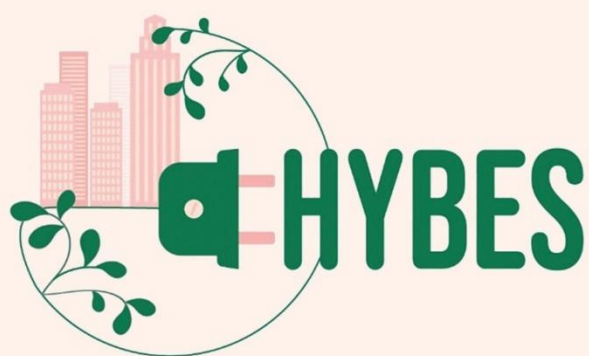




H Y B E S

HYBRID ENERGY SYSTEMS
FOR REMOTE COMMUNITIES
IN THE ARCTIC

WORK PACKAGE

Activity:	2.5	Decarbonisation as an Influencer for Educational Curriculum Change
Deliverable:	2.5.1	Report on the potential for educational curriculum change for the delivery of decarbonisation goals
Author(s):		Peter Luddy on behalf of NCE Insulation



POSITION WITHIN HYBES PROJECT

Work Package:	2	Energy Efficiency and Management: Monitoring and Assessment
Activity:	2.5	Decarbonisation as an Influencer for Educational Curriculum Change
Deliverable(s):	D.2.5.1	Report on the potential for educational curriculum change for the delivery of decarbonisation goals
Contributing to Output(s):	Output 2.2	Jointly developed energy monitoring and educational tool for educators and educational facilities
Contributing to Output Indicator(s):	RCO116_2.2	Jointly developed energy monitoring and educational tool for educators and educational facilities
Contributing to Result Indicator(s):	RCR104_2.1	Solutions taken up or up scaled by organisations

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P E T E R L U D D Y
P E A D A R Ó L O I D I D H

B S c (H o n s) A r c h | M A r c h

Peter Luddy — Bsc(Hons), MArch

Peter Luddy is an architectural graduate, educator, and researcher/writer. Peter holds a MArch degree from the Cork Centre for Architectural Education (CCAIE) and has enjoyed several years of experience in practice and occasional freelance work. He is currently a part-time Assistant Lecturer (design studio and history & theory) at CCAIE and a Research Assistant at University College Cork (UCC) on the EU-Interreg-NPA-funded *Bauhaus Goes North* project. He has also previously worked as a Research Assistant at the intersection of climate and the built environment at UCD, and participated in the Irish Architecture Foundation's (IAF) national 'Architects in Schools' post-primary programme. Peter's independent historical research and writing has also been published or disseminated publicly and nationally. He has already contributed to the *HYBES* project — developing D.2.4.2 ('12-week Educational Module') on behalf of NCE Insulation in 2025.

LIST OF FIGURES & TABLES

No table of figures entries found.

GLOSSARY OF ACRONYMS

CCC	Cork County Council
CCAIE	Cork Centre for Architectural Education
CPD	Continuing Professional Development
D	Deliverable
DZ	Decarbonising Zone
ETB	Education and Training Board
HEI	Higher Education Institutions
HYBES	Hybrid Energy Systems for Remote Communities in the Arctic
ISSN	Irish Schools Sustainability Network
MTU	Munster Technological University
NCCA	National Council for Curriculum and Assessment
NCE	Northside Community Enterprises
NEB	New European Bauhaus
NPA	Northern Periphery and Arctic
SF4C	SchoolFood4Change
SDGs	Sustainable Development Goals
SEAI	Sustainable Energy Authority of Ireland
TY	Transition Year
UCC	University College Cork
UMU	Umeå University
WP	Work Package
WWF	World Wildlife Fund

EXECUTIVE SUMMARY

1. INTRODUCTION

1.0 D.2.5.1 in the context of the HYBES Project

The HYBES Project (NPA0100025), funded by the Interreg NPA Programme, aims to strengthen capacity for climate change adaptation and decarbonisation in the NPA region by providing education on energy/resource efficiency and developing sustainable hybrid energy systems. HYBES recognises that providing educational resources for children/young adults will arm them with the knowledge and tools necessary to combat climate change, and can initiate cultural shifts in the wider community towards decreasing carbon emissions and other sustainable practices.

UMU and Umeå Municipality co-lead WP2, which delivers technical assessments of decarbonisation and develops educational outreach. As part of this, NCE Insulation lead Activities 2.4 and 2.5 which focus on influencing curriculum and behavioural change through targeted educational interventions. Activity 2.4 advanced second-level curriculum change through the Carbon Club School Competition and a 12-week module on 'Sustainability and Decarbonisation' (please see NCE's D.2.4.1 and D.2.4.2). Activity 2.5 will now develop a roadmap to replicate these models in other educational settings, including third level and Continuing Professional Development (CPD), and support behavioural change across the NPA region and beyond. Building capacity and knowledge in decarbonisation by embedding energy efficiency and sustainability principles in education and professional development is a key HYBES objective. This report draws on lessons learned from WP2 to develop the roadmap.

1.1 Developing the report

This report — D.2.5.1 — is one of three WP2 educational deliverables developed by NCE Insulation (D.2.4.1 and D.2.4.2 were delivered in period 4 and 6 respectively). These will be combined into a single report upon their completion. NCE Insulation appointed Peter Luddy to develop D.2.5.1.

Desktop Research

Reviewed existing HYBES educational content (including D.2.4.1 and D.2.4.2) and case studies of real change (SchoolFood4Change's 'Whole School Food Approach', Umeå Kommun's 'Energy In Kitchen', WWF Sweden's 'One Planet Plate', Vistorka's 'KortEr' and Bodø Museum's 'At Our Service')

Drafting and Completion

The finalised report was delivered on 30 January 2026.

2. THE ROADMAP

2.0 Replication of previously developed models

This section provides tangible steps to enable the replication of previously developed resources/models. While *not exhaustive*, this guide can expedite future expansion. The roadmap provides the following recommendations:

Expanding to Irish post-primary schools outside the Cork DZ

1	National Replication Pack	Develop a National Replication Pack.
2	National Pilots	Identify 2-3 new pilots outside of Cork. Collect evaluation data to demonstrate replicability.
3	Consortium	Establish a dedicated team / consortium to manage and deliver the educational programme in partnership with School Environmental Officers.
4	Website & Repository	Develop and maintain a programme website and central resource repository.
5	Rewards	Fund and implement an appropriate reward system to motivate programme engagement.
6	Video Competition	Run a video competition demonstrating carbon reduction in pilot schools which can be used as a programme advertisement and educational tool.
7	Content Reviews	Review and update educational resources / supports for easy adaption in varied contexts.
8	Cross-curricular Links	Incorporate cross-curricular links using alternative perspectives and activities around sustainability and decarbonisation.
9	Funding	Seek appropriate central funding for any future development and all lifetime costs.
10	Alignment for Accreditation	Align the language of the TY module with appropriate frameworks and strategies to prepare for future accreditation.

Expanding into third-level education

11	TY Workshop	Organise a workshop for TY students with CCAE students and graduates focused on decarbonisation in architecture, research and career pathways, and transferable knowledge and skills.
12	Teacher Workshop	Organise a workshop for post-primary teachers with CCAE teaching staff focused on decarbonisation in architecture, research and career pathways, and transferable knowledge and skills.
13	Third-level Module	Adapt the existing 12-week educational module on 'sustainability and decarbonisation' as a third-level module.

Expanding into CPD

14	Teacher-fronted CPDs	Develop a teacher-fronted CPD programme using a tiered approach and recognised delivery structures.
15	Community of Practice	Develop a community of practice through annual meetups, peer-sharing, and exchange.
16	Onsite Coaching	Prioritise onsite CPD coaching over online resources where possible.
17	Inter-generational exchange	Implement inter-generational knowledge exchange and collaboration as a prelude to formal educational resources.

Expanding across the NPA region and further afield

18	International Replication Pack	Develop an International Replication Pack, updated for easy translation by separating core and local layers, and introducing new case-studies for new contexts.
19	Language Accessibility	Provide a variety of language options across programme website, resources, and literature.
20	'Replication Schools' Network	Establish a global network of 'Replication Schools' to pair existing and new participants together for collaboration, support, and project amplification.

2.1 The Roadmap — Influencing behavioural change

This section will provide tangible steps to realise the long-term goal of Activity 2.5, which is to influence behavioural change for the delivery of decarbonisation across the NPA region (and further afield).

Visibility and legibility of energy use

21	Integrate energy monitoring data into educational activities and daily institutional practice where possible.
22	Present energy and carbon information in accessible, age-appropriate formats.
23	Support students to interpret and communicate energy-related data within and beyond the school.

Embedding behavioural change within routine practice

24	Support student-led sustainability or energy groups with defined roles and responsibilities.
25	Embed energy-conscious behaviours into routine institutional practices.
26	Align behavioural initiatives with existing school policies and frameworks where relevant.

Peer learning and social reinforcement

27	Facilitate peer-to-peer exchange between participating schools or institutions.
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28	Use student-generated outputs as tools for dissemination and reflection.
29	Recognise and communicate participation and progress within schools and communities.

Linking behaviour to tangible outcomes

30	Document and communicate the outcomes of behavioural change where feasible.
31	Reinvest financial savings from energy reductions into sustainability initiatives where possible.
32	Situate educational activities within local or regional decarbonisation objectives.

Reflection, evaluation, and reinforcement

33	Incorporate reflective evaluation at the end of programme cycles.
34	Develop simple indicators to track behavioural change alongside educational outcomes.
35	Use evaluation findings to inform the ongoing refinement of educational supports.

Supporting longer-term cultural change

36	Position educational initiatives within a longer-term transition context.
37	Encourage continuity between post-primary, third-level and CPD engagement.
38	Support inter-generational learning pathways that extend impact beyond the classroom.

2.2 The Roadmap — Additional recommendation(s)

This section outlines additional recommendations that do not lie within the scope of the previous sections.

39	Take steps to counter the limitations of this report (single author with academic and architectural focus) by opening conversation around proposed expansion(s) to actors engaging with education in multiple or diverse ways who could add further expertise to the recommendations set out herein.
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1. INTRODUCTION

1.0 D.2.5.1 in the context of the HYBES Project

Extreme weather conditions, long periods of darkness, and limited infrastructure means that Arctic communities still rely on environmentally unsustainable fossil fuels. The primary objective of the HYBES project, no. NPA0100025, funded by the Interreg Northern Periphery and Arctic (NPA) Programme, is to strengthen capacity for climate change adaptation and decarbonisation in the NPA region by:

1. providing education on energy and resource efficiency and its environmental or financial value for households and communities
2. developing, implementing, and promoting sustainable hybrid energy systems — stable and flexible infrastructures which integrate locally-produced Renewable Energy Sources (RES) and storage technologies

Umeå University (UMU) are lead partners for Work Package (WP) 2 *Energy Efficiency and Management: Monitoring and Assessment*, with Umeå Municipality operating as co-lead. This WP seeks to monitor, measure and evaluate contributions to decarbonisation offered by renewable energy storage and management strategies in domestic and community buildings. However, it is also charged with developing and delivering on the educational needs of the HYBES project. Activities 2.4 (*Energy Monitoring and Behavioural Change for Educators and Educational Facilities*) and 2.5 (*Decarbonisation as an Influencer for Educational Curriculum Change*) focus on the latter goal in particular. Northside Community Enterprises (NCE) are the lead partners for both of these Activities, supported by the other partners.

HYBES recognises the green transition as a multi-generational effort that requires all parts of society to be involved. Children and young adults are the demographic most likely to be affected by climate change, but they are also poised to be the greatest contributors in efforts to combat against it. The provision of educational modules for children and young adults now will arm them with the knowledge and tools which are necessary for the future. However, the provision of these resources can also trickle upwards to support the education of the wider community — engaging parents/guardians, administrators, teachers, and others to think critically about the environmental and financial values of climate change adaptation, energy and resource efficiency, and decarbonisation. In the short term it is hoped that promoting awareness of energy consumption will initiate decreases in carbon emissions. However, the ultimate long-term goal is to transform

curriculum change into real behavioural change and a widespread cultural shift towards sustainable practices.

Activity 2.4 has already advanced curriculum change in second-level education by developing the necessary educational resources — the Carbon Club's School Competition (please see NCE's D.2.4.1: *Collaborative Report on Energy Monitoring and Behavioural Change for Educational Facilities* for further details) and a new 12-week educational module on the theme of 'Sustainability and Decarbonisation' (please see NCE's D.2.4.2: *12-week Educational Module* for further details).

Activity 2.5 will build upon Activity 2.4, documenting and developing a roadmap which will:

- [medium-term goal] provide tangible steps to enable the replication of those previously developed resources/models in other educational settings, including third-level education and areas of continued professional development (CPD)
- [long-term goal] influence behavioural change for the delivery of decarbonisation across the NPA region (and further afield)

This is an important objective for HYBES as it will build capacity and knowledge in the area of decarbonisation. By strongly influencing and moulding effective and energy conscious young professionals and future decision-makers we can ensure that future developments in the area of decarbonisation are embedded within the lenses of energy efficiency and sustainability policy and implementation. The current document, D.2.5.1, will use the lessons learnt from WP2 activities to develop the roadmap, which will be revealed in the following sections.

1.1 Developing the report

The following deliverables for WP2 were identified as addressing the educational needs of the HYBES project:

- D.2.4.1: *Collaborative Report on Energy Monitoring and Behavioural Change for Educational Facilities*
- D.2.4.2: *12-week Educational Module.*
- D.2.5.1: *Report on the Potential for Educational Curriculum Change for the Delivery of Decarbonisation Goals*

The *Joint Action Plan for the HYBES Project* marked NCE Insulation responsible for developing each of these deliverables. It was agreed at a HYBES Partners' meeting in March 2025 (Cork County Council, Ireland) that all three deliverables, upon their completion, could be merged into a single report, owing to their overarching theme of education. D.2.4.1 and D.2.4.2 were completed and delivered by NCE Insulation in Period 4 (month 19-24, 01.08.2024-31.01.2025) and Period 6 (month 31-36, 01.08.2025-31.01.2026) respectively. Meanwhile, D.2.5.1 (the current document) was also proposed to be completed and delivered at the end of Period 6 (month 31-36, 01.08.2025-31.01.2026).

To this end, in early December 2025 NCE Insulation asked Peter Luddy to follow on from his earlier work — as 'Education Module Developer' on D.2.4.2 ('12-week Educational Module') — and develop D.2.5.1 on their behalf. A meeting was held between Peter and representatives of NCE Insulation in early January 2026 to outline an approach to the report.

Desktop Research

The report was developed through independent desktop research, which began in December 2025. The lessons learnt from earlier WP2 activities was a key consideration for this report so all existing HYBES materials related to the theme of education were reviewed, including:

- a video recording of the HYBES Co-Creation Café on 'Education and Circularity' (May 2025).
- NCE's reports for D.2.4.1 and D.2.4.2.

Additional materials or case-studies from partners and associated organisations which illustrate how real change is being achieved by schools/education-facing initiatives in other countries were also reviewed. These included:

- [The SchoolFood4Change project](#), including their leaflet on 'Whole School Food Approach'
- Umeå Kommun's summary report of 'Energy in Kitchen' (Dec 2025)
- [World Wildlife Fund \(WWF\) Sweden's 'One Planet Plate' guide](#)
- [Vistorka's 'KortEr' map tool/application and educational programme](#)
- Bodø City Museum's education programme for the 'At Our Service' exhibition (2024-5)

Drafting and Completion

The finalised copy of D.2.5.1, as presented here, was delivered to NCE on 30 January 2026.

2. THE ROADMAP

2.0 Replication of previously developed models

This section will provide tangible steps or recommendations to enable the replication of any previously developed resources/models in other educational settings, including third-level education and areas of continued professional development (CPD), across the NPA region (and further afield). It is *not an exhaustive list* but rather a guide which could expedite the transition to any subsequent expansion phase of the project.

Expanding to Irish post-primary schools outside the Cork DZ

Currently, only the ten schools involved in NCE Insulation's 12-week pilot Carbon Club's School Competition have engaged with the educational outputs of HYBES Activity 2.4. Each of these was a post-primary school operating within the Cork Education and Training Board (ETB) system. The completed pilot programme and the developed outline for a new educational module align closely with Transition Year (TY) curriculums in the Cork Decarbonising Zone (DZ). However, they also align with the emerging 'Climate Change and Sustainable Development' Leaving Certificate subject and existing national supports (including Green-Schools, SEAI and Scoilnet). This presents an opportunity for national replication — into other schools (primary and post-primary) and other locations beyond Cork DZ.

Recommendation(s):

1	National Replication Pack	Develop a National Replication Pack, to include: • a teacher handbook • editable lesson plans (with prompts for locations) • pre-mapped curriculum links (for Junior, TY, and Senior Cycle)
2	National Pilots	Identify 2-3 ETBs outside of Cork for short TY pilots and use education centres to host induction workshops for teaching staff and disseminate the National Replication Packs. Collect evaluation data at the completion of each pilot to demonstrate that the model is replicable.

The following items should also be considered in any future expansion:

- **Management and implementation**

Many local authorities in Ireland have newly appointed School Environmental Officers. These officers could be consulted with in order to make the 12-week module, and other resources, available to schools who might be interested in participating.

The programme will only be of value if its contents and delivery remain updated, current, and relevant for contemporary education. Outdated information should also be phased out. This will require a permanent team of experienced professionals, who will need to be replaced as they retire or move on from the project.

Recommendation(s):

3	Consortium	Establish a team / consortium who will be responsible for the long-term management, curation, quality assurance, and implementation of the educational programme. This team should involve or consult with School Environmental Officers in local authorities, or their equivalent. An existing and established partner with established funding streams is advised as resources and personnel could be shared, meaning that savings could be made. More importantly however, this would add to the credibility of the educational programme, ensuring that it adheres to best practice and also secures its accessibility into the future. This could be initially tested in Cork, where the pilot scheme was implemented and where networks already exist before it is rolled out across the country or internationally.
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- **Communication, dissemination, and advertisement**

Efficient methods of communication and disseminating information, as well as advertisement, are necessary to support the expansion of any educational programmes. Participants in Carbon Club's School Competition identified the need for ongoing external support during their programme. Feedback from the schools surveyed for D.2.4.2 identified the need for ongoing external support for the successful delivery of the

educational module. Meanwhile, the SchoolFood4Change (SF4C) project notes that 'effective onboarding is a crucial task' and they have developed an informative flyer and website to help prospective schools understand and engage with their programme, based on their previous experiences with school partnerships.

Recommendation(s):

4	Website & Repository	Develop a live programme website, from open-source systems, which will be maintained and updated throughout the lifetime of the programme and provide the following information: • a project description • an overview of the educational module • a directory of partners and participating schools • a central repository providing access to informative literature, practical guidelines, lesson materials, videos, quizzes, templates, etc. • any funding information • FAQs • a news feed (highlighting new initiatives, events, project updates etc.) • any necessary social media links or contact details • a search bar interface • GDPR, ethics & legal statements • any additional website requirements
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- **Motivation**

Participating schools might require certain motivations to be enticed to initially engage with the programme and to remain committed to it from year-to-year. This could take the form of funding, or annual prizes or competitions run in conjunction with local authorities or other bodies. For example:

- Participants in SF4C's Whole School Food Approach framework are awarded a medal and a grading (bronze, silver, gold) based on the status of the programme's implementation across the school. This grants the schools prestige and staff and students a sense of achievement, and it motivates schools to continue to progress through each of the grades in the programme.
- Participants in Carbon Club's School Competition were awarded with a number of prizes (installation of solar photovoltaic systems and electric vehicle chargers, and energy audit reports) depending on the points they accumulated from various challenges completed over the course of the school year. This motivated staff and students to engage with each of the actions, regardless of scale, and the competition as a whole. However, some challenges / activities were left incomplete.

Recommendation(s):

5	Rewards	Identify, fund, and implement an appropriate reward system to entice new participants and to motivate existing participants to continually engage with the programme.
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- **Efficient onboarding**

Exchange and interaction between schools and sites where the programme has already been implemented and new or prospective participants is critical, the first instance, for increasing awareness and understanding, but also to effect efficient onboarding and implementation.

Recommendation(s):

6	Video Competition	Run a new competition for schools who previously participated in the pilot Carbon Schools Club Competition, centred on creating online videos which demonstrate how the changes which were made in the school are successfully reducing carbon output. These
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		videos can then be used as an educational tool which can prompt new schools to participate.
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- **Updating educational content**

One of the challenges emerging out of the Carbon Schools Club Competition is that some schools faced structural obstacles (including the size of buildings, lack of resources and working materials) and human-related obstacles (number of students, lack of motivation, less experience, or resourceful teachers). Therefore, educational content needs to be more adaptable for the specific contexts of different schools.

Recommendation(s):

7	Content Reviews	Review, update, and arrange any educational resources and supports to build in flexibility that will allow the programme to be adapted to the varied contexts of individual schools.
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- **Cross-curricular links**

Alternative curricular links, outside what would be considered typical for the themes of sustainability and decarbonisation, are helpful for introducing additional perspectives, diverse voices, and new ways into the topics. For example: Bodø City Museum's education programme during the Sami arts exhibition 'At Our Service' proved a beneficial way of introducing visiting grade 5 pupils to the idea of 'reduce, reuse and recycle' — which is relevant to the content of the 12-week educational module ('Individual and collective actions/solutions') and its cross-curricular links ('Art & Design — posters, upcycling projects, etc.).

Recommendation(s):

8	Cross-curricular Links	Identify and incorporate cross curricular links within the educational module, including alternative and diverse perspectives and activities on sustainability and decarbonisation (for examples: those around circularity and reuse in arts and design).
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- **Funding**

Without sustainable and long-term funding, the educational programme would have very limited value. It is critical that lifetime costs are considered in order to ensure high-performance and relevancy.

Recommendation(s):

9	Funding	Appropriate funding should be identified and obtained for the further development and maintenance of the educational programme. Investigate Interreg follow-on funding and institutional co-financing. However, it is recommended, for longevity and sustainability, that the programme be centrally funded (perhaps through national climate education budgets) rather than by competitive grants. The following costs will need to be considered in any calculation of funding: • Personnel — salary (tax and pensions) • Other direct costs — any software, hardware/equipment, materials, etc. • Competition prizes / awards • Website — lifetime costs (data management, maintenance of contents and infrastructure) • Overheads
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- **Accreditation**

Further research is required on this area for the expansion of any educational programme but some steps can be taken now to expedite the transition to any subsequent expansion phase of the project.

Recommendation(s):

10	Alignment for Accreditation	Rather than seeking full accreditation for formal qualifications, position the educational module as simply an approved TY module and align its language with that of appropriate frameworks and strategies (NCCA, ES, etc.) to future proof any future adoption.
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Expanding into third-level education

There will also be opportunities for the programme to engage with or develop within Higher Education Institutions (HEI) as a generation of more eco and energy-conscious, who might have engaged with expanded primary/post-primary streams above, transition into higher-level education. The below items should be considered in any future expansion:

- **Outreach and staff / student collaborations**

One of the challenges emerging out of the Carbon Schools Club Competition is that schools might face a lack of resources / working materials, and under-experienced or less resourceful teachers. Feedback from the schools surveyed for D.2.4.2 also revealed that existing teaching staff in post-primary schools feel underprepared to teach on sustainability and decarbonisation in a meaningful and practical way due to lack of specialist training.

However, interactions and collaborations between post-primary schools and third-level institutions could catalyse new methods of knowledge and skills creation or exchange to bridge these gaps. Student-led and facing workshops could open up non-hierarchical avenues of learning. The expertise of university staff could also be availed of, as many lecturing and tutors operate between education and industry and they possess expert knowledge in areas such as decarbonisation, sustainability, etc. These interactions could initially be tested (1) within architecture schools, as these institutions directly engage with the appropriate themes (particularly in light of the curricular change brought about by the Building Change initiative), and (2) in the local context of the Cork DZ, where the pilot scheme was implemented and where participant networks are already established. Subsequent workshops could expand into other disciplines and fields and roll out across the country or internationally.

Recommendation(s):

11	TY Workshop	Organise a workshop (or other form of collaboration and exchange) for TY students, in schools which are participating in the post-primary education module, which will be run by current students and recent graduates of Cork Centre for Architectural Education (CCAIE, a joint venture between UCC and MTU). These workshops should focus on: • demonstrating the positive effects of decarbonisation within architecture • highlighting study and research pathways, and career opportunities in architecture for post-primary students • supporting and empowering post-primary students with new knowledge and transferable skills around sustainability and decarbonisation
12	Teacher Workshop	Organise a workshop (or other form of collaboration and exchange) for post-primary teachers, who are delivering the educational modules in participating schools, which will be run by university lecturers and tutors engaged in teaching at CCAIE. These workshops would focus on: • demonstrating the positive effects of decarbonisation within architecture • highlighting study and research pathways, and career opportunities in architecture for post-primary students • supporting and empowering post-primary teachers with new knowledge and transferable skills around sustainability and decarbonisation

- Scalability

Many of the module's themes, including energy, circularity, justice, and systems thinking, already feature across third-level education, but often in fragmented ways. There is an opportunity to scale the module up for third-level education that would resolve this.

Recommendation(s):

13	Third-level Module	Adapt the existing 12-week educational module on 'sustainability and decarbonisation' as a university module by: • shifting emphasis from awareness to applied analysis and solution design. • reconfiguring assessments • building in discipline-specific pathways (for example: BE disciplines investigate energy monitoring and retrofit, Business disciplines focus on circular economy and cost-benefit analysis, and the Social Sciences explore behavioural change and climate justice, etc.) • anchoring the module in appropriate areas (for example: civic engagement offices, first year transition modules, postgraduate electives, or adult continuing education)
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Expanding into CPD

The increased provision of educational resources and its expansion beyond the post-primary environment, as outlined above, will see opportunities for educational tools and knowledge to trickle upwards and outwards to the wider community and wider industries. The below items should be considered in any future expansion:

- **Upskilling**

Much of the established workforce may not be as familiar on the themes of sustainability and decarbonisation as future generations will be, owing to the previous lack of educational resources on these topics. Feedback from the schools surveyed for D.2.4.2

also revealed that existing teaching staff in post-primary schools feel underprepared to teach on sustainability and decarbonisation in a meaningful and practical way due to lack of specialist training. The establishment of a CPD programme based around these themes could provide for refreshing or upskilling and the acquisition of new transferable knowledge. Teachers would experience the module as student learners first, and build the confidence and familiarity necessary to take on the responsibility of delivery.

Recommendation(s):

14	Teacher-fronted CPDs	Target the CPD strand at teachers by introducing a tiered approach (ranging from introductory to applied to advanced categories of CPD) and aligning the CPD programme with recognised structures (for example: ETB education centres, and ISSN or Green Schools summer courses).
15	Community of Practice	Develop a community of practice through annual online meetups and peer-sharing and exchange.

However, SF4C noted that projects like this struggle with implementation outside typical educational environments (inter-departmental collaboration in municipalities, etc.). They mitigated this challenge by focusing on onsite coaching. Similar difficulties might be encountered within the workplace when implementing CPD programmes.

Recommendation(s):

16	Onsite Coaching	Prioritise carefully coordinated and executed onsite CPD coaching over online resources where possible.
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- **Inter-generational knowledge exchange and collaboration.**

The SF4C project had notable success with its 'parent's tasting events', which invited parents into the school environment to experience how children/students were engaging with health and sustainability through school dinners. It showed how children can successfully carry messages around these themes and around behaviour change to homes, families, and the wider community. Any expansion of the educational modules into

CPD programmes could avail of similar outlets for inter-generational knowledge exchange and collaboration.

Recommendation(s):

17	Inter-generational exchange	Where possible, implement inter-generational knowledge exchange and collaboration (through workshops, videos, or online resources) — whereby students speak on their experience of the established post-primary programme — as a prelude to more formal educational resources for any CPD programme.
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Expanding across the NPA region and further afield

Due to NCE's location in Cork City and its existing networks and partnerships, many of the previously developed educational models/resources were focused and piloted or tested within the Cork DZ. However, it is necessary to expand the programme across the NPA region and there are also opportunities to look further afield. The below items should be considered in any future expansion:

- **Adaptability / Translation**

In order to enable the programme to be accessible, translatable and have a far reach, it must be feasible to adapt the education resources for new contexts.

Recommendation(s):

18	International Replication Pack	Develop a National Replication Pack, which reviews the existing educational module and implement the following changes: • separate core areas (including climate basics, justice, SDGs, energy literacy, behaviour change) from local layers (including climate impacts, energy systems, livelihoods, cultural sensitivities)
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		• adapt examples and case-studies to reflect different contexts, including both urban and rural livelihoods.
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- **Accessibility**

In order to enable the programme to be accessible and have a far reach, any associated resources, literature, or website should be cognisant of the necessity for different language options or variants.

Recommendation(s):

19	Language Accessibility	Where possible, provide for the following: • a variety of language options on any programme website • a variety of language options within subtitles of any video resources • variants of programme literature and online resources in different languages
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- **Efficient onboarding**

Exchange and interaction between schools and sites where the programme has already been implemented and new or prospective participants is critical for efficient onboarding and implementation. For example: the SF4C project amplifies its impact by establishing a group of 'Replication Cities' which paired or twinned existing partners with new members. This facilitates online and offline exchange and interaction through dedicated webinars, site visits, and project meetings. It enables new participants to explore the challenges and opportunities that lie ahead, and give existing partners the chance to review and assess the work done to date.

Recommendation(s):

20	'Replication Schools' Network	Establish a global network of 'Replication Schools' to pair existing and new participants together for collaboration,
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		support, and project amplification across the NPA and further afield.
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2.1 Influencing behavioural change

This section will provide tangible steps to realise the long-term goal of Activity 2.5, which is to influence behavioural change for the delivery of decarbonisation across the NPA region (and further afield).

Activity 2.4 demonstrated how targeted educational interventions can increase awareness and understanding around sustainability, decarbonisation, and energy use. However, it also highlighted that awareness alone does not necessarily result in sustained behavioural change. The following recommendations build upon the lessons learned from earlier WP2 activities and related case-studies, and identify enabling conditions which could support the translation of educational engagement into that long-term action.

Visibility and legibility of energy use

One of the recurring observations from the Carbon Club's School Competition was that engagement increased where energy use and related data were made visible and accessible to both students and staff. Making energy consumption legible within everyday educational settings can help to ground abstract concepts such as decarbonisation in local and relatable contexts.

Recommendation(s):

21	Where possible, integrate energy monitoring data into educational activities and the daily life of participating institutions.
22	Translate technical information into accessible formats which are appropriate to different age groups and learning environments.
23	Encourage students to interpret and communicate energy-related data to peers, teachers and, where appropriate, families and the wider community.

Embedding behavioural change within routine practice

Short-term initiatives risk losing impact unless behavioural change is reinforced through routine practice and shared responsibility. Educational institutions provide opportunities to embed energy-conscious behaviours into everyday activities and organisational structures.

Recommendation(s):

24	Support the establishment of student-led sustainability or energy groups with clearly defined roles and responsibilities.
25	Embed energy-conscious practices into daily routines, such as shared responsibilities for monitoring or equipment use.
26	Where possible, align behavioural initiatives with existing school policies and frameworks, including those related to sustainability or wellbeing.

Peer learning and social reinforcement

Exchange and interaction between participants can play an important role in reinforcing behavioural change. Peer learning can help to normalise sustainable practices and support collective engagement.

Recommendation(s):

27	Facilitate peer-to-peer exchange between participating schools or institutions through online platforms, shared challenges, or collaborative activities.
28	Encourage the use of student-generated outputs (for example: videos, exhibitions, or assemblies) as tools for dissemination and reflection.
29	Recognise and communicate participation and progress within schools and local communities to reinforce engagement.

Linking behaviour to tangible outcomes

For behavioural change to be sustained, it is important that actions are clearly connected to tangible outcomes. Demonstrating the impacts of behavioural change can help to reinforce motivation and relevance.

Recommendation(s):

30	Encourage participating institutions to document and communicate the outcomes of behavioural change, including energy savings or emissions reductions where feasible.
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31	Where possible, reinvest financial savings arising from energy reductions into further sustainability-related initiatives.
32	Situate educational activities within broader local or regional decarbonisation objectives to reinforce their significance.

Reflection, evaluation, and reinforcement

Behavioural change is an iterative process which benefits from reflection and evaluation. Building opportunities for feedback into educational programmes can support learning, adaptation, and long-term impact.

Recommendation(s):

33	Incorporate reflective evaluation at the conclusion of programme cycles, including feedback from students and teaching staff.
34	Develop simple indicators to track behavioural change alongside educational outcomes.
35	Use evaluation findings to inform the ongoing review and refinement of educational resources and supports.

Supporting longer-term cultural change

While individual behavioural change is important, the overarching ambition of Activity 2.5 is to contribute to a broader cultural shift towards sustainability and energy consciousness. Education has a particular role to play in shaping future practices, professions, and decision-making.

Recommendation(s):

36	Position educational initiatives as part of a longer-term transition rather than as isolated interventions.
37	Encourage continuity between post-primary education, third-level engagement, and CPD to reinforce learning and behaviour across life stages.

38

Where possible, support inter-generational learning pathways which allow students to influence household and community practices.

2.2 Additional recommendation(s)

This section outlines additional recommendations that do not lie within the scope of the previous sections.

Recommendation(s):

39

It is recommended that steps be taken to counter the limitations of the report, which had a single author with a third-level academic and architectural focus. The conversation around the proposed expansion of any educational programme should be opened to a broader variety of voices and interests — to actors engaging with education in multiple or diverse ways who could add further expertise to the recommendations set out herein. This would expedite the transition to any subsequent expansion phase of the project.

