4 Systemic resilience: an approach to future-proofing climate action

This chapter highlights how the confluence of recent overlapping global crises with the profound socio-economic changes necessary to enable the net-zero transition point to the need to pursue systemic resilience, ensuring that systems can anticipate, absorb, recover and adapt to potential future shocks. It defines systemic resilience and how it can be applied to climate policy making, including through the use of strategic foresight to identify and prepare for potential future disruptions.

This chapter draws on contributions to the Horizontal Project carried out under the OECD's New Approaches to Economic Challenges (NAEC) programme and Strategic Foresight Unit.

As depicted in the previous chapters, the risk of climate tipping points highlights the non-linear, systemic nature of climate impacts. However, the climate system is only one of many human and natural systems in a highly interconnected world. The COVID-19 pandemic and war in Ukraine are recent examples of interwoven crises with far-reaching socio-economic consequences, including implications for climate action.

The potential for both climate impacts and the transition to net zero by mid-century to trigger cascading socio-economic effects exemplifies the need to consider important interactions between all manner of natural and human systems. This requires systems thinking, as systemic interactions generate impacts that detailed but isolated knowledge of each system's individual parts cannot predict (Hynes et al., 2022[1]).[1]

This chapter defines systemic resilience and how it can be applied to climate policy, highlighting strategic foresight as a means for governments to stress test and future-proof their climate policies against a wide array of possible disruptions.

What is systemic resilience?

Systemic resilience is the ability of a system to anticipate, absorb, recover and adapt to unforeseen shocks (OECD, 2020[2]). It assumes that shocks are inevitable, their consequences large, and their origins unpredictable. As such, systemic resilience is "risk agnostic": it integrates and builds upon risk management in the sense that it considers not just how to anticipate, avoid and limit damages, but also how a system recovers from any given shock and adapts to the resulting new circumstances (Hynes, Trump and Linkov, 2019[3]). Recovery here refers to the ability of a system to return to its pre-shock state as quickly and efficiently as possible, whereas adaptation refers to the ability of a system to adjust based on its experience of the shock in order to increase its resilience to future shocks. As such, resilience stands apart from risk management in the sense that it considers not just how to anticipate, avoid and limit damages, but also how to bounce back from inevitable disruptions and learn from them, in a sense to "bounce forward".

Hynes et al. (2022[1]) point to two broad means of achieving systemic resilience. Resilience by intervention (i.e. exogenous resilience) refers to the transfer of immense resources by governments, usually as a stop-gap measure to avoid systemic collapse following a major shock. Resilience by design (i.e. endogenous resilience) refers to measures that enhance a system's ability to self-regulate or self-organise, internally reallocating resources so as to absorb, recover and adapt to shocks.

The predominant response to recent systemic crises has largely been exogenous. Both the COVID-19 pandemic and 2007-2008 global financial crisis have had lasting global impacts on a wide variety of socio-economic systems. Both originated from local or firm-level disruptions that quickly cascaded throughout other interlinked systems at considerable cost. The reaction to both also focused primarily on large transfers from governments to ensure that financial and economic systems did not collapse. In the case of the global financial crisis, this involved bank bailouts. In the case of the COVID-19 pandemic, furlough schemes and direct transfers to households and affected businesses were widely used to protect livelihoods.

Such direct intervention by governments, while necessary, is extremely expensive and does little to enhance future systemic resilience. For example, austerity measures implemented in response to the global financial crisis starved health care systems of the funding necessary to prepare for a public health crisis such as a global pandemic (OECD, 2020[2]). More recently, policies taken in response to COVID-19 and the war in Ukraine, discussed in the previous chapter in relation to their impacts on climate policies, also have implications for vulnerability to future shocks. This includes the immense transfers governments had to undertake to avoid economic collapse during COVID 19, which raised debt levels and generally contributed to economic volatility. Non-monetary interventions, including widespread lockdown measures, had similarly disruptive effects, including supply chain bottlenecks and global materials shortages. The war in Ukraine has exacerbated this precarious situation. As before, governments have reacted through transfers to households, and now energy subsidies that threaten not only to further lock in fossil fuel use but also to increase public debt levels (OECD, 2022[4]).

These examples illustrate the need for endogenous resilience, whereby systems are able to themselves reallocate resources to absorb and adapt to shocks, reducing the need for exogenous intervention. For example, a health care system that is resilient by design would have been better able to cope with a surge in new patients due to a novel virus such as COVID-19. This would have limited the need for widespread lockdown measures and the resulting government transfers. Pre-emptive resilience by design thus facilitates more effective resilience by intervention when major shocks occur. This is because the initial need for large-scale intervention is reduced, allowing for more targeted and less costly exogenous measures that can ensure a faster and more efficient recovery.

In addition to needing to consider both exogenous and endogenous resilience, there is a trade-off between resilience and short-term efficiency (Hynes et al., 2022[1]). Currently, economic systems are geared towards extracting maximum value in the short term, with little regard for the underlying structure of the system and its ability to self-organise in the face of shocks. This further limits the resources available for resilience by intervention, for example by discouraging strategic redundancies or safety nets that could ensure the continued functioning of a system during shocks.

An example of this compromise can be seen in the 2021 electricity system collapse in Texas. In early 2021, cold weather and soaring demand resulted in near collapse of the entire electricity grid, at considerable human cost (Jin et al., 2021[5]). Decisions guided solely by economic efficiency left the state's electricity system vulnerable to shocks. For example, Texas's energy grid lacked interconnections with other states, allowing efficient governance of the system without federal oversight, but also reducing its ability to manage demand surges with imports. An additional factor is that Texas's plants were only compensated for power produced, not their capacity to produce electricity. This maximises economic efficiency but reduces resilience and redundancy, as plants are not incentivised to prepare for demand surges or other shocks.

Finally, efficient pricing kept prices low, pushing producers to delay winter weatherisation investments in order to maintain profits. These effects were compounded by inadequate risk assessment, with prior testing of the system's ability to withstand shocks based on approaches that did not include the potential for low probability, high-impact events. They were also largely based on historic climate data without taking into account projections of future climate risks in light of global warming (Jin et al., 2021[5]). While Texas's electricity grid is an outlier (electricity systems in other jurisdictions are resilient by law, mandating capacity reserves to ensure energy security (OECD, 2020[2])), similar trade-offs between efficiency and resilience are ubiquitous throughout socio-economic systems.

In addition to trade-offs with efficiency, resilience measures may compromise other objectives such as sustainability (Keenan et al., 2021[6]). For example, recent measures enacted to enhance economic resilience in the face of crisis could be seen as conflicting with other imperatives such as climate action. Despite promises of a "green recovery", a relatively low proportion of COVID-19 recovery spending (33%) has been oriented to environmental objectives.

Ensuring systemic resilience thus requires careful balancing between endogenous and exogenous measures, between resilience and efficiency, and between resilience and other normatively desirable outcomes such as sustainability. Practically, this implies the following:

- Methods for quantifying resilience so that trade-offs between resilience and efficiency – and sustainability – can be made explicit and managed. This requires novel analytical approaches (Box 4.1).
- Oversight of systems and systemic interactions to minimise the potential for cascading failures, as well as communication and co-ordination across systems components and between different systems. This applies to various components of infrastructure systems as well as broader governance, i.e. of the economy, with siloed decision making on economic sectors in isolation inconducive to broader economic resilience.
- Concerted efforts to ensure sufficient resources and redundancies to manage unexpected shocks (OECD, 2020[59]).

Box 4.1. Methodological approaches to assessing systemic resilience

Assessing systemic resilience and designing measures to enhance it requires a broad approach covering multiple domains, from physical to social (Linkov, Trump and Hynes, 2019[7]). Key to this is the availability of a transparent dataset and a clear and replicable framework or approach to processing this data, as well as predetermined criteria for resilience success or failure. Finally, assessing systemic resilience must take into account the dynamic nature of social systems and their implications for resilience, such as political upheaval, etc. (Linkov, Trump and Hynes, 2019[7]). Although systems thinking and resilience assessment remain nascent concepts, concrete methodologies and approaches for better incorporating systemic resilience within policy making are emerging:

Resilience analytics entail the systematic use of data-driven methods to ensure resilience in interdependent infrastructure systems. Thanks to advances in digital network technologies, infrastructure systems can be replicated as real-time digital counterparts, or digital twins, which can be subjected to stress tests and simulations in order to understand and visualise systems responses to shocks. This results in targeted information on which specific system components are likely to fail and how they can be adapted to ensure overall systems resilience. Shocks can be randomised to account for the risk-agnostic nature of resilience, and the low-probability, high-impact nature of systemic risk. Applied to electricity systems, for example, resilience analytics could assess the application of targeted redundancies such as microgrid configurations, in effect reorienting or containing a part of the system, that could be switched on in the event of a significant disruption (Jin et al., 2021[5]).

The use of digital technologies generally can assist in balancing trade-offs between resilience and efficiency, assisting in the collection and process of data and supporting decision making, e.g. through real-time assessment tools. However, digital technologies also come with their own resilience implications, e.g. reliance on a stable power supply and being vulnerable to cyber-attacks (Argyroudis et al., 2022[8]).

The **resilience matrix** is organised across four domains (physical, informational, cognitive and social) and four phases (prepare, absorb, recover and adapt). To employ the matrix, weights and scores are applied to the systems assessed based on relevant indices and indicators, resulting in average overall resilience scores that can be compared across systems. As such, the matrix provides important information on resilience gaps within and across systems (Linkov, Trump and Hynes, 2019[7]). Along with stress testing, the matrix has been suggested as a useful component of a multi-tiered approach to resilience assessments. Under this approach, the first tier entails the gathering of quick qualitative information to identify scenarios and critical systems functions. In the second, the resilience matrix and stress testing are applied to understand overall systems dynamics. The third and final tier provides targeted information on interconnected systems components (Linkov et al., 2022[9]).

Applying systemic resilience to climate policy

Climate change will invariably lead to systemic disruptions, due to its impacts and the rapid transition to net zero emissions. In addition, climate action itself must be resilient to shocks to avoid catastrophic climate impacts. Resilience thus needs to be integral across climate policy.

Concerning mitigation, key systemic interactions threaten policy ambition. First, the transition to net-zero emissions will face numerous socio-economic challenges and bottlenecks, a reality brought into focus by the consequences of interventions made following COVID-19 and the war in Ukraine. Political upheaval may also distract from climate targets as political parties focus on short-term economic stability over long term sustainable development in order to attract voters. Indeed, the current cost-of-living crisis is already testing government commitment to mitigation efforts, with energy subsidies threatening to lock in fossil fuel consumption (IEA and OECD, 2022[10]; OECD, 2015[11]). Increasing capital costs may further threaten investment needs for renewable energy and other green technologies.

Second, the net-zero transition itself will pose systemic challenges. For example, recent research highlights the considerable risk of stranded fossil fuel assets (Semieniuk et al., 2022[12]). Modelling predicts that the fiscal implications of stranded assets will be potentially dire for countries heavily reliant on fossil fuel production and export (see Chapter 6). Assessing the resilience of socio-economic systems to this shock will require transparent monitoring of assets and clear communication of risks. In addition to emissions reductions measures, policy design should include means to limit the potential economic fallout of stranded assets. Societal upheaval due to concern about social impacts of the transition – whether through employment upheaval or inequality or both – is another transition risk. Here, adequate social safety nets and targeted interventions to ensure worker compensation are tried and tested means of ensuring resilience within labour markets (Chapter 8).

Broader systemic effects should also receive more attention. Indeed, just transition concerns are a subset of broader political volatility. Even if fossil fuel-intensive sectors experience a just and orderly transition, social vulnerabilities exacerbated by cost-of-living crises, social media, etc. may still pose a threat to climate ambition overall.

Concerning adaptation, the threat of cascading impacts necessitates transformational policies. Of particular importance is a system’s ability not only to recover, but to adapt to new circumstances. For example, air conditioning alone does not ensure resilience to mounting heatwaves, as it does little to address urban heat island multipliers or badly insulated homes. It may in fact threaten emissions reductions if increasing energy demand cannot be met through renewable sources (OECD, 2021[13]).

A more systemic approach to climate action would serve to mitigate emissions while building resilience to physical impacts. Such an approach can also have important synergies with welfare outcomes, as highlighted by the OECD’s *Transport Strategies for Net-zero Systems by Design* (OECD, 2021[14]). For example, systems redesign of urban transport focused on accessibility would increase well-being and also reduce emissions and material and energy use. By design, it would also be more resilient to shocks. Multi-modal travel reduces reliance on the manufacturing of electric vehicles and on the electricity grid to power them. Moreover, reducing distances between places increases resilience to extreme weather events by reducing individuals’ exposure radius (e.g. shorter commutes may be less affected by local floods inundating roads). Accessibility to health and other services is also important in the case of shocks such as a public health emergency, conflict or natural disaster (OECD, 2021[14]). The synergies between well-being, mitigation, and resilience further highlight the imperative of systemic approaches to climate action.

Addressing climate change also has systemic implications far beyond mitigation and adaptation. For example, rapid technological change, while entailing its own systemic risks, may prove invaluable in reducing emissions and decarbonising the global economy, as well as building resilience to climate impacts. Here, the science and technology system is of particular importance. For example, the response

– and global resilience – to the COVID-19 crisis owes much to rapid progress in vaccination and digital technologies. In both cases, a long-term commitment to innovation support was crucial. Rapid vaccine development could not have occurred without decades-long investment into the sector. Similarly, digital technologies were mature enough to meet demand during the pandemic. This highlights the need for patient and sustained investment in innovation as a means to ensure societal preparedness in the face of shocks (OECD, 2021[15]).

The climate crisis has implications beyond economic, financial and energy systems. For example, the health system co-benefits of climate action are well documented, such as the role of green spaces in improving climate resilience and public health (Anderson, Patiño Quinchía and Prieto Curiel, 2022[16])). Conversely, biofuel demand can have implications for food prices, with cascading effects (Subramaniam, Masron and Azman, 2019[17]). The climate crisis also has considerable mental health and gender implications that are only slowly being explored in detail (OECD, 2021[18]).

Addressing climate change will considerably impact systems for international co-operation. For example, the lead-up to COP26 in 2021 was strongly affected by concerns over vaccine distribution and technology transfer. Climate clubs and proposed schemes such as the EU’s proposed carbon border adjustment mechanism (CBAM) will have impacts on international co-operation beyond the climate sphere (Jakob et al., 2022[19]) (OECD, 2020[20]). Russia’s war on Ukraine has further exposed considerable vulnerability in the international co-operative system. As such, failure to reach a co-operative agreement on continued climate action may have cascading effects beyond mitigation and adaptation policy. Ensuring that the international co-operative architecture remains strong is paramount to ensuring the net-zero transition.

Biodiversity and other natural systems are extremely vulnerable to climate impacts. At the same time, synergies between these systems can be effective in addressing the climate crisis. Nature-based solutions (NbS) have received increasing attention as a means to mitigate emissions and adapt to climate impacts, with natural systems often considerably more resilient than those managed by human intervention. (NbS are explored in more detail in Chapter 12.)

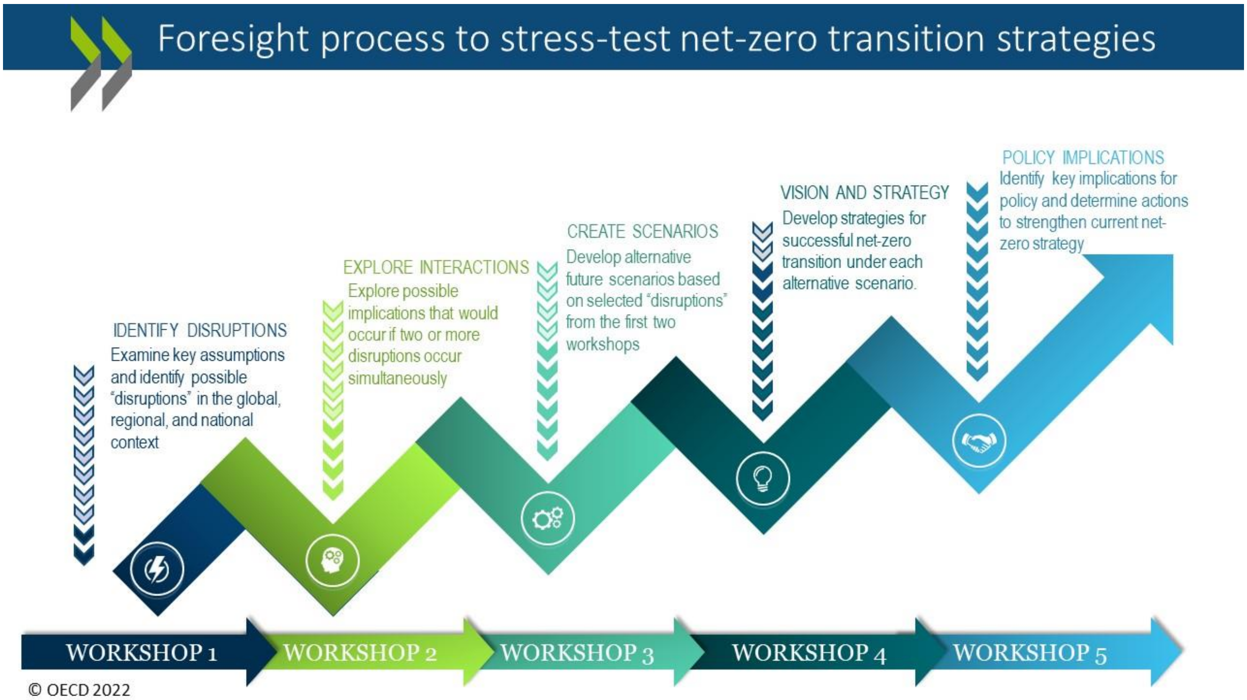
Strategic foresight as a means to building systemic resilience

Given the complexity of systems and their interactions, governments can strengthen systemic resilience by stress testing their policy strategies. Strategic foresight offers a way to do this by providing a structured approach to exploring possible future disruptions and their implications.

Strategic foresight entails scanning the horizon for new developments and emerging trends, constructing scenarios about how the future could unfold, and designing forward-looking strategies under a wide range of possible circumstances. In a governance context, it allows decision makers to examine the assumptions underlying their current strategies, anticipate how those strategies might be vulnerable to radical changes in areas outside of their control, and design more robust strategies that are better equipped to withstand potential shocks.

The OECD Strategic Foresight for Successful Net-Zero Transitions Toolkit uses strategic foresight to examine factors that could enhance or limit the ability of countries and organisations to meet their net-zero greenhouse gas emissions ambitions. By applying a five-step strategic foresight process specifically to climate policy making, it provides a methodology and guidance for countries and organisations to stress test their net-zero transition plans (Figure 4.1).

Figure 4.1. Strategic foresight for successful net-zero transitions



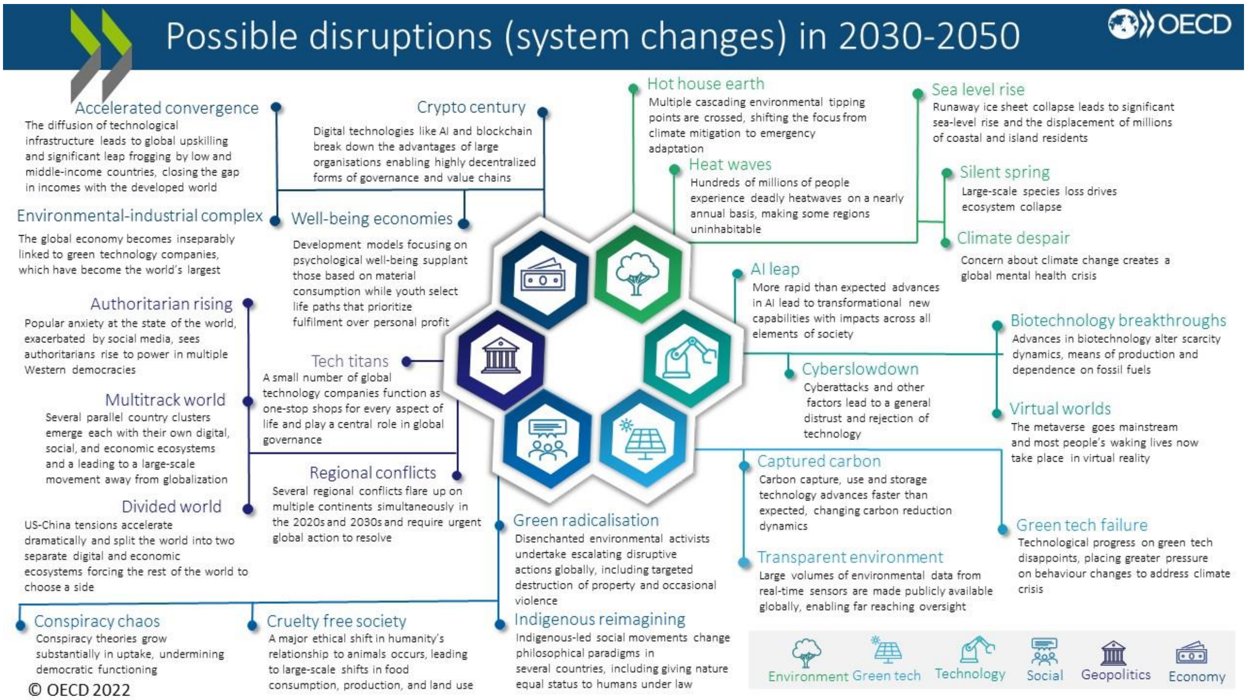
Source: OECD Strategic Foresight Unit.

The toolkit is a highly adaptable model for integrating strategic foresight into long-term planning. It can be applied at multiple levels of government with diverse mandates, and is particularly useful for organisations as an accelerator for horizontal and forward-looking climate policy and strategy development. It can be applied to diverse groups with varying backgrounds. For groups that do not have a traditional climate policy background, the toolkit can introduce a climate lens into long-term planning processes. For more climate focused groups, it provides an opportunity to bring other aspects (e.g. social, geopolitical and technological) into the fold. In all cases, the toolkit is a way to bring forward topics that are insufficiently considered and often treated in separate silos.

A fundamental challenge of net-zero strategies is that, because they are so all encompassing, they are vulnerable to a wide variety of disruptions across sectors. This means that a change in one area could radically alter how net-zero strategies need to be conceived or implemented in several others. To this end, the toolkit provides a way to ensure the robustness of net-zero strategies by testing how they would perform under scenarios in which the world is subjected to various plausible disruptions.

The OECD Strategic Foresight Unit has developed a list of 25 possible disruptions to illustrate how a specific uncertainty in one sector could plausibly occur and lead to surprising implications for net-zero strategies (Figure 4.2).[2]

Figure 4.2. Drivers of change that, if pushed to a plausible extreme, could cause significant system-level changes in the period 2030-2050



Source: OECD Strategic Foresight Unit.

The disruptions are grouped across six domains: Environment, Green Tech, Technology, Social, Geopolitics and Economy. Each disruption represents a plausible extreme development that could present significant challenges or opportunities. Some of these disruptions are already taking place today: for example, the war in Ukraine exemplifies the threat of regional conflict to net-zero transitions, and emerging evidence on climate tipping points increases the likelihood of reaching a "hot-house Earth" scenario in which multiple cascading tipping points are crossed. This makes foresight all the more necessary in order to build resilience to future possible disruptions.

The disruptions serve as a starting point to raise awareness of potential future shocks. Participants explore how they could occur concurrently and interact, then develop strategies to adapt to, and contingency plan for, various potential futures. These exercises are an important first step in engaging policy makers with long-term resilience plans for the net-zero transition (Figure 4.2).

Preparing for disruptions is necessary due diligence in modern policy making. Successful net-zero transitions depend on the ability to design well-considered and future-ready transition strategies today, with the capacity to continually anticipate, prepare for, and adapt to change over the years and decades ahead. The OECD Strategic Foresight for Successful Net-Zero Transitions Toolkit is one model for governments and organisations to engage in climate-focused foresight work.

Box 4.2. High-level takeaways from piloting the OECD Strategic Foresight for Successful Net-Zero Transitions Toolkit

In developing the OECD Strategic Foresight for Successful Net-Zero Transitions Toolkit through workshops with countries and groups of experts, several takeaways emerged which have important strategic considerations for the net-zero transition. These are presented below in two parts: i) description of a possible future context that could occur in response to some of the disruptions explored, and ii) potential actions that governments might need to consider and act upon to prepare for these possible futures.

Developed countries should avoid creating walled-off green gardens

Possible future: Developed countries successfully achieve net zero domestically, but in ways that undermine sustainable development in low- and middle-income countries. Circular economies boom in advanced economies and green innovations transform cities in the Global North. However, firms in developing countries are not able to meet environmental standards and lose access to developed country markets, while green technology transfer is limited. All the while, poorer countries bear the brunt of extreme weather events and sea-level rise. The result is a green and prosperous Global North and an impoverished Global South struggling to cope with climate catastrophes.

To ensure that net-zero transitions do not leave the Global South behind, governments should integrate a global systems approach throughout climate policies. The upstream and downstream implications for initiatives designed to lower domestic emissions in developed countries should be assessed to ensure that they do not cause undue hardship in developing countries.

Net-zero transitions must be insulated from geopolitical conflict

Possible future: Geopolitical confrontations lead to a breakdown of multilateral co-operation. Separate economic spheres emerge, with little to no trade between major economies, even in critical raw materials, and limited technological interoperability. Markets for green technologies shrink and innovations cannot be shared from one sphere to another. Strategies cannot be co-ordinated globally, and countries and spheres scapegoat each other for collective failures to reduce emissions.

Given the possibility of serious challenges to multilateralism, governments should push for global commitments to preserve co-operation on key areas for net zero (i.e. technology transfer) while preparing safety nets in case of a breakdown of global trade (i.e. sufficient redundancy in or stockpiles of critical inputs and functions). While interconnected economies are preferable, and states should be careful not to encourage protectionism, being prepared for circumstances in which supply chains collapse is appropriate due diligence.

Protecting the information ecosystem from misinformation is crucial

Possible future: Net-zero transition strategies are targeted by misinformation and disinformation campaigns co-ordinated by private actors and countries that export fossil fuels. The quantity and quality of conspiracy content is enabled by next-generation digital technologies such as deepfakes and AI language processors. The result is a nearly complete democratic paralysis, as consensus on most issues becomes impossible without a shared fact base. Polarisation within societies is driven to an extreme where democratic compromise is no longer possible.

Given the possibility that information campaigns could target climate strategies, governments should integrate misinformation and disinformation risk assessments into all major climate initiatives and implementation plans. Governments should make proactive investments in communications plans for climate initiatives to bolster widespread support for sustainable products and behavioural changes.

Urgent and unprecedented behavioural change may be necessary

Possible future: Worsening storm surges and heat waves wreak havoc upon large parts of the global population. Drastic changes in lives and lifestyles are urgently required, including relocation and substantial declines in consumption as a result of the destruction of infrastructure and interruption of supply chains. Governments are forced to mandate strict and unprecedented behavioural changes to manage the climate emergency and have begun to face substantial backlash for these measures to the point of heightened worry of societal breakdown.

To be prepared to take rapid large-scale action to meet climate targets or respond to extreme weather events, governments should explore what can be done to foster legitimacy to act in case large-scale behaviour change policies are needed in the event of future catastrophic events. Buy-in and understanding could be built through tools such as citizens' assemblies and supported through a public narrative focusing on green jobs and the wartime-like mobilisation necessary to address the climate emergency.

Safe and trusted AI development is key

Possible future: Artificial intelligence is deployed with great success in the fight against climate change, leading to breakthroughs in green technologies, better co-ordination of climate policies and a far greater capacity to monitor climate conditions, emissions and weather patterns, as well as numerous other areas relating to climate mitigation, adaptation and finance. The efficiency gains enabled by AI have come with substantial increases in job losses due to automation, invasive surveillance by authoritarian states and incomprehensible behaviours among black box algorithms charged with governing complex social systems.

Given that AI will likely play an important role in facilitating net-zero transitions, governments need to proactively address the social impacts and technical safety risks associated with advanced AI systems. Governments need to ensure that AI safety and controllability mechanisms keep pace with advances in AI systems so that there will be adequate trust and reliability to adopt such systems in key infrastructure and other areas critical to reaching climate goals.

Promote competition, not market concentration

Possible future: Massive government investment in green (and digital) transition benefits ultimately only a few incumbent companies, concentrating immense market and political power. This provokes accusations of profiteering among populations experiencing significant hardship due to climate change. In this scenario, extreme corporate concentration leads to some corporations or individuals exercising nearly complete control over quasi-essential services or infrastructure, giving them incredible leverage to shape public policy to suit their interests at the expense of societal benefit.

To prevent net-zero strategies from creating harmful forms of inequality, governments should promote competitive markets, particularly in sectors highly reliant on government investment, and ensure that returns on public investments are widely distributed to avoid exacerbating inequalities and safeguard public support. In instances where concentrations of power cannot be avoided, transparent processes for engaging and negotiating with the most powerful non-state actors to secure their co-operation throughout the course of just transitions could become a crucial factor in the success of net zero.

Note: This list is not exhaustive: the takeaways above are examples of scenarios that, in the absence of strategic foresight processes, might otherwise be missed in conventional climate policy making.
Source: OECD Strategic Foresight Unit.

Chapter conclusions

The systemic nature of climate risks and risks to climate action require systemic solutions. Systemic resilience entails conceptualising and assessing the ability of specific systems to deal with such risks. A systemic approach should be more widely applied to climate related decision-making processes. This requires stress testing climate policy strategies against potential future disruptions, their interactions, and identifying win-win responses to enhance the resilience of policies themselves. It also requires an awareness and understanding of the interlinkages between climate, other natural and human systems, taking advantage of synergies and minimising trade-offs. The remainder of this report applies this approach to a number of different policy areas, focusing on the resilience of the net-zero transition and on building resilience to climate impacts.

Notes

1 Systems thinking is an approach to problem analysis and decision making in a highly complex world. Rather than dividing complex issues into smaller, more manageable parts, systems thinking attempts to look instead at the whole system, focusing on identifying relationships between systems components, the functioning of the system in question, and interactions with other existing systems. It also specifically accounts for the possibility of non-linear systems behaviour.

2 The 25 disruptions were developed in close consultation with OECD subject matter experts, academics, and members of the OECD's global Government Foresight Community, including through a number of focused expert workshops.

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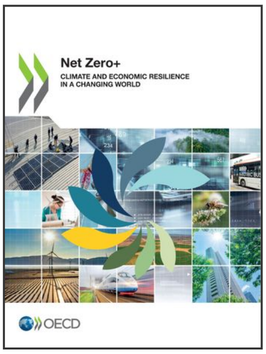

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