The Benefits

Local communities, councils and people have the potential to gain through:

- **More prosperous local economy with new, local jobs**
- **Substantially improved local environment and better health**
- **Low-cost, renewable heat and electricity**

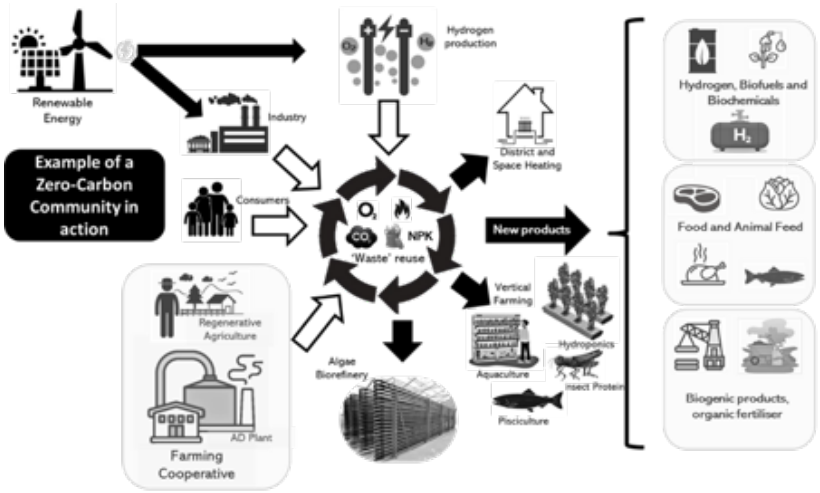
All regions across Northern Ireland, rural or urban, have the ability to come together to develop a zero-carbon community.

Each area has a different mix of industry, farming, public services, and distribution of housing and so has different natural resources, waste streams, potential customers, and challenges to be solved.

While a single model zero-carbon community will not fit all situations, key components with proven outcomes can be used such as repurposing organic wastes (food, farm, forestry, sanitation) or redistributing surplus heat. An example zero-carbon community is shown below.

In the example above heat and waste streams from industry are combined with food and other rubbish from households, agricultural waste plus waste oxygen and heat from a new industry producing hydrogen. Together these unused wastes are used to provide district heating; heat, nutrients, and feeds for novel forms of farming; and heat, CO2 and nutrients to an algal biorefinery that can produce biochemicals and biofuels.

Ultimately, these waste-processing businesses provide a range of new, zero-carbon products for sale, all derived from regional resources and produced locally.



ZERO-CARBON COMMUNITIES

THE BRYDEN CENTRE
ADVANCED MARINE AND BIO-ENERGY RESEARCH

UK Government

QUEEN'S UNIVERSITY BELFAST

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WHAT IS A ZERO-CARBON COOPERATIVE?

A clean energy future is coming to replace fossil fuels. A zero-carbon cooperative is designed to accelerate this change for local benefit. Rethinking how we can use renewable energy locally and manage waste creates opportunities to deliver:

- **New products**
- **Heat and green electricity**
- **Carbon removed from the atmosphere**
- **Local jobs and economic growth**

Such a cooperative can be a partnership between communities of local industry, business, farmers, and people. Together this community can cooperatively solve many local challenges in energy and the wider environment. Combining these solutions will greatly reduce waste, greenhouse gas emissions, and pollution whilst creating a prosperous local economy with improved health and wellbeing for everyone.

Succeeding from Waste

In today's world we have had great success with initiatives such as recycling household waste or using animal manures to produce biogas. These achievements have reduced, but not removed, the need for consumption of virgin raw materials, waste disposal by landfill or spreading of farm slurries on fields - all creating pollution and harm to the environment.

We know how to prevent and reduce waste and pollution. However, many individual solutions are not low-cost or create their own problems. A zero-carbon community is designed to make the economics of waste and pollution reduction work by generating value from waste that would have been disposed of in landfills or dispersed into the local environment.

One such example is using waste heat generated from many industrial and other processes.

Capturing this energy opens up the opportunity to provide low-cost heating for homes, schools, factories, and offices. Linking sources of waste heat into a heat-network can provide an extra income for businesses and stable, low-cost heat for all of us with the bonus of a reduction in our greenhouse gas emissions.

Intelligent design is an important component of a zero-carbon community

Successful communities will match a range of different wastes streams with businesses and consumers that can use or transform these wastes to new products or low-carbon energy.

A zero-carbon community should be prosperous, sustainable and near energy-independent while generating almost no pollution or waste for disposal. Achievement will see industry and agriculture benefit through:

- **Sale of waste for reuse**
- **Removal of waste disposal costs**
- **Development of new business opportunities**
- **Prevention or reduction of carbon taxes and potentially development of carbon offsets**
- **Reduced risk of pollution and the cost of mitigation**
- **Lower risk of external energy price shocks**

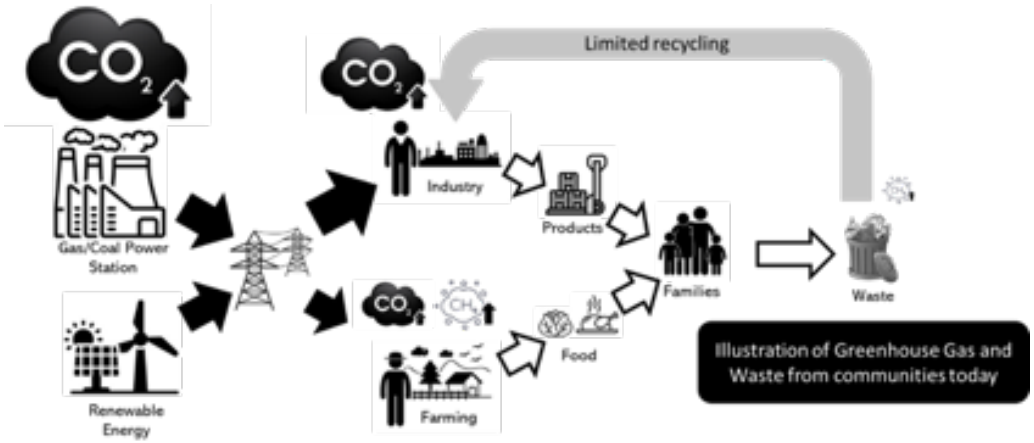

Illustration of Greenhouse Gas and Waste from communities today