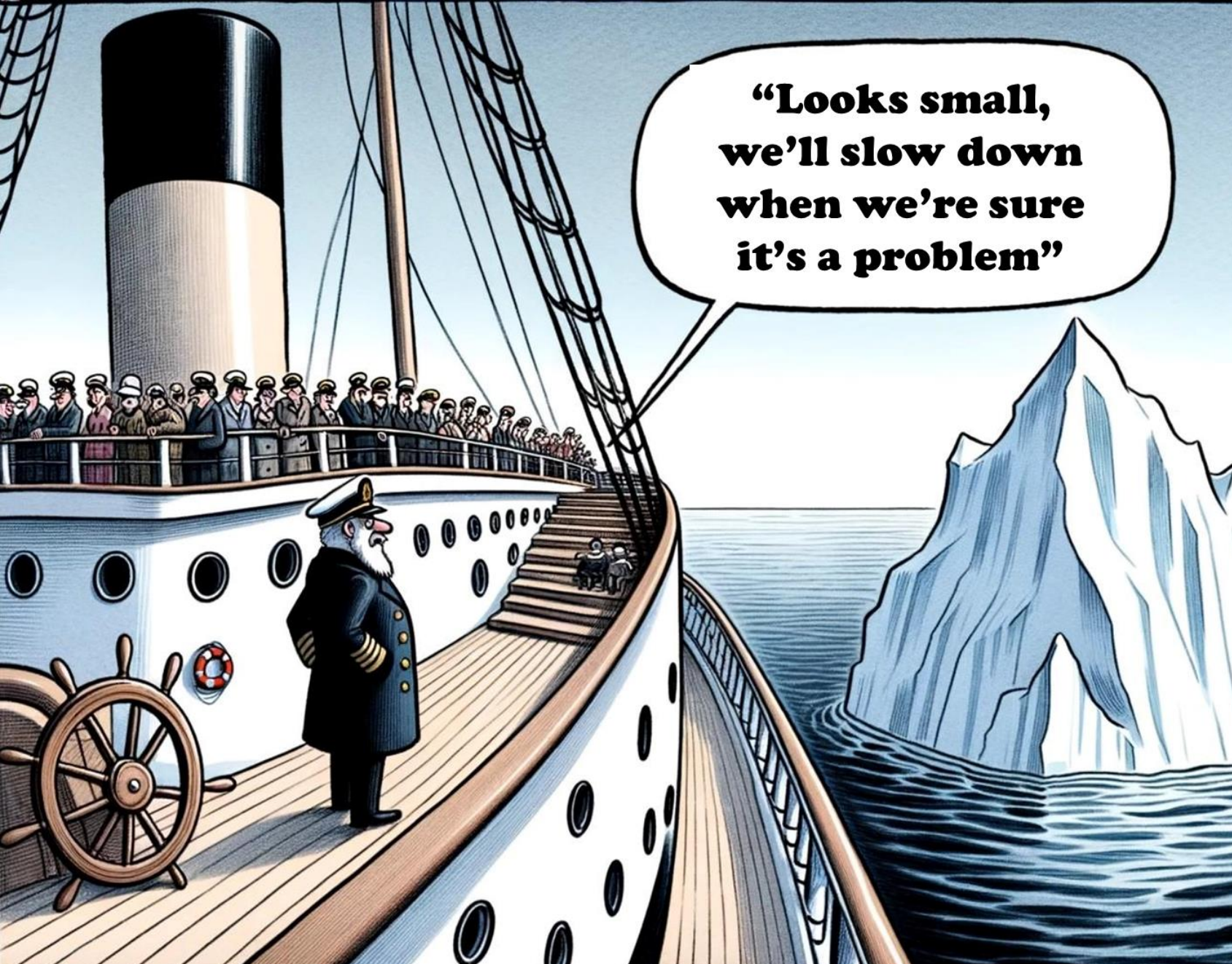
An aerial photograph of a lush green landscape, likely a river valley. A prominent river flows through the center, with a large dam structure visible in the lower right. The surrounding land is covered in dense green vegetation, and the water is a deep blue-green color. The overall scene is bright and natural.

Leveraging place-based resources to deliver sustainable growth.

A Green Economy

David Rooney



Green economy

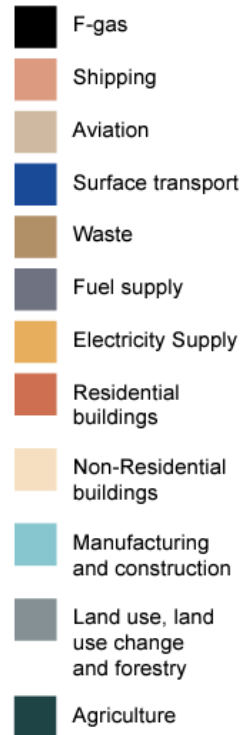
- Concept coined in 2012 at Rio+20 conference
- Defined as being low-carbon, resource efficient and socially inclusive economy
- “Umbrella” concept encompassing areas including enhanced energy and resource efficiency, and prevention of the loss of biodiversity and ecosystem services



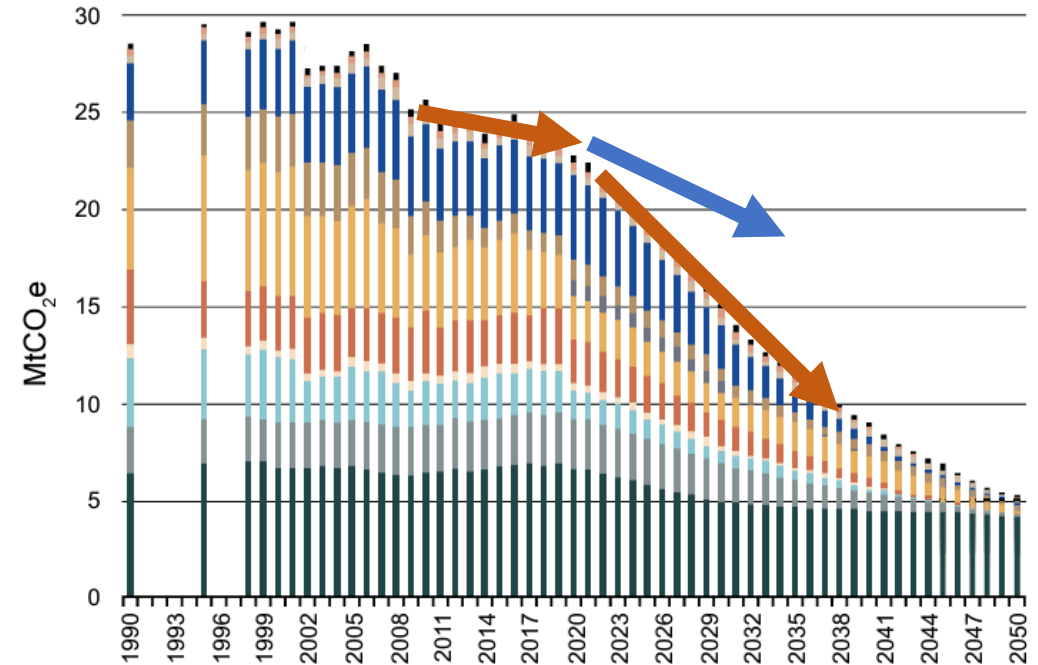
More than just emissions

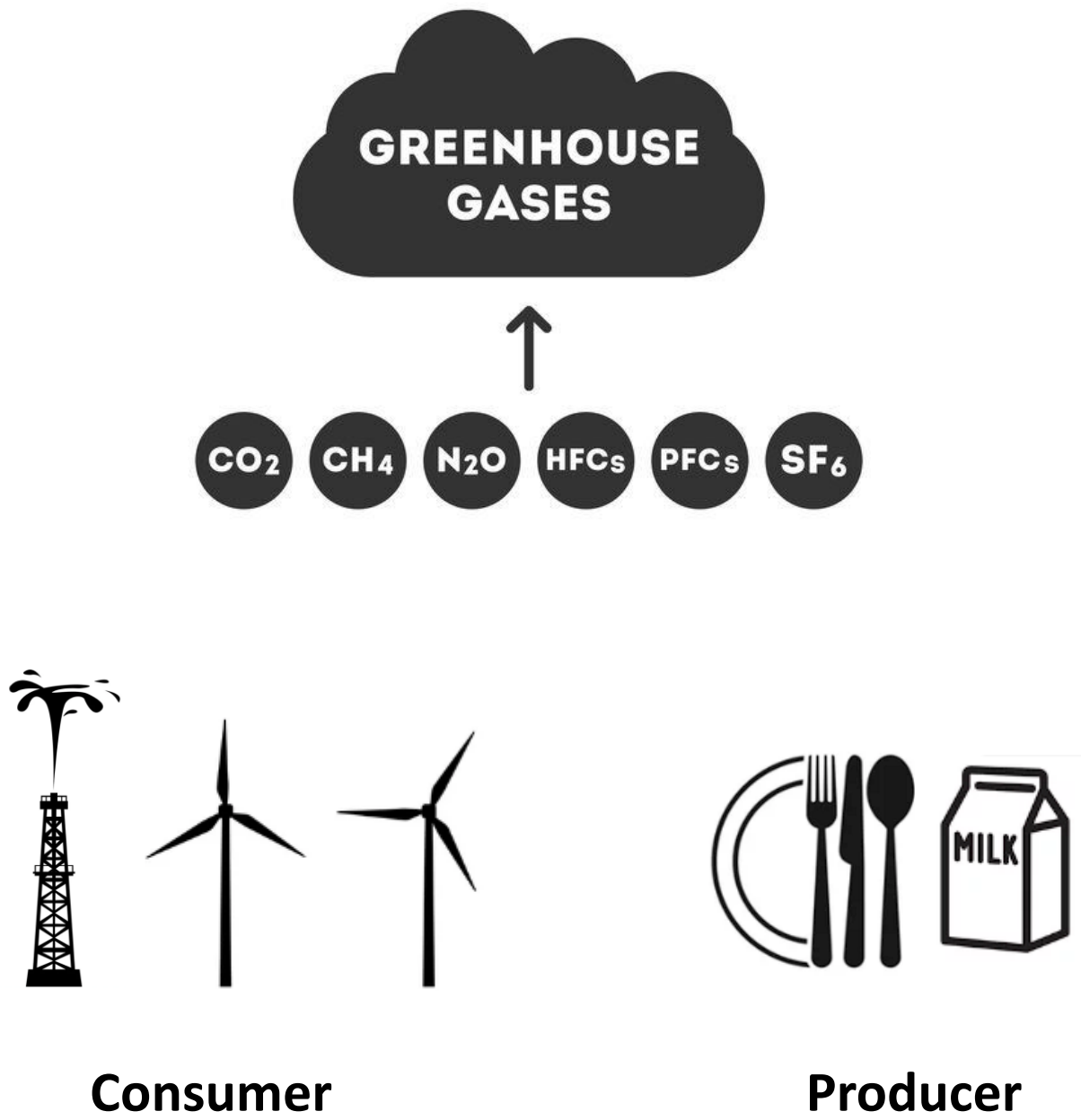
Next 15 years will require a massive increase in decarbonisation investment to deliver on climate legislation.

How can the economy evolve?

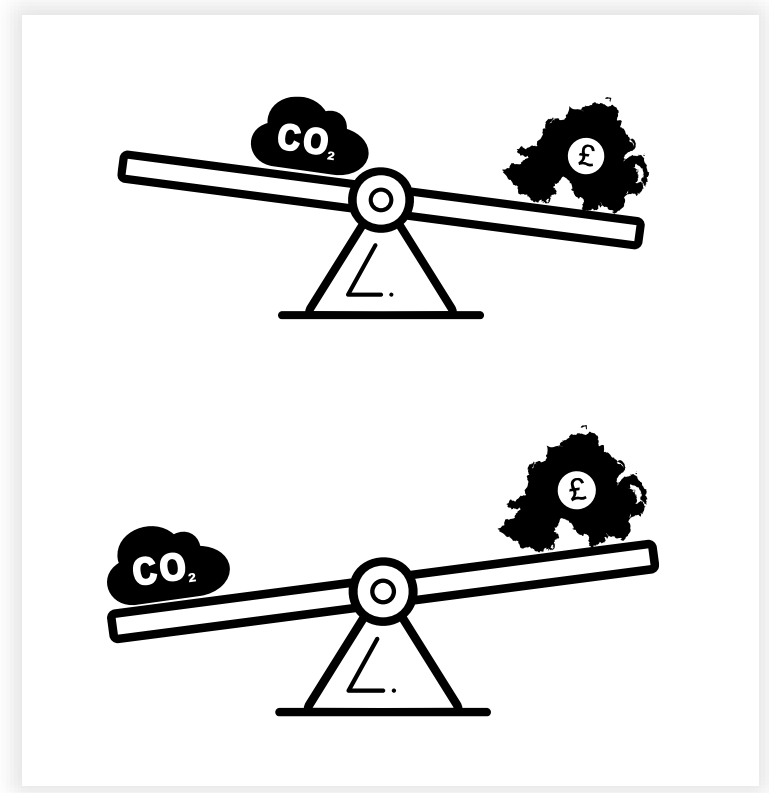


Sectoral emissions in Northern Ireland under the UK's Balanced Net Zero Pathway compared to historical emissions





Question: Importing fossil fuels to produce high CO₂ footprint foods whilst exporting renewables.

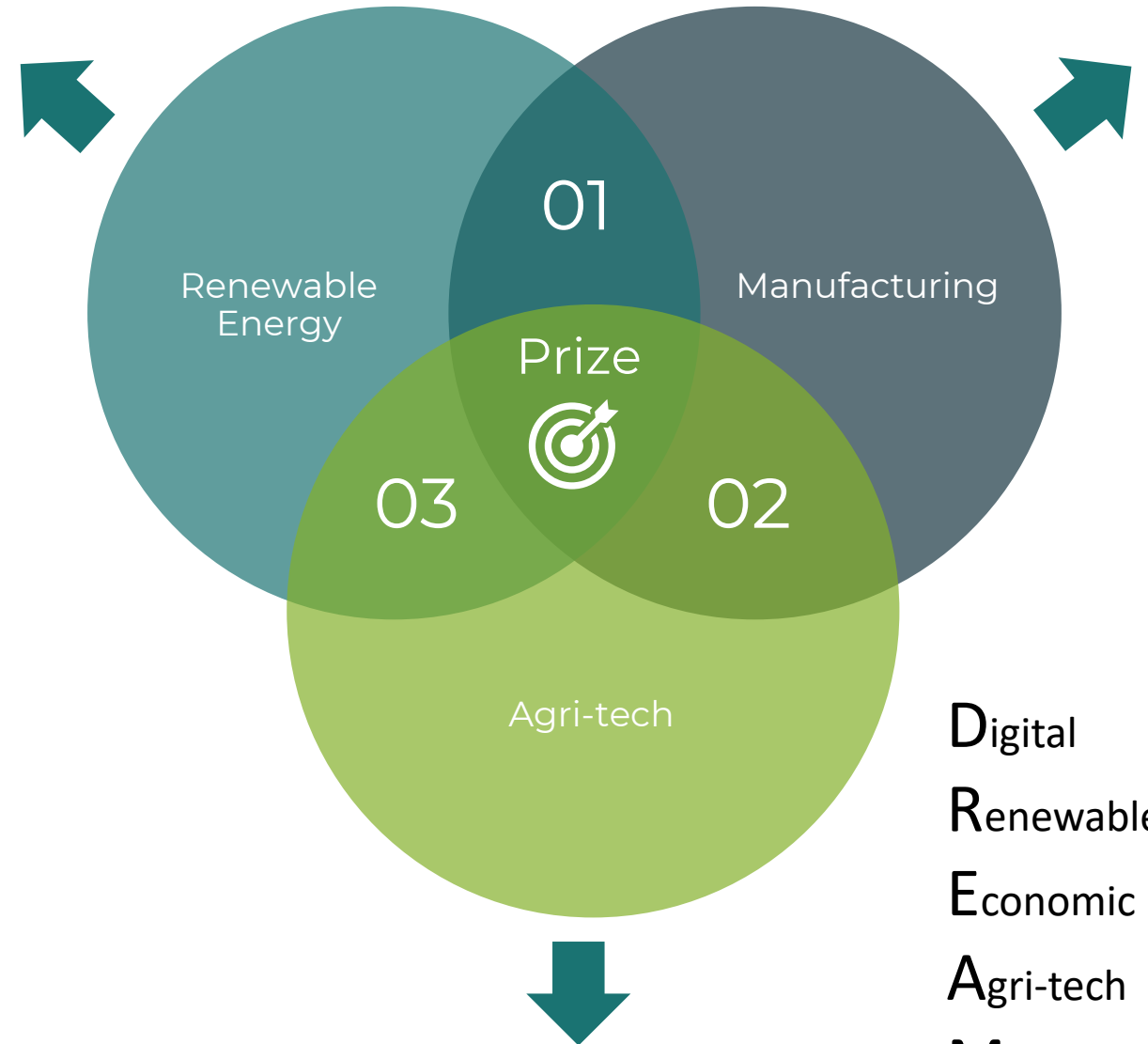


External factors, internal opportunities

A systems approach to sustainability
Building on strengths (own and neighbours)

Many valorisation pathways (agri-tech, fuels, construction, data)

Cooperative approaches can aggregate opportunity



Digital
Renewable
Economic
Agri-tech
Manufacturing



A Stronger Green Economy

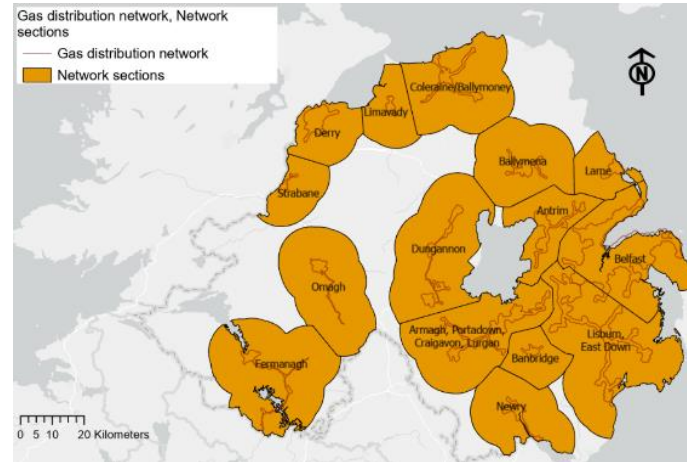
INGREDIENTS: 'Nature' resources,
Circularity, Cooperation, Energy
integration, Supply chains,
Innovation, Skills, Finance,
Research capacity, Infrastructure

CONTAINS: Farmed carbon

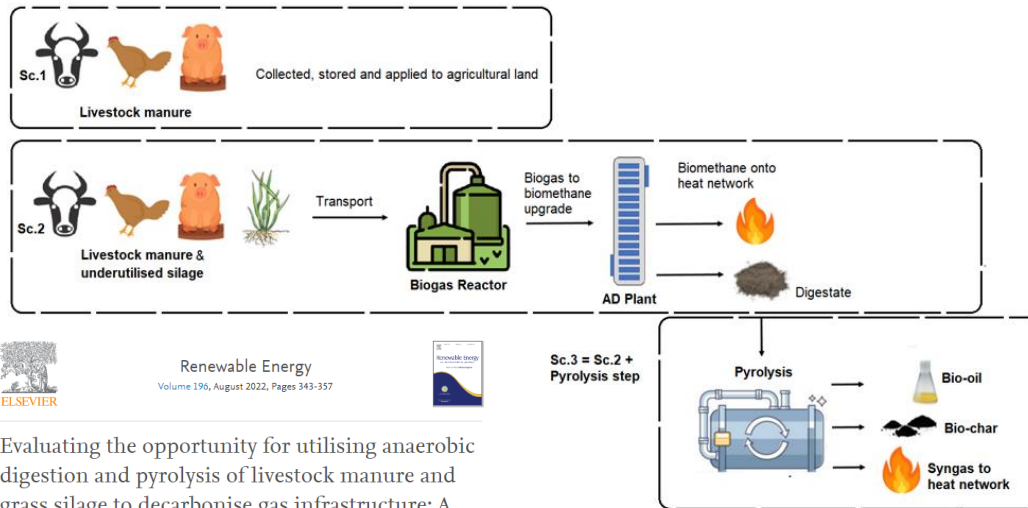


Biogas potential

1. Geospatial analysis of biomethane potential
2. Life Cycle Assessment
3. Consideration of secondary benefits/risks



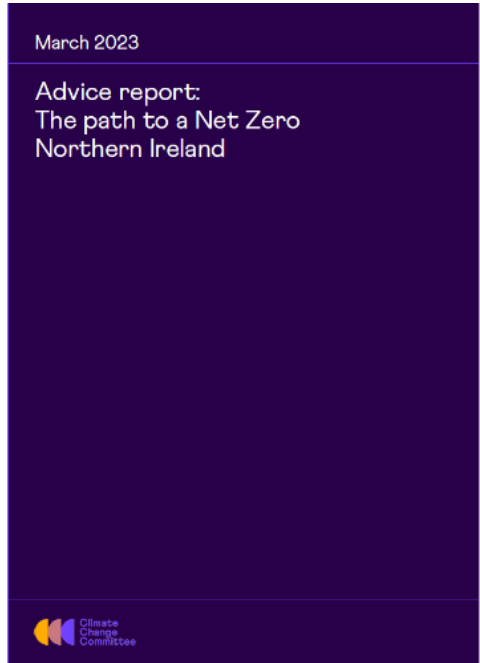
Total in the zones:
 627 million m³ CH₄
 6.3 TWh
82% of demand



Renewable Energy
 Volume 19, August 2022, Pages 343-357

Evaluating the opportunity for utilising anaerobic digestion and pyrolysis of livestock manure and grass silage to decarbonise gas infrastructure: A Northern Ireland case study

Neha Mehta ^{1,2,3,4}, Aine Anderson ^{1,2}, Christopher R. Johnston ¹, David W. Rooney ^{1*}



Maximising use of available tools - AD

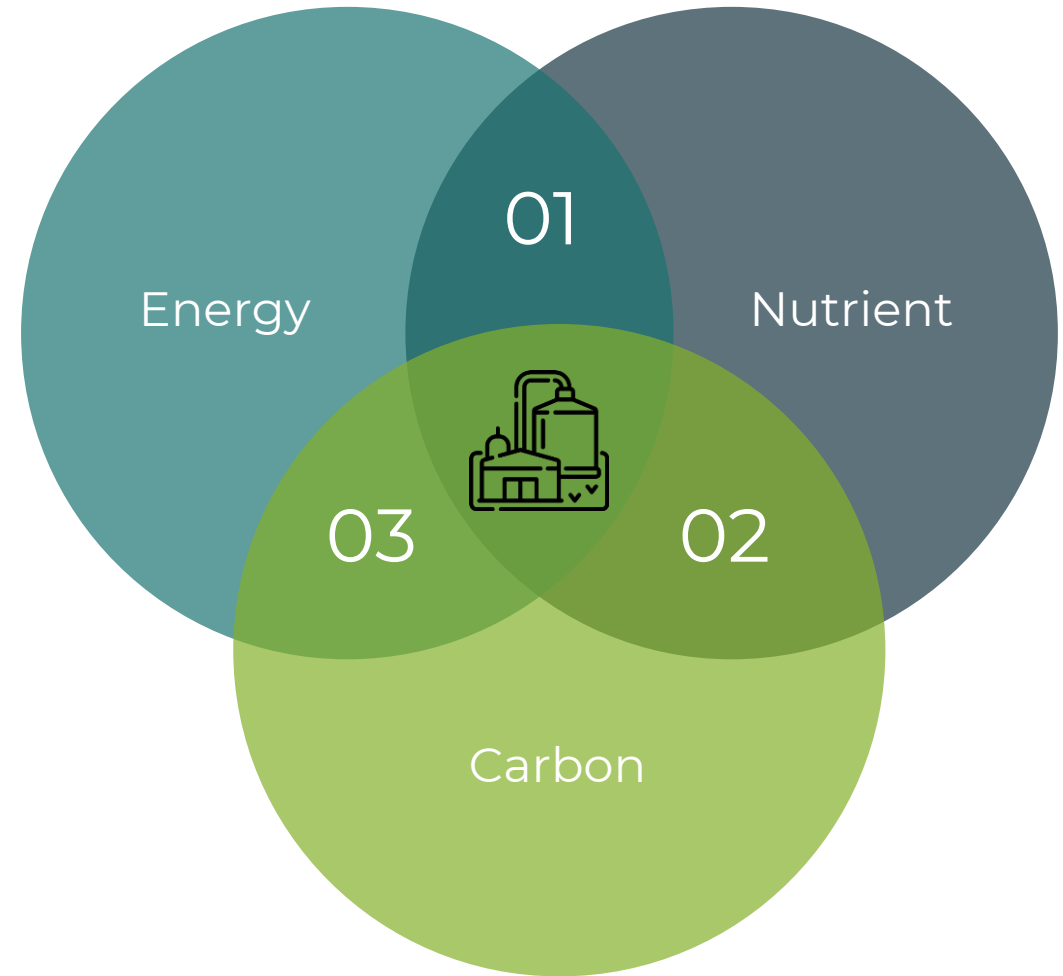
Energy Services to multiple businesses and consumers via biomethane

Nutrient services to manage land and support agri-tech

Carbon services to deliver CO₂ to food and e-fuels markets, carbon for sequestration or construction

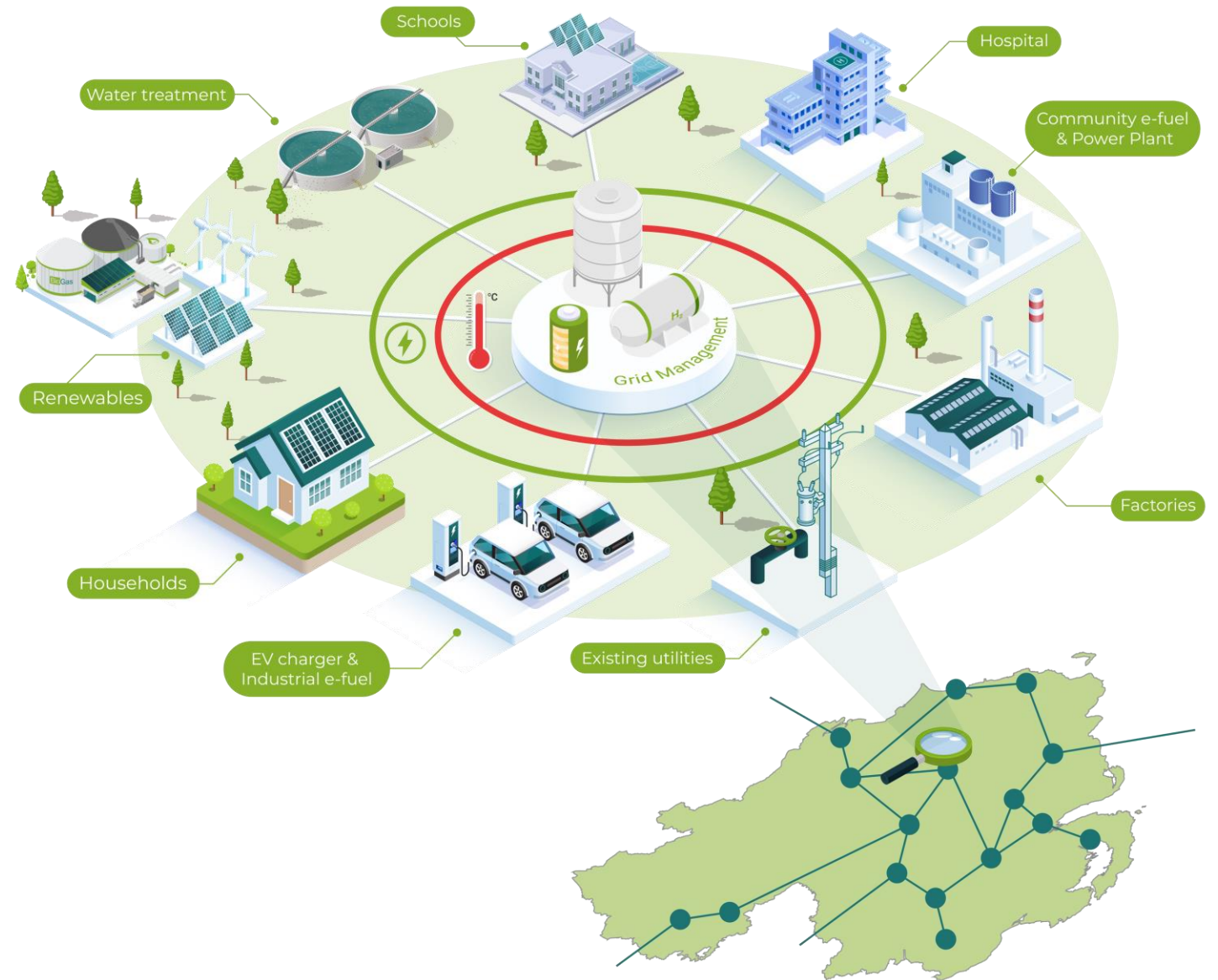
What future jobs could be generated in each of these areas building on regional strengths?

What is the equivalent of financial services but for carbon and nutrient?



What if... we connected

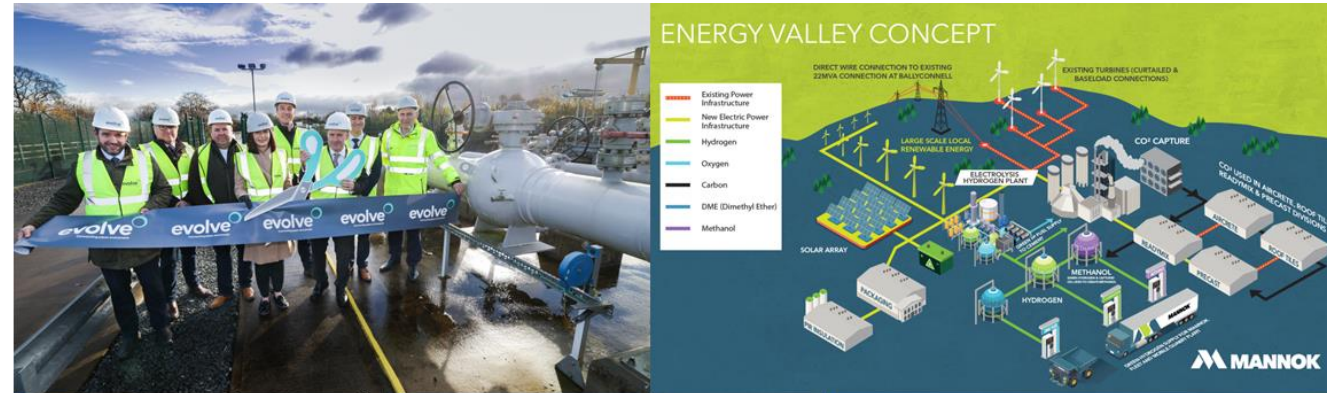
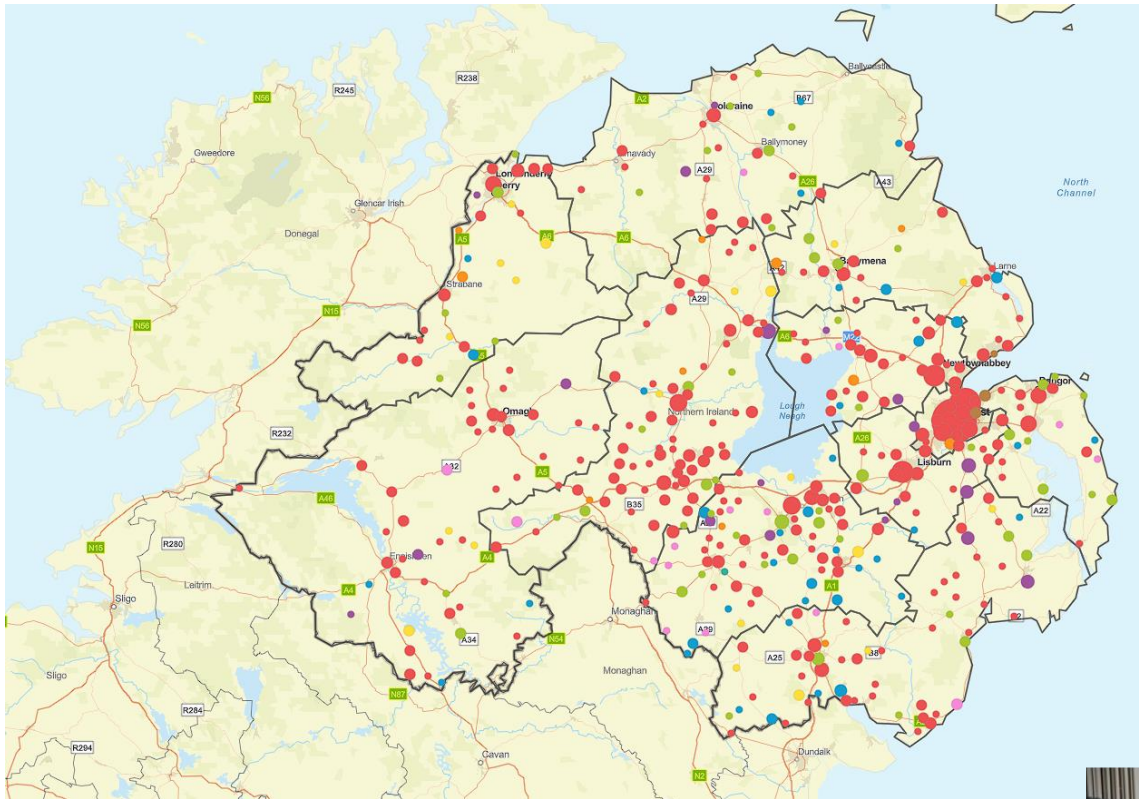
- Energy islands concept
- Maximises energy and access across electricity, heat and fuels.
- Utilisation of storage at key sites with distribution via networks
- Balanced power and offtake within defined areas
- Designed to specific codes to allow for future integration
- Can be tailored to specific areas



What if... we networked

Industrial Decarbonisation Northern Ireland – INI (Under development)

- Regional complexity due to geographic spread
- Link to regional infrastructure to share energy across users for regional benefit
- Smart digital decisions to assist business decisions and pricing
- Prioritised regional trading
- Building on strengths



Are we missing an opportunity?

2020



5,250 tonnes of biomethanol per year from Swedish forest residue with 6.3 million litres used for Danish biodiesel production



Shell to acquire renewable natural gas producer Nature Energy

28 Nov 2022

Shell Petroleum NV, a wholly owned subsidiary of Shell plc (Shell), has reached an agreement with Davidson Kempner Capital Management LP, Pioneer Point Partners and Sampension to acquire 100% shareholding of Nature Energy Biogas A/S (Nature Energy) for nearly USD \$2 billion (€ 1.9 billion). The acquisition will be absorbed within Shell's current capital range, which remains unchanged.

Maersk enters deal for half a million tonnes of green methanol annually

By Johannes Birkebaek

November 22, 2023 3:55 PM GMT · Updated 6 months ago



the shipping industry's first large-scale agreement for green methanol from China's Goldwind

Innovating to succeed.

The innovation ecosystem playbook comprises six key actions.



Aspiration and bold vision setting
(“North Star” that informs all other elements)



Cluster and partner strategy



Capital and funding¹



Talent and community building



Real estate, infrastructure, and placemaking



Diversity, equity, and inclusion

<https://www.mckinsey.com/industries/public-sector/our-insights/building-innovation-ecosystems-accelerating-tech-hub-growth>

Innovation ecosystems can thrive when playing to a region’s existing skill base and institutional strengths.

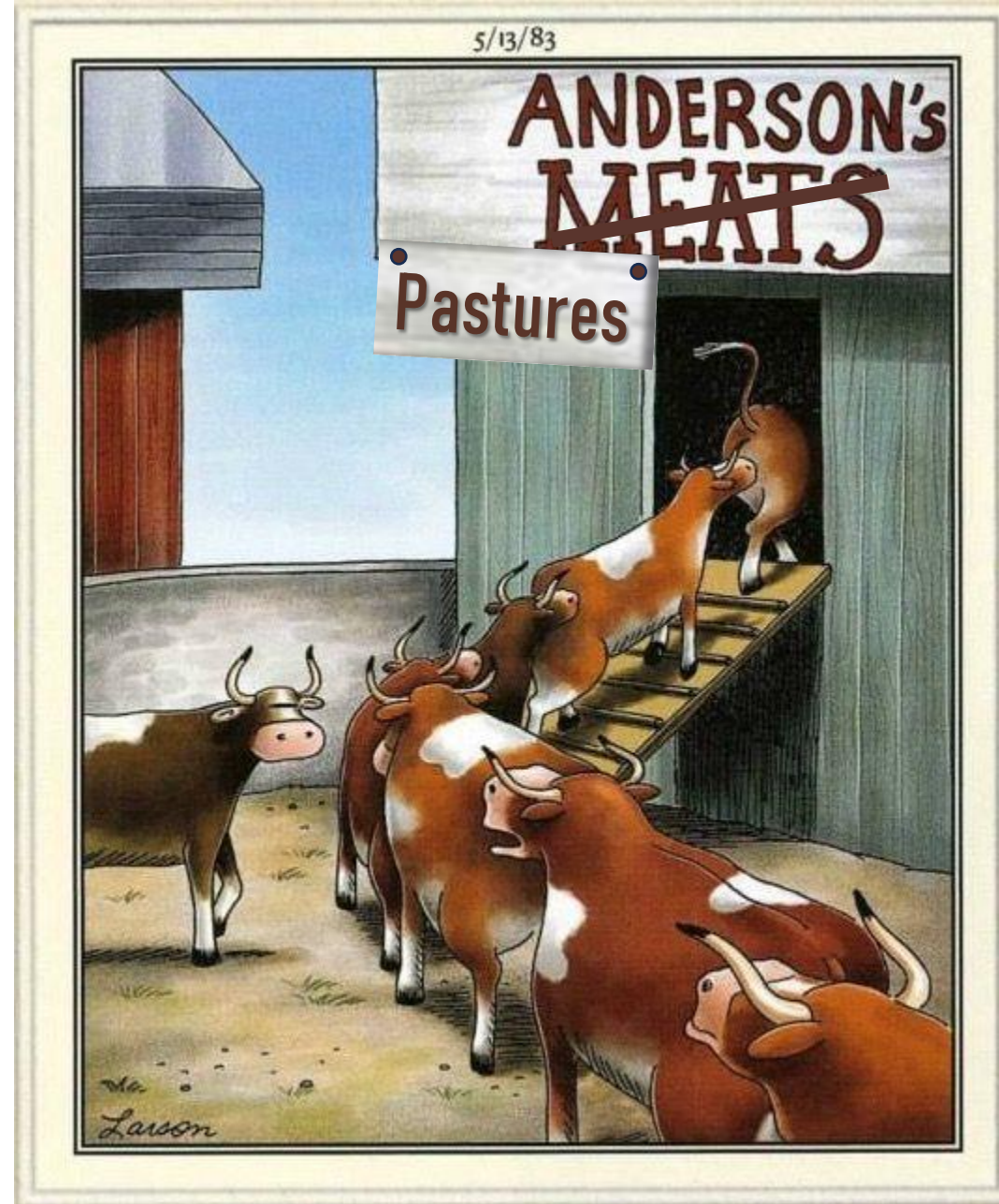
A region’s value proposition can:

- Build off existing sector-based assets in an area of advantage, or
- Create an area of advantage by leveraging current conditions and trends to drive investment



A green economy can leverage regional assets to deliver growth

- Enabling infrastructure - Regional renewables supporting regional business (keeping jobs)
- Future agri-tech is critical to delivery in rural regions (evolving jobs)
- Opportunities in energy services and eco-system services to NI and beyond (new jobs)
- Systems approaches to maximise benefits (increased productivity)
- Long-term and community benefits from investments (sustained growth)



“Earl wasn’t sure about signing up to the early retirement plan”