

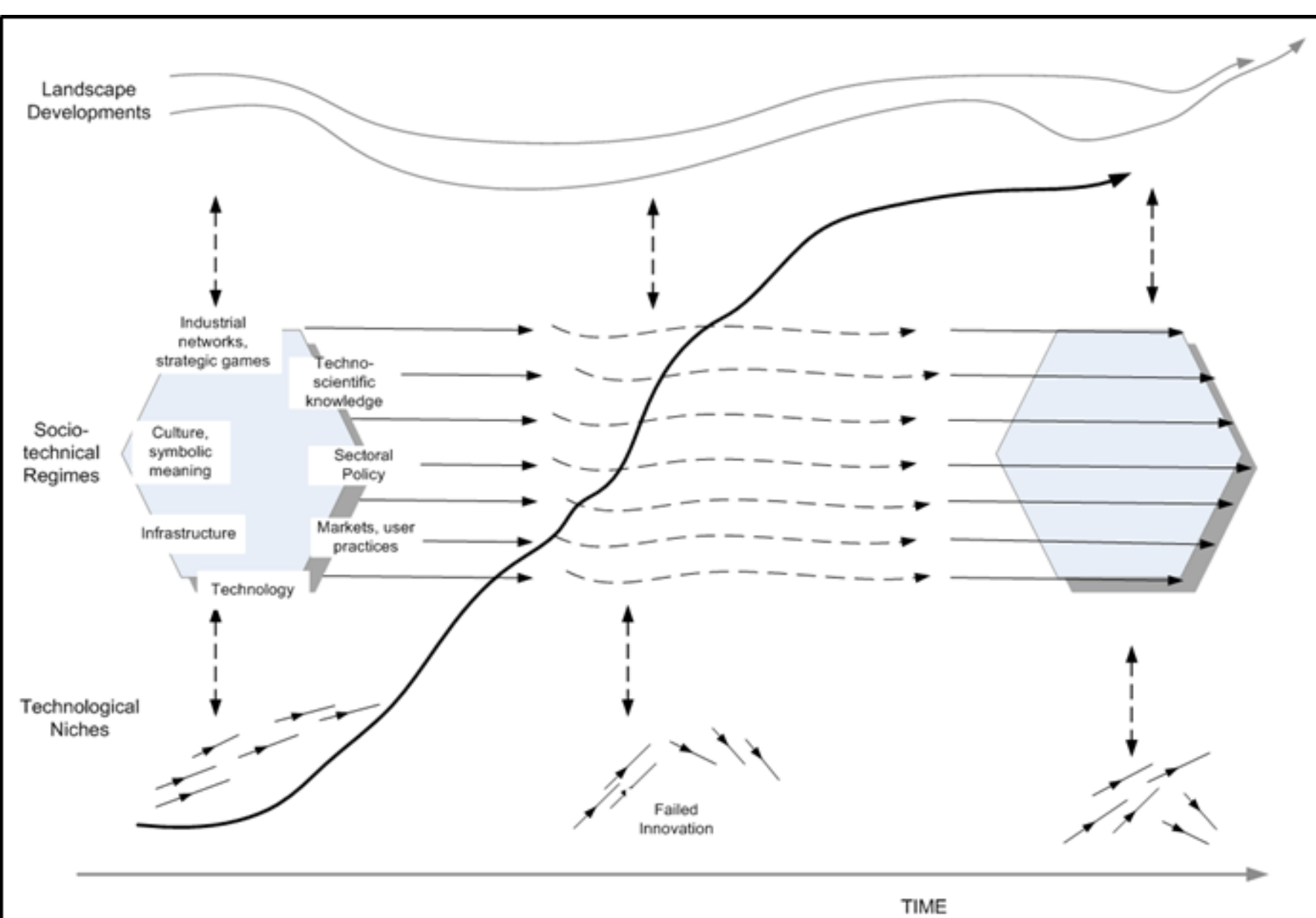
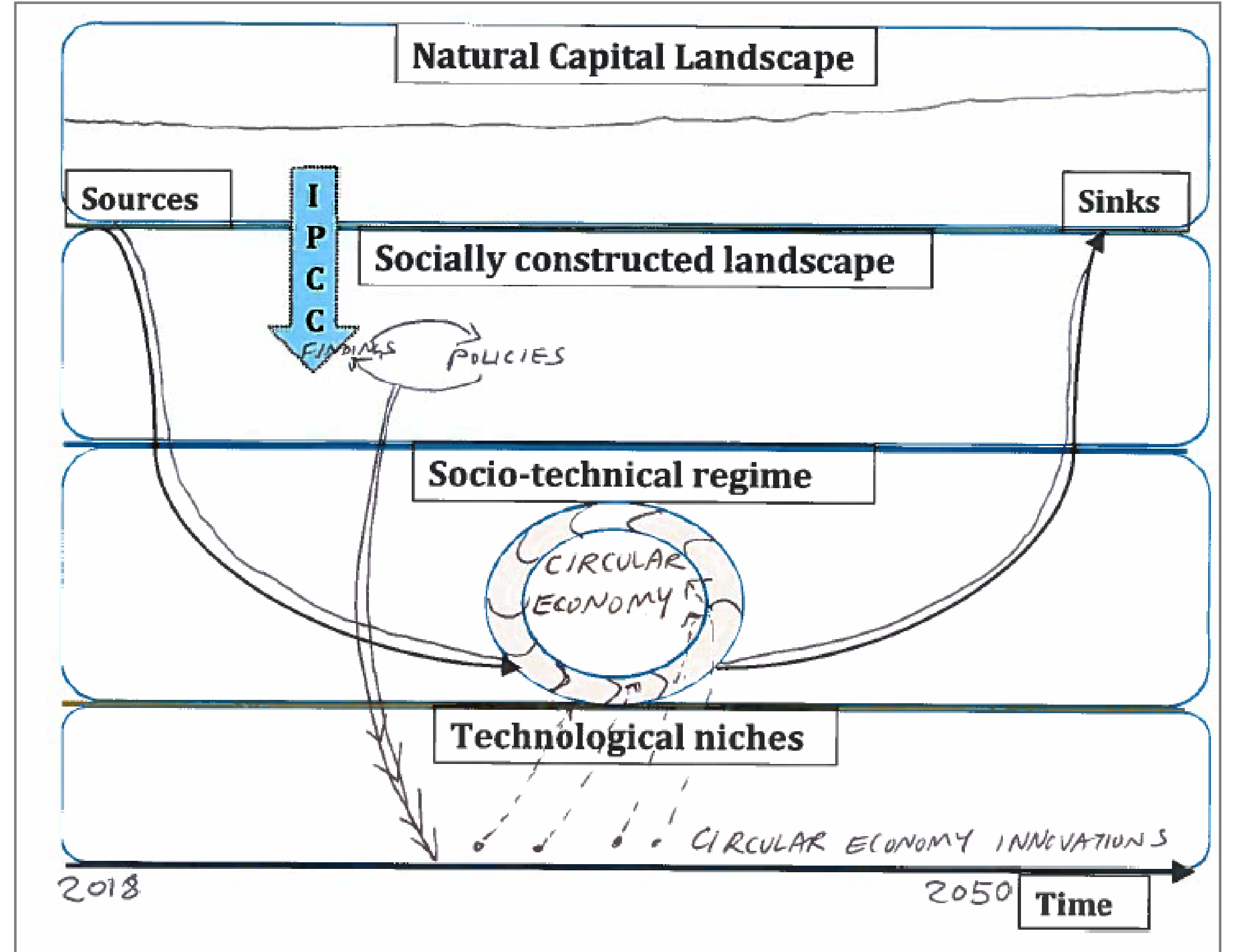
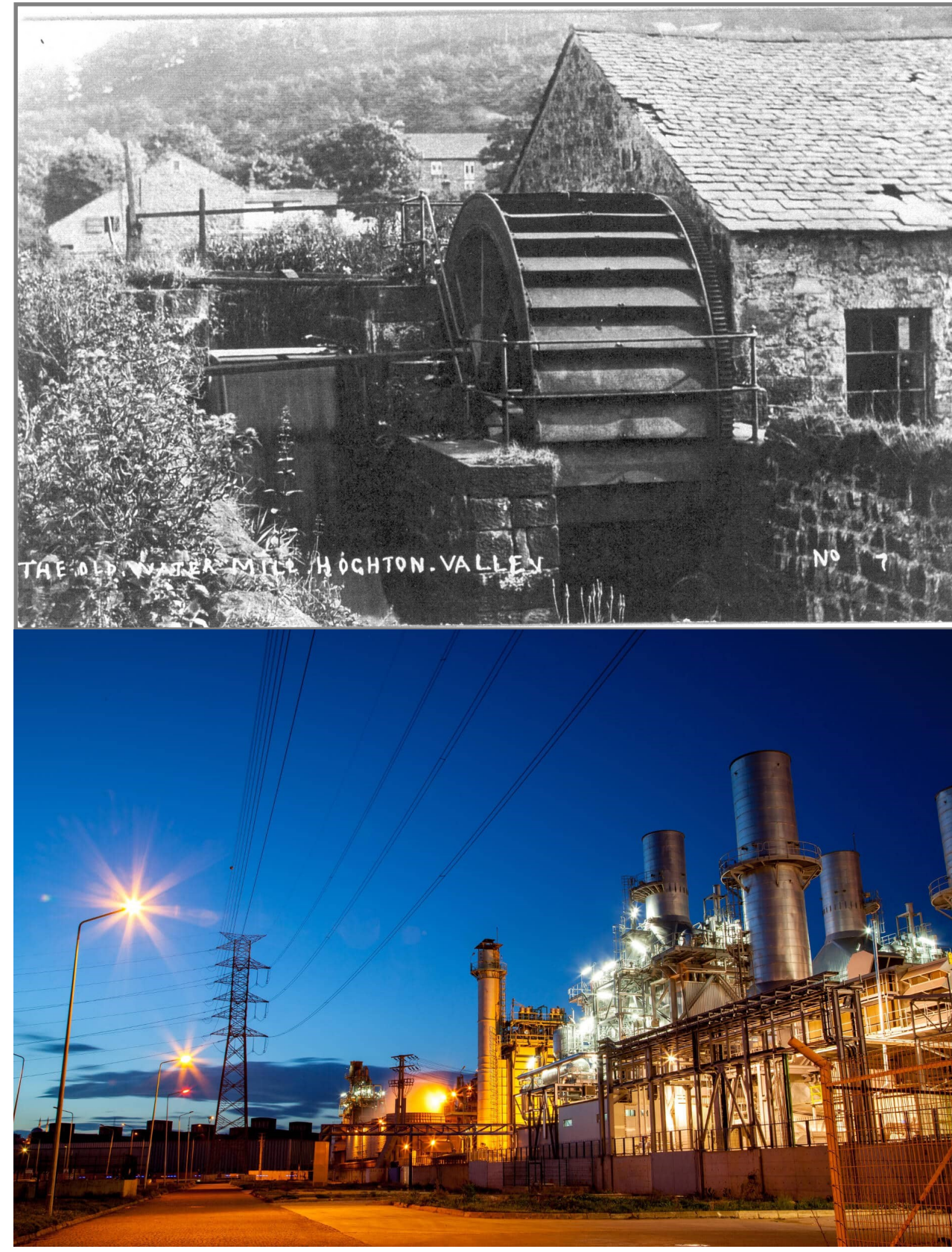
Imagining Technology Transition as if the Natural World Mattered

Dr Rachel Freeman; Tyndall Centre for Climate Change Research, University of Manchester

The Multi Layer Perspective

The Multi Level Perspective represents the process of socio-technical transition.

- The landscape is the environment in which the socio-technical regime exists.
- The landscape is *socially constructed*.
- The static landscape includes: constitutional structures, policy styles, ideologies, and economic structures.
- Landscape changes can include *elections, accidents, macro-economic trends, commodity price developments...* (Geels).



An Expanded MLP that represents the Great Acceleration

The expanded MLP has:

1. An additional landscape to represent natural capital.
2. A generative mechanism (critical realism) representing the underlying cause of resource use and waste creation.

The Great Acceleration, from 1940's to now, has seen growth in resource use and declines in natural capital, including:

- Pollution and waste in ecosystems
- Overexploitation of ecosystems
- Anthropogenic climate change
- Imbalances in the nitrogen cycle
- Increased species extinction rates...

The growth engine (Ayres, 2002) has driven economic growth, resource use, waste.

An epistemic rift exists between scientific evidence on natural capital and government policy.

A possible circular economy future

In a circular economy future, the generative mechanism is the circulation of materials and energy in near-closed cycles.

- Amounts of resources taken from natural capital are small, and within the annual budget of ecosystem goods and services.
- Amounts of waste added to natural capital are small and within its capacity to absorb without degradation.
- Pressures from the natural capital landscape influence the socially constructed landscape and its policies
- The socially constructed landscape pressures the regime to be circular
- Niche circular economy innovations transform the regime
- Natural capital falls for some time but eventually recovers to 1940s levels.

The importance of natural capital

Natural capital is the stock of all ecosystems and the goods and services they provide.

- Natural capital supports all life on earth (including human beings!).
- The value of natural capital is estimated to be worth \$33 trillion per year.
- Pressures on ecosystems from society are real and growing—both at the local and the global scale.
- The MLP's Landscape sits within a landscape of natural capital

Proposition:

natural capital should be explicitly represented in the MLP as a separate layer.

