translate

waste heat to electricity

D4.5

3rd Annual report on dissemination, exploitation and communication activities

WP4 TRANSLATE Dissemination, Exploitation and Communication

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UNIVERSITY OF LATVIA

CIDETE EL ARTE DE REFRIGERAR TERMOELECTRICIDAD

UCC ACADEMY

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Contents

Executive Summary

The 3rd Annual report on dissemination, exploitation and communication activities (D4.5) is a deliverable of TRANSLATE Work Package 4. This deliverable is part of Task 4.2 “Implementation of the Dissemination, Exploitation and Communication (DEC) Plan”.

Sections 2 and 3 include a high-level overview of our strategy for dissemination, exploitation and communication, as derived from our DEC plan (Deliverable 4.1).

Sections 4-6 summarise our key activities over the past year (1 June 2023 – 31 May 2024), broken down by Communication, Dissemination and Exploitation activities.

Table 1 summarises the key objectives, audiences, channels, KPIs and progress to date for DEC activities.

About TRANSLATE

Tackling climate change requires a radical shift in how we produce and consume energy, away from fossil fuel burning and towards clean, renewable sources of energy. Yet every day, it's estimated that 70% of all the energy produced from sources such as power generators, factories, and homes is lost in the form of heat, which evaporates away into the atmosphere. This wasted heat is one of the largest sources of clean and inexpensive energies available, and yet it is currently untapped.

Although technologies for converting waste heat into electrical energy have been around for a long time, there is still no environmentally sustainable and efficient technology platform available for the harvesting of low-grade waste heat.

The central aim of TRANSLATE is to develop a new proof-of-concept nanofluidic platform technology based on the flux of ions in nanochannels, leading to a breakthrough in versatile and sustainable energy harvesting and storage.

1. Introduction

The European Commission's commitment to Responsible Research and Innovation (RRI) and its broader 'Science with and for Society' objective aims to ensure that EU-funded research helps meet the current social, ethical, and political demands in society. Good dissemination, exploitation and communication is a critical component of fulfilling this commitment which the TRANSLATE project aims to achieve through the implementation of an effective strategy across all three areas.

According to the Horizon 2020 Online Manual, **dissemination** refers to sharing research results with potential users including peers in the research field, industry, other commercial players and policymakers, **exploitation** refers to the use of results for commercial purposes or in public policy making, and **communication** refers to providing targeted information to multiple audiences (including the media and the public), in a strategic and effective manner and possibly engaging in a two-way exchange. Whilst all three of these areas of engagement are linked, they also need to be considered separately when devising an effective DEC plan. TRANSLATE's DEC plan focusses on the key objectives, audiences, messages and channels for dissemination and communication, as well as the procedures put in place to facilitate exploitation.

2. Strategy for TRANSLATE dissemination and communication

The following sections outline our overall strategy for dissemination and communication which is summarised in Table 1. This strategy is structured according to the following questions:

- Why? – our key objectives
- Who? – the main audiences we want to reach
- What? – the main messages we want to deliver to these target audiences
- Where? – the channels through which we want to deliver these messages
- When? – the key events and activities that are taking place in order to implement our strategy

The content in these sections has been informed by a survey that was conducted at the beginning of the project in June 2021, along with a follow up workshop which was held to discuss the survey results. Both of these activities were led by UCC Academy with inputs gathered from all partners.

2.1 Why – Key Objectives

In order to implement a successful dissemination and communication strategy, we first had to tease out and agree on our main objectives. The results of the survey (Figure 1) and further discussion revealed that the three main overarching objectives are to:

1. Raise **awareness and understanding** of the research in TRANSLATE amongst the general public, specifically its importance, challenges and advances, and how it is trying to solve energy and environmental issues.
2. **Disseminate project results** at European and international conferences and industry events.
3. **Engage with similar projects** in order to achieve greater impact.

Further details on these objectives including Key Performance Indicators (KPIs) are covered in Table 1 to ensure they are SMART (Specific, Measurable, Achievable, Relevant and Time-bound).

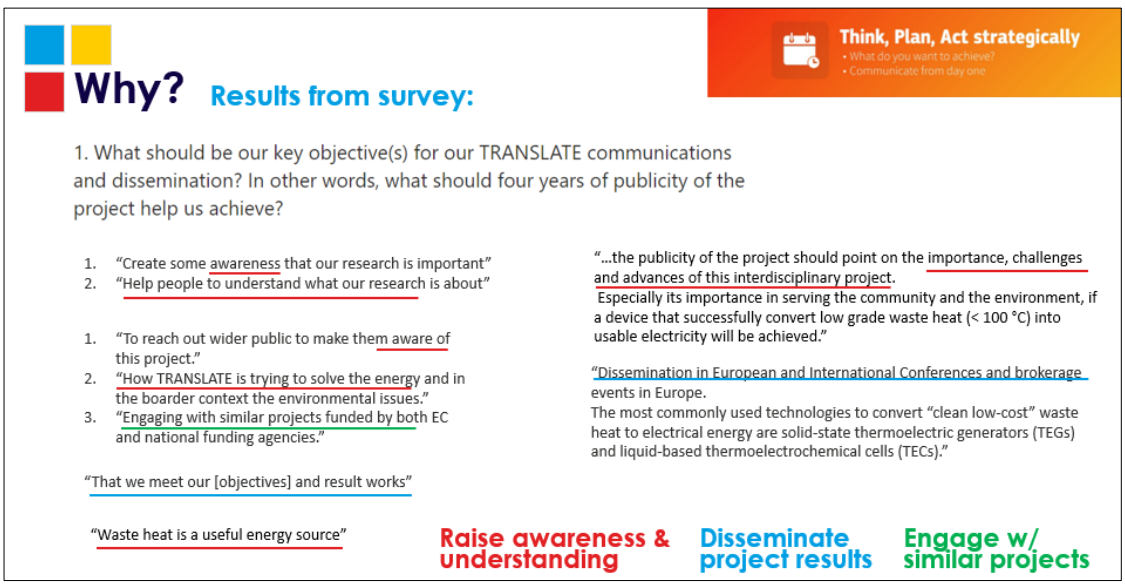

Figure 1: Summary of partner responses to an online survey on TRANSLATE communication and dissemination objectives, June 2021 – What should be our key objective(s) for our TRANSLATE communications and dissemination?

2.2 Who – Key Audiences

Identifying our main target audiences was the next component to defining our strategy. These include:

1. **Industry partners** and future users of the TRANSLATE device
2. **Researchers and academic colleagues** (in materials science, energy harvesting, and waste heat capture)
3. European **research funders** (current and future) interested in sustainable energy projects
4. **Public and community groups** who are interested in emerging sustainable tech

The first three audiences were chosen due to the nature of TRANSLATE as a proof-of-concept project. Our efforts in dissemination will target these audiences specifically. An important part of our overall strategy is also to engage the general public with our communication and outreach activities. This will help achieve our objective of raising awareness and understanding of the research in TRANSLATE and its importance in the wider context of the energy and environmental issues facing society.

2.3 What – Key Messages

Once our target audiences were identified, we then captured the main messages we want to deliver. The survey conducted with the consortium helped to shape this messaging which broadly fits under three key themes which are:

1. The **wider societal and environmental benefits** that the project's aim will achieve.
2. The **applicability of the technology** in TRANSLATE to a wide range of industries.
3. The **collaborative and interdisciplinary** nature of the project.

These themes have been incorporated in the messaging for the TRANSLATE project website (translate-energy.eu) which went live on 1st October 2021. Specific messaging under these themes which will be employed to reach our target audiences are included in Table 1.

In addition to our specific messaging about TRANSLATE, all forms of dissemination, exploitation and communication will acknowledge EU funding. This is built into our website and social media channels, as well as our project templates for presentations, posters, and publications.

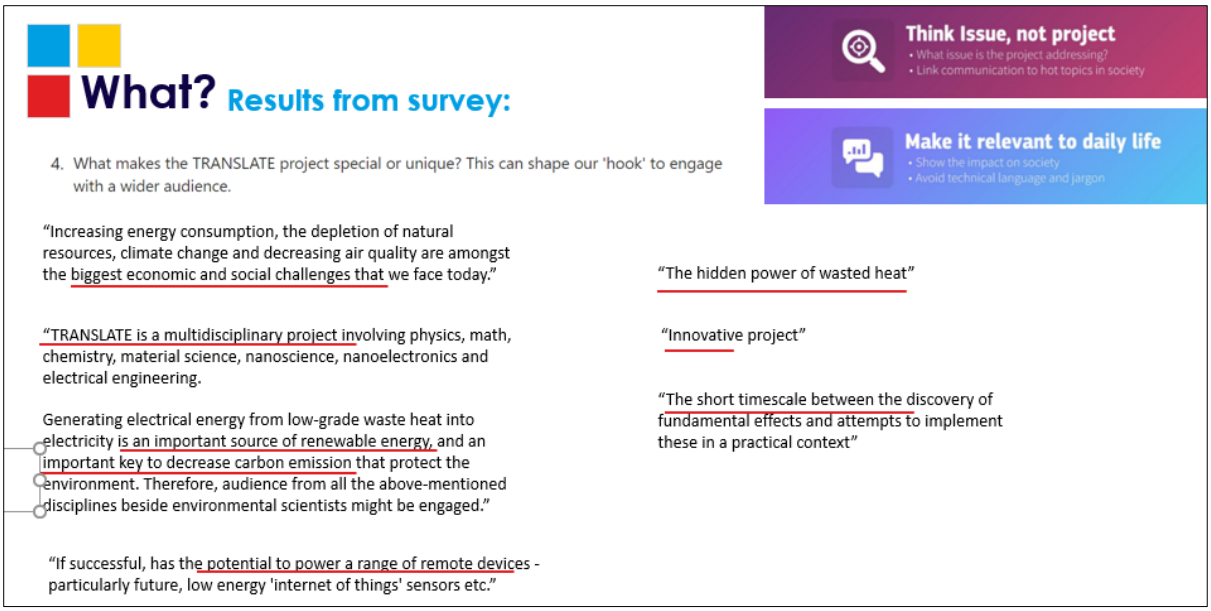

Figure 2: Summary of partner responses to an online survey on TRANSLATE communication and dissemination objectives, June 2021 – What makes the TRANSLATE project special or unique?

2.4 Where – Key Channels and Key Performance Indicators (KPIs)

Finally, we defined the various channels that will be employed over the course of TRANSLATE to ensure that the right message is delivered to our target audiences. Some of these channels will be used solely for dissemination or communication and others will be used for both activities. The effectiveness of these channels in achieving our objectives will be measured by Key Performance Indicators (KPIs). A summary of the main channels and KPIs is included in Table 1 below.

2.4.1 Publications

Publications, both scientific and non-scientific, are an important channel in our overall dissemination and communication strategy. Scientific publications will form the backbone of the dissemination strategy, with results from the project being disseminated to key scientific communities across different peer-reviewed, subject-specific journals. All scientific publications will be made open access, with the data made open access via our community page on the open access repository Zenodo. Non-scientific publications including articles published in the media will be important for communicating scientific results from the project to the general public, and will be facilitated by engaging press releases. Informal publications in the form of blog posts which will be hosted on the TRANSLATE website will be key for driving engagement on the website and communicating topics related to the project that have relevance amongst the general public.

KPIs: Number of publications, citations, article views and downloads.

2.4.2 Events

Events will facilitate two-way engagement with our target audiences which will be important for gathering feedback on both the project and our overall strategy in dissemination and communication. As with scientific publications, conferences will facilitate the dissemination of results from the project to the research community. Industry and networking events will become particularly important in years 3 and 4 of the project when there are more tangible outputs. In terms of communication, community and outreach events will be important to involve and integrate the public in TRANSLATE research activities, and will be necessary to achieve our objective of raising awareness and understanding of the research in TRANSLATE amongst the general public.

KPIs: Number of events attended/organised, qualitative feedback from surveys, anecdotal feedback from consortium participants and number of contacts/collaborations.

2.4.3 Website

The TRANSLATE project website (translate-energy.eu) is integral to our dissemination and communication strategy as it is the focal point for sharing progress updates on the project. The aim of the website is to be a resource to find out more about the project, with content that is relevant, accessible, accurate and up to date for our key audiences. As well as information about the project research and team, the website also includes a News & Events page for press releases, blogs, newsletters and upcoming events, and a Research page aimed at research and industry that will include links to all project publications, data and materials. On all pages, visitors are encouraged to follow the project's progress through our social media channels.

KPIs: Page views, website visits and bounce rate.

2.4.4 Social media

Given our target audiences, the social media platforms that were selected as the most relevant to our strategy are LinkedIn and Twitter. Accounts for both of these platforms were set up in June 2021 (LinkedIn: linkedin.com/company/translate-energy; Twitter: twitter.com/TranslateEnergy). Both platforms will be important for disseminating short summaries of project milestones including research publications and outputs, with Twitter being most important for reaching the research community and funders, and LinkedIn being most important for reaching industry professionals. These platforms are also vital for our communication strategy as a place for sharing blog posts and articles on results from the project relevant to the general public, and for learning about upcoming community and outreach events applicable to TRANSLATE.

KPIs: Number of followers, number of post likes and retweets.

2.4.5 Video

Video has become increasingly relevant to science dissemination and communication in recent years and will form part of our strategy for distilling complex information in an engaging format. As part of the initial launch of TRANSLATE, we created a video summarising the main aims, objectives and partners involved in the project which is featured on the project website homepage. We plan to create a number of videos over the course of the project to facilitate the dissemination and communication of our results and outputs.
KPIs: Number of videos and video views.

2.4.6 Resources and materials

As mentioned in section 2.4.3 above, we have created an area of the TRANSLATE website on the Research page that is dedicated to hosting resources and materials from the project. These resources will take many forms including infographics for communicating graphical representations of research outputs, as well as technology fact sheets for disseminating the benefits, uses and Technology Readiness Levels (TRLs) of project outputs. We plan to highlight these materials at conferences and events, on social media and in an annual newsletter.
KPIs: Downloads and page views.

2.5 When – Key Events

The most impactful dissemination and communication activities will take place in years 3-4 when the project will have a significant amount of research output. Between now and then however, there are many events and activities that TRANSLATE will participate in to build networks and raise awareness of the project. The TRANSLATE DEC Plan includes a list of these planned dissemination and communication activities which is continually added to over the course of the project.

Table 1: Summary of the TRANSLATE dissemination and communication strategy

Key objectives	Key audiences	Key messages	Key channels and KPIs	Progress towards targets (as of May 29th, 2024)
1) Raise awareness and understanding of the research in TRANSLATE amongst the general public, specifically its importance, challenges and advances, and how it is trying to solve energy and environmental issues.	1) Members of the public and community groups who are interested in emerging sustainable tech	"Waste heat energy discharged into the atmosphere is one of the largest sources of clean, fuel-free and inexpensive energies available." "Generating electrical energy from low-grade waste heat into electricity is an important source of renewable energy, and is key to decreasing carbon emissions." "Accessing this largely untapped energy source could help tackle some of the biggest economic and social challenges we face today including climate change and the depletion of natural resources."	• Social media (Twitter) e.g. retweeting content from the media about environmental issues and highlighting the work in TRANSLATE; **KPI(s):** Number of followers; **Target:** At least 50 followers by the end of year 1 and 300 followers by end of the project. • Video e.g. summary of research outputs in accessible language; **KPI(s):** Number of videos and video views; **Target:** At least 1 video by the end of year 1 and at least 4 videos by the end of the project. • Blog posts e.g. topics such as the link between TRANSLATE and wider societal issues; **KPI(s):** Number of blog posts and page views; **Target:** At least 2 blog posts by the end of year 1 and at least 6 blog posts by the end of the project. • Press releases e.g. communicating results from scientific papers that are interesting for a general audience; **KPI(s):** Number of press releases and	• 390 followers - 170 followers on Twitter; 220 followers on LinkedIn • 17 videos created – see YouTube channel (details on videos created in Year 3 outlined in Section 4 below) • 26 blog posts – see News & Events section of website (details on blogs created in Year 3 outlined in Section 4 below) • 3 press releases (1 UCC, 2 UL) – see News & Events section of website

			amount of media coverage; **Target:** At least 2 press release by the end of year 1 and at least 6 press releases by the end of the project. • Events e.g. outreach events to engage in two-way communication with the public; **KPI(s):** Number of events attended and feedback from events via surveys; **Target:** Participation in at least 1 outreach event by the end of year 1 and at least 4 outreach events by the end of the project.	• Participation in 6 outreach events (details on outreach events in Year 3 outlined in Section 4 below)
2) Disseminate project results at European and international conferences and industry events. 3) Engage with similar projects in order to achieve greater impact.	2) Researchers and academic colleagues (in materials science, energy harvesting, and waste heat capture)	"Nanochannels, fabricated from cheap Earth-abundant materials and infiltrated with ionic conductive liquids, have the potential to play a key role in the capture and conversion of low-grade waste heat into electrical energy." "The individual processes in the TRANSLATE technology will work synergistically together at the nanoscale level to create an energy harvesting technology that has the potential to exceed the efficiency of the current state-of-the-art thermoelectric	• Scientific papers in peer reviewed journals e.g. *Physical Review Letters, Nature Energy, Nano Energy, ACS Applied Energy Materials and Advanced Energy Materials*; **KPI(s):** Number of papers and citations: **Target:** 12 papers by the end of the project (all open access). • Scientific conferences e.g. MRS, EMRS and APS, as well as other smaller subject-specific conferences; **KPI(s):** Number of conference attended and number of conference presentations; **Target:** At least 3 conference presentations by the end of year 1, at least 20 conference presentations by the end of the project.	• 3 scientific papers published (details on papers published in Year 3 outlined in Section 5 below) • Participation in 20 scientific conferences (details on scientific conferences in Year 3 outlined in Section 5 below)

		generators and liquid-based thermoelectrochemical cells."	• Social media (Twitter) e.g. short summaries of research progress and results; **KPI(s):** Number of followers; **Target:** At least 50 followers by the end of year 1, 300 followers by end of the project. • Events e.g. EU energy initiatives involving other similar EU projects such as ReUseHeat, COOL DH, REWARDHeat and Waste-not; **KPI(s):** Number of engagements/collaborations; **Target:** At least one engagement before the end of the year and at least 4 by the end of the project	• See social media stats above • Participation in 2 EU energy initiatives involving other similar EU projects (details on event in Year 3 outlined in Section 6 below)
	3) European research funders (current and future) interested in sustainable energy projects	"Generating electrical energy from low-grade waste heat is a key enabler to meet the growing global energy demand, whilst reducing Europe's carbon footprint and supporting the realisation of the UN SDG7-Energy plan, the European Green Deal strategy and Europe's binding renewable energy targets for 2030." "TRANSLATE is a multidisciplinary project involving physics, math,	• Social media (Twitter and LinkedIn) e.g. short summaries of project milestones on Twitter and LinkedIn, tagging relevant hashtags and accounts such as European Innovation Council, European Environment Agency, EU Climate Action, UN Environment Programme; **KPI(s):** Number of followers; **Target:** At least 50 followers by the end of year 1, 300 followers by end of the project. • Events e.g. EU project networking events such as FET Briefing's 'Research Meets Industry' event; KPI(s): Number of events attended, number of	• See social media stats above • Participation in 2 EU project networking events (details on event in Year 3

		chemistry, material science, nanoscience, nanoelectronics and electrical engineering."	contacts/collaborations: **Target:** At least 1 EU event attended by the end of the year, at least 4 attended over the course of the project. • Websites e.g. CORDIS platform and Horizon Results Platform; **KPI(s):** Number of contacts made from project profiles; **Target:** At least one contact made by end of the year, at least 4 contacts made by end of the project.	outlined in Section 6 below) • Published on Innovation Radar.
	4) Industry partners and future users of the TRANSLATE device	"The technology in TRANSLATE will improve the energy efficiency of many devices and systems, such as combustion engines, industrial manufacturing and conversion processes, by recovering large amounts of waste heat from these systems and converting it to useable electricity." "TRANSLATE's approach of generating electrical energy from low-grade waste heat and from very small temperature differentials has the potential to revolutionise the field of waste	• Industry events e.g. Dublin Tech Summit; **KPI(s):** Number of events attended; Target: At least 1 industry event attended by the end of the year, at least 4 attended over the course of the project. • Social media (LinkedIn) e.g. short summaries of research progress and results; **KPI(s):** Number of followers; **Target:** At least 50 followers by the end of year 1, 300 followers by end of the project. • Project resources e.g. technology factsheets and newsletter; **KPI(s):** Number of artefacts produced; **Target:** An annual newsletter and at least 2 technology factsheets by the end of the project.	• Participation in 2 industry events (details on industry event in Year 3 outlined in Section 6 below) • See social media stats above • Issue 2 of the newsletter published in June 2023, with Issue 3 expected to be published in June 2024

		heat harvesting for both portable electronic devices and wireless stationary applications, with scope to extend into other areas.”		

3. Strategy for TRANSLATE Exploitation

The objective of exploitation is to ensure that the research outputs from TRANSLATE are utilised. In many cases this use will be commercial, but there may also be uses that are oriented towards research and policy making. It is fully expected that the project will generate results with real potential for commercial exploitation. The TRANSLATE Executive Board are tasked with the responsibility of managing the exploitation of project results and outcomes. This includes ensuring potentially valuable IP is captured, evaluated and protected by the appropriate means as the project progresses. This role will become more important towards the latter end of the project when there are tangible outputs from the project for exploitation.

The dissemination and communication strategy outlined in the proceeding sections will facilitate exploitation by raising awareness of the research outputs from TRANSLATE amongst industry and policy representatives. A number of target companies have already been identified, including Analog Devices (ADI), who provided a letter of support at the time of the project proposal expressing their interest in the technology being developed in TRANSLATE. New opportunities including potential companies and uses for the technology that come to light over the course of the project will also be explored and discussed amongst the Executive Board for their potential within the TRANSLATE exploitation strategy.

The procedures for the management of any IP generated in the project have been outlined and agreed upon in the Consortium Agreement (submitted at month 2). Once the IP agreements for the TRANSLATE technology have been put in place, it is at this stage that discussions will begin with interested companies. This will be facilitated by the technology transfer offices from the relevant partners. As per Article 28 of the Grant Agreement, each partner will take measures to ensure exploitation of the results in TRANSLATE, even beyond the end of the grant (for up to four years), by:

(a) using them in further research activities (outside the action);
(b) developing, creating or marketing a product or process;
(c) creating and providing a service, or
(d) using them in standardisation activities.

4. Communication activities in Year 3

4.1 Events and campaigns

As part of the DEC plan implementation, TRANSLATE has organised and participated in **5 outreach events** during the past year to raise awareness of the project and encourage active participation from the general public:

- **Cork Carnival of Science 2023 (10th – 11th June 2023)**
  TRANSLATE team members from UCC and UCC Academy participated in the Cork Carnival of Science 2023, Ireland's largest outdoor science engagement event. Hosted by Science Foundation Ireland and Cork City Council, this festival attracted over 25,000 attendees, including curious kids and fun-loving families. With a strong emphasis on climate action, the event offered a wide array of STEM-based activities, live shows, interactive demonstrations and captivating discoveries. The TRANSLATE stall had a number of child-friendly demonstrations introducing the concept of generating electricity from heat (Figure 3). A short video of the highlights of the Carnival was uploaded to the project YouTube channel.

Figure 3 – TRANSLATE's participation in Cork Carnival of Science 2023

- **European Researchers' Night at the University of Latvia (29th September 2023)**
  On the evening of September 29, within the framework of Researchers' Night 2023, the University of Latvia (UL) hosted approximately 4,000 science enthusiasts in the Academic Center, Lativa to showcase how diverse and fascinating science can be in the form of experiments, discussions, games and lectures. An active and engaging discussion was hosted with guests about the main paradigms of the TRANSLATE platform and the importance of converting low-grade waste heat into usable electricity. Hundreds of visitors, both children and adults, were able to transform the energy of flowing liquid and heat into electricity at the hands-on interactive workshop (Figure 4).

Figure 4 – UL researcher demonstrating TRANSLATE's principles at European Researchers' Night

- **European Innovation Council Information Day (4th December 2023)**
  Following an invitation from the Research Support Office in University College Cork (UCC), Principle Investigator Prof. Justin Holmes (UCC) and Project Manager Rebecca Buckley (UCC Academy) participated in a European Innovation Council Information Day to provide insights on how to successfully develop a proposal for an EIC Pathfinder Grant, and the role of UCC Academy in supporting the management and DEC activities of the project (Figure 5).

Figure 5 – Prof. Justin Holmes presenting at the European Innovation Council Information Day, UCC

- **AMBER's Transition Year Event 2023 (13th December 2023)**
  AMBER, Ireland's leading materials science research centre, recently co-organised an outreach event with TRANSLATE for Transition Year students (16–17-year-olds) on 13th December 2023, at the Environmental Research Institute (ERI), University College Cork (Figure 6). The centrepiece of AMBER's initiative is the annual "Exploring Materials" Transition Year work experience programme. This event provided hands-on experience for students to delve into the world of scientific exploration. The TRANSLATE project, alongside two other EU-funded research and innovation projects (RADICAL and FreeHydroCells) were presented to eight transition year students by Prof. Justin Holmes, Dr. Ievgen Nedrygailov and Dr. Ailbe Ó Manacháin (UCC). Dr. Ievgen Nedrygailov also led a practical demonstration with the students. The highlights of the event are available here.

Figure 6 – TRANSLATE researchers with participating students at AMBER's Transition Year Event

- **Presentation to Minzu University delegation (20th March 2024)**
  Project researcher Dr. Ailbe Ó Manacháin (UCC) delivered a presentation on 'Pathways of Water, Heat and Light to Novel Renewable Energy Sources' to a delegation of 30 students from Minzu University of China and their supervisors. The presentation highlighted the innovative research happening in TRANSLATE (Figure 7).

Figure 7 - Dr. Ailbe Ó Manacháin presenting to Minzu University of China delegation

4.2 Website

The TRANSLATE website continues to be a primary communication channel for the project, with content posted regularly in the form of blog posts, event updates and publications such as the annual newsletter. UCC Academy manages the website with

support from an external website hosting and maintenance supplier, Buchanan Solutions. Website activity and engagement is monitored via Google Analytics. In Year 3, the website has received over 1K page views with an average engagement time of 3 minutes 21 seconds (as of 29th May 2024).

4.3 Social media

4.3.1 Twitter

As of 29th May 2024, the TRANSLATE Twitter account has 170 followers. The account has received 63,935 impressions to date and the average engagement rate on the account is 5.24% (industry standard for good engagement: 0.5-1%).

4.3.2 LinkedIn

As of 29th May 2024, the TRANSLATE LinkedIn account has 220 followers. The steady growth in followers on LinkedIn over the last year is reflective of our change in social media strategy to pivot our focus to this platform, given the diminishing visibility and decrease in engagement on X (formally Twitter). LinkedIn posts from the project page have received 46,866 impressions to date. The average engagement rate on the account in the last year has been 7.27% (industry standard for good engagement: 2-3%).

4.4 Video

A project YouTube channel was created in August 2022 which stores all of TRANSLATE's video content (17 videos to date). During Year 3 we published **five new videos** and **three 'shorts'** (videos less than 60 seconds). Three of the five videos are a part of an educational series exploring TRANSLATE's scientific innovation (Figure 8). The series has been promoted via our website and social media channels. The other two videos created are Dr. Ievgen Nedrygailov's presentation at IWTED 2023 and highlights from AMBER EPE TY event. The three shorts are highlights from TRANSLATE's participation in the Cork Carnival of Science, Project General Assembly 2023 at Riga and the ENLIT Europe event.

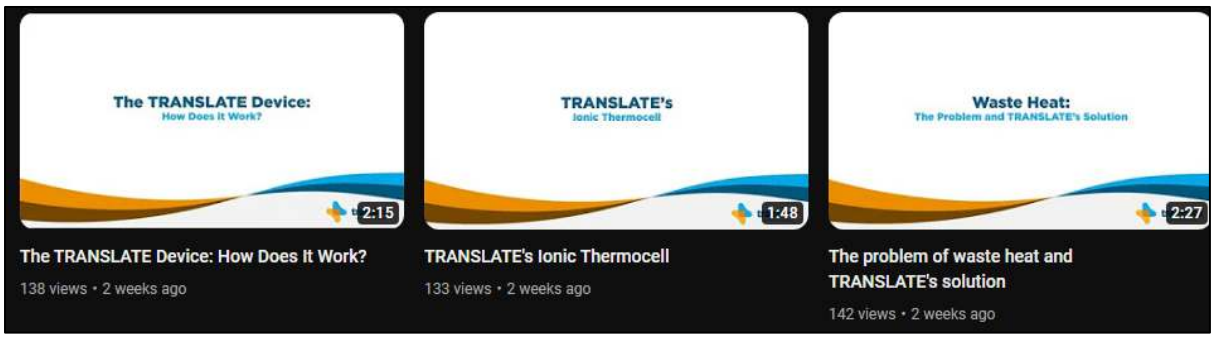

Figure 8 – TRANSLATE educational video series published on YouTube

The educational video series has also been published on LabTube, which is a home of videos for the scientific community. Unlike YouTube, LabTube is created specifically for scientists (Figure 9).

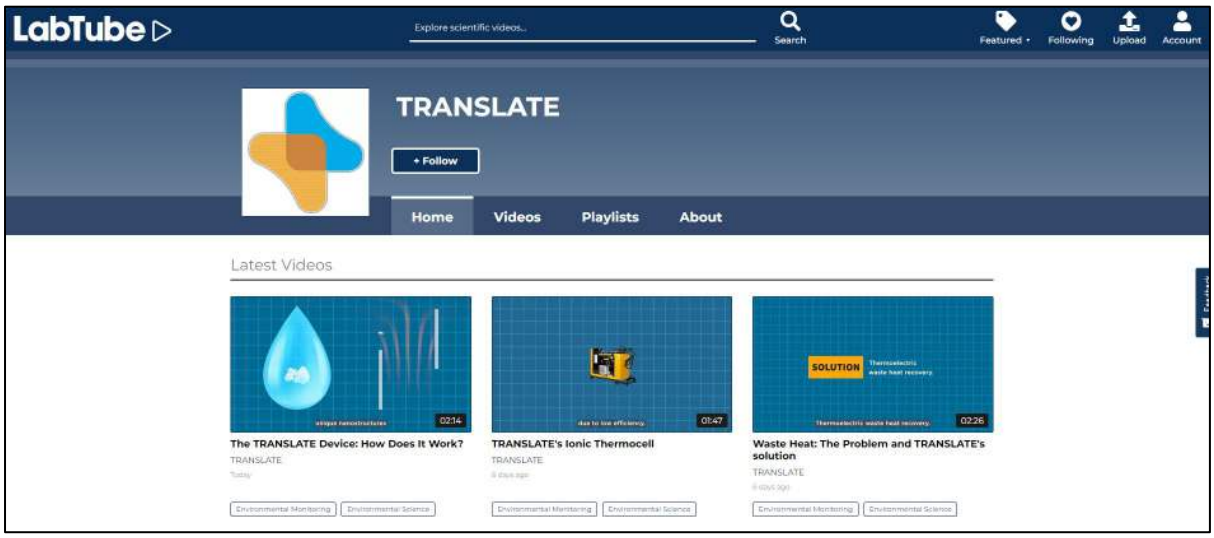

Figure 9 – TRANSLATE educational video series published on LabTube

4.5 Materials & online resources

TRANSLATE exhibited at Enlit Europe on 28-30 November 2023, represented by researcher Dr. Ievgen Nedrygailov (UCC) and Project Manager Rebecca Buckley (UCC Academy). To aid networking and engagement activities, eco-friendly tote bags and travel mugs, both made of recycled materials, were created and distributed to visitors at the TRANSLATE stand (Figure 10).

Figure 10 – Tote bags and travel mugs created for ENLIT event

4.6 Non-scientific publications

4.6.1 Newsletter

TRANSLATE published its second newsletter in July 2023 (Figure 11). It highlights key research advancements made over the past year in the TRANSLATE project. This includes the optimal design of nanochannels based on simulation results from Technische Universität Darmstadt, selection of materials for nanofluidic membranes (anodised aluminium oxide and cellulose), functionalisation of nanochannels, and the identification of an optimised electrode-electrolyte combination for the thermoelectric cell. These milestones signify significant progress made towards efficient waste heat harvesting and storage. The development and design of the newsletters was led by UCC Academy with input from the consortium.

Figure 11 – TRANSLATE 2nd annual newsletter opening page

4.6.2 Blog posts

TRANSLATE has published 26 blog posts to date which feature on the News & Events section of the website. In Year 3 we published **14 new blog posts** on various topics including reflections on project events, research updates and project news.

5. Dissemination activities in Year 3

5.1 Events

5.1.1 Conferences

Over the course of Year 3, TRANSLATE researchers participated in **five conferences**, details of which are outlined below:

- **Materials Today Conference 2023 (2nd – 5th August 2023)**
  Irina Oliseveca (UL) delivered a poster presentation titled 'Comprehensive comparison of anodic alumina membrane infiltration methods: electrolyte selection, membrane stability and flow rate characterization' (Figure 12). The conference was organised in partnership with the Materials Today family of journals and offered the materials science community a highly-visible platform to showcase their latest and novel research alongside an outstanding list of invited speakers.

Figure 12 – Collage of pictures of Dr. Irina Oliseveca representing TRANSLATE at Materials Today Conference

- **iCOM - First Indian Conference on Micro Nano Fluidics (29th September – 1st October 2023)**
  Dr. Steffen Hardt (TUD) attended this first of its kind conference where research and industry were brought together on the topic of micro nano fluidics. Dr. Hardt distributed TRANSLATE brochures to the attendees and attended a small industrial fair at the conference.

- **ADI European Technical Conference 2023 (9th November 2023)**
  Project Manager Rebecca Buckley (UCC Academy) attended this internal conference on invitation of external advisor Dr. Colm Glynn (Figure 13). Along with attending the talks, Rebecca met with Colm and distributed TRANSLATE promotional materials and flyers for colleagues working on projects relevant for future exploitation activities in TRANSLATE. Over the course of two days the event had over 650 in-person attendees.

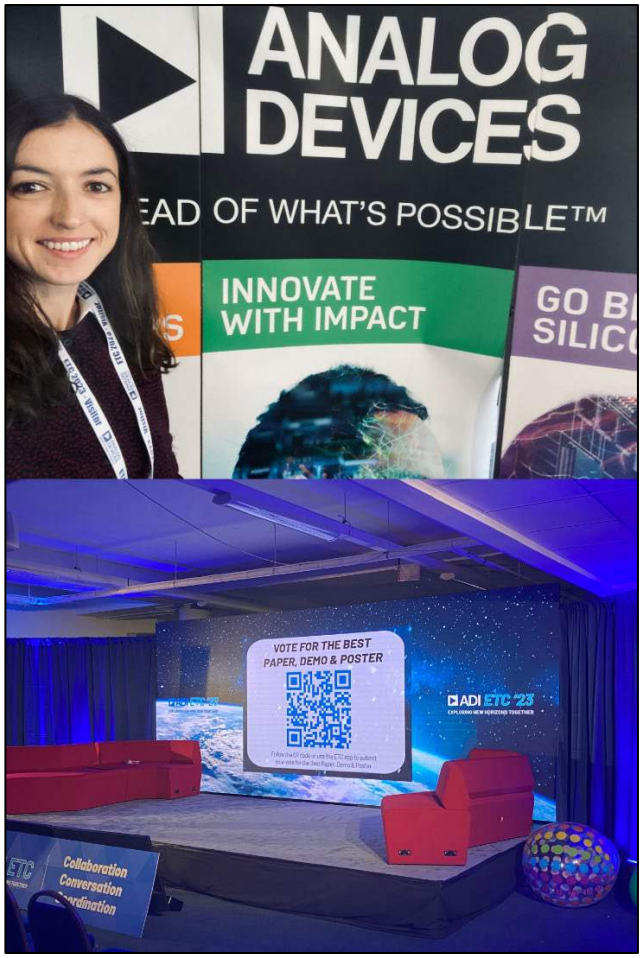

Figure 13 – Rebecca Buckley at ADI European Technical Conference 2023

- **75th Annual Meeting of the APS Division of Fluid Dynamics (APS DFD) (19th – 21st November 2023)**
  TRANSLATE researcher Dr. Rajkumar Sama (TUD) delivered a presentation titled 'Thermoelectric Energy Conversion in Nanochannels Filled with Ionic Liquids'. The meeting focused on the theme of "Fluid Dynamics & the World's Grand Challenges." Participants engaged in discussions related to emergent global issues, including education and inequality, water security, climate change, renewable energy, health, and our understanding of the universe.

- **8th Baltic Electrochemistry Conference: Finding New Inspiration (BEChem) (14th – 17th April 2024)**
  TRANSLATE PhD student Inara Nestrova (UL) participated with a poster presentation titled 'Na2FeP2O7 cathode material for aqueous sodium-ion batteries', for which she was awarded the best student poster (Figure 14). This conference was held in Tartu, Estonia, on April 14-17, 2024. The meeting was hosted by the Institute of Chemistry at the University of Tartu in collaboration with the Estonian

electrochemistry society Elektrokeemia Selts. The scientific programme of BEChem 2024 focused on sustainable energetics, the application of operando and computational methods for the development of interfacial electrochemistry as well as finding new employment for prominent electrochemical measurement methods.

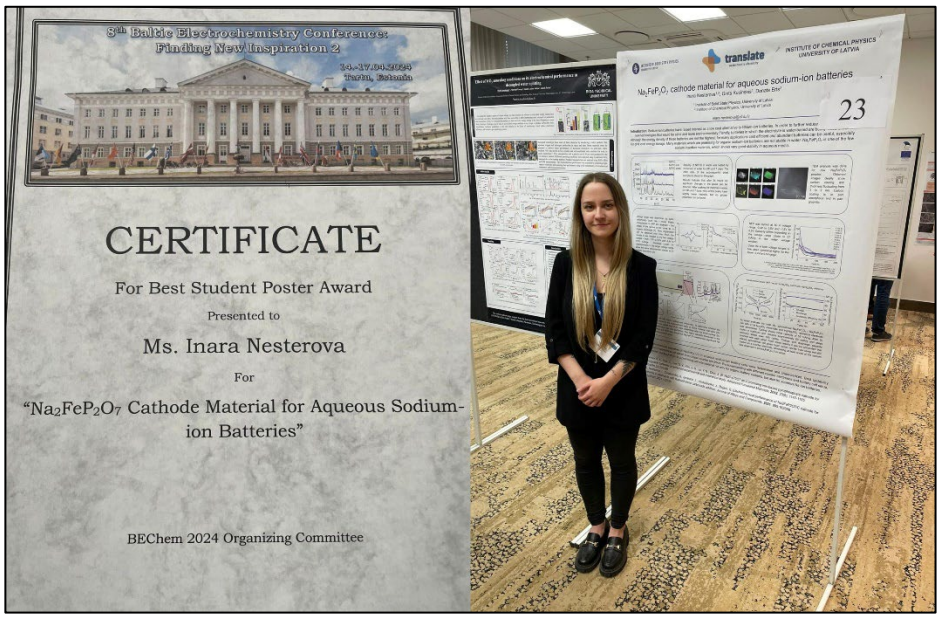

Figure 14 – Inara Nestrova at 8th Baltic Electrochemistry Conference with the poster and certificate

5.1.2 Other events

In the last year, TRANSLATE researchers participated in **eight other events** including workshops and symposiums, details of which are outlined below:

- **74th Irish Universities Chemistry Research Colloquium (14th & 15th June 2023)**
  Held at the Institute of Chemistry, University of Galway, TRANSLATE PhD students Rupa Ranjani and Anjali Ashokan (UCC) presented two different posters at this colloquium titled 'Optimization of nanoporous membranes for ionic thermoelectric energy harvester' (from 7th Green and Sustainable Chemistry Conference), and '$NiSe_2$ modified Carbon Fibre Cloth as the High- Performance electrode for Thermally Chargeable Super capacitors'.

- **ERI Early Career Researcher lunch (20th July 2023)**
  University College Cork's Environmental Research Institute hosted an early career researcher lunch where PhD student Anjali Ashokan presented an overview of the project along with latest findings (Figure 15). This event was attended by other early career researchers including PhD students and postdoctorates.

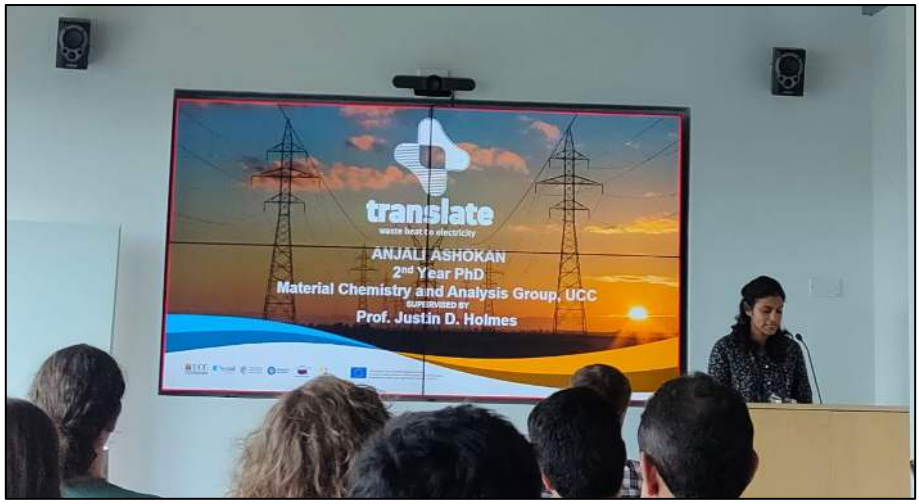

Figure 15 – Anjali Ashokan presenting the project to PhD students and postdoctorates

- **STS Elionix Scientific Image Competition (28th July 2023)**
  PhD student Rupa Ranjani and Tyndall researcher Dr. Padman Narayanasamy won the Q2 2023 of the STS Elionix competition (Rupa - Blue Star Gooseberries | Padman - Co3O4 Blue Daisy Flowers) (Figure 16).

Figure 16 – The winning pictures of STS Elionix Scientific Image Competition

- **Tyndall Poster Presentation competition/event (1st August 2023)**
  PhD student Rupa Ranjani presented a poster titled 'Insitu grown metal selenides (MX; M=Ni,Co; X=Se) on carbon fibre cloth as novel electrodes for thermally chargeable supercapacitors'.

- **International Workshop on Thermo-electrochemical Devices (IWTED) 2023 (7th – 8th September 2023)**
  IWTED was the first event completely devoted to Thermo-electrochemical systems, such as Thermo-electrochemical cells (thermocells, thermogalvanic cells), ionic thermoelectric supercapacitors, and similar devices combining electrochemical phenomena with thermal processes. Dr. Ievgen Nedrygailov from UCC delivered a presentation in person entitled 'Nanowood: Fully renewable, biodegradable, environmentally friendly, natural material for the next generation thermoelectrics'. TUD researcher Dr. Rajkumar Sarma presented a talk online entitled 'Thermovoltage Generation with Thermally Activated Electrolytes'. At the workshop, 30 researchers had the opportunity to disseminate their work, meet the invited speakers, enjoy scientific discussions, exchange ideas, and meet other international researchers and collaborators (Figure 17). Dr. Nedrygailov's presentation has been uploaded to the project's YouTube channel.

Figure 17 – In-person attendees of IWTED 2023

- **EU Energy Efficiency Day (12th October 2023)**
  The second edition of European Energy Efficiency Day took place in a hybrid format. This high-level conference brought together leading policymakers, business players and civil society organisations. The event was a unique platform to discuss energy efficiency as cost-effective and socially fair decarbonisation solution to achieve the EU Green Deal. Project Officer Abhisweta Bhattacharjee (UCC Academy) attended the EU Energy Efficiency Day 2023 online and disseminated on social media.

- **STS Elionix Scientific Image Competition (31st October 2023)**
  PhD student Rupa Ranjani Palanisamy achieved distinction by winning the STS Elionix Scientific Image competition for the second time in a year (in Q3 2023) for picture of "candy cubes." (Figure 18). These innovative structures, crafted from

transition metal chalcogenides (TMCs), hold significant promise in the field of thermal energy storage and conversion. Renowned for their remarkable thermal stability, superior electronic conductivity, and versatile redox states, TMCs have emerged as pivotal materials in this domain. The inherent attributes of Zinc-based "Candy Cubes," characterized by their multifaceted valence states, diverse morphologies, and heightened redox activity, position them as highly viable candidates for electrode applications within thermal management systems (TMSs).

Figure 18 – Rupa's winning image for STS Elionix Scientific Image Competition

- **Mathematics Seminar of New Jersey Institute of Technology (12th April 2024)** Prof. Steffen Hardt from TU Darmstadt was invited to speak in a Mathematics Seminar organised by New Jersey Institute of Technology where he shared the results achieved so far by TRANSLATE (online event).

5.2 Publications

The TRANSLATE project has published **2 scientific articles** in Year 3 (Table 2), with several others submitted and in review.

Table 2: Summary of the TRANSLATE publications in Year 3

Publication title	Date of publication	Journal and DOI
In situ optical sub-wavelength thickness control of porous anodic aluminum oxide (Zenodo link)	31st January 2024	Beilstein Journal of Nanotechnology https://doi.org/10.3762/bjnano.15.12
Giant thermoelectric response of confined electrolytes with thermally activated charge carrier generation (Zenodo link)	28th February 2024	Physical Review Letters https://doi.org/10.1103/PhysRevLett.132.098001

6. Exploitation activities in Year 3

6.1 EIC T2M Venture Building & Market Entrepreneurship Programmes

Following a successful online application, TRANSLATE team members Dr. Ievgen Nedrygailov and Dr. Ailbe Ó Manacháin participated in the EIC Tech to Market (T2M) Venture Building Programme, which supports innovators in transitioning their projects from the lab to the market. During their participation, Ievgen and Scott represented TRANSLATE and showcased the market potential of the TRANSLATE technology. Their efforts were met with success, as the project was selected to progress to the next phase — the EIC Tech to Market Entrepreneurship Programme. Our participation is summarised in the blog titled 'TRANSLATE in EIC Tech to Market (T2M) Programme' on the project website.

6.2 Horizon Results Booster

The Horizon Results Booster (HRB), an initiative pioneered by the European Commission, functions as a catalyst in translating research endeavours into tangible societal benefits. Going beyond conventional Dissemination and Exploitation (D&E)

obligations, the overarching goal of the HRB is to maximise the impact of publicly-funded research through free consulting services provided by a consortium of specialised companies. The main output of our participation in this programme was an exploitation strategy document. Further details of our participation is detailed in a blog titled 'TRANSLATE's Participation in Horizon Results Booster' on the project website.

6.3 Enlit Europe Event

TRANSLATE secured a sponsorship of the large European energy event - Enlit Europe, which was held in Paris. The sponsorship included an exhibition space within a designated 'EU Projects Zone' in the exhibition hall. Project Manager Rebecca Buckley (UCC Academy) and Researcher Dr. Ievgen Nedrygailov (UCC) attended the event as booth staff and had several useful conversations with both research and industry representatives (Figure 19). Dr. Ievgen Nedrygailov also participated in a panel discussion on Grid Technologies, offering solutions to current energy challenges based on developments in the TRANSLATE technology. The highlights of the participation are available here.

Figure 19 – Rebecca Buckley and Dr. Ievgen Nedrygailov at the TRANSLATE stand at Enlit Europe 2023