Tio Ltd, based in Forres in the Highlands of Scotland, was established in 1998 and currently employs 58 members of staff. Tio Ltd is an organic root crop washing and packing facility providing UK supermarket clients and a number of smaller customers with a range of products including whole carrots, diced carrots, carrot batons, halved swedes and whole parsnips. The company has access to over 7,000 tonnes of farmed vegetables that are grown locally in Moray and Aberdeenshire during the UK growing season, outside of this period organic produce is imported from Spain and Italy.

As a result of the vegetable washing and packing process Tio Ltd have a substantial level of food and farm waste.

The Business Challenge

Tio Ltd were looking to evaluate the methane yield created by food and farm waste feedstocks and investigate the feasibility of creating an anaerobic digestion (AD) plant on land owned by the company. An AD plant relies on a steady source of feedstocks that have physical and chemical properties that are amenable to biological breakdown. The stability of methane is key, so that factors such as seasonal variation in feedstocks have to be taken into account.

The Solution

Tio Ltd approached Interface - The knowledge connection for business, following an Interface event they had attended, looking for assistance in identifying the relevant expertise they required in Scotland’s universities and research institutes. Interface facilitated a project between Tio Ltd and academics at the Urban Water Technology Centre (UWTC) based in the University of Abertay Dundee. The UWTC has extensive experience of working with anaerobic digestion in a research capacity and also for commercial projects. The project was awarded £5,000 by Interface helps food packaging company to create more than just hot air!

"Interface has opened up a fantastic opportunity for us and by working with the University of Abertay Dundee we now have a greater understanding of the challenges which underpin the successful management of an Anaerobic Digestion system and it has given us the confidence to progress."

TRISH WINCHESTER, TIO LTD
Highlands and Islands Enterprise through the Scottish Funding Council Innovation Voucher Scheme. Academics carried out an assessment of the methane yields from a batch reactor study of agricultural residues to address the question of methane stability over time.

The UWTC produced a report of their findings which is being used by Tio Ltd to assess the key parameters for the efficiency and stability of a larger scale continually fed bio reactor to generate heat for local companies surrounding the AD development and to also export electricity to the grid. The waste heat produced also has a potential application to be utilised in greenhouses or other industrial users with a heat demand.

Trish Winchester at Tio Ltd commented "Interface has opened up a fantastic opportunity for us and by working with the University of Abertay Dundee we now have a greater understanding of the challenges which underpin the successful management of an anaerobic digestion system and it has given us the confidence to progress".

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**Commercial Benefits**

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<td>2 additional jobs created and 2 jobs safeguarded through the project.</td>
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<td>Potential commercial application of findings creating diversification of operations for the business.</td>
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<td>Cost effective waste management.</td>
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<td>Project provided the necessary research and analysis for the AD system and given the business the confidence to progress the idea further.</td>
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<td>Successful long term relationship established between the university and the business.</td>
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“This project provided essential experiences which the University of Abertay Dundee can build upon and develop research networks on the development of AD systems in rural areas.

**DR JOSEPH AKUNNA, UWTC, UNIVERSITY OF ABERTAY**

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**Interface fast facts**

- We match businesses with academics - making available the world class expertise and facilities in Scotland’s Universities and Research Institutes
- We have initiated over 700 company and university collaborations
- We can help identify suitable funding options to off-set the cost of the collaboration

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