setting up joint warning systems at the cross-border level can enhance crisis preparedness. Strengthening the sense of solidarity within communities is also vital for collective resilience<sup>1</sup>

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## **Knowledge Preservation and Local Skills**

Creating a "know-how database" at the local level, stored on analogue media, can provide access to vital knowledge during power failures. An inventory of local skills should be compiled to facilitate the efficient redistribution of tasks in times of crisis, enabling "task shifting" between citizens and ensuring the flexibility and resilience of the local workforce

In summary, the exercise stresses the importance of:

- Developing analogue communication alternatives and strengthening local crisis management capabilities.
- Diversifying and decentralizing energy production.
- Ensuring healthcare system resilience through autonomous technologies.
- Implementing training and education programs.
- Promoting ecological measures and responsible consumption practices.
- Enhancing multi-level coordination and community solidarity.
- Preserving local knowledge and skills.

These measures are liable to make communities more resilient and better prepared to face future challenges and disasters.