Innovation Framework

Setting the Scene

Scottish & Southern Electricity Networks

TRANSMISSION

System Change

Key message and actions

Decisive action is needed within the next two years to deliver the fundamental change required for a fair, affordable, sustainable and secure net zero energy system by 2050.

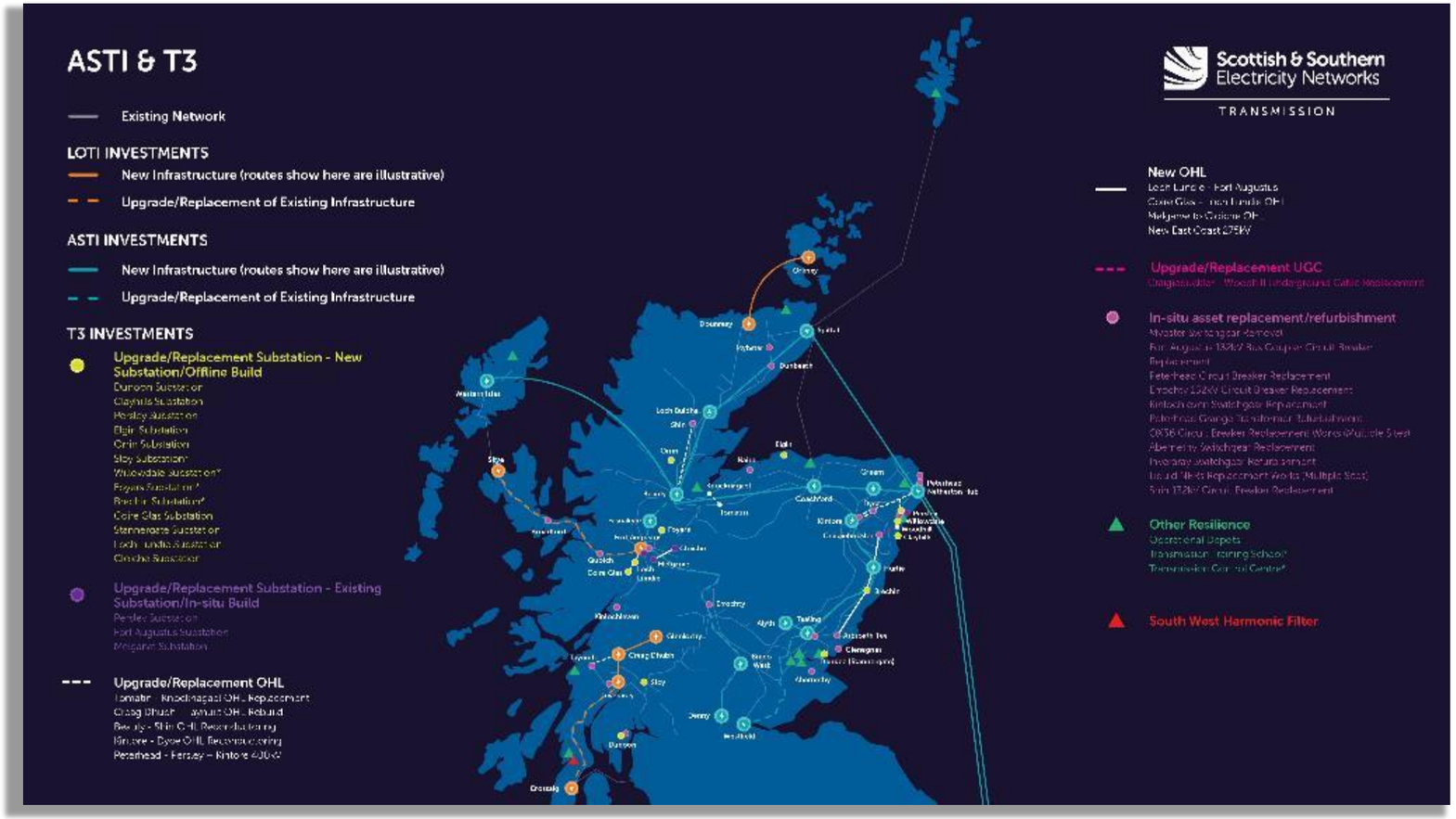
Actions:

1. Accelerate the delivery of whole system infrastructure through a strategic approach to network investment and introduction of planning reforms.
2. Deliver market reform, considering electricity, gas, hydrogen and CO_2, to ensure we have energy markets that provide for and work with a reliable and strategically planned energy system.
3. Prioritise the use of hydrogen for hard-to-electrify applications. Agree business models and kick-start delivery of the hydrogen and CO_2 transport and storage infrastructure needed for system flexibility.
4. Accelerate progress on low carbon heating including faster rollout of heat pumps irrespective of a decision on hydrogen for heat.
5. Deliver innovation and build consumer trust in affordable smart technology, enabling consumers to save on energy costs while helping with the management of Great Britain's electricity system.
6. Focus on energy efficiency improvements across all sectors to reduce overall energy demand.
7. Expedite the delivery of clean, low-cost and reliable new technologies and long-duration energy storage connected to the system by reforming the connections process.
8. Invest in supply chain and skills to deliver the low carbon technologies and infrastructure needed for net zero and enable the UK to become a world leader.

Source: FES 2024 / Pathways at a Glance 2024 04

Shifting Priorities

A North of Scotland Perspective



- Latest FES expects 50GW of renewable energy capacity connected to our network by 2050
- The Pathway to 2030 programme has established the need for significant investment in the North of Scotland
- RIIO-3 identifying further investment
- Government's Clean Power Plan 2030 ("CPP30") shifting priorities from 2035, to 2030

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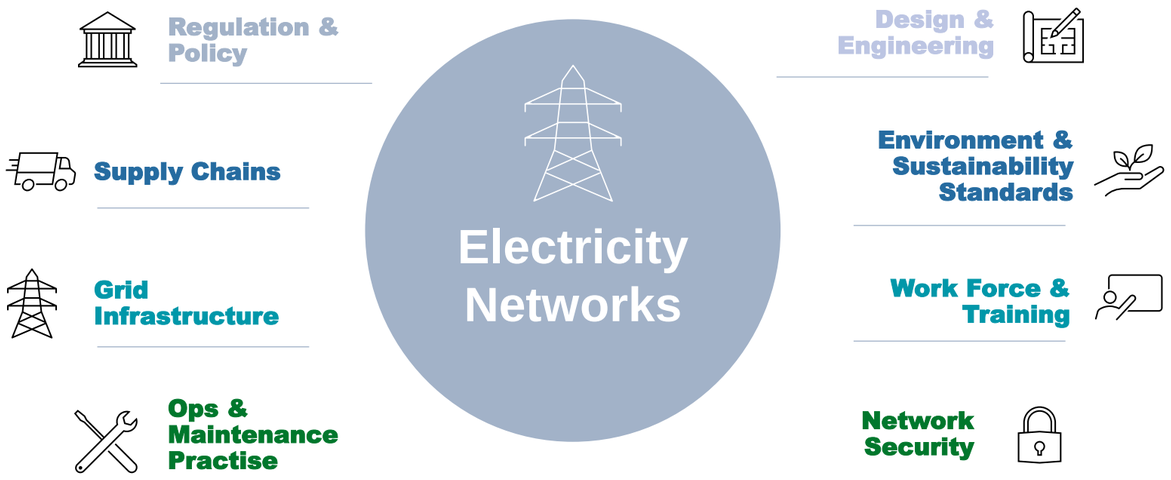
Transformational Change

Incremental change and BaU approaches are not enough. There is a cluster of elements that have remained unchanged for decades…some examples



Given the immense transformation required and the tight timelines, we must approach this challenge with fresh, innovative strategies. Building an energy system of this scale is unprecedented, and traditional methods simply won't suffice – we need bold, forward-thinking solutions to succeed

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Collaboration for change

We need a number of organisations to influence and support this change, organisations like:

- Government and Regulatory bodies
- Network Operators
- The System Operator
- Energy suppliers
- Equipment manufacturers (OEMs)
- Academia and research institutes
- Financial institutions and Investors
- Community energy groups
- Consumer advocacy and Environment Organisation
- Standards and Professional bodies
- Public, Private and non-profit sectors

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Our Locus of Innovation

A *locus of innovation* is a specific environment, location, or context where innovative ideas and activities are actively generated, developed, and implemented. In this "locus," different factors such as collaboration between individuals or organisations, supportive policies and resources come together to encourage and foster the innovation process.

Some Examples:

Agriculture

Supplier Dominant: Major agricultural suppliers, such as those providing seeds, chemicals, machinery, and digital farming technology

Pharmaceuticals

Science Based: New drug discovery, development and delivery focused on their own research and development

Energy Networks

Supplier Dominant: The energy networks rely on specialist suppliers making that Research and Development sits outside of their sphere

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Barriers to Change

Innovation can face major challenges from existing and well-established regimes that create barriers to change, some of these barriers are:

01

Regulatory and Policy

Constraints around legacy regulations, potential incentive misalignments, and complex permitting and consenting

02

High Capital Cost

The high capital costs against long asset life spans, or stranded asset risks

03

Operational Complexity

The challenges and complexities associated with system integration and interoperability

04

System Failure

The risk of system failure and preference for proven technology and experimental solutions sitting outside, this environment – not a safe space for R&D

05

Cautious Approach

Networks can often be cautious when approaching new technologies, meaning slower adoption, driving the need for more proven technologies

06

Public and Community Resistance

“Not in my back yard” can cause delay and prevent deployment of new technologies

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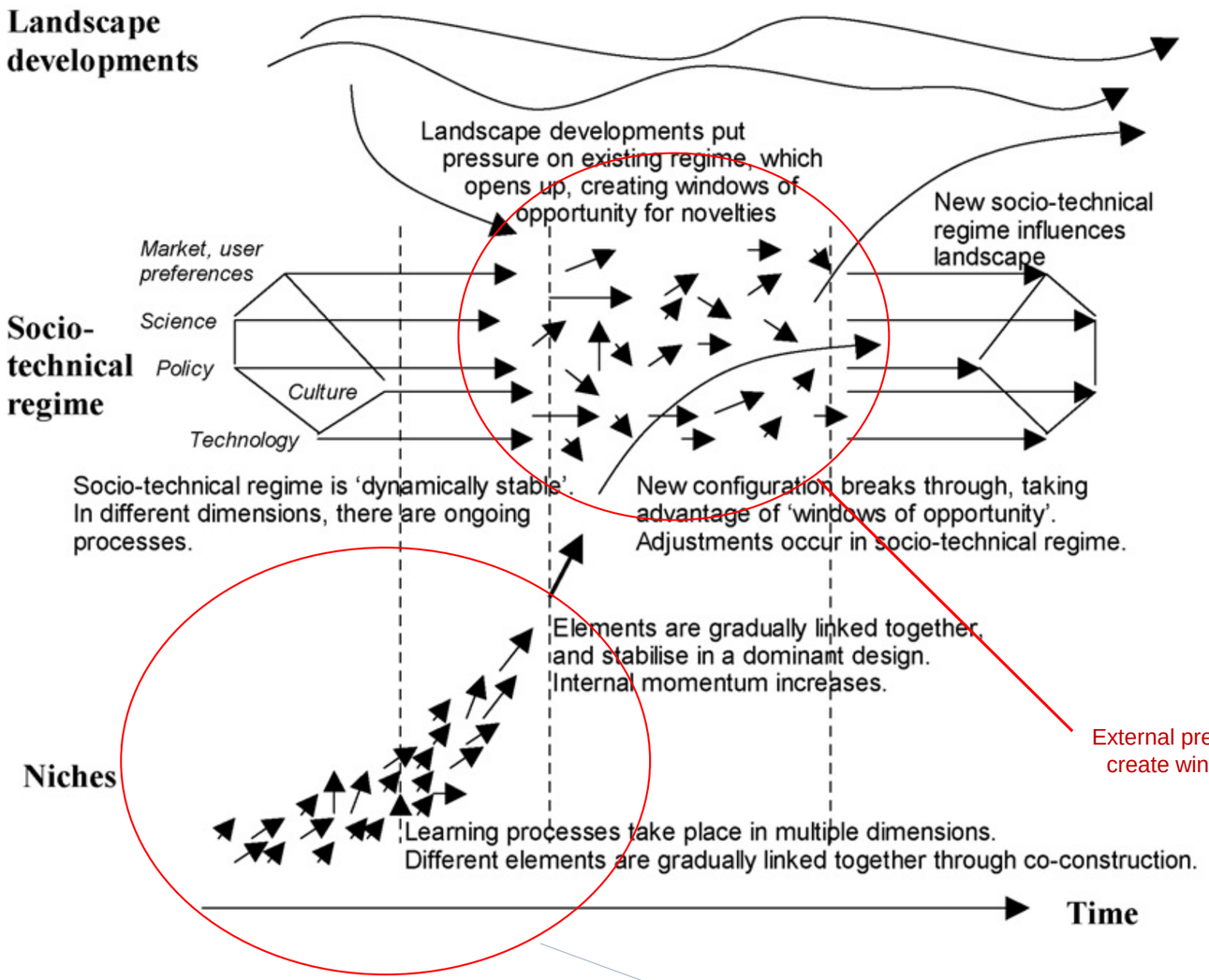
Innovation as a System



It's helpful to conceptualise innovation as a system, applying the Multi-Level Perspective (MLP) model developed by Prof Frank Geels. This model examines how niche innovations often face resistance from the established regime. However, as broader landscape shifts occur, windows of opportunity can open, enabling these niche innovations to gradually replace and redefine the existing regime

External pressure in the existing regime to open up the regime to create windows of opportunity to allow the niche innovation in.

A lot of variety and flux, a lot of failure struggling against the existing regime. Long time of learning experimentation and eventually it stabilises, there is an agreement

Source: Frank W.Geels, Professor of Sustainability Transitions, Manchester Business School