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When Crises Collide: Energy, Security, Climate Change

Geopolitical instability underpins the short-term energy-saving measures adopted in Europe in preparation for winter. Climate change's impact on energy insecurity highlights an urgent need to simultaneously integrate longer-term climate mitigation measures.

By Christine Eriksen and Andrin Hauri

Energy is among the key security issues that have risen to the top of political agendas internationally since Russia's invasion of Ukraine on 24 February 2022. While the matter is often referred to as a crisis of energy supply, a deeper analysis reveals a triple-dilemma that has been decades in the making. It is driven by three entwined challenges: 1) the high energy demands of current standards of living in Europe, 2) the impact of geopolitical conflicts on energy supply security, and 3) a climate crisis that is exacerbated by a continued reliance on fossil fuels. The fact is, while the political will to act in a sustained and committed manner was lacking, climate change had already made the link between energy and insecurity demonstrably clear long before the war in Ukraine began. It has taken the immediacy of the impact of a potential energy supply shortage on European households and industries this winter to make energy security not only headline-news but also an energy-consumption regulator.

Sadly, a perceived lack of urgency doggedly negates the linked acuteness of implementing longer-term mitigation measures that will stem unchecked climate change. Short of newsflashes reporting death and destruction by heat waves, wildfires, or floods, the climate crisis struggles to retain a prominent position in political and public attention-cycles, in large parts because the everyday lives of many Europeans have not been markedly changed or inconvenienced, yet. Particularly troublesome is how the current geopolitical conflict with Russia has sidelined, paused or, in some cases, directly reversed policy measures initiated to address climate change just at a time when a sustainable energy transition had gained political traction with the 2020 European Green Deal and national strategies.[1]

This Policy Perspective argues that while recently announced energy-saving measures are critical in the short term to avoid shortages in Europe this winter, the positive feedback loop between climate change and energy insecuri-

Key Points

- Climate change will have a more lasting and far-reaching impact on Europe's energy security than the war in Ukraine. Its ultimate impact increases significantly for every year without action.
- Some of the politically and economically driven measures taken to secure Europe's energy supply in the short term have the potential to jeopardize the transition to a resilient and environmentally sustainable energy future.
- The ripple effect of the war in Ukraine shows that the drastic measures, economic investments, and everyday inconveniences required to implement climate mitigation measures are not only possible but also socially acceptable if the threat is perceived to be immediate.

ty makes immediate longer-term climate mitigation measures an imperative. The momentum gained due to the conflict with Russia must be used to invest in a resilient, and ultimately sustainable, energy supply – in terms of production, storage, distribution, and consumption. This will reduce the impact of geopolitical turmoil, help to stem unchecked climate change, and create capacity to cope with the short- and long-term challenges of the climate crisis.

This summer's record-breaking heat waves, drought, and wildfires have made climate change more of a felt reality to Europeans at the very same time as the prospect of a geopolitically caused energy crisis lurks. How can Europe and Switzerland embody the uncertainty inherent to these crises without sidelining their respective legislated transition towards a more sustainable future?[2]

Existing Energy Transition Measures and Emergency Plans

By 2020, electric power supply shortages and electricity blackouts had risen to the top of the 44 risks listed in Switzerland's National Risk Analysis due to the combined impact of the predicted frequency and the likelihood of widespread socioeconomic damage.[3] Its high damage potential is largely due to the interconnectedness and interdependence of socio-technical infrastructures powered by electricity. Switzerland's decision to transition away from nuclear power – for important environmental and social reasons – thus directly influences its national risk factors.

The Federal Energy Act underpins these changes. Brought into force in January 2018, the Act introduced the Energy Strategy 2050 and plans for a low-carbon economy that replaces nuclear energy with higher energy efficiency and renewable energy sources. The decision by the Federal Council in May 2011 to gradually phase out Swiss reliance on its five nuclear power plants was, in part, a response to the Fukushima disaster in Japan in March 2011 – a decision confirmed in a 2017 referendum. All plants will be decommissioned by the end of their operational lifespan, starting with Mühleberg in 2019, and with a ban on any new nuclear facilities. At present, Switzerland's reliance on electricity generated by nuclear power (36 per cent) and hydropower (56 per cent) makes its electricity sector largely carbon-free.[4]

Around 90 per cent of Switzerland's total energy requirements are currently met by oil, electricity, and natural gas, and around 80 per cent of this energy is imported from abroad (oil and gas completely, electricity partially).[5] Gas and oil respectively meet about 15 and 50 per cent of Swiss energy requirements. This continued reliance on gas and oil makes Swiss energy supply vulnerable to geopolitical conflicts. Normally, around half of Swiss gas imports originate from Russia, acquired through long-term contracts and trading platforms in neighboring countries that are also feeling the pressure of Russian gas export cuts.

As a net electricity importer in winter, Switzerland is particularly vulnerable to energy competition during the colder months. Usually, electricity supply is secured in winter through the import of French nuclear power. However, in a geopolitically and climatically fragile world, such arrangements are increasingly brittle, and Switzerland is still not fully integrated in the EU electricity market. To avoid energy shortages this winter, Switzerland will – if necessary – implement long-established emergency demand and supply measures. These start with the voluntary savings appeal initiated in late-August[6] and consumption restrictions, followed by fuel switching and quota systems for large consumers, and finally regular grid shutdowns.

Neighboring countries have similar emergency measures in place, albeit with certain variations due to different energy mixes and a greater integration in the EU internal energy market. In June 2022, a coordinated EU approach stipulated gas storage facilities should maintain at least minimum filling levels, and in July 2022, the majority of EU countries agreed to reduce gas consumption by 15 per cent until the end of the winter. The focus is on industrial users, with the exception of critical goods manufacturers or plants that are difficult to restart after switching off energy. National energy saving measures range from heating restrictions in shops and public buildings (max. 19

Further Reading

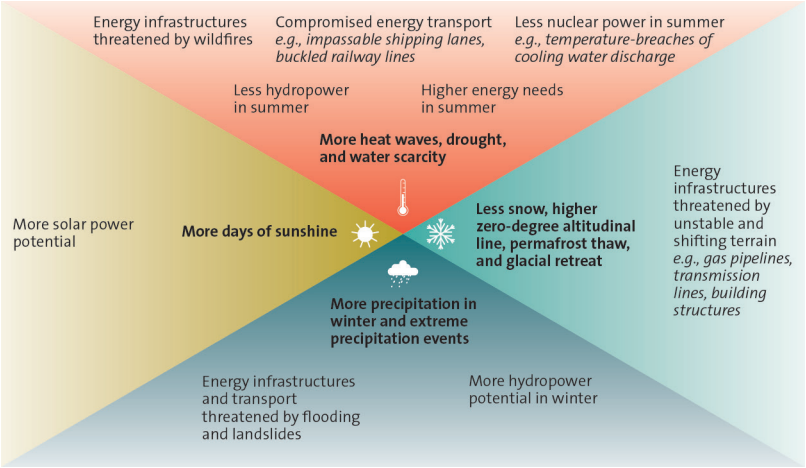
Jason Horowitz, **"Europe's Scorching Summer Puts Unexpected Strain on Energy Supply,"** *The New York Times,* 18.08.2022.
An overview of climate change and the consequential practical challenges for the energy supply systems in Europe.

Christine Eriksen / Andrin Hauri, **"Climate Change in the Swiss Alps,"** *CSS Analyses in Security Policy No.290,* ETH Zürich, 2021.
An overview of climate change and its tangible consequences for Switzerland and other Alpine regions.

Swiss Federal Office of Energy, **"Energy Strategy 2050,"** 15.12.2021.
The Strategy for the gradual transition of Switzerland towards a sustainable renewable energy supply system.

Victoria Sword-Daniels, et al., **"Embodied Uncertainty: Living with Complexity and Natural Hazards,"** *Journal of Risk Research* 21:3 (2018): 290–307.
A detailed examination of how society adapts (or not) to climate-exacerbated hazards depending on collective and individual lived experiences.

Examples of Climate Change's Impact on Energy Security



degrees), a ban on lit shop windows at night, and a closed-door mandate on climate-controlled shops. The remainder of civil society are expected to voluntarily reduce their energy usage by switching off lights and turning down thermostats. Many European countries have prepared additional non-market-based measures if needed. France, for example, can disconnect the gas supply to industrial customers on a contractual basis in return for financial compensation.

The most troublesome aspect of these short-term emergency measures is that they are supplemented with longer-term measures in some European countries, such as giving a new lease of life to scheduled or already decommissioned coal, gas, and nuclear power plants. Germany passed a law allowing 27 coal-fired power plants to restart. Austria reinstated the country's last coal-fired power plant, which was taken off the grid in 2020. As necessary as these additional measures might be in the short term, they deviate from climate adaptation measures, and are deeply problematic in term of political legacy. The EU's decisions to label natural gas and nuclear power as "green" energy are unlikely to just be a "transitional" measure both due to deep-seated political and economic interests, and because the war in Ukraine may continue for many more winters. Their prolonged use under a "green" label burdens the environment and jeopardizes the EU's aim to be climate-neutral by 2050 through net-zero greenhouse gas emissions and a shift to renewables, as chartered in the 2020 European Green Deal.

The Ripple Effect of Climate Change

A closer look at the direct and indirect consequences of climate change demonstrates why it is so important that resilience-focused short-term energy adaptation measures feed into long-term sustainability goals. A prime example is the ripple effect of extreme weather on both energy consumption patterns and energy infrastructures. Heat waves and drought, for example, are shifting electricity usage towards higher consumption peaks in summer when current energy generating systems will be hampered by the extreme weather. Warmer river waters breach the legal regulations on cooling water discharge from nuclear reactors, thus reducing energy production, and less water in reservoirs and rivers means less hydropower.

This type of ripple effect has already led disaster-prone places like California to proactively address climate change by commencing a replacement of coal, nuclear, and natural gas with solar and wind energy in addition to existing hydropower facilities.[7] Yet, extreme weather events are placing strain on the transition phase required to build up a renewable energy supply and storage capacity that can adequately span the peaks and troughs of daily demands. In July 2021 (and again at the time of writing), for example, a series of unprecedented heat waves put significant pressure on California's power grid at the same time as a wildfire threatened the transmission lines that bring electricity from the Pacific Northwest to California.[8] In a hotter and drier climate, wildfires not only threaten power lines more frequently, but are also more often ignited by power lines. The transmission lines ultimately failed, as the heavy smoke generated by the wildfire acted as conductor that interfered with the electric current, demonstrating the vulnerability of places not necessarily in proximity to the flames. As voluntary pleas for people to consume less electricity did not have the desired effect, gas-fired power plants scheduled for shutdown a year earlier were brought back online to avoid a power shortage, thus continuing the vicious circle of fossil fuel dependence and associated global warming. Sustained investment and political pressure are required to reach the desired energy-resilience goal.

In Switzerland, climate change is also affecting energy infrastructures by accelerating the thaw of glaciers and permafrost. Warmer mountain slopes cause soil subsidence and landslides that destabilize buildings, railway tracks, and roads, and endanger the transmission lines and gas pipes that transport energy domestically and from/to abroad. The low water levels of the Rhine in recent summers disrupt the import of oil via river barges, with alternative routes, such as railway lines, buckling in the heat. At the same time, the potential of renewable energy is not exhausted. Biofuels and waste currently only count for 4 per cent of energy generation, while solar panels and wind turbines produce 3 and less than 1 per cent respectively. While Switzerland's size and topography pose geographi-

cal challenges, technological progress has increased the potential of, for example, wind power tenfold in the past ten years alone. There is also a lot of untapped potential for solar power both in the mountains and on buildings in urban areas. Such opportunities must be grasped with a sense of urgency at the same time as compulsory measures to increase energy efficiency and reduce energy consumption are made commonplace in homes and the economy.

Outlook

It is time to face the no-nonsense reality that lies ahead, as energy, security, and climate change force societies around the world to reevaluate their energy supply, geopolitical dependencies, and capacity to cope with climate-exacerbated hazards. Climate change will have a more lasting and far-reaching impact on Europe's energy security than the war in Ukraine. Europe must adapt now to ensure long-term coping capacity by implementing desperately needed climate adaptation measures. Building on recent political momentum and public attention towards securing energy supply provides a rich opportunity to overhaul energy supply systems and infrastructure beyond the challenges of the coming winter(s). The ripple effect of the war in Ukraine shows that drastic measures, large economic investments, and everyday inconveniences and constraints are not only possible but also socially acceptable if the threat is immediate. So why do most people continue to sleepwalk through the climate crisis?

It has long been established knowledge via regular reporting systems, such as the Intergovernmental Panel on Climate Change, that the ultimate impact of climate change drastically increases for every year without action. Transitioning to a resilient and sustainable energy supply system now will reduce emissions and thus mitigate the dire consequences of unchecked climate change, which are increasing in scale, frequency, and intensity. It is therefore critical that Switzerland, as well as other European countries, adhere to their ambitious climate-informed energy transition strategies. Recent events demonstrate that voluntary pleas and good intentions are not enough to substantially and persistently change everyday lifestyles and economies. Despite a wildfire-exacerbated energy crisis in the midst of a heat wave, Californians were reluctant to reduce their energy consumption. Vows to fly less in response to the felt improvement in air quality during the COVID-19 pandemic were quickly disregarded as lockdowns lifted. If Europe fails to act now, the potential energy shortages and associated inconveniences this winter are but a taster of everyday life in a hotter and more extreme climate. Not only will the environment suffer, economies will lose their competitive edge, emergency services and the health system will be overwhelmed, and everyday access to clear air and water, heating and cooling, transport and goods, which most Europeans take for granted, will no longer be a given. Like many crises, this one provides an opportunity for improvement.

Selected sources

1. "A European Green Deal," *European Commission,* 2022; "2050 Long-Term Strategy," *European Commission,* 2022.
2. For a recent debate, see Gabriela Hug, "Don't attack the Energy Strategy with simplified assumptions," ETH Zürich Zukunftsblog, 29.07.2022.
3. "The National Risk Analysis of Disasters and Emergencies in Switzerland," *Federal Office for Civil Protection,* 2020.
4. "Countries and Regions," *International Energy Agency,* 2022.
5. "Energy," *Federal Office for National Economics Supply,* 28.06.2022.
6. "Helfen Sie mit, keine Energie zu verschwenden," *Federal Department of the Environment, Transport, Energy and Communications and Federal Department of Economic Affairs, Education and Research,* 2022.
7. For another example, see Patricia Cohen, "Portugal could hold an answer for a Europe captive to Russian gas," *The New York Times,* 1.8.2022.
8. Sammy Roth, "How an Oregon wildfire almost derailed California's power grid," *Los Angeles Times,* 12.07.2021.

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