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NEWS
February 2023
www.reamit.eu



Dear <<First Name>>,

The REAMIT project is excited to share the latest edition of our newsletter for February 2023. You will see below highlights from our recent bi-annual REAMIT project consortium meetings in Dublin, Ireland as well as updates on the REAMIT pilot test with Musgrave, a large food supplier in Northern Ireland. The REAMIT communication team have captured the highlights of its pilot-tests in our new documentary film, the details of which you can also see in this newsletter.

We hope you will enjoy reading!

[Highlights from our Bi-Annual RAC/RSC/WP Meetings, held at University College](#)

Dublin, Ireland on 11-12 January 2023



The REAMIT team at University College Dublin, Ireland, hosted the bi-annual REAMIT Advisory, Steering Committee and Work packages (WP) meeting on the 11-12 January 2023. These 2 days of fruitful meetings comprised of the following:

- Technology work package meetings - discussed the progress of REAMIT pilot tests with local agri-food companies and looking at the Big Data integration and its application to reduce food wastage
- Business development of REAMIT technologies was discussed with various interesting options of widening the use of IoT in food sector
- WP Communication: discussed the policy documents and making impact in food waste



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- policies in North-West Europe
- WP Long Term: discussed the long-term plans for rolling out the projects approach to reducing food waste in agri food supply chains
- WP Project Management: discussed the updated project handbook, risk log, extensions of the project and the formalities for closing the project

New REAMIT Documentary video out now on Youtube

The REAMIT communication team at Nottingham Trent University have been working with a professional film production company for some months during 2022, to produce the new REAMIT Documentary. In this documentary, we explore some of REAMIT's most successful pilot tests with agri-food businesses across North-West Europe. We demonstrate how REAMIT is using innovative Big Data technologies to really help agri-food companies monitor the condition of their food in real-time, and essentially making huge savings on their resources, thus avoiding food waste. Below you'll see the shorter 8 minute version of the documentary, but full length versions are available on [Youtube](#).



Statistics from REAMIT Symposium in December 2022



In the last newsletter, we highlighted the recently held REAMIT Symposium, which took place on 8 December 2022 at the Chamber of Commerce and Industry in Nantes, France. This event was hosted by our French partners, Valorial, and Images and Reseaux.

Here are some interested stats from this Symposium:

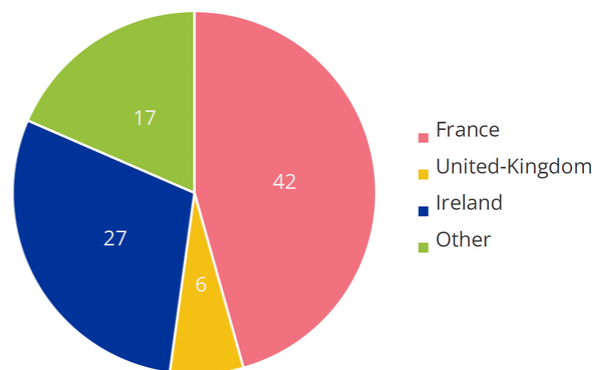
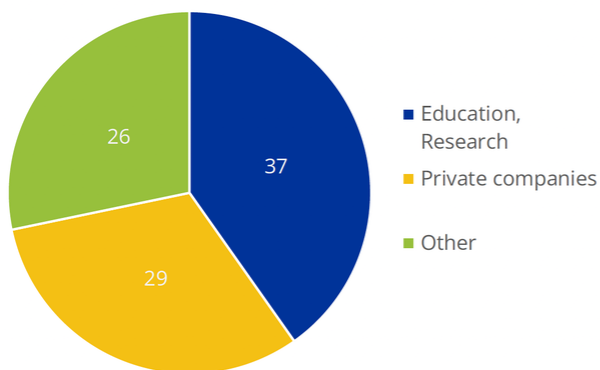
- 92 registrations
- 20 speakers
- Net promoter score (NPS): 57
- Several B2B opportunities
- Symposium onsite & online

Statistics of the event


- Onsite: 58 registered
- 38 participants
- Online: 34 registered
- 151 views on the replay (January 2023)

[Click here to watch the playback](#)

- 92 registrations



Now published 11 articles: A Special Issue on Food Waste in the open access journal "Sustainability"



sustainability
an Open Access Journal by MDPI

Editor-in-Chief
Prof. Dr. Marc A. Rees
Faculty of Engineering and Applied Science, University of Ontario Institute of Technology, Oshawa, ON L1H 3K9, Canada

Message from the Editor-in-Chief
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Professor Ram Ramanathan, Professor Yanqing Duan, Professor Joan Condell, Professor Usha Ramanathan and Dr Tahmina Ajmal, from the REAMIT project consortium, have contributed as guest editors on the special issue of the journal Sustainability on the theme "New Multidisciplinary Approaches for Reducing Food Waste in Agribusiness Supply Chains". The special issue was closed for new submissions on 30 November 2022.

There were 16 submissions to the special issue, 14 of which are directly or indirectly from the REAMIT project. Of these, 11 have been accepted and published as on 6 February 2023. More articles are in various stages of review.

[More details here](#)

REAMIT partners Whysor, the Netherlands and Ulster University, UK visit Musgrave, Northern Ireland

In April 2022, the REAMIT team deployed 3 IoT monitoring systems in the last mile delivery vehicles of Musgrave Northern Ireland, Ireland's leading grocery distributor. Musgrave were seeking to reduce the volume of food waste, increase product shelf life and reduce the cost of losses through the real-time monitoring and alerting of their logistics fleet.

Since then, data has been collected and analysed by the analytics partners on the REAMIT project to help define the criteria required for the alerting system. 3152 individual deliveries have been monitored by the 3 systems since pilot launch.



Key findings from the pilot so far include:

- Ability for intelligent alerting accounting for both vehicle motion and vehicle cool down period.
- Battery lifespan of 180 days / 1812 journeys achieved.
- Substantial power saving benefits through using the trip detection system.

Recently, an [article](#) has been published in the [Sustainability special issue](#) detailing this work.

On 13th January 2023, some members from the Whysor team visited Musgraves' facilities in Belfast to learn more about their operations.

Jon Mckenzie, Warehouse Manager at Musgrave Northern Ireland provided a tour of the Musgrave facilities in Belfast to the REAMIT engineering group. Jon provided an overview of the operations at Musgrave and explained how maintaining the cold chain was achieved, from point of delivery from a supplier until it was delivered by them to one of their business customers. The importance of the cold chain integrity, especially given the small profit margins Musgrave work with, helped contextualise the importance of the REAMIT project within the use of their cold-chain transport delivery fleet.

Thanks to the REAMIT project, there are exciting future projects planned between Ulster University and Musgrave Northern Ireland.

As part of the REAMIT documentary, we visited the premises of Musgrave in early 2022. Here's a video from the documentary on our REAMIT pilot test with Musgrave, a large food wholesaler in Northern Ireland. See below.



Click the image above to view the new video on Musgrave.

REAMIT team install temperature sensors for Rent-a-fridge UK in portable cold store

In November 2022, the Ulster University team deployed an IoT temperature monitoring system in a



portable cold store in collaboration with rent-a-fridge UK.

Andy Keery, owner of rent-a-fridge, has over 25 years of experience in the refrigeration industry and has designed bespoke portable cold storage systems that he rents and delivers to anywhere in Northern Ireland & Ireland. Andy's portable cold stores appeal to a wide variety of clients, from fast food outlets based at festivals and supermarkets who are performing maintenance on their main fridges to florists, wineries, and more.

For Andy, it is vital that his portable cold stores are reliable. At present, he has a remote monitoring system in place allowing him to offer assurances to customers that his cold stores are being constantly monitored and that he will be notified instantly if a breakdown has occurred. In the unlikely occurrence that a breakdown is detected, Andy offers 24-hour support and call-out ensuring that the customer's chilled products are not at risk of spoilage.

The system Andy had previously, however, was not without issue. No historical data was recorded by the system, it was costly to maintain, and there was no dashboard for visualisation to better understand the data.

On 19 November 2022, a REAMIT dual-zone temperature logger was installed in one of Andy's cold stores, destined for the Belfast Continental Market. The logger monitored both air-on and air-off of the refrigeration unit, giving accurate insights into the cooling profile of the cold store as well as providing scope for an efficiency estimation on the fridge unit. However, since the store was stationary, the battery saving trip-detection could not be enabled.



Therefore, to ensure that the logger could record readings at 5-minute intervals without running out of power, the logger was wired into the permanent power supply of the fridge. The Market ran from 19 November - 22 December 2022, and was a success. Piloting the technology continues with Andy who has provided very useful feedback so far based on his experience, including future development work.

On 13 January 2023, Andy met with engineering partners at Whysor, Netherlands to discuss potential future features of the REAMIT technology, both from a hardware and software perspective. Whysor are currently exploring how to implement some of the features suggested by Andy at the meeting.

Announcing the 9th & final meeting of REAMIT Advisory Committee, Work Packages and REAMIT Steering Committee, in Colchester, UK on 22-23 March 2023



The 9th meeting of REAMIT Advisory Committee, Work Packages and REAMIT Steering Committee will take place on 22-23 March 2023 in Colchester, UK. The format of these meetings will be in person. The meetings are hosted by the University of Essex, sub-partner of the University of Bedfordshire (REAMIT Lead organisation). All REAMIT Partners and Associate Partners are invited to take part in these 2-day meetings.

Popularising REAMIT achievements - participation by partners in various events

2nd International Conference on Advanced Enterprise Information System (AEIS 2022) online on 3rd December 2022

Professor Yanqing Duan gave a keynote presentation on "Improving Resource Efficiency in Food Enterprises Using Internet of Things Sensors - REAMIT Project Experience on Preventing Food Waste" in 2022 2nd International Conference on Advanced Enterprise Information System (AEIS 2022) online on 3rd December 2022.



Presentation of the REAMIT project at a primary school for 8-year old pupils



REAMIT Project Manager, Katarzyna Pelc delivered a 40 minute presentation on food waste to an enthusiastic group of 8 year old children at a primary school in St Albans, UK. Many ideas were shared and discussed about reducing food waste, and ofcourse, the children had many questions during this interactive presentation. The children were particularly interested in learning how remote monitoring of

Food waste and how we can reduce it?

Katarzyna Pelc, Project Manager of the REAMIT project, University of Bedfordshire, UK
17 January 2023



temperature is done when food is on the move.

The children have since been working on a poster inspired by the theme of food waste reduction.

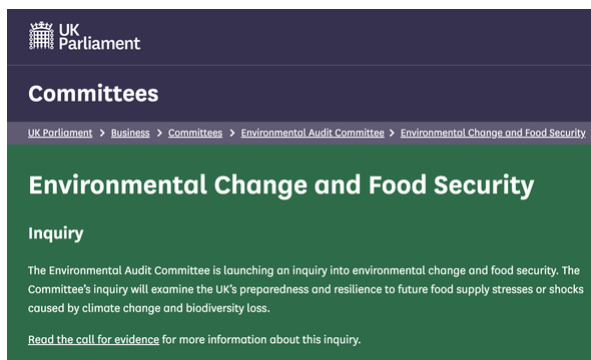
Keynote and Panel discussion of Prof Usha Ramanathan, Nottingham Business School, Nottingham Trent University, UK



Prof Usha Ramanathan of Nottingham Business School delivered a keynote speech at the POMS India international conference in December 2022, where she discussed the role of IoT in food supply chains for avoiding waste and achieving zero-waste. Usha shared stories from the pilot-tests conducted by REAMIT project (www.reamit.eu), funded by Interreg North-West Europe) and from her other GCRF_QR projects funded by Nottingham Trent University, UK. Top motivation of this keynote speech was derived by impactful results of these Sustainability related projects. Usha has discussed (a) How IoT sensors are used in food supply chains effectively to avoid any waste? This was discussed with an example of a frozen meals company Yumchop, UK. (b) What social impact can IoT technology bring in the operations of the Human Milk foundation, UK to ensure quality of the milk being distributed to the babies in need. (c) How can we create value from house-hold plastic wastes? This work was based on work in a project carried out with PSGR Krishnammal College for Women, Coimbatore India.



Prof Usha Ramanathan took part in a panel discussion at the conference, where she contributed to the current global views on sustainability. The topic of the discussion "Reimagine Role of Operations Management for Sustainable Solution in New Normal", aroused several interesting active conversations not only from the panel members but also from the audience. The lessons learnt by global supply chains during the COVID outbreak sent a strong message that the appropriate use of modern technologies will support building sustainable solutions and achieving net-zero. Usha also insisted the importance of inculcating the habit of practicing sustainability, such as not wasting food, at the school levels for growing children.



UK Government Committee on Environmental Change and Food Security

A policy document prepared by Prof Ram Ramanathan, University of Essex, based on the findings the REAMIT project, in shaping food waste policy in the UK has been accepted and published by the UK Government Committee on Environmental Change and Food Security.

[Learn More](#)

During the last few months, communication partners at Nottingham Trent University have been popularising our achievements in the REAMIT project via multiple press releases. The following are some excerpts:

REAMIT Press release from Nottingham Trent University

Pilot study shows how zero waste in food supply chain could be achieved through smart IoT technology



Nottingham Trent University

[Learn More](#)



Web Article on Circular Online

Study: zero waste in food supply chain possible using smart IoT

[Learn More](#)

The Journey of REAMIT - January 2019 to January 2021



The REAMIT team is happy to document the journey of the project in a two-part series. The first part is included in this newsletter. The second part will be included in a future newsletter.

The REAMIT project was successful in the 7th Call for

Among the presenters were Mrs Harriet Illman from

proposals and the approval notification was received from Interreg North West Europe Programme on 15 January 2019.

In April 2019, the REAMIT team first met with the funder, Interreg North West Europe in Lille, France. The consortium met for the first time in May 2019 at the project kick off meeting at the picturesque Putteridge Bury campus of the University of Bedfordshire, UK. The meeting was hosted by the lead partner of the REAMIT project, the University of Bedfordshire, UK. At the kick-off meeting, project partners discussed their roles and responsibilities in the project and agreed on the first activities.



The REAMIT project partners met again in Putteridge Bury campus, UK in September 2019 for the 1st REAMIT Advisory Committee, Work Packages and Steering Committee meeting. During this meeting, the REAMIT communication team from Nottingham Trent University, UK presented the first draft of the REAMIT communication strategy (as required by the funder at Interreg North West Europe Programme), to support partners with their communication actions to reach out to stakeholders involved in agri food supply chains in North West Europe.



In the first year of the project's operation, the consortium worked on developing a technology

ADAS, UK who spoke about "Tackling supply chain food waste", Prof Chungui Lu from Nottingham Trent University, UK who presented "Sustainable Agriculture through Innovative Vertical Farming" and Dr Frans Harren of Radboud University, Netherlands who discussed "Quality control of fresh agro products with gas sensing technologies". A notable moment during this Symposium was from Prof. Alistair Bruce, of Nottingham Trent University, UK gave a warm introduction to Nottingham Business School and credited REAMIT for our collaborative and multi-disciplinary work.



This first REAMIT Symposium was followed by the 2nd bi-annual meeting of the REAMIT Advisory Committee, Work Packages and Steering Committee in Rennes, France in January 2020. It was hosted by the REAMIT partners at Images and Reseaux, France.



Following such inspiring events, even despite the COVID-19 pandemic causing a global lockdown shortly after, the REAMIT partners continued to engage with agri food companies in North West Europe, tailored Internet of Things solutions to their

demonstration (also known as a 'pilot test') with the REAMIT project sub-partner organisation, an abattoir in Northern Ireland, UK. The aim of the pilot test was to adapt IoT sensor technology to early detect the presence of clostridium bacteria in the abattoir and take corrective measures to reduce beef meat waste. Severely hit by the outbreak of COVID-19 pandemic, the abattoir was not able to dedicate resources to the REAMIT technology demonstration and research, and ultimately exited the REAMIT consortium in May 2020. In spite of losing an important sub-partner, a large enterprise and beef meat producer and exporter to European and global markets, the REAMIT partners started to reach out to many agri-food companies in their respective countries in North West Europe, including France, Germany, the Netherlands, Ireland, and the UK.

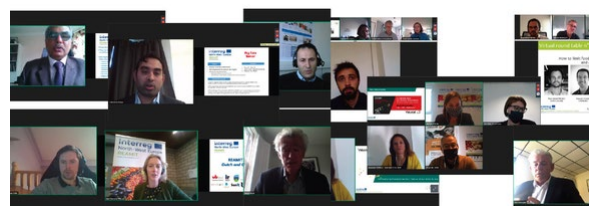
Before the end of 2020, the REAMIT partners engaged in 2 technology demonstrations in Ireland and Germany. A new abattoir in Ireland and a whole food supply chain company in Germany became partners in REAMIT technology demonstrations. The abattoir was very keen to test the REAMIT approach and technology to reduce fresh beef meat loss due to the contamination by the Clostridium bacteria and inadequate environmental conditions during the dry aging process of beef meat. The whole food supply chain company applied the REAMIT approach and technology to ensure the optimal temperature conditions in which food was stored and transported throughout the entire food supply chain. The core of both technology demonstrations was to test and adapt Internet of Things sensors to the specific needs of each agri-food company and help them reduce food waste.

In January 2020, the REAMIT project partners at Nottingham Trent University, UK hosted the project's first Symposium attended by local and regional agri-food companies, REAMIT partners, academics and technology specialists.

needs and helped them reduce food waste.

Between September and November 2020, the REAMIT project consortium worked jointly to launch the Big Data Hub at the University of Bedfordshire, UK, and the REAMIT dashboard online application by partners at Whysor, in the Netherlands. While many people were forced to work from home during the global pandemic, REAMIT partners were able to remotely access data being retrieved from the pilot tests and stored in the Big Data Hub and the REAMIT dashboard at Whysor. The great abilities of cloud technology allowed the REAMIT data analytics partners to provide vital solutions to agri food companies for reducing food waste, even during subsequent lock downs.

The second REAMIT Symposium was hosted online in November 2020 by Valorial and Images and Reseaux, REAMIT sub-partner and partner respectively, based in France. Despite its online format, the Symposium gathered 121 attendees and hosted 72 B2B meetings. A key moment at the Symposium was the presentation made by the guest speaker Mrs Anne-Laure Gassin, Policy Officer at the European Commission, Health and Food Safety DG, and her keynote speech on 'State of the art on food waste and losses & European strategy on food waste'. This presentation stressed the importance of food waste policy in the EU as enabler for long term change in societal attitudes to food waste.



We then entered 2021, still in online working mode as the pandemic continued to disrupt our daily lives and activities. A 4th bi-annual meeting of the REAMIT Advisory Committee, Work Packages and Steering Committee was hosted online in July 2021 by



Over 100 guests gathered in Nottingham, UK for a day filled with presentations by senior academics and business representatives, discussions, technology exhibitions and networking.

partners at Whysor, The NL. We had fruitful discussions on project activities, progress of the current pilot tests and recruitment of 3 new companies for REAMIT pilot tests (in UK and The NL), and we explored disruptions to the project caused by the pandemic and how to tackle them.



In the next newsletter, we will continue exploring the rest of the timeline of the REAMIT journey. We hope you will stay tuned for the next edition in April 2023.

Past Events

Dr James Gillespie of Ulster University, gave a presentation at the 36th EFFoST conference 2022 ([The European Federation of Food Science and Technology](#)). The title of this presentation was 'Real Time Anomaly Detection in Cold Chain Transportation using IoT Technology'. The conference took place in Dublin, 7-9 November 2022.

The UN75+2 Future Mobility Workshop, took place on 22 November 2022, hosted by Nottingham Trent University (Virtual).

This prestigious conference received a presentation by Prof. Usha Ramanathan of Nottingham Trent University on Supply Chain Sustainability, where REAMIT was presented.



Professor Yanqing Duan and Katarzyna Pelc from the REAMIT project Lead Partners organisation at the University of Bedfordshire, UK, co-presented the REAMIT project at the Annual Conference of the Business and Management Research Institute at the University of Bedfordshire (18 January 2023) in Luton, UK.

The presentation has sparked a fascinating discussion on the importance of seed funds small projects, which aim at building international networks capable of achieving impacts. Such networks are fundamental later on, when developing large transnational projects and consortia. Also, since these networks bring the best expertise and shape the body of knowledge in the domain, they can help develop 4 publications.

Upcoming Events

On 27 February 2023, Katarzyna Pelc, Project Manager of the REAMIT project, will present the REAMIT project at "Advancing Women in Agri-Food Rural Environments" (AWARE) event, at the University of Bedfordshire, Luton, UK.

The focus of the event is on training and mentoring women Entrepreneurs in Europe's agri food sector. AWARE is a project led by the University of Bedfordshire and co-funded by Erasmus+ Programme of the European Union.

A conference paper has been submitted by REAMIT Project Lead, Prof. Ram Ramanathan, Prof. Yanqing Duan, Dr Tahmina Ajmal and Katarzyna Pelc, titled 'Food waste reduction using IoT-Big Data technology demonstrations in the food sector North West Europe and learnings for use in other sectors'.

This paper was submitted for the 10th International EurOMA Sustainable Operations and Supply Chains Forum 2023, 20-23 March 2023, Online organised in Hamburg, Germany. Status: Abstract submitted.

A conference paper has been submitted by Dr. Tamiris da Costa for the [SETAC Europe 33rd Annual Meeting](#), which will take place from 30 April - 4 May 2023 as an in-person meeting in Dublin, Ireland, featuring several virtual components for remote participants.

The presentation will be on 'Life cycle analysis to determine the trade-offs between food waste reduction and the implementation of monitoring technologies'. Status: Abstract Submitted.

About the REAMIT Project

Our main objective is "Improving Resource Efficiency of Agribusiness supply chains by Minimising waste using Big Data and Internet of Things sensors" (REAMIT). Since reducing food waste not only increases food availability but has more benefits in the form of saving significant food production resources (water, energy, labour, fertilisers, etc.) and most importantly there are social benefits too.

This REAMIT project (www.reamit.eu) is funded by [Interreg-North West Europe](#) and the project duration has now been extended until June 2023. REAMIT is led by the University of Bedfordshire involving 12 Academic and Industry partners. Nottingham Trent University, the Communication Lead in the project, are supporting the project in additional ways in reaching end-users in agribusiness supply chains and logistics.



Check out our REAMIT explainer video

Thank you for expressing your interest in our work in the REAMIT project.

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