

How do stakeholder needs and values shape the successful implementation of hydrogen energy systems within regional decarbonisation strategies?

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The Big Question, ‘Why Hydrogen?’

The Role of Hydrogen in Regional Decarbonisation

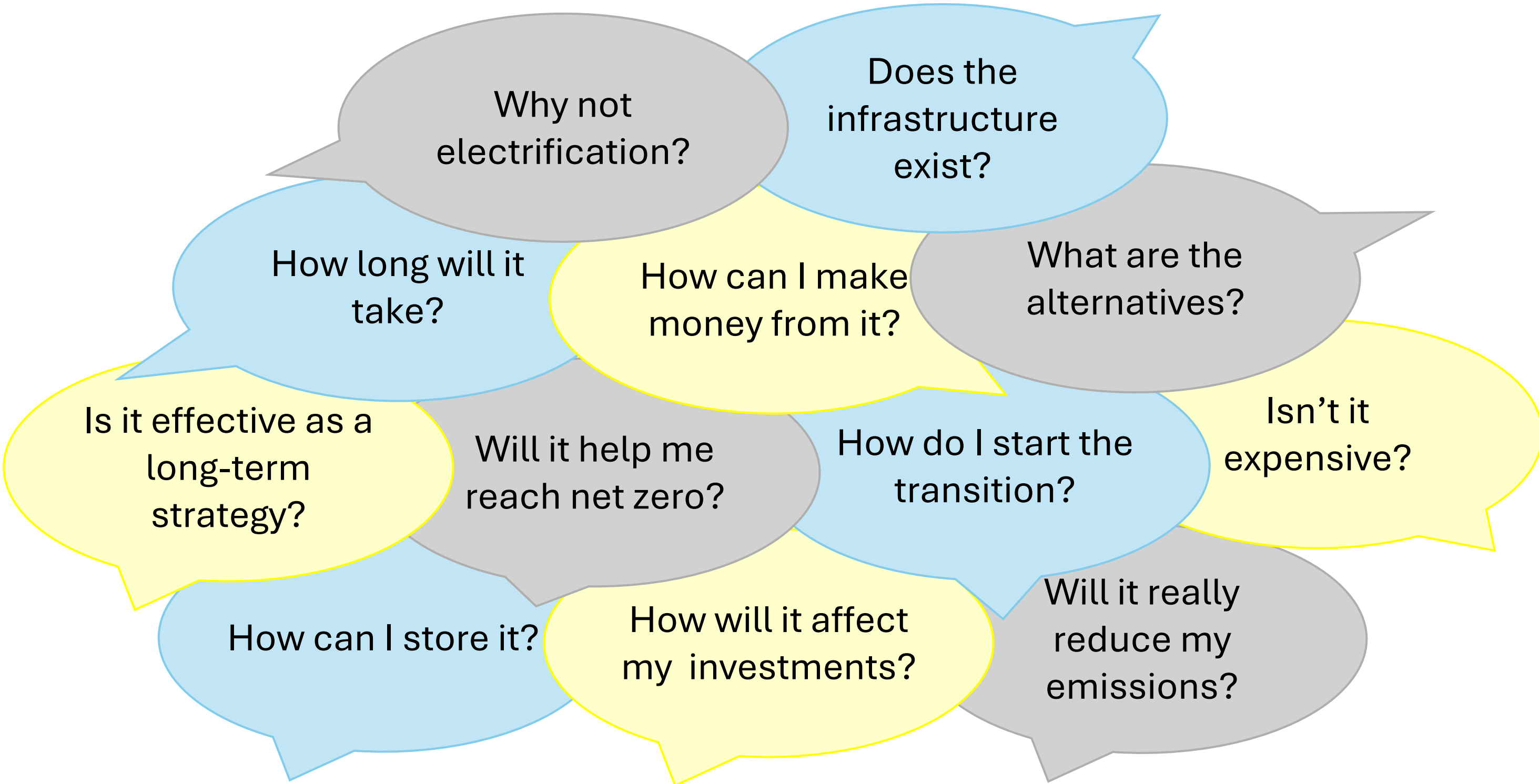
Hydrogen energy systems are central to the UK’s clean energy strategy, enabling deep decarbonisation in challenging sectors like heavy industry, transport, and heating.

The Challenge: Understanding Stakeholder Needs and Values

Integrating diverse stakeholder views with existing research, including industry, policymakers, local communities, and end users is crucial for designing hydrogen systems that are both effective and widely-accepted

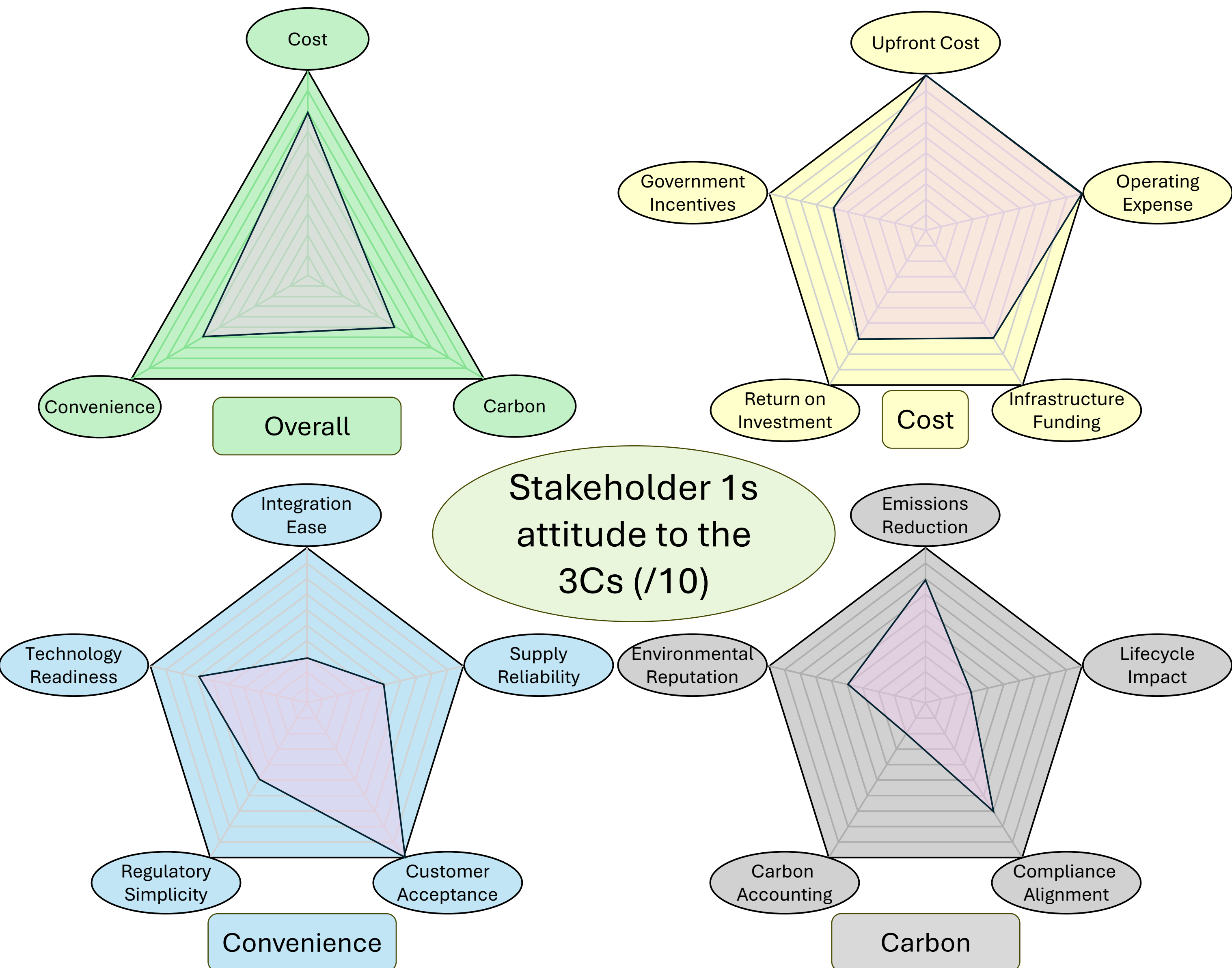
Scope of this research

The primary research question addresses how stakeholder needs and values shape the success of hydrogen energy systems within regional decarbonisation efforts, aiming to bridge gaps between feasibility studies and real-world implementation



How will it be done?

1. Systematic literature review identifying research gaps and establishing theoretical foundations
2. Analysis of regional decarbonisation initiatives, and wider UK policy and strategy
3. Semi-structured interviews with key stakeholders identified through stakeholder mapping techniques
4. Value analysis through the "3C framework" (Cost, Convenience, Carbon), extending the established Technology Acceptance Model.
5. Scenario development using modified Delphi techniques combined with systems modelling



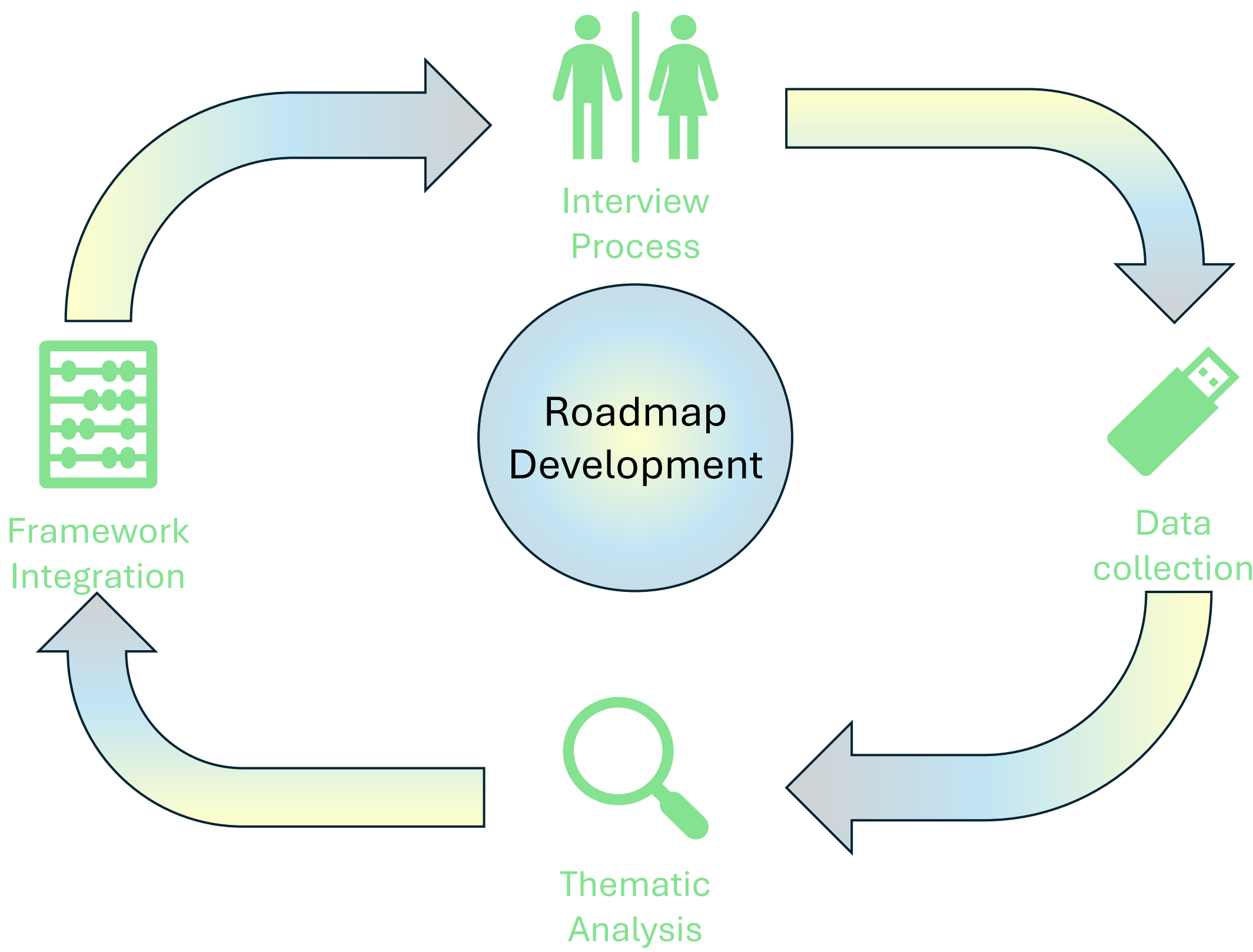
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What will be done?

Research Aim- To bridge the gap between technical feasibility and stakeholder acceptance in hydrogen transitions by providing actionable insights into how stakeholder needs and values influence successful implementation within regional decarbonisation strategies

MLP Framework- uses a multi-level perspective to analyse energy transitions at niche, regime, and landscape levels, enabling in-depth regional analysis and international comparison within feasible research parameters

Scenario Development- will incorporate stakeholder perspectives into modelled pathways, addressing a common methodological gap in previous hydrogen studies that focused only on technical parameters



What will be found?

The 3C Framework
The 3C Framework offers an analytical structure that recognises the complex interplay between economic, behavioural, and environmental factors, building on diffusion of innovations theory while addressing its limitations in energy transitions

Theory
The framework will highlight necessary considerations and optimal processes of decarbonising via hydrogen energy systems, adhering to stakeholder needs and values, to accelerate progress to net zero and beyond

Application
The framework will be used to advise hydrogen energy system manufacturers, developers, and purchasers on how to interact with hydrogen, providing a roadmap for when, where, how, and why to use hydrogen instead of other means of decarbonisation

How You Can Help
This research will require extensive stakeholder feedback and interviews, and I would greatly appreciate your input, perspective, and vision for a hydrogen-ready world. Please reach out to me at tjg45@bath.ac.uk