

Introduction to Deep Transitions Thinking: A Springboard to Global Sustainability

The First Deep Transition began as the Industrial Revolution. Having begun 250 years ago, the world it produced is unravelling at speed as its methods and values become unsustainable for our planet. To succeed in delivering a better future, the Second Deep Transition needs to place sustainability at its core.

The Deep Transitions Global Investors Panel aims to inspire the investment trajectory for this Second Deep Transition, shaping a sustainable future for upcoming generations in service of leaving a legacy that matters.

Since the First Deep Transition, the world has experienced a succession of surges in economic and social development. This led to modern societies as we know them today. In the Deep Transition theory, we explore underlying drivers in the establishment of our lifestyles, but from an unusual angle. We examine how values and rules are adopted

by people and organisations to become defining features across the systems that support us.

Traditionally, these rules embrace fossil fuels; linear, 'extract and discard' production; centralised, globalised mass-production and consumption. This has led to 'socio-technical systems' (more on this term below) or infrastructures for the provision of food, mobility and energy (amongst others) that are unsustainable. The First Deep Transition 'rules' are now crumbling away, with the climate emergency necessitating the race-to-net-zero. Deep Transition Futures looks at how these rules, values and systems can be unmade to catalyse a stable, sustainable Second Deep Transition.

A walk through the theory

The academic definition of a Deep Transition is 'a series of connected individual transitions in a wide range of socio-technical systems.'

ONE

Within Deep Transitions theory, numerous dynamic **‘socio-technical systems’** are pivotal in transitioning to a sustainable world. Socio-technical systems theory sits within the discipline of **‘sustainability transitions’**.

Society and technology continually interact to evolve and shape these systems. Alone, technological development does not drive change – we are not ‘technology determined’. The shaping forces of people and society on technologies need to be accounted for. These dynamics influence how technologies emerge, their uptake, and their actual end-use and outcome. The interdependency between technology and society needs a systems perspective that includes all the determining factors in a socio-technical system - science and technology, markets & users, governance and cultural conditions. The components of a socio-technical system, using the mobility system as an example, are shown in Figure 1. Initiating sustainable change in a “socio-technical system” means something very different from just developing new radical technological solutions. Without a dual focus on the ‘socio’ and the ‘technical’ a transition will not occur. We cannot rely on technology alone: People matter too.

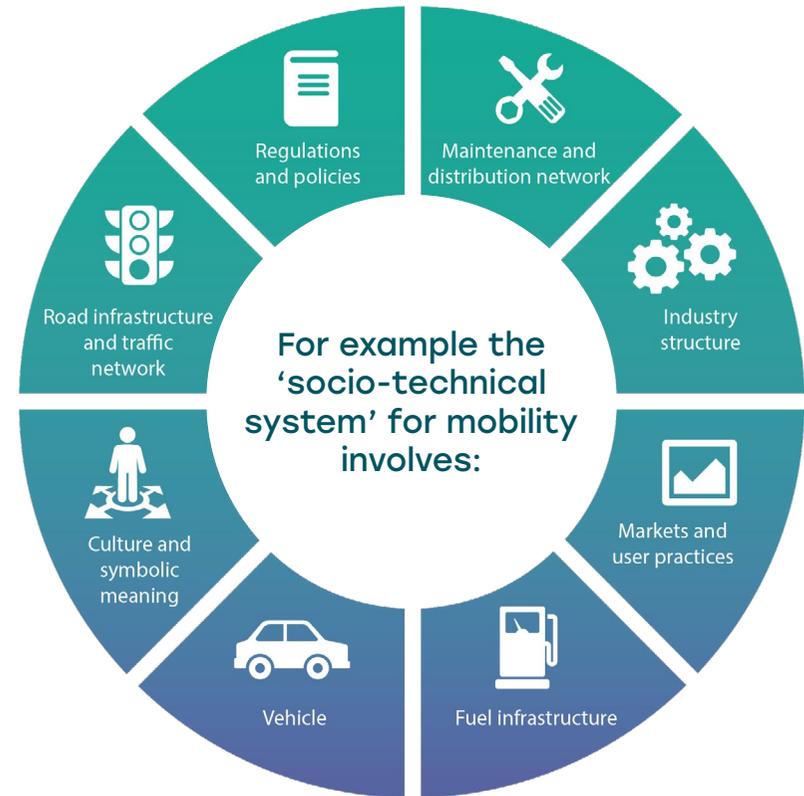


Figure 1: The component parts of the socio-technical system for mobility & transport

TWO

We use the **‘historical imagination’** to understand the creation of these socio-technical systems.

Throughout history socio-technical systems have evolved along certain trajectories of development, shaped by many human opportunities and choices. Understanding potential future paths for new sustainable systems needs knowledge of the historical interplays that produced the current world. The ‘historical imagination’ identifies what yesterday’s alternatives were, as well as those of today. Why did they not come to be dominant? By doing so, we can better understand where tomorrow’s prevailing socio-technical system may be advancing from. Take the transport and mobility system - could the horse and cart have evolved towards anything but the car? Were there other feasible alternatives? Why did they halt while the car sped on? Will digitally-driven mobility-as-a-service using bikes, trains and other transport modes lead to a trend in non-car ownership that will shape a new sustainable transport system? Will car ownership ever be viewed as vulgar due to its singular use and excessiveness? We have to explore questions like this to better understand how to create the sustainable systems the world needs.

THREE

The power interplay in a socio-technical system is between **“regimes”** and **“niches”** that are influenced by **“landscape shocks and pressures”**. This dynamic shapes a whole process known as a **“transition”** (or **“socio-technical transitions”**).

In Deep Transitions theory a socio-technical system is created through the interaction of the dominant system - the “regime” - and emerging, alternative innovations - the “niches”. This interplay is shaped by

external shocks and mega-trends known as “landscape pressures”. A transition in a socio-technical system happens when niches flourish; and the existing, dominant system opens up for reconfiguration due to the pressure of shifting trends in the landscape. For example, the carbon side-effect of fossil fuels is a mega-trend causing global warming and the climate emergency. This mega-trend exerts ‘landscape pressure’ that necessitates and bolsters renewable alternatives. The dominant fossil fuel regime is being hollowed out and decentred. Renewable energy, originally a niche player, vies for dominance in the new sustainable regime.

MLP MODEL

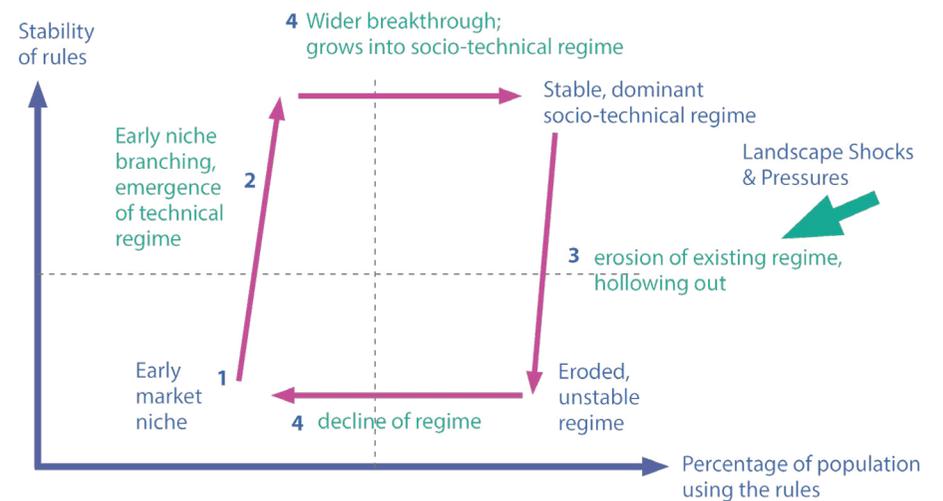


Figure 2: The Multi-Level Model (MLP) showing the dynamic of niches, regimes and landscape shocks (Source: Johan Schot and Frank Geels, ‘Niches in Evolutionary Theories of Technical Change’, *Journal of Evolutionary Economics* (2007), 17 (5), 605-622.)

FOUR

In Deep Transitions theory, regimes are seen as consisting of a mesh of **“rules”** that encompass not only laws and regulations, but societal “rules” around people’s routines, expectations, values, norms and mindsets.

Regimes are the major configuration at the core of the socio-technical system. Not political regimes but those centred on the social and technological behaviours of actors in the system. These interconnected rules have been shaped through historical trajectories, carved out by a socio-technical system along its rise to primacy. This nexus of rules, that makes up the regime, has a universality across different societies globally; being implicitly or explicitly understood and aligned across multiple actors in the regime – markets, governments, organisations. Alignment and adherence, consciously or unconsciously, to these rules is how a regime remains stable and ‘locked-in.’ It is therefore hard to change. Niche social and technical innovations can disrupt and ‘hollow-out’ regimes to build fresh pathways to new sustainable systems.

To transform societies towards a sustainable future, we need fundamental change in the organising rules that govern socio-technical regimes. For example, the ‘rule’ that cars run on fossil fuel is slowly being overtaken by people valuing electricity as a preferred power source. For a sustainable future, rules such as this need to be altered across multiple, interconnected socio-technical systems in society. A ‘Deep Transition’ (as opposed to a single system transition) occurs when these multiple, interrelated socio-technical systems transform in the same direction. As we will see in point 6, this is a process that is most likely to happen during dramatic ‘surges’ in technologies or as a response to ‘landscape shocks’ such as wars or global pandemics...



Transitions in multiple socio-technical systems...

...Moving in a similar direction with new rules, behaviours and values for sustainable systems

Figure 3: A Deep Transition definition: A transition in direction for multiple, as opposed to single, socio-technical systems. This makes it a ‘Deep’ transition.

FIVE

For a Deep Transition to happen, sustainably oriented **“meta-rules”** must emerge that succeed in transferring and ‘coupling’ with other socio-technical systems to inform how they behave as well.

For example, the mode of mass production for cars, originating with Henry Ford, and others, in the mobility system, became a “meta-rule” for manufacturing. Mass production jumped to other systems to create mass consumption opportunities for the production of goods to grow markets. Mass production became the dominant meta-rule of production in multiple systems. For the second Deep Transition, in our sustainable future, will the principles of a circular economy become the meta-rules for production and the manufacturing norm?

SIX

A collection of meta-rules across many socio-technical systems is known as a **“meta-regime”**. These dominated history through **“surges of development”** occurring since the onset of the First Deep Transition in the Industrial Revolution. These meta-regime surges are demonstrated in figure 4 on the right.

Since the Industrial Revolution, these surges of development have added layers to the first surge’s meta-rule. For example, the hegemony of fossil fuels as a primary energy source is reinforced in successive surges. The accumulation of these meta-rules has propelled the “directionality” of the socio-technical system along an ultimately unsustainable path. These historic surges were driven by public and private investments. Therefore, investments will play a crucial role in shaping the directionality of a Second Deep Transition, and the outcome thereof for our future. This is the principal reason for engaging in the Deep Transitions Futures project.

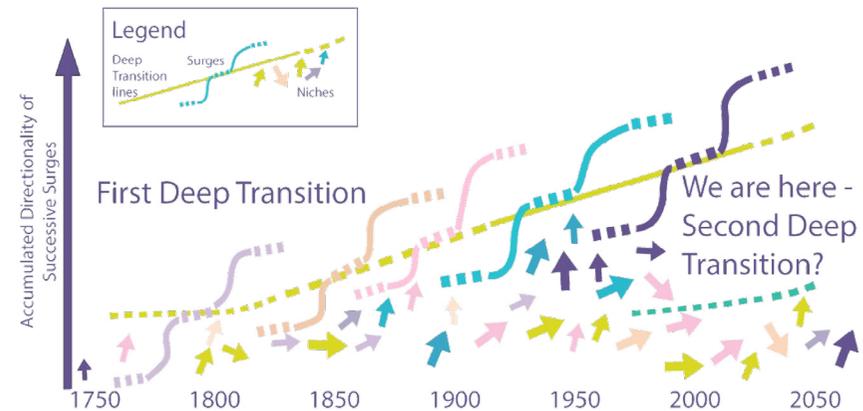


Figure 4: Development surges which create meta-rules and regimes to contribute to the First Deep Transitions progression and directionality (Source: Schot, J., & Kanger, L., Deep transitions: Emergence, acceleration, stabilisation and directionality. *Research Policy* (2018), 47(6), 1045-1059.)

SEVEN

What does the Deep Transitions theory say about how the Second Deep Transition can be created? A Deep Transitions perspective views the Second Deep Transition as being created through development surges. These surges would be characterised by a stage:

“emergence” | “acceleration” | “stabilisation” and “directionality”

The Deep Transitions theory highlights a further five phases in the creation of a transition - the move towards a new meta-regime and how it comes to dominate.

For illustration, we can view the ascension of the car through each phase:

Gestation

1801-1890 - The innovative idea of a motorised carriage is developed, becoming a novelty for the rich. In this phase, we see several different technologies being used - there were steam as well as petrol engines at this time, vying therefore, to become the ‘rule’.

Irruption

1890-1900 - A rapid proliferation of companies emerged, all focusing on cars for the relatively wealthy as well as some further niches, like race cars.

Frenzy

1900-1903 - Several companies began using mass production, including the one founded by Henry Ford. At this point, Ford was also working on the idea of tractors and farm mechanisation - an example of multi socio-technical system thinking, as he began the coupling the rules between the transport and food system. The Ford Motor Company produces an array of models - A, B, C, F, K, N, R, and S. A similar variety was being

produced by others in America and Europe, showing the frenzied activity in the quest for dominance.

Synergy

1908 - Ford introduces the ‘Model T’ which was intended to be affordable by the people that assembled it. The Model T is a good candidate for the tipping point when one specific new meta-regime prevails. This new regime was then ‘locked in’.

Maturity

1945 - Following World War II, the car industry matures with a long run of being the established meta-regime.

Prior to WW II there were many couplings that linked car production to other sectors (for example, steel, plastics, glass) in order to service the infrastructure needed for the provision of petroleum, for example paved roads and petrol stations. This demonstrates how links and couplings between socio-technical systems occur and intensify to pervade other systems to influence directionality.

There are three processes at the heart of this Deep Transition dynamic which the Deep Transitions Project Team and the Deep Transitions Global Investors Panel - where appropriate - can seek to fulfil. These are:

- Being intermediary actors between ‘niches’ and the dominant ‘regime’ to bridge the different systems and their ‘rules’
- Coupling between socio-technical systems, where one influences another, and the ‘rules’ around sustainability replicate
- Actors shaping the mission, the purpose and the expectations of the new sustainable system as it is configured

This Deep Transition Dynamic is illustrated further with detailed graphics demonstrating the phases and coupling mechanism in the Deep Transition Research Paper - Deep transitions: Emergence, acceleration, stabilisation and directionality (Schot, Kanger 2018)

Our Hypothesis & Mission

In Deep Transitions Futures we believe that there are key action sites and leverage points for influencing. We aim to develop a new investment philosophy together which seeks:

- A. Changes in beliefs, norms, expectations and routines (in Deep Transitions-speak 'meta-rules') to create new ones that are orientated towards sustainable development;
- B. Levering a change through collective action in a direction towards identified desirable sustainable future scenarios.

Deep Transition Futures and their leverage points and action sites reflect similar themes in both the Global North and South, but need to be adapted to different socio-cultural, economic and political contexts. The Deep Transitions Global Investors Panel can help understand, create and inspire these, using the panellists' knowledge and resources to shape a desirable, sustainable future for our world.