

THE ACCELERATING TRANSITIONS FRAMEWORK

The Accelerating Transitions Framework can inform governments' thinking about the forms of policy and diplomacy that are likely to be effective in each emitting sector at each stage of its low carbon transition.

Not entirely unprecedented

The Intergovernmental Panel on Climate Change has described what is needed to meet internationally agreed goals for avoiding dangerous climate change as '*rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems. These systems transitions are unprecedented in terms of scale, but not necessarily in terms of speed*'.¹

This statement is a reminder that 'system transitions' – the replacement of one set of technologies and its associated business models, markets, infrastructure, and social practices, with another – have happened before. We can look back at past transitions to understand how they happened, and to see what kind of actions helped them progress more quickly.

Not just pricing the externality

What is obvious from looking at technology transitions of the past is that many actions contributed to their occurrence and their pace. Regardless of the nature of public interests involved, there was no single government policy that was always the best. When an incumbent technology created a problem, moving away from it was not as simple as just pricing that problem. At its peak, horse-drawn transport caused city streets to be clogged with horse manure. But the transition from horses to cars was driven by investments in motors, factories, roads, and institutions, not by a tax on manure.

Patterns and policies

The good news is that despite every technology transition being unique, they tend to follow some recognisable patterns. It is possible to anticipate the kinds of policies that can help advance a transition through each of its stages.

The Multi-Level Perspective (MLP), developed by Professor Frank Geels, describes how transitions come about through the interaction of processes at three scales: *niches*, where new technologies are developed and nurtured; the *regime* – the dominant cluster of technologies, businesses, infrastructure, institutions, and consumer practices; and the wider social and economic *landscape*.

The MLP also describes transitions as having three stages. In each stage, different processes are taking place, and different policies are likely to be effective. These can be roughly summarised as follows²:

1. **Emergence:** In this early stage of the transition, radical new ideas and technologies are developed and tested. Innovation takes place through trial and error, in a context of high uncertainty. Competition and learning eventually leads to stabilisation of a dominant design.

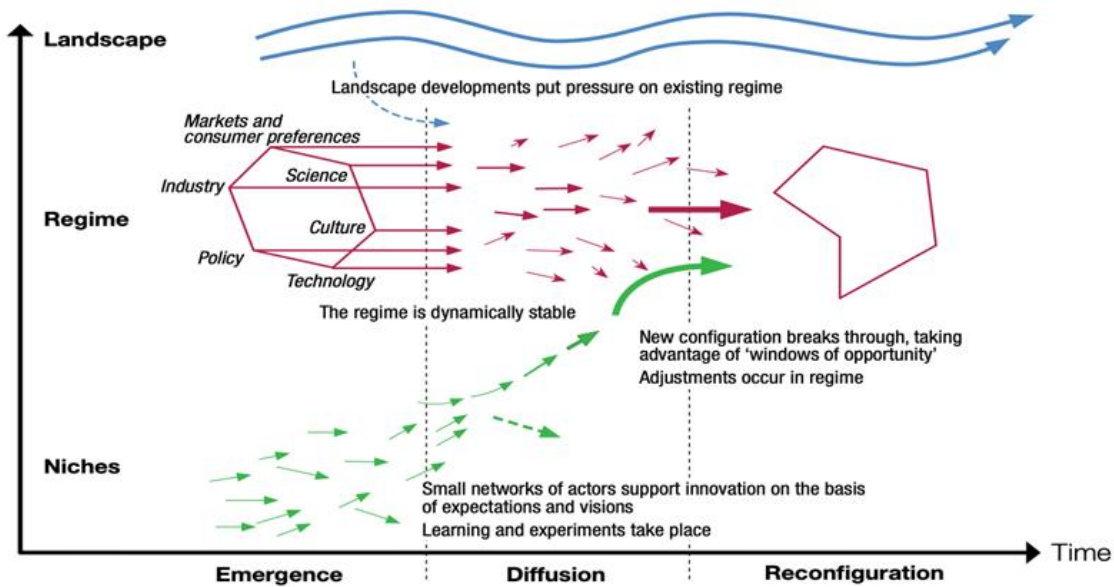
¹ IPCC, 2018. Special Report on Global Warming of 1.5°C, Summary for Policymakers.

² Summary adapted from the forthcoming report 'Analytical tools for innovation and competitiveness in the low carbon transition', based on the work on Frank Geels.

Policies likely to be effective at this stage include public funding of research, development and demonstration projects, and public procurement or targeted subsidies to create niche markets for the first deployment of new technologies. These niche markets give the new technologies a chance to develop and improve before they are exposed to competition with incumbents.

2. **Diffusion:** In this middle stage of the transition, the new technology enters mainstream markets and competes with the incumbents. The incumbent technologies are entrenched within the regime of markets, infrastructure and business practices that has built up around them, and are supported by vested interests that typically oppose major change. Policies likely to be effective at this stage are those that give the new technology an advantage over the old. These can include subsidies for the new technology, taxes on the old, regulation that forces a shift of investment from the old to the new, investments in infrastructure, and public communications.
3. **Reconfiguration:** In this late stage of the transition, as the new technology becomes dominant and displaces the old regime, wider changes take place as social and economic systems reorganise around it. Policies likely to be effective at this stage include those that support the emergence of complementary technologies (such as energy storage, to complement renewable power), deeper market reforms, extension of new infrastructures and creation of new institutions, and skills policies to help the workforce adapt to the new industries.

Figure 1: the Multi-Level Perspective on transitions.³



Governments can use this framework to identify the kinds of policies they should be considering in any one of the green-house gas emitting sectors of the economy, based on the stage of transition it has reached. To identify the *specific* policies that are likely to be most effective, governments will need to draw on the best available knowledge of the relevant sector.

³ Figure source: Victor, D.G., Geels, F.W., and Sharpe, S., 2019. [Accelerating the Low Carbon Transition](#). Adapted from Geels, F.W., 2002. [Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case study](#).

How diplomacy can succeed

To state the obvious, diplomacy is difficult. There is no global government, and countries' interests often differ strongly. And yet, sometimes diplomacy does something useful. How does this happen?

An important point is that strong agreements are not usually reached in a single step. Typically, cooperation develops gradually over time.⁴ At first, understanding of the problem at hand is low, and so is the degree of consensus about who should do what to solve it. Under these conditions, an experimentalist approach to cooperation is most likely to be effective. This is where parties test possible solutions, share learning, and build experience and understanding.

As understanding and consensus increase, enabled by this process of shared learning, a stronger form of cooperation becomes possible. Parties can deliberately align or coordinate their actions, taking up solutions that have been found to be viable, and applying them across a wider scope.

Eventually, when understanding of a problem is well developed, and consensus is high, international cooperation can take its strongest form: contracting. This involves detailed agreements that set out specific actions that parties must take, guaranteed by law or by incentives and penalties governing participation and compliance.

A guide to effective diplomacy for the transition

The Accelerating Transitions Framework combines these insights – how transitions can be accelerated, and how diplomacy can succeed – to provide a guide to effective diplomacy in the low carbon transition.

The framework recognises that there is a rough correspondence between the three stages of a technology transition, and the three overarching forms of international cooperation.

1. In the emergence stage of a transition, the experimentalist approach to cooperation is most appropriate. This means a focus on coordinated development and testing of new technologies, and the sharing of learning. As innovation stabilises around a dominant design, countries can align their actions to create a larger niche for its first deployment.
2. In the diffusion stage, coordinated deployment policies that give clean technologies the advantage over fossil fuels in global markets are the most powerful form of cooperation. Practical and financial assistance between countries can also support the clean technologies' wider adoption.
3. In the reconfiguration stage, as clean technologies become well established, cooperation can take its strongest form: contracting. This can include trade agreements based on stringent emissions standards, and eventually even bans on fossil fuel technologies or products.

Of course, the boundaries between these stages and forms of cooperation are not exact, and there are important variations between sectors.

⁴ This summary is based on the work of David Victor, and draws on the history of diplomacy in fields including security, trade, and environment. Relevant publications include Victor, D.G., 2011., 'Global warming gridlock: creating more effective strategies for protecting the planet'; and Sabel, C.F. and Victor, D.G., 2022., 'Fixing the climate: strategies for an uncertain world.'

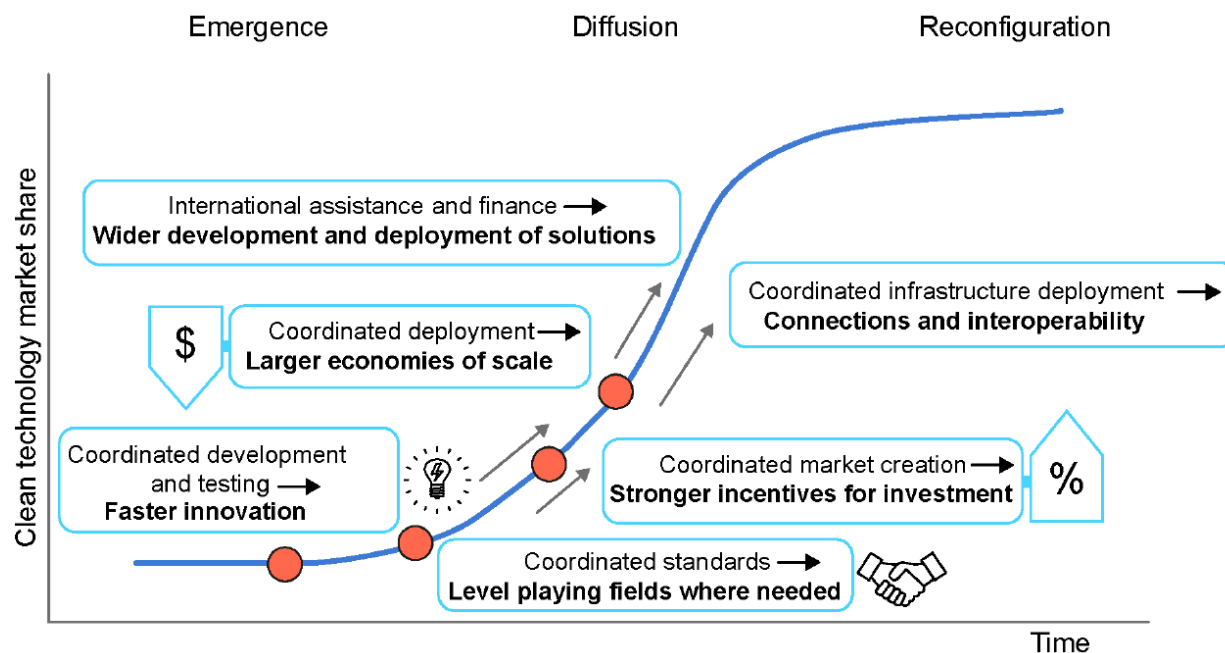


Figure 2: *The Accelerating Transitions Framework.*⁵

At each of these stages, there are coordination gains – benefits that countries can only achieve by working together. Aligning action on development and testing leads to faster innovation. Coordinated deployment policies create larger economies of scale and faster cost reduction in clean technologies. Agreements on standards and trade can establish level playing fields in global markets, making it less difficult to deploy clean technologies in sectors where they are highly traded and at a cost disadvantage.

A different structure for climate change diplomacy

To realise these coordination gains, making low carbon transitions faster, less difficult, and lower cost for all countries, a different structure of climate change diplomacy is required:

Scope: The scope should be sector-specific, not economy-wide. Each sector is different in its technologies, industries, financing, political economy, and forms of international connections. These unique characteristics must be at the centre of attention, for diplomacy to be effective.

Participation: The priority is to involve a critical mass of countries that together can shift the global market in the relevant sector. Early in the transition, this is a small number. Having too many participants makes a deep agreement more difficult.

Timescale: The focus should be on actions more than targets, the present more than the future. Governments have more confidence in what they can do now than in what they can achieve in a decade's time, so this shift in focus enables stronger cooperation. The right actions taken now enable progress in the transition, which shifts interests over time, leading to even stronger actions later.

⁵ Figure source: International Energy Agency, International Renewable Energy Agency, and UN Climate Change High-Level Champions, 2023. 'The Breakthrough Agenda Report 2023'. Adapted from Victor, D.G., Geels, F.W., and Sharpe, S., 2019. 'Accelerating the low carbon transition: the case for stronger, more targeted and coordinated international action.'

Putting it into practice: the Breakthrough Agenda

In 2021, leaders of 45 countries together representing over 70% of global GDP [committed](#) to work together in each sector to make clean technologies and sustainable solutions more affordable, accessible and attractive than fossil fuels before the end of this decade. The process they launched, the Breakthrough Agenda, aims to continually reassess and strengthen international cooperation in each of the emitting sectors. This process is ongoing. Information can be found at breakthroughagenda.org

Sources of further information

This note is based on the report [‘Accelerating the low carbon transition: the case for stronger, more targeted and coordinated international action’](#) (Victor, D.G., Geels, F.W., and Sharpe, S., 2019). The report includes brief examples from historical technology transitions, and from diplomacy in the fields of security, trade, and environment, to illustrate the general argument, and chapters exploring how the framework can be applied in practice to ten of the major greenhouse gas-emitting sectors.

The [Breakthrough Agenda Report 2022](#) (International Energy Agency, International Renewable Energy Agency, and UN Climate Change High-Level Champions, 2022) provides an in-depth assessment of the state of international collaboration in the power, road transport, hydrogen, steel, and agriculture sectors, analyses the opportunities for cooperation in each sector, and makes recommendations to governments.

The [Breakthrough Agenda Report 2023](#) (IEA, IRENA, and UN Climate Change HLCs, 2023) updates the assessment of progress and the recommendations, referring back to the earlier report for the underlying arguments, and also extends the assessment to the sectors of buildings and cement. The Breakthrough Agenda Report 2024 will be published in early October 2024.

The Intergovernmental Panel on Climate Change’s Sixth Assessment Report [Working Group III: Mitigation of Climate Change](#) (2022) includes chapters with information on the system transitions required in each of the major greenhouse gas-emitting sectors of the economy.

The academic paper [‘Prisoners of the wrong dilemma: why distributive conflict, not collective action, characterises the politics of climate change’](#) (Aklin, M. and Mildenerger, M., 2020) explains why battles between interest groups within countries are more important for policy than concerns about free-riding between countries, and outlines the implications for climate change diplomacy.

Academic papers on the Multi-Level Perspective on transitions include [‘Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case study’](#) (Geels, F.W., 2002), [‘Typology of sociotechnical transition pathways’](#) (Geels, F.W. and Schot, J., 2007), and [‘The multi-level perspective on sustainability transitions: responses to seven criticisms’](#) (Geels, F.W., 2011).