

Design a Sustainable Village in Ireland for

2050

Limerick City & County Schools
Transition Year
STEAM Education Project
Climate Action For Social Justice
And Sustainable Development



National Centre for STEM Education



School of Education



SCHOOL - UNIVERSITY - MUSEUM - PARTNERSHIP

STEAM EDUCATION aims for an equitable green and digital transition for Ireland and elsewhere that is compatible with the UN SDGs.

We urgently need to tackle the world's most pressing problems of social justice, climate justice and sustainability.

This CPD resource supports the imaginative and problem-posing approaches needed to design a community centric eco-village in Ireland for 2050.



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A GREEN & EQUITABLE TRANSITION

GERALDINE | MICHELLE
SIMMIE | STARR

(SOCIAL JUSTICE, CLIMATE ACTION & SUSTAINABILITY)

EPI-STEM CPD RESOURCE
FOR TEACHERS



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Foreword



Foreword

In this booklet from EPI•STEM National Centre for STEM Education, School of Education, University of Limerick, we want to share ideas and resources for getting ahead with the STEAM Education partnership project we are offering schools in Limerick in collaboration with the Hunt Museum and the Limerick Education Support Centre.

In this partnership project, which we entitled “Design a Sustainable Eco-Village in Ireland for 2050”, we are inviting Transition Year (TY) teachers and students in Limerick post-primary schools to register for this exciting pilot project. It comes at a time when there is deep interest in education nationally and globally in securing a successful green and digital transition, while developing new capabilities for coping well with demographic change and with unexpected shocks into the future. The project can be anchored at the school by one teacher and through one STEM subject area and will greatly benefit from cross-curricular collaboration with at least one other subject e.g. Science, Maths, Technology, Engineering, History, Geography, CSPE, Wellbeing, Religion, Politics & Society, Business Studies. This eco-village project with its emphasis on social justice is a natural fit between STEM subjects and CSPE or Politics & Society (e.g. Science & Society). While we identified TY as a suitable location for the project, we are open to other suggestions from interested teachers.

The eco-village project is an open invitation to young people to think deeply about how best to design the next generation of public living spaces - public infrastructures and public services in the heart of village life in Ireland in 2050 - so that a diversity of people can live well together in a decent democracy, a thriving economy and a sustainable environment.

The project aligns with new developments in the national curriculum in Ireland that advocate for an inquiry-approach to learning and for grappling with big ideas, concepts, ethics and values in preference to a tight focus on factual knowledge. The project encourages teamwork, inclusion of different voices, wellbeing, skills of inquiry, social and cultural awareness. The project values the joy of learning and the role of creativity and a collective consciousness [e.g. altruism] in fostering active citizenship and care for others [humans and non-humans].

We will provide each school with this EPI•STEM resource booklet and with a Gimbal for video making. We will provide an opportunity for you to discuss the outline of your design with faculty at the University of Limerick. We are working with a number of local enterprises to have in place some prizes to acknowledge and celebrate your group participation.

Schools will register on-line for the project by 4th October 2024. The first phase of the project will run from October to December 2024. This phase will typically include the design and planning stage of the project and the active development of an artefact and a local video [seven minutes]. We are suggesting a full hour or a double-class a week for 8 weeks in the first semester and an hour or double class a week for 7 weeks in the spring semester as a possible timeline. This gives typically 15-20 hours of class contact time and allows students time to work in collaborative ways to decide the design of the project. Once the planning and design phase is completed the students will be ready to conduct the practical part of the project: to make the artefact and the local video that best represents their collective thinking.

The second phase of the project will run from January to March 2025 and will involve the preparation of a poster [template to be provided]. The students will populate the headings in the poster, including a brief write up in relation to their learning from the design and planning phase, a brief description of the artefact and the local video, and a final reflection from the group in relation to their overall learning from taking part in the project.

After that, the school project teams will present and communicate their poster and recommendations in an invited public space in Limerick [some day during the week of 24th March 2025] to teachers, school leaders, educators, the public and national policymakers.

We are delighted to work with the Hunt Museum and the Limerick Education Support Centre to bring this exciting STEAM Education project to your attention. We are providing you with research-led resources that can inspire your students in relation to the project. We take sole responsibility for any errors or omissions that may have occurred in this publication.

In Chapter 1, we introduce you to EPI•STEM, an internationally renowned research centre in UL dedicated to supporting Research & Outreach projects that support STEM and STEAM Education. We outline the requirements for the project. We will provide teachers with an on-line seminar on Tuesday, 22nd October 2024, 4.15pm to 5.15pm, and an in-person meeting at the Limerick Education Support Centre on Tuesday, 5th November, 2024, 4.30pm to 5.30pm.

In Chapter 2, we review the literature to show how STEM learning is reimagined today for stronger connections to civic engagement for democracy, the economy and the environment, as a sociological project concerned with the future success of a green and digital transition.

In Chapter 3, we outline the national curriculum in Junior Cycle and in Senior Cycle to show how our partnership project aligns well with reform-minded approaches to inquiry-oriented and inclusive learning, forging connectivity between STEM and CSPE, Wellbeing, and Politics & Society (e.g. Climate Action & Sustainable Development due in September 2025).

In Chapter 4, we consider the layout and design of a planned eco-village in Ireland in 2050 from the perspective of architecture, public infrastructure and a diverse range of public services. We link to a number of current eco-villages in Ireland, Iceland and Scotland.

In Chapter 5, we consider the impact of changing demographics in Ireland and how this, and any new unexpected shocks will need to be supported in relation to future sustainability.

In Chapter 6, we provide additional examples of efforts to mitigate and to conduct a successful green and digital transition for Climate Justice & Sustainability. Here we show that countries, whether in the Global North or in the Global South are not starting from the same baseline. This is an important consideration in terms of social justice, and in securing the sustainability goals and human rights charter of the United Nations (UN).

I want to take this opportunity to thank our partners in the project, Maria Cagney and Emma King from the Hunt Museum, and Norma O'Brien, Director of the Limerick Education Support Centre without whose support and persistence this project would never have started.

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©EPI-STEM 2024 ISBN 978-1-911620-78-5

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Maria Cagney and **Emma King** (Hunt Museum, Limerick city).

I want to thank the Research & Development team at EPI-STEM who worked tirelessly in UL for the last number of months to make this EPI-STEM resource a reality and to keep the project on track: Dr. Michelle Starr, Research Liaison Officer, Eamonn Stack Mulvihill, Associate Teacher in Technology Education, School of Education, Affiliate of EPI-STEM, and the five Research Assistants, Emer Fallon, Alexander Maycock, Patrick O'Dea, Lauren O'Gorman, and Katelyn O'Neill. Finally, a special word of thanks to Helen Fitzgerald, Senior Executive Administrator in EPI-STEM who coordinates our meetings and resources.

Finally, I want to share with you the warm regards and best wishes of the President of Ireland Michael D. Higgins for our Sustainable and Futuristic Eco-Village partnership project, to the students and everyone involved. President Higgins in a recent speech delivered to the United Nations Summit of the Future in September 2024 shared the importance of our alignment with the broader aims of the United Nations 2030 Agenda and the need for ambitious, inclusive action on sustainability and the SDGs. A copy of the speech can be found at the following link: <https://president.ie/en/media-library/speeches/speech-by-president-higgins-at-united-nations-summit-of-the-future>

Chapter 1

Introduction to EPI-STEM & the Eco-Village Project



Chapter 1 Introduction to EPI-STEM & the Eco-Village Project

EPI-STEM is a research centre in UL since 2008, a National Centre for STEM Education with an outstanding track record in research & outreach projects that support the Continuing Professional Development (CPD) of science, math, engineering, technology and STEM teachers (see link to website www.epistem.ie).

For example, the Professional Diploma in Mathematics for Teaching (PDMT), our flagship programme – is a government funded initiative for upskilling mathematics teachers (since 2012) – that we nationally manage with seven Higher Education Institutions and in collaboration with the Department of Education and the Teaching Council.

As a result of a recent HEA funded project (2020-2022), upskilling science and mathematics teachers in teacher knowledge we designed a new on-line EPI-STEM Academy of STEM Teachers. On this platform, we provide registered STEM teachers regular updates of hundreds of cutting-edge and inclusive CPD resources in order to engage in powerful and inclusive pedagogies in their classrooms and schools. We currently have a number of STEM education outreach projects underway with national and local enterprises and have eight PhD students taking part in cutting-edge research in STEAM Education & Sustainability.

For the last three years, we partner with DCU on a national STEM Internship project (STInT), where UL Initial Teacher Education STEM students have the opportunity to engage in a three-month paid summer internship in a STEM-related enterprise.

In contemporary times, education and STEM education is undergoing global and national reviews in relation to new green and digital transitions, changing demographics due to migrant patterns and new labour markets, and new adaptability and resilience requirements for individuals and societies as a result of unanticipated shocks into the future. As well as new STEM knowledge and skills, we will need to have the ethical and reflexive values needed to display principles of care, equality and justice for all humans, other species, the environment and the planet. What will be needed in a future Ireland for a thriving economy, a plural democracy and a sustainable environment, for a floor below which no one falls and for a sustainable cap on greed and pollution of our rivers, lakes, air, land, and seas?

This newly imagined eco-village in Ireland in 2050 will have the advantage of cutting-edge science and STEM technologies and new materials and at the same time, will need to be underpinned by ethical principles and values of communal care, sustainability, equality, and social justice for

a just and caring economy, society and politics [e.g. guided by an identified number of UN Sustainable Goals]. We are therefore delighted to be a partner in this project.

Rationale for the Eco-Village Project

We live in a time of rapid information and knowledge and with constantly new and scientifically improved systems of energy, design of buildings, new public systems of transport, health care, access to higher education for all and innovative modes of conservation in the natural environment. At the same time, the fast-globalising world and planet is experiencing unprecedented rates of climate change, global warming, migration patterns, famine and the ravages of war.

UNESCO (2021), and a number of international organisations are calling for a new social contract for education and human flourishing connected to an interdependent view of our actions on the rest of humanity, other species, our environment and the planet itself.

In this Eco-Village project, we want Transition Year (TY) students and their teachers in Limerick schools to partake in a local STEAM Education project (Science, Maths, Technology, Engineering, Arts, Geography, CSPE, & Politics & Society) in order to co-design and (re)imagine a new type of “SUSTAINABLE VILLAGE IN IRELAND IN 2050”.

This project is an open invitation to young people to think deeply about how best to design the living spaces and structures in the heart of the village so that people can live well in a just society in ways that show ethical principles and values of care and justice for fellow humans, other species, the environment and the planet.

How the TY Project Connects to National Policies and Strategies

All education policies today place students at the centre of their learning and encourage active participation in their local communities, across all aspects of society and political life (NCCA, 2015). In support of experiential learning, the Designing a Sustainable Village in Ireland in 2050 project aims to give TY students the opportunity to plan, design, make, reflect on and communicate their ideas/visions of how and what sustainable living for social justice might look like for their local community into the future (Mooney Simmie & Moles, 2020). Creativity, collaboration, critical thinking, communication, self-management and the gathering and contextualisation of information are key skills of inquiry, teamwork, reflection and care that the students get to build-on during the project process of creating their vision of a *Sustainable Eco Village* in Ireland for the future. *Designing a Sustainable Village in Ireland for 2050* project supports the Irish National Strategy on Children and Young People's Participation in Decision-making (2015); the National Framework for Children and Young People's Participation in Decision-making (2021) and the United Nations Convention on the Rights of the Child (UNCRC). These policies aim to give young people the opportunity to speak out and to engage with matters affecting them and to have their views considered and taken seriously (Article 12, UNCRC).

The Eco-Village project recognises that all students and young people do not belong to one homogenous group. The participation of a diversity of students, i.e. social class, ethnicity and gender etc. is promoted so that a diversity of views will broaden the creativity of what future sustainable villages might look like and challenges patterns of discrimination often deeply embedded in cultural norms. Social inclusion is critical in the vision of future sustainable villages for families and communities to live well in a pluralist democratic society.

This project enables students and their teachers to decide the interdisciplinary approach that best fits with their vision and plan of a sustainable eco-village into the future. They will have access to a number of resources, such as digital resources, museum visits, technology.

Most importantly, this TY project's bottom-up approach aims to honour and to facilitate the students' group contributions, imaginative ideas are sought, as everyone's views on what sustainable village life into the future looks-like are equally relevant and important. There will be prizes for each group entry, and for what the judges deem as 'outstanding' in a number of categories, such as, green energy conservation, biodiversity, social and affordable housing, public transport, and social justice.

An exhibition of the students' projects in poster format will run over a period of time for the public to view. This exhibition will be formally opened and media publicity will be organised so that the students' visions of an eco-village in Ireland in 2050 is widely reported.

Design Brief for the Designing a Sustainable Village in Ireland in 2050 project

Each of the schools, teachers, and TY students will be given a “Design Brief” (Design plan ideas in Chapter 4) for the project in addition to an “Information Leaflet” for each grouping, in addition to “How to Apply”.

The TY project divides into four sub-sections:

- Information About the TY Project
- Research Sources of Inspiration provided (in each chapter)
- The Design Brief Explained
- Final Submission of Portfolio as a Poster (poster with headings to be provided)

The design brief will invite a strong team effort among a diversity of students. The following four components form part of each final Portfolio submission and will be presented by each school group as a poster under the following headings:

- A brief write up of the agreed plan and design and the group learning from this process.
- A short video from their locality of items or people that inspired them (e.g. seven minutes).
- An artefact in a selected medium designed by the group showing their vision for a sustainable eco-village in Ireland for 2050 (e.g. technical drawing, wood, metal, cardboard)
- A written reflection agreed by the group and sharing (a) the 'personal learnings' from taking part in this TY project, and (b) how their local project can make a difference and influence not only their locality but beyond toward a just society and a just global world.

Researching Sources of Inspiration from Irish History: The Hunt Museum

You will get an opportunity to visit the Hunt Museum and participate in their new Sustainability workshop which offers an enriching educational experience that combines history, culture, sustainability, and innovation. This specialised workshop, developed by the Hunt Museum will guide students through key aspects of designing a sustainable village.

Workshop Structure:

1. Exploration of Sustainable Village Infrastructure:

- **Building History:** Students will delve into the history of the Hunt Museum's building, examining the advantages and challenges of renovating old structures versus constructing new ones.
- **"Design a Sustainable House" Game:** Through this interactive game, students will learn best practices for creating sustainable homes, focusing on energy efficiency, material use, and environmental impact.



2. Cultural Analysis and Historical Perspectives:

- **Cultural Shifts:** Students will explore the cultural transformations from the past to the present, gaining insights into how these changes have shaped our current values regarding objects and materials.
- **Historical Practices vs. Modern Consumption:** By examining how people in the past repaired, repurposed, and recycled possessions like jewellery, bowls, and clothing, students will contrast these practices with today's more disposable culture, fostering a deeper understanding of sustainability.



3. Art, Heritage, and Social Change:

- **Role of Art and Heritage:** The workshop will encourage students to analyze the significance of art and heritage in society and consider their place in a sustainable village.
- **Social Innovations:** Students will explore the social changes and innovations that have improved our standard of living and contemplate the new innovations required to protect our planet.
- **Temporary Biodiversity Exhibition (available between October and November only):**

Exhibition Tour: Students can enhance their learning experience by booking a tour of the museum's temporary biodiversity exhibition. This exhibition complements the workshop by highlighting the importance of biodiversity in sustainable living.

This comprehensive workshop at the Hunt Museum not only provides students with the knowledge needed to design a sustainable village but also encourages them to critically think about the cultural, social, and environmental aspects that influence sustainable living.



Digital Resources

These resources are designed to support students in their research by providing valuable insights into sustainable village design. The content will include detailed innovations and case studies from the past, showcasing the practical application and impact of sustainable technologies. Additionally, the resources will explore the challenges faced in developing and implementing these technologies, highlighting the slow process of introducing their benefits to the public. By offering historical perspectives and detailed information, these digital materials will complement the in-person workshop, helping students to deepen their understanding of sustainable practices and their importance in future village designs.



Development of Hydroelectric Scheme at Ardnacrusha



New innovations with renewable energy with Shannon Estuary

ESB and National Electrification



Eco-Village at Clough Jordan



ART as a way of interrupting the discourse and learning anew. The Hunt Museum offerings of case studies and digital artefacts: e.g. Sean Keating Painting depicting 1920's Ireland and the thinking at the time [status quo; imagination and innovation]; Candle Exhibition [ESB]; Floating Wind Farm for Shannon Estuary: Biodiversity project; ESB archives: Head Race Canals: Picasso; Fast Fashion (Sibel Connolly), Irish textiles in the 1950s. Link to the Garden and Bees. CloughJordan Eco-Village. Georgian buildings in Limerick: History and Future possibilities. Circular Economy. Wind Farm. Building a Sustainable Home.

Ambitious and Imaginative Political Decisions Taken in Ireland that Inspire:

As a source of inspiration, TY students might like to research at least one key national political decision taken in the past in Ireland that had a lasting and substantial difference to the quality of village life in Limerick and Ireland. [e.g. Rural Electrification at Ardnacrusha. Free Education and Minister Donagh O'Malley T.D. The Duty Free Concept for Shannon Airport. Monseigneur Horan and Knock Airport].

Five Key Questions to stimulate discussion

1. How to power the eco-village with green energy?
2. What impact will living in this eco-village have on the national and global village?
3. How to ensure social justice and equality e.g. affordable and social housing, public transport, food, public spaces for the greater good of community life in the village?
4. How will equality for diversity be ensured i.e. social class, ethnicity, religion, disabilities, sexuality etc. of families' sense of belonging in the village community?
5. How to care for all life in the village, including humans, non-humans, and the biodiversity in the local environment?



Chapter 2

Review of the STEAM Education Literature



Chapter 2

Review of the STEAM Education Literature

We appear today to be at an exciting crossroads in relation to STEM Learning & Civic Engagement, for local, national and global citizenship and for sustainability of humanity and the planet. For example, there are calls internationally from more than eighty countries to humanize education in the face of an increasing reduction of education to a commodity and a private good in a marketplace. There is a perceived need for new thinking and values in relation to the ethical journey of human change, especially in this time of an upsurge in artificial intelligence and new modes of algorithmic measurement and management.

UNESCO (2021) calls for a new social contract in education in order to repair the damage done in former times by oppressive systems, such as, the many ways science and science education in the past supported the reproduction of those already privileged and advantaged and left others, such as women, girls and minorities outside the field. At an institutional level in higher education, and in universities in Europe there is research and innovation support for academics to move beyond disciplines and better connect to the big citizenship and sustainability questions of our time, questions in relation to equality, diversity and inclusion that need new ways of thinking, feeling and acting. Research and new thinking that offer affordances for new spaces for STEM Learning and the not-yet-thought.

In this chapter, we review some of the literature on STEAM Education from the perspective of the big ideas and concepts that are advocated for and the policy push behind the changes. There is a strong policy imperative for better connectivity between STEM Learning and Civic Engagement in democratic societies, for a new green and digital transition taking place at a time of demographic change and in preparation for a future of uncertainty.

In order to embed STEM meaningfully into the classroom, teachers, school leaders, policy makers and teacher educators need an agreed sense of what STEM education means in reality and a definition of STEM and STEAM education in terms of inclusive pedagogies today for a diversity of learners from multicultural and ethnic backgrounds. What is crucial here is the way human development is framed, whether education is perceived as a matter for the individual only or as a proactive and responsible member of a changing society and planet.

History of STEM Education

The story of STEM Education began in the United States in the mid-1990s and has since become a fast globalizing phenomenon. In the literature STEM education is a deeply contested construct that can be approached taking multiple and differing perspectives.

STEM stands for *Science, Technology, Engineering and Mathematics*. The construct of STEM Education was first defined by the *National Science Foundation* in the mid-1990s in the United States (US). It was at a time in the US, when policy imperatives were starting to change the former distinctive boundaries between the social sciences (e.g. education, the arts and humanities), the natural sciences (e.g. physics) and the applied sciences (e.g. engineering). These boundaries were becoming blurred and were collapsing. The net result for the field of education was a diminution in the prominence given to the arts and humanities, such as, philosophy and history and an increase in evidence-based policy making and empirical studies across the field of educational studies.

Today there is a fast globalizing policy push for STEM learning across the curriculum of schooling. This global reform imperative is citing the changing face of employment, society and the environment, including the impact of robots and artificial intelligence on jobs that rely on routine ways of production and the impact of new migration patterns brought about by natural and man-made disasters (e.g. war, hunger, flooding). The policy push is for moving learning for the individual beyond a preoccupation with facts and content knowledge for a new focus instead on attitudes, dispositions and skills needed for this century. The ambition is for higher order thinking skills and a normative set of values connected to integrity, truth, ethics and honesty. Transversal skills are highly valued, skills that move across disciplines are adaptable and can display resilience and fluidity.

This reform-minded adaptive expertise in STEM learning, works at a level above disciplinary knowledge, and includes the multidisciplinary, interdisciplinary and the transdisciplinary. Science is an example of a multidisciplinary field, seen in distinct disciplines such as physics, chemistry and biology. The field of education as a social science concerned with human change and development is an example of an interdisciplinary field that, among other things requires access to key foundational disciplines i.e. philosophy of education, history of education,

sociology of education and psychology of education. The rationales for these disciplines is the notion that to plan for the future [philosophy], one needs access to the past [history] and the present [sociology]. Psychology is added as the science of behavior.

The transdisciplinary level is understood as a level above all the other levels, it encompasses all lower levels but takes a new type of integrated approach that can move beyond the boundaries and constraints of individual disciplines. It can focus on patterns, big ideas and concepts beyond the disciplines (e.g. climate action and sustainable development). The relationship between the discipline and the transdisciplinary is often compared to the difference between the foundational work involved in mastery of an instrument (e.g. music) and the capacity to play well and with mastery in an orchestra. For the transdisciplinary approach to STEM learning to be successful, students therefore will need a masterful grasp of each individual discipline as well as a grasp of the higher level of connectivity between disciplines. This is an important distinction as there is often today a felt sense that the curriculum of STEM learning is less interested in the acquisition of disciplinary knowledge.

STEM Learning & Civic Engagement

Therefore, it is in the connectivity between these different levels in the (ever changing) canon of knowledge and knower dispositions, or indeed their lack of connectivity that we see the positioning of the multiple pedagogical approaches to STEM Learning and their connectivity, or otherwise to the present-day requirements for Civic Engagement with Science & Society.

Fitzgerald, Haeusler and Pfeiffer (2020) explain the multiple pedagogical approaches to teaching and learning in STEM education. Their study focuses for the most part on the approaches to STEM Education (primary) in Australia and to a lesser extent New Zealand. They suggest that the starting place for STEM education is most often a science problem enriched through the addition of one or more of the other STEM disciplines. For example, the addition of science (e.g. physics of light) and measurement in mathematics in order to build an optical instrument. Another example, might involve the use of design thinking (Engineering & Technology) for a problem-solving approach to illustrate the necessary conceptual thinking to highlight a real-world application of a science problem.

Fitzgerald, Haeusler and Pfeiffer (2020) provide a spectrum of pedagogical approaches to STEM Teaching & Learning, which we describe as follows:

1. At one end of the STEM Learning Spectrum, we encounter a strong disciplinary knowledge and skills focus where practitioners, teachers and teacher educators often fail to work meaningfully across boundaries in ways that lead to

a productive blurring of boundaries between disciplines. Authentic STEM identities here are generally weak and might resemble more historical notions of disciplinary supremacy, possibly engaging in STEM only when mathematics or science are the dominant disciplines.

2. Another more popular STEM Learning approach involves the addition of design thinking (e.g. Engineering & Technology) by way of a problem-solving skillset. Students work in groups and experience collaboration and inquiry-oriented learning through the solving of real-world problems. This problem-solving approach respects all the STEM disciplines on an equal footing to the problem under investigation and is a widely used reform-approach in STEM learning today.

3. The third approach to STEM learning is a fully integrated approach to STEM, called integrated-STEM learning or i-STEM learning. This i-STEM learning approach most often calls on a strong focus on coding and/or digital competences. i-STEM strives to consider the problem under inquiry from a transdisciplinary view. STEM learning from this place – depicted in terms of big ideas and concepts – can be about spotting patterns between conceptual ideas and making wider representations. In the national curriculum in Ireland, this approach can be found in the new draft specifications of ‘Climate Action and Sustainable Development’ (due September 2025).

4. A less widely used but upcoming approach to STEM Learning involves a problem-posing approach to STEM learning, especially in relation to the necessary ethical, reflexive and critical connectivity between STEM Learning and the contemporary socio-cultural and political (policy) world of Civic Engagement, understood to be taking place in pluralist democratic societies [a changing demography]. This problem-posing approach has its roots in critical pedagogy and feminist theories of care and social & planetary justice and is found making inroads today in new social movements, for example global efforts at Reimagining Science Education in the Anthropocene (Tolbert et al., 2024; Wallace et al., 2022). A problem-posing approach to STEM Learning regards education as a relational and emancipatory practice and a holistic journey that is upstream of any final destination.

In EPI-STEM we want to make space for a multiplicity of Research & Development approaches. We are interested in STEM teacher learning and the Continuing Professional Development [CPD] of all STEM teachers in Ireland. With recognition of a changing demographics (population) for Ireland, we are interested in a more expansive and inclusive vision for STEAM Education and the necessary interplay between STEM subjects and the big moral and political questions of the day. We draw from a ‘both/and’ approach that enables STEAM Learning, as a cutting-edge and inclusive pedagogical approach where the Arts & Humanities occupy co-equal spaces with the Sciences and STEM subjects.

This expansive view of STEM learning as a sociological and cultural problem of our time supports an outward-looking view of STEM Learning that allows us to reimagine STEM Education today in ways that can make a difference as a critical sociological project to the wellbeing and the quality of life of people, populations, places and the planet. According to Ball (1995) inclusion of the Arts and Humanities in educational studies offers new synergies between theory and practice that not only support creativity but offers new affordances for interruption of the discourse so that it becomes possible to move beyond a preoccupation with qualification and socialization and give space to new and different ways of knowing, affective equality and care, considerations of power and privilege and the big ethical-political questions of our time.

A new emphasis on research projects that have impact for society and the environment can be seen in the way that current research funding proposals in STEM education are worded. For example, to secure competitive research funding grants from the U.S. National Science Foundation, the criteria set out that research proposals must not only advance knowledge but must also set out how the research will impact in terms of benefitting society (U.S. National Science Foundation n.d.). Societal benefits include for example, inclusion, infrastructure, and STEM education for girls and minorities.

However, to date most efforts at reform-minded teaching and learning STEM subjects are framed within a view of the individual learning to become an adaptable, self-regulating and resilient individual, a S.M.A.R.T. [Self-regulating, Motivated, Adaptive, Responsible and Technically competent] individual. This is in sharp contrast to learning to engage in a journey of education that is concerned with becoming an individual within recognition of our dependency and interdependency with others for a care-based society and environment [both/and]. It is this deliberative teaching of social consciousness and the need for a collective consciousness to solve the bigger societal and planetary problems of our time that is at the heart of calls for social and planetary justice today. Calls echoed by the United Nations Sustainable Development Goals and the UN Charter for Human Rights.

High Tech High (HTH) Schools in California

One example of a reform-minded effort to develop individual capabilities in students to have the attitudes, knowledge, and necessary skills to withstand the unexpected shocks that life throws up can be seen in the High Tech High (HTH) schools in California in the US. HTH refers to several public schools in America, from elementary schools to middle schools to high schools that incorporate principles of project-based learning, the integration of STEAM subjects, for enhancing creativity, entrepreneurialism and innovation.

The focus in the HTH schools is on project-based learning and collaboration to encourage students to apply and incorporate knowledge from various subjects. Each student directs their own learning and has the freedom to pursue areas that interest them, leading to a highly bespoke and personalised education [for the individual SMART student]. The intersection of subjects and integrated learning is encouraged. For example, subjects like biology and engineering are often taught in conjunction to allow for interdisciplinary projects and analysis of specific topics (Behrend et al, 2014). In addition, topics studied are constantly linked with real life applications, to relate the knowledge to the students’ lives and make it a more relevant and meaningful learning experience. These schools hold equality and diversity as core values and aim to assist students from a variety of backgrounds, particularly those from underrepresented minorities and low-income households. This is made possible via a lottery-based admissions procedure that guarantees a varied student population. The benefits of these educational approaches are measured in terms of success in individual qualification. This is reflected in the percentage of HTH graduates that are accepted into 4-year degrees in college and higher education (90.75% in 2024).

Chapter 3

Eco-Village Project Aligns with National Curriculum



Chapter 3 Eco-Village Project Aligns with National Curriculum

The global backdrop in relation to STEM Education is a major influencer of national policies in the STEM National Curriculum in Ireland and across Europe. There is recognition of the changing needs of the workforce, the attention to economic competitiveness and what is called the 'pipeline' of talent in a world where artificial intelligence and mathematical modelling will increasingly change the face of work and the face of life as we know it. At the same time, there is a need for peaceful and tolerant diverse societies, as well as scientifically literate societies, and this gives the impetus today for a policy push for agentic civic engagement if not activist efforts at securing fair and just democracies.

The national curriculum in Ireland, across the curriculum and in STEM education reflects these reform minded efforts, mostly listed as attributes, skills and knowledge requirements. There is a new policy emphasis on inquiry-oriented learning across the curriculum, such as grasping the 'big ideas' and concepts', and moving beyond facts in the new draft specifications of subjects, programmes and in short courses.

In this chapter, we outline this reform minded change concerned with the forging of new student and teacher dispositions and specialist identities in relation to STEM learning, across the curriculum. The focus will be on the statements of key skills, attributes and desired dispositions and a new view of content knowledge – subject matter knowledge and pedagogical knowledge - as given expression in learning outcomes.

We interrogate the intersections between Civic, Social and Political Education [CSPE] as a short course at junior cycle, Politics & Society in senior cycle and Science & Society in the national curriculum by tapping into the bigger questions of a just and caring society as portrayed in the primary school curriculum (ESD), junior cycle curriculum (Science and Wellbeing) and senior cycle curriculum (Draft Specifications in Chemistry, Biology and Physics, Engineering & Technology, Transition Year, Climate Action & Sustainability).

We selected a number of outcomes from these current and upcoming curriculum changes to show that our Eco-Village partnership project aligns well with proposed changes in the national curriculum in contemporary Ireland.

National Policy Report in STEM Education in Ireland
The national policy report on STEM Education in Ireland, updated in the post-pandemic years reveals a decade of thinking and aspiration from 2017 (DES 2016). The first report, 2017-2019 speaks to national ambition for STEM Education in Ireland in relation to the economy and society. The

Foreword makes the case that 'expertise in STEM disciplines' is necessary to deliver Ireland's economic ambition and support innovation as the cornerstone for future prosperity. The report asserts that 'knowledge-based economies are particularly dependent on the quality and quantity of STEM graduates', and there is an expressed desire for Ireland to become a 'hub of technological creativity', to support foreign direct investment and become an active 'ecosystem for indigenous start-ups' (DES 2016).

In this Eco-Village project we want to interrogate how STEM disciplines might best work to assure the greater good of our democratic society, care of the environment and a thriving economy for all. On page 66 of the report, there is a summary of a working definition of what constitutes 21st century skills. The skills are categorized using three overarching headings: (1) Ways of Thinking [problem-solving, decision-making, metacognition, higher order critical thinking creativity, innovation], (2) Ways of Working & Tools for Working [communication, collaboration, ICT (information literacy)], and (3) Living in the World [personal and social responsibility, life and career, local and global citizenship]. The skillset elaborates what Living in the World translates to in relation to each the stages of the Irish Education System with a strong emphasis on managing self; wellbeing; identity and belonging; and being personally effective. This foundation can be seen today across each of the reform minded approaches to STEM learning in the contemporary national curriculum.

The Government of Ireland (2022) released the STEM Education Implementation Plan to 2026. The Foreword stresses the value of curiosity and creativity and the 'invention and inquiry that are central to the world of STEM and ART'. There is an expressed understanding of the importance of STEM and the ARTS, the value of play in the early years giving way to experiential and hands-on learning experiences throughout the national curriculum. There is an understanding of the need for STEM education to include all children and young people no matter their background, gender, class, race, disability. This aims at 'ensuring that all children regardless of gender, background or ability have equality of opportunity' and that all learners have the wherewithal to 'inspire their learners in STEM and the ARTS'. A holistic vision for STEM education explicitly mentions inquiry-oriented learning:

Ireland will be internationally recognized as providing the highest quality STEM education experience for learners that nurtures curiosity, inquiry, problem-solving, creativity, ethical behavior, confidence, and persistence, along with the excitement of collaborative innovation (Ibid, p.5). On page 24, item 4.4 explicitly shares a vision of strong

partnerships to enhance STEM and the ARTS in education: 'this partnership will include supporting programmes which aim to enhance STEM awareness, including in education and careers, development of key skills and which provide connections between STEM and the ARTS'.

We now consider how this framework for STEM Education and its attention to new ways of thinking, working and living in the world are expressed in aspects of the national curriculum.

Junior Cycle Science Curriculum

The specification for the Junior Cycle Science Curriculum (DES, 2015) links the learning of science and science literacy to statements of learning, key skills and expectations for students expressed as learning outcomes. Junior Cycle is expressed in reform minded ways that put the student at the centre of their learning with the aim of 'equality of opportunity, participation and outcome for all'. Taking an inquiry-oriented view the specification stresses the meaning of scientific literacy for a changing Irish society: The wider benefits of scientific literacy are well established, including giving students the capacity to make contributions to political, social and cultural life as thoughtful and active citizens who appreciate the cultural and ethical values of science (Ibid, p.4).

This rationale aligns well with our Eco-Village project entitled 'Designing a Sustainable Village in Ireland in 2050'. Attention to the local environment, to nature and to the planet is specifically included in the section Science & Society. The Statement of Learning (SOL) number 19 shares that 'The student values the role and contribution of science and technology to society, and their personal, social and global importance'. The key skill of working with others not only pay attention to the need for recognition and respect for a diversity of people ['cooperating'; 'developing good relationships'; 'dealing with conflict' and 'respecting difference'] but 'contributing to make the world a better place'. As well as 'managing self' and 'wellbeing' this key skill is supported by a critical literacy approach: Students enjoy frequent opportunities to discuss and debate issues relating to sustainability. They will learn to think critically about the world and its problems and propose solutions (Ibid, p.8).

The specification allows for big ideas and crosscutting themes to emerge between the contextual strands, such as 'Energy and Sustainability' and that are of personal, local, national, and/or global interest. Inquiry is understood as taking place on a continuum from limited inquiry, structured and guided inquiry to open-ended inquiry and recognizes the different pedagogical approaches depending on cultural contexts and available resources.

In Nature of Science, the Science in Society strand states that students should be able to research and to present information, and in particular the student needs to 'appreciate the role of science in society, and its personal, social and global importance, and how society influences scientific research'. In this regard our partnership project entitled 'Designing a Sustainable Village in Ireland for 2050', offers students access to many of the key skills, attributes and knowledge mentioned in the JC science specification. This is seen in the need to 'appreciate the role of science in society', the personal value of learning to manage self and work in inquiry-oriented and cooperative ways, with respect for difference, and in ways that seek to work for the betterment of the wider world. This care and justice aspiration is at the heart of our Eco-Village project.

Politics & Society

Politics and society in the national curriculum is positioned as Civic Social & Political Education CSPE, a short course in junior cycle and in the subject Politics & Society at senior cycle. The specification for Politics and Society updated in 2019, speaks to the need for preparation of young people for learning to 'participate in and contribute to a changing world where the future is uncertain' (DES, 2019, p.3). The senior cycle curriculum itself is underpinned by a number of stated values: human dignity and respect; equality and inclusion; justice and fairness; and freedom and democracy' (p.5). The rationale for Politics and Society seeks to develop the capacity of young people 'to engage in reflective and active citizenship' and to do this in ways that foster 'the imagination to think creatively and to propose new and alternative futures' (p.7) and 'a willingness to play an active role in their society' (p.7). The subject informs young people how social and political institutions operate at local, national and European level and the importance of political and social institutions 'in shaping our society'. The subject seeks for a broad understanding of equality, inclusion and diversity in a 'range of areas of human life, including gender, ethnicity and social class' (p.7)..

The curriculum states that Politics and Society at senior cycle has multiple cross-curricular linkages, with big ideas, values and attitudes that connect with areas and subjects such as, geography, history, religion, and wellbeing. Divided into four strands: *power and decision-making, active citizenship, globalization and localization and human rights and responsibilities*, the subject offers fresh insights into stronger connectivity between STEM education today and active Civic Engagement for Climate Justice, Care and Social Justice: Central to Politics and Society is the idea that learners should be exposed to competing ideas about their world..... as a consequence, discussion, deliberation and debate are important learning methodologies.....the ability to constructively engage in debate as a means of coming to reflective and informed positions is a central skill for democratic participation' (Ibid, p.15).

The rationale for the subject addresses the interdependence between humans, non-humans, the local environment and the planet. It calls on young people to learn about the workings of their social and political world, to have the attitudes, skills, values and knowledge and to work with others to seek alternatives and to make the world a better and more sustainable place through active, reflective participation, engaged citizenry and contribution.

Climate Justice & Sustainable Development

The NCCA recently released the syllabus for a new Senior Cycle subject, Climate Action & Sustainable Development to be introduced to post-primary schools in September 2025 (NCCA 2024). The rationale for this subject is to empower students to become active citizens and to balance realism and optimism in addressing sustainable development issues (climate change, biodiversity loss, resource depletion etc.). 'The experience of the subject enables students to manage the uncertainty brought about by environmental crises through hope, resilience, and a sense of solidarity' (NCCA 2024, p.3).

It is suggested that Senior Cycle students need opportunities to grapple with social, environmental, economic, and technological challenges 'to deepen their understanding of human rights, social justice, equity, diversity and sustainability' (Ibid, p.1). The rationale for the new subject, Climate Action & Sustainable Development is to 'enable students to apply an interdisciplinary and solutions focused approach to living in a sustainable world as they engage with complex and relevant sustainability challenges, including the climate crisis (Ibid, p.2). This climate crisis is seen in the rate of environmental degradation, with the upset in the delicate and interconnected systems that regulate the Earth's stability.

People are needed, as individuals and as collectives to make the difference to address biodiversity loss and the climate crisis as a matter of urgency. This capacity can be found today among young people: 'Young people continually demonstrate their innovation, capacity, and passion in mobilizing for action, as advocates for climate justice, and as active citizens initiating and participating in social change' (p.2).

The subject offers a foundational knowledge of climate science, the damage caused by climate change and the political efforts undertaken in relation to climate mitigation and adaptation and the green transition. They examine our role as 'global citizens', the public systems that govern decision-making in society and the drivers of poverty and injustice. They reflect on different worldviews, think critically and develop and apply skills of designing, evaluating and reflecting in and on action for a healthy environment and a more just and sustainable society ('societal sustainability'). The young people will use an evidence-informed approach,

the benefits of outdoor learning and develop new capacities to look across subjects and the creative edges between subjects where innovation resides. Overall, students need to bring 'lenses of empathy, leadership, and community' (p.3) in order to transform their experience and to make a difference for 'those in their surroundings' (p.3)

The transdisciplinary and interdisciplinary aspect of this new subject can be seen in the framing of the subject as cutting across a wide number of subject areas while advocating for the ethical and critical values needed for development of a social awareness and collective conscience needed for new political decisions to be encouraged at all levels:

Specific learning outcomes related to climate change and sustainable development are outlined in subjects such as science, geography, business studies, home economics and wood technology. Students learn about causes and effects of climate change, and initiatives attempting to address those effects. They investigate natural and renewable resources and the impact of their use on the environment. They explore how to minimize waste and recognize the environmental and social impacts of human decisions. They learn about the balance between environmental, economic and social systems and develop their capacity to act and live sustainably. Students learn about active citizenship through studying the Civic, Social and Political Education (CSPE) short course. Its learning outcomes are organized into three strands: Rights and responsibilities; Global citizenship, and exploring democracy, with an emphasis on sustainable development, climate change and climate action' (NCCA 2024, p.4).

The teaching follows the current reform-minded approach and at the same time goes beyond this to consider the nature of the learning space and the nature of collective action, for example, taking collective action in relation to an issue of climate justice. The subject divides into four strands, as follows:

In Strand 1: Earth & Planet. Students will learn about the knowledge of climate science with topics such as the variety of earth systems [e.g. biosphere, atmosphere, hydrosphere], global ecosystems [e.g. terrestrial, freshwater, marine] and interconnecting cycles such as the water cycle and the carbon cycle. They will explain the Greenhouse Effect and the factors driving changes in climate and environmental systems. They will understand different systems of measurement used to quantify climate change and the use made of climate modelling.

In Strand 2: People, Power & Place. Students will learn about sources of information and acquire the critical literacy needed in this regard. They will learn about community-based activities that show care for the environment on a voluntary basis, such as the Tidy Towns Competition. They learn about public services that showcase the environment

based on political decisions taken by the government, at a national and at a local level.

In Strand 3: Global Connections. Students learn about climate justice movements across the world and have a chance to critique different models of the economy that are offered as an alternative to the contemporary human capital model, such as, the circular economy and doughnut economics. They explore the UN Sustainable Development Goals and what is understood by climate change mitigation and adaptation (UNESCO Education 2030). Different people experience the effects of climate change differently, and therefore intersectional issues need foregrounding (e.g. social class, gender, race, disability).

In Strand 4: Applied Learning Tasks. Students develop their competences to think and to act sustainably. The students engage with four learning tasks in small groups. The students will 'plan, design, and carry out tasks which they deem personally relevant to them or their peers, their local community, or to society more broadly' (NCCA 2024, p.19). The teacher will assess the four learning tasks. The final summative assessment for this subject will include an assessment component (e.g. Action Project) and a written examination.

The assessment of the Action Project will be under three headings: planning and conducting the action, communicating the action, and capacity for reflecting on the action. This approach assures a PAR cycle of learning [Planning, Action and Reflection]. This PAR cycle is also on display in our framing of the Eco-Village project. The depth of treatment is evaluated using the following criteria: the students' demonstrating a 'high level of achievement'; a 'moderate level of achievement' or a 'low level of achievement' in one or more of the three headings.

Junior Cycle Short Course Specification

The NCCA designed a template for a short course specification in Junior Cycle that can run over 100 hours. The author of the course needs to state the rationale for the short course, why the learning in this short course is important on the basis of a number of pre-specified criteria, including 'relevance – inside and outside the school'. Our Eco-village project, offers students this opportunity e.g. for a better society within the school as a community, and at the same time, for the greater good of society outside the school, including for the greater good of the local environment internal and external to the school as a community.

This rationale of social relevance offers students an opportunity to make the vital linkages between content knowledge [e.g. STEAM subjects] and the critical and reflective intelligences needed to actively contribute to civic engagement for the greater good of society and the local environment. This rationale recognizes the importance of values connected to our dependence and interdependence as humans and with other humans, non-humans and the environment [e.g. UN Sustainable Goals 11-13 & 16]. It recognizes the need for content knowledge so that young people have subject proficiency and can gain mastery of the conceptual and procedural aspects of the subject domain [e.g. science, math, engineering, technology, geography], and connectivity to key skills identified for the 21st century.

Five of the eight key skills found in page 5 of the JC short course specification, are found running throughout the national curriculum in Ireland today are relevant to our Eco-Village project. They are 'being literate', 'being numerate', 'being creative', 'staying well' and 'working with others'. These five key skills form the basis of our Eco-Village project and work alongside the three central pillars (Public Infrastructure, Green Housing and Local Environment) and the three cross-cutting themes of the project (climate justice and sustainability; social justice and working for a green and digital transition). A useful template that can support the mind-mapping of the project is found in Table 3.1.

Table 3.1 Key Skills & Cross-Cutting Themes replicated in the Eco-Village Project

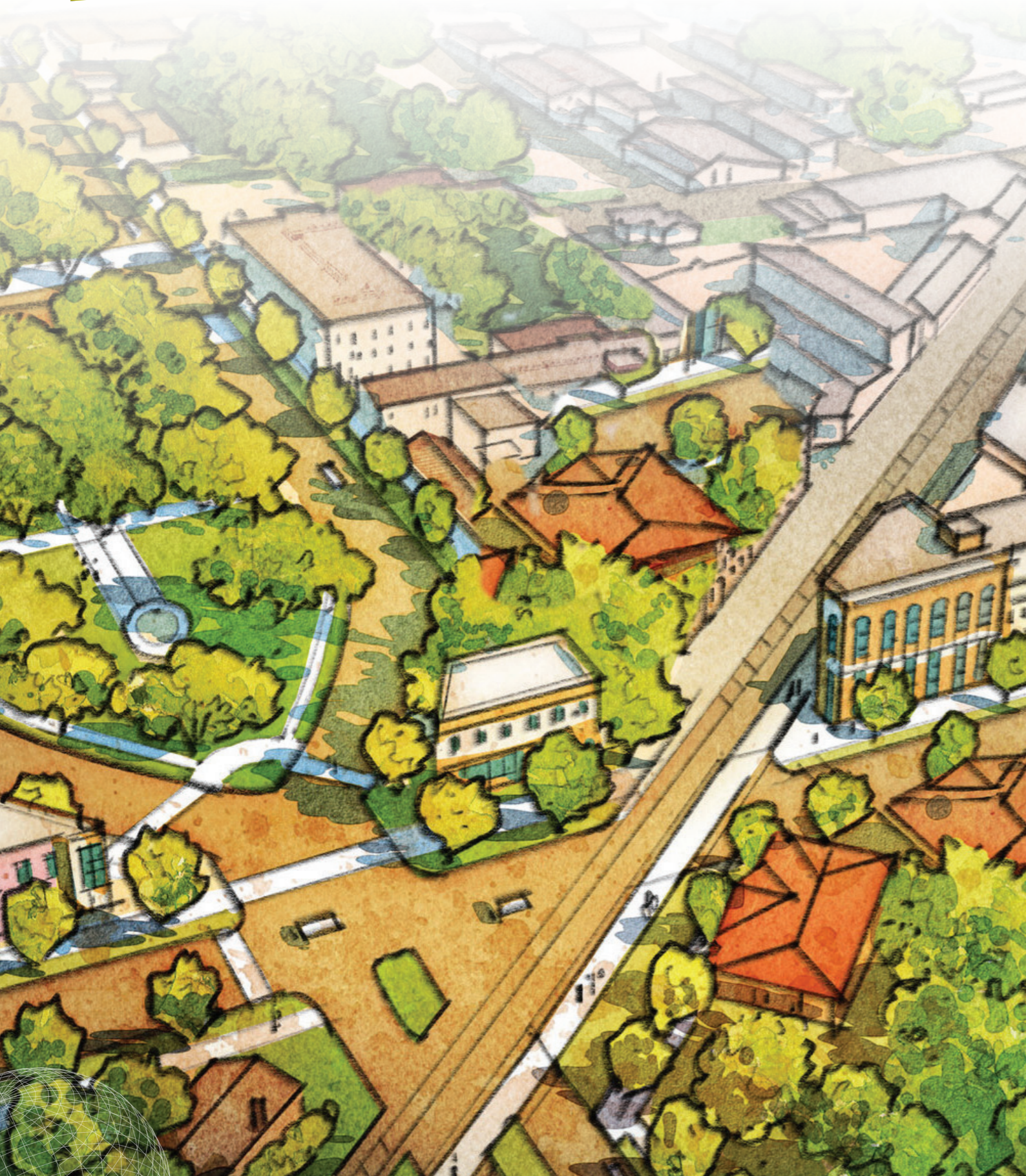
Key Skills [in national curriculum]	Cross-cutting Themes • Green & Digital Transition • Social Justice • Climate Justice & Sustainability	Pillar I: Public Infrastructure	Pillar II Green Housing	Pillar III Local Environment
Being Literate	STEM knowledge from more than one discipline & ethical values of community			
Being Numerate	Mathematical intelligence applied to this problem			
Being Creative	Ambitious, caring and imaginative thinking			
Staying Well	Public spaces allotted for wellbeing, community building, social harmony, human dignity and respect			
Working with Others	Capacity to debate the issues, to tackle controversial dilemmas as a collective, to respect difference at all times			

For the greater good of the local society, economy and environment, for climate action and sustainability which translates on another level to the greater good of a decent democratic society, a thriving economy and a sustainable environment.



Chapter 4

Architecture for a Sustainable Eco-Village



Chapter 4 Architecture for a Sustainable Eco-Village

The physical layout and design of cities, towns and villages, and the buildings within them are often planned in advance by specialist experts, such as, urban planners, ecological designers and architects. Good examples of planned towns in the west of Ireland include Clifden in Co. Galway and Westport in Co. Mayo. This can be seen from the layout of the village, with the way the traffic flows, the presence of a square and a promenade, the way the streets flow together. Other ways in which towns emerge is through people coming to live in what was formerly a rural area and starting to build dwelling homes. Often in this type of ribbon development services start to arrive afterward and when the population starts to grow.

Quality of life in rural areas is greatly enhanced through the addition of public infrastructure and public services, such as, access to electricity and the internet, the building of public roads and their upkeep, access to a public rural transport system, a water scheme, and a waste treatment and management scheme. By the time an enterprise starts up in this village all of the above need to be first provided by the state and the local county councils. This is but one example of the important interdependence between the public and the private sector.

Throughout the history of Ireland there are several examples we can point to in relation to a major investment in and the planning and design of a necessary public infrastructure and public services. The political decision would have been taken at the cabinet table (government) and would more than likely have required a sizeable state funded loan to make the investment a reality. For example, in the past the state took a major political decision to make a massive investment of behalf of the people through a Rural Electrification Scheme that brought electricity to every dwelling house and industry in Ireland.

In this chapter, we outline the public infrastructure and public services that underpin the functioning of an eco-village. This will help you in the design phase of your project especially when you are considering the size and location of your village and the public infrastructure and public services that you want for your eco-village in Ireland in 2050.

One of the first considerations is the layout of your eco-village. You might like to begin with a map of your eco-village as you plan and design what buildings, streets, infrastructure and services you want in your village. At the same time, and continuing the theme of interdependence it will be clear that your village will not exist on its own, it will need good internet connectivity and access to energy and transport so that it can have an accessible national and global reach. It will need to be physically connected to the nearby region and the rest of Ireland, with access to good roads and a reliable system of green public transport. By 2050, the use of individual cars might have decreased in such a way that there is a loan system for cars in much the same way as there is a loan system for bicycles today. This is already in operation in London, where you can order a zip car using your mobile phone and have it delivered to you whenever you need it [see example and link below].

In **Table 4.1** you will find some examples of infrastructure that you can typically find in villages and towns around Ireland today. This list is not exhaustive and there are no doubt additional items that might be missing. Nonetheless it is designed to get you started in your planning discussions of your agreed layout and design for your futuristic eco-village.

Table 4.1 Examples of infrastructure and services found in Village Life

Infrastructure & Services	Examples	Purpose(s)
Town Hall	Elected Local Mayor of Village; Offices (tourist, upkeep of roads; water quality testing, waste management)	Public meetings Public administration of state services to the community, social welfare, tax office, Department of Agriculture
Public Library	Books, i-pads, printing of local newsletters, local podcasts, local radio	Public access to information Citizens advice bureau
Public Community Hall	Leisure and community activities	Community meetings, Leisure activities such as dancing and badminton clubs
Churches	Religion	Denominational Churches, Interdenominational places of worship
Public Areas	Public parks, community allotments, designed green and blue areas for community wellbeing, leisure and tourism	Biodiversity Allotments for growing fruit and flowers and vegetables Green Meeting Areas Public Swimming Pool Outdoor adventures
Cultural Centre	Cultural activities	Café; theatre, cinema, museum, music recitals, dance studio
Public Schools	Access to publicly funded education, continuing learning and upskilling for all	Public access to a system of pre-school, early childcare, primary, post-primary education, higher education, adult and continuing education
Garda Station & Court House	legal and judiciary system	Public order offences, doing community service
Public Health Centre	Holistic Health & Wellbeing	Access to medical and holistic health care: e.g. doctors, nurses, dentists, social care workers, mental health services, physiotherapy
Public Housing Schemes	Public funding of green social housing e.g. Right to Housing e.g. Housing for Refugees	Mixture of different social and affordable housing schemes e.g. apartments, duplexes, houses
Market Square	Purchase of Local Produce Buying and Selling of Livestock & Fish	Organic vegetables; local cheeses; recycled fashion; homemade produce
Shops & Services	Customer Services	Hairdresser, barber, laundry; butcher, bakery, health foods, fashion outlets, pharmacy, garage, public house and licensed premises, restaurant
Business Park	Enterprise Development	Established industries, early start-up enterprises
Public, Private & Residential Housing	Housing & Tourism	Residential homes and apartments, duplexes, , hotels, social and affordable homes

In **Table 4.2** you will find examples of additional public infrastructure that is needed in the design and delivery of public services to the sustainable eco-village, some of which is located in the heart of the town (e.g. bus stop, train station) and more on the outskirts (waste management). To encourage the use of public transport there is nowadays an increase in the priority status given to these vehicles, such as bus lanes.

Table 4.2 Examples of public infrastructure

Public Infrastructure /Services	Location	Examples
Public Transport system	Centre of Village [Bus Lanes; Bicycle Lanes]	Public systems of electric trains, electric buses; access to electric cars and bicycles
Water Treatment Plant	Outskirts of village	Preparation of drinking water; water for housing and industry; quality testing infrastructure
Sustainable Waste Management [Reuse and Recycling Centres]	Centre of Village & Outskirts of Village	Recycling paper goods and cans; Local Fashion Outlet for Reusing and Recycle Fashion
Green Energy Systems	Generating Electricity	Solar Panel Farms Wind Turbines

At this moment in Ireland, we have a serious housing shortage in cities, towns and villages. This is due to a number of problems that have all come together at the same time e.g. asylum seekers fleeing war from the Russian invasion of Ukraine, a higher than normal influx of refugees since 2022, and a national policy of fiscal conservatism in relation to public expenditure as a result of a national financial crash in Ireland in 2011. It is a problem that urgently needs new and innovative design thinking as we now have a serious shortage of accommodation for tourism [an important enterprise for Ireland], and an exceedingly high expenditure of public funds to private providers for emergency accommodation.

This system of publicly-funded private accommodation, in Ireland since 2020, continues for the most part to be understood to be a temporary measure. However, the evidence coming from current immigration patterns across the globe, the increasing threat of war and famine, the impending threat to social cohesion with the rise of far-right protestors in Ireland and across Europe, and the changes to employment suggest otherwise (e.g. artificial intelligence).

Public Spaces & Places

Public spaces play a crucial role in urban and village design as they provide areas for social interaction, recreation, and numerous cultural and civic activities. These spaces contribute to the liveability and well-being of eco-village life by fostering a sense of belonging, promoting physical

and mental health, and enhancing social cohesion. Here we explore the importance of public spaces in eco-village design, the benefits they can offer to residents, and some key considerations in creating vibrant and inclusive public spaces [for further reading see **Monika Palani** Planning Engineer May 29, 2023 Open Immersive Reader]. Public spaces offer a unique space for social and cultural interaction in eco-village life providing opportunities for people from diverse backgrounds to come together, foster good social connections and develop a sense of community and civic engagement. Accessible and well-designed public spaces offer an opportunity for people in the eco-village to enjoy good physical and mental health as these spaces encourage physical activity, reduce stress levels, and enhance mental well-being.

When used well for the civic, social, cultural and political work of living well in a shared pluralist democratic society, public space can contribute to cultural life and civic identity, serving as gathering points for cultural events, celebrations, and civic activities, reinforcing a sense of identity and pride in the community [felt sense of having a stake in society]. By recognizing the importance of public spaces to the social fabric of communities, incorporating inclusive design principles and engaging the community in the decision-making, eco-villages can create vibrant, accessible, and meaningful public spaces that enhance liveability and community well-being.

While seeking to generate a successful green and digital transition in the years ahead, Ireland will be faced with the dilemmas and possibilities of creating inclusive and accessible public spaces, where everyone feels that their point of view is listened to and works to contribute to a pluralist democracy. Eco-villages in Ireland in 2050 will need to ensure that public spaces are accessible and usable by people of all ages, abilities, and backgrounds. They will need to be designed in ways that address safety and security for everyone with for example, appropriate lighting, visibility, and surveillance systems creating a sense of safety and encourages usage by all members of the community. The connection to nature integrates nature elements such as parks, gardens, and green infrastructure and enhances the aesthetic appeal, ecological value, and overall well-being of public spaces.

Plazas and Squares in the centre of the eco-village are open areas that can typically serve as focal points for social gatherings, cultural events, and public celebrations, fostering community involvement, social and civic engagement. Pedestrian streets and promenades in the design of an eco-village can create pedestrian-friendly streetscapes and work to encourage walking, cycling, and active transportation, reducing overall reliance on cars and improving air quality. There are different types of community centres and libraries that can lie within an eco-village that serve multiple purposes for educational, cultural, civic and political and sporting and recreational activities, catering to the diverse needs of the community.

There are a number of innovative designs in relation to the development of public spaces in urban areas and in eco-villages that have worked to renew and to revitalise neighbourhoods and communities. One example is the High Line in New York City. This is an example of an elevated public park built on a former railway track that now serves to revitalize the surrounding neighbourhood, attracting visitors, promoting local businesses, and providing a unique green space for recreation and wellbeing of the community. Another example is Cheonggyecheon Stream, Seoul in Japan. This is an example of a restoration of a formerly neglected urban waterway into an inviting space which resulted in transforming the local area, improving water quality and enhancing social connectivity. Finally, there is The Plaza Mayor in Madrid in Spain. This historic square serves as a vibrant hub for social gatherings, cultural events, and local markets and embodies the city's rich cultural heritage.

Green Architecture in Singapore

Singapore has taken massive steps towards improving sustainability and taking action to protect the climate (Yin et al., 2018). In the 1960s Singapore they began with a strong focus on developing their construction industry [see link: <https://www.archdaily.com/976437/how-singapore->

is-pioneering-the-way-to-creating-a-greener-urban-environment]. Despite the advantages to the economy, and the rapid development, the detrimental aspects of environmental stress and exhaustion of natural resources quickly became apparent. In response, the government introduced a number of initiatives, including the Green Building Masterplan, which strived to make 80% of buildings green by 2030. This involved incorporating plants, foliage, trees, and more, onto the roofs and balconies of buildings (Mohammed et al., 2024).

This innovative architecture focused on vertical growth and working with the available space, rather than contributing to urban sprawl. The incorporation of the lush foliage into modern living spaces reduced the rising CO2 levels, increased biodiversity and cooled the climate by storing water. Over time, with the community surrounded by nature, individuals become invested in the environment and care for the plants. This suggests that a holistic approach to climate action and sustainability is possible and is vital in protecting the environment.

Solar Bicycle Lanes in the Netherlands

A novel renewable energy initiative in the Netherlands introduced photovoltaic technology [solar panels] as easily adhesive tiles into bicycle lanes to merge public infrastructure with renewable energy generation, see the following link to a description of how this works <https://happyeconews.com/pedaling-solar-netherlands-solar-bike-paths/>].

The approach works well in the Netherlands, the country is already renowned worldwide by its bicycle usage, having more than 35,000 km of bike lanes and now working to harness this for a sustainable solution for green energy generation.

The idea behind solar lanes is to harness the vast surface area of these lanes to generate renewable energy, which can then be fed back into the grid, stored for later use, or directly used to power nearby homes and businesses. The technology typically involves the use of durable, transparent materials that protect the photovoltaic cells while allowing sunlight to reach them. These materials must be robust enough to withstand heavy traffic, weather conditions, and wear over time. The surface layer includes textured patterns to ensure adequate traction for bikes and foot traffic, while beneath it, layers for wiring, control systems, and energy storage are embedded.

The integration of solar roads into green towns and eco-villages offers numerous environmental, economic, and social benefits. One of the most significant advantages is the potential to generate clean, renewable energy directly within communities, reducing reliance on fossil fuels and decreasing carbon footprints. This localized energy

production can be particularly beneficial in remote or rural areas, where access to the main power grid may be limited. Solar lanes can contribute to energy resilience and help communities better withstand power outages or disruptions. The energy generated from the solar bike lanes can be used to provide charging stations for bicycles and electric scooters along the lane, for the operating of closed-circuit security cameras and for bus shelters and dynamic signs. The solar bike lanes are expensive to establish in the first instance. In the Netherlands they are paid for from the public purse and from the local authorities. [If you would like to read more, see the following links: Solar Bike Lane and Government Funded Solar Bike Lane.]

The United Kingdom's Architecture Prize - the Stirling Prize

The Royal Institute of British Architects Stirling Prize provides architects from the United Kingdom with the opportunity to showcase their skills and ingenuity in improving infrastructure and catering to the evolving needs of society (see link: <https://www.architecture.com/awards-and-competitions-landing-page/awards/riba-stirling-prize>). This prize celebrates new, innovative thinking, and places an emphasis on sustainable practices, with the 2024 shortlist showcasing the six most impactful designs. For example, King's Cross Masterplan involved transforming an industrial area into an exciting, vibrant area that is integrated into city life. Wrexham Yard rejuvenated an old farm into holiday accommodation. Characteristic features of innovative entries include an emphasis on connected communities, sustainability, inclusivity and adaptability, useful when considering the design of an eco-village.

Another example, relevant to our eco-village project is the Norwich council houses in the UK that won the Stirling Architecture prize in 2019 for the best new building in the UK. In the long history of this prize, it was the first time for a social housing project to be declared a 'masterpiece' and the outright winner (see Oliver Wainwright's account in The Guardian newspaper, see the link <https://www.theguardian.com/artanddesign/2019/oct/08/stirling-prize-architecture-goldsmith-street-norwich-council-houses>). This group of 105 'ultra-low-energy-houses' was built by the local council - rented with secure tenancies at fixed social rents - and designed by the architecture London firm of Mikhail Riches and Cathy Hawley.

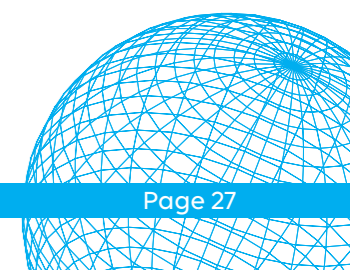
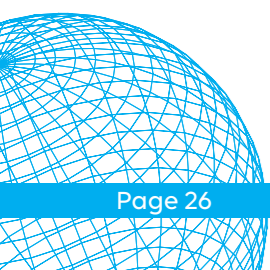
The creamy-brick houses in Goldsmith Street, Norwich were designed to the most stringent environmental standards, making them 70% cheaper in energy costs compared to the average house at the time. The walls and doors were highly insulated. The letter-boxes were set into a communal space rather than their front door for fear of draughts. They won the prize as the most environmentally and socially conscious housing. The design went beyond the buildings and focused on the social, wellbeing and environmental aspects, with communal seating and space for the people and with the car park moved to the side. You can read details by **Peter Rickaby** of the solar panels and the collection of other details and features that assured them as passive sustainable buildings (see the link: <https://passivehouseplus.com>).

ie/magazine/new-build/stirling-work-the-passive-social-housing-scheme-that-won-british-architecture-s-top-award#:~:text=Early%20in%20October%2C%20Norwich%20City,purest%2C%20most%20environmentally%20and%20socially

The Vertical Forest in Milan, Italy

In 2014, there was the opening of two impressive architectural towers designed by Stefano Boeri in Milan (Boeri, 2024; Salamanca, 2023). These residential skyscrapers of 80m and 112m respectively house the residents who live there as well as a rich diversity of flora and fauna, promoting biodiversity while helps to provide a green transition to climate change as oxygen is continually produced by the building and carbon dioxide is absorbed (Boeri 2024).

Fig 4.1 Vertical Forest Milan Photo by David Salamanca on Unsplash



A group of 'flying gardeners' manage the property, pruning all the plants, trees and shrubs once a year by descending down the outside of the tower. An innovative system of irrigation ensures the plants are watered appropriately using the buildings filtered effluent, for a green waste management system.

While this example from Italy provides us with an imaginative suggestion, you will need to critically examine this design to see how it stands the test of time, who lives there now and if there are any unforeseen issues with this green design. It would be worthwhile to debate the following questions in this regard:

1. Could there be an issue with pests for the residents?
2. Are there risks related to the growth of trees on the building? (Branches falling, how to prevent the root system damaging the structural integrity of the building over time)
3. Are the maintenance costs high: how accessible is this to people outside of the wealthy and would the wealthy live in a high rise building of this type?
4. Could this design or modification be implemented in Ireland (different climate)?

Global Eco-Village Network

The Global Ecovillage Network (GEN) is a non-profit organisation that links ecovillages around the world [see the website link: <https://ecovillage.org/>]. GEN embraces a holistic approach to sustainability – which integrates the social, cultural, ecological and economic aspects of life. At the heart of this integrated design is the recognition of our dependence and interdependence as a people [as a human species homo-sapiens]. We are not simply individuals living in a marketplace or within institutions we are deeply connected and tied in every way, socially, emotionally, affectively, culturally and economically with one another, with humans, non-humans and with the environment and the planet.

GEN designed their eco-village map of regeneration, as a set of guiding principles to sustain these aspects of life when designing or redesigning ecovillages. The following is a summary of GEN's guiding principles, see Global Ecovillage Network (n.d.):

Social:

- Nurture diversity and cohesion for thriving communities
- Develop fair, effective and accountable institutions
- Practice conflict facilitation, communication and peacebuilding skills
- Empower collaborative leadership and participatory decision making
- Ensure equal and lifelong access to education for sustainability
- Promote health, healing and wellbeing for all Culture:
- Clarify vision and higher purpose
- Nurture mindfulness and self-reflection
- Enrich life with art and celebration
- Honour indigenous wisdom and welcome positive innovation
- Engage actively to protect communities and nature
- Reconnect to nature and embrace low-impact lifestyles

Ecology:

- Grow seeds, food and soil through regenerative agriculture
- Clean and replenish sources and cycles of water
- Move towards 100% renewable energy and transport
- Innovate and spread green building technologies
- Work with waste as a valuable resource
- Increase biodiversity and restore ecosystems

Economy:

- Reconstruct the concepts of wealth, work and progress
- Commit to responsible production, consumption and trade
- Cultivate social entrepreneurship for local regeneration
- Increase economic justice through sharing and collaboration
- Ensure equitable access to land and resources
- Use banks and currencies that strengthen communities

Integral Design:

- Learn from nature and practise whole systems thinking
- Identify assets, needs and leverage points
- Adapt solutions to scale and context
- Be aware of privilege and use it for the benefit of all
- Build alliances across all divides
- Engage all stakeholders in designs for the future
- Spread core patterns of regeneration
- Listen to the feedback of the world

Contemporary Eco-Villages in Ireland and elsewhere

Today there are a number of eco-villages in Ireland and elsewhere (Scotland, Iceland) that can act as a source of inspiration for our eco-village partnership project. The eco-village in Cloughjordan in Tipperary is not only providing inspiration for our project, its community have also provided a video resource to assist you in the planning and design phase of the project.

Ruddock (2022), writing in an article in RTE Brainstorm reminds us that sustainable living is not something completely new as: "Human beings have survived on earth for millennia by living in sustainable communities, and many indigenous peoples still do. In many ways, modern eco-villagers are learning what ancient cultures have always known: we must co-operate with nature and each other to survive and thrive." (Ruddock 2022).

According to Ruddock (2022) the four main elements to eco-village life are:

- 1) Right livelihood (Localization as an alternative to capitalism)
- 2) Community
- 3) Ecology (low carbon footprint, zero waste, renewable energy and sustainable food production)
- 4) Ethical, worldwide view

See link to Ruddock (2024) article in RTE Brainstorm - <https://www.rte.ie/brainstorm/2022/0923/1325000-ecovillages-cloughjordan-findhorn-beddington-bicester-solheimar-sekem-damanhur-sieben-linden/#:~:text=Ireland's%20only%20ecovillage%20is%20in,2005%20by%20Sustainable%20Projects%20Ireland.>

This chapter briefly considers three eco-villages in the following pages, including the Cloughjordan ecovillage in Co. Tipperary, the Findhorn ecovillage in Scotland and the Sólheimar eco-village in Iceland.



Cloughjordan

Ecovillage, Co. Tipperary



The Cloughjordan ecovillage site was bought in 2005 by a group of dedicated environmentalists calling themselves Sustainable Projects Ireland Ltd., and established as an educational charity, with the aspiration of having a great place to live, work and play.

The group employed ecological designers and an architect in the early years when they were planning the physical layout and ecological features of the eco-village which they then needed to agree between themselves before they purchased the site and began the building and construction work. By 2009 the first residents moved in and now the eco-village has 50 homes and a population of about 130 people.

The three pillars of sustainability are concerned with making a successful green and digital transition in relation to (1) a thriving local economy [Profit], (2) a decent and caring society [People] and (3) a cared-for local environment [Planet], that takes account nowadays of the fast changing demographics in the region and country [diversity in populations] and empowers capacity and resilience to deal with unforeseen shocks into the future.

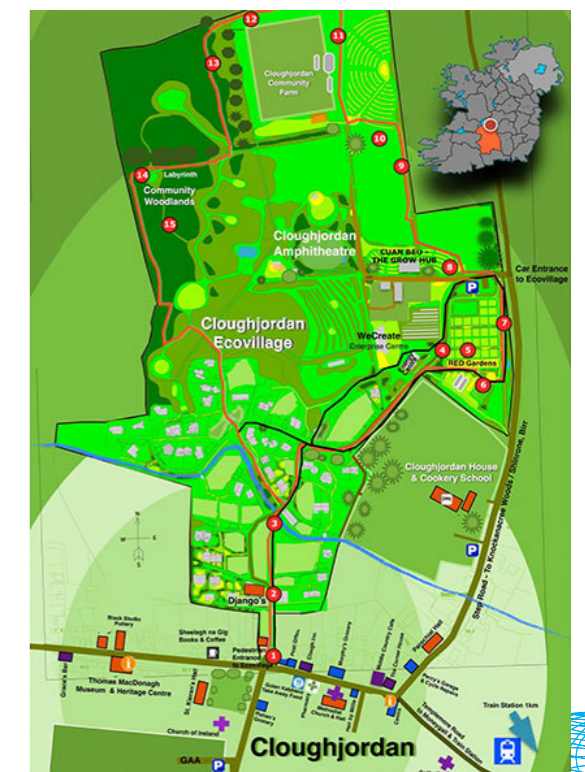
The eco-village in Cloughjordan has a low carbon footprint, renewable energy sources, food, woodlands, social enterprises and education projects. They organise visits such as school tours, 3rd level tours and individual stays in the village.

It is clear that tourism and these types of educational visits create income for the village. With farms, hotels, fabrication labs, gardens, cafes, and community spaces, there is lots to do for visitors and community members alike. You can find out more about this eco-village website - <https://www.thevillage.ie/>



Above: Images of the unique buildings in Cloughjordan

Below: A map showing the various features and structure of the village.



Findhorn

Ecovillage, Scotland



'biological living machine' for waste water treatment, along with a 250 kW biomass boiler to heat water, which reduces CO2 emissions by 80 tons (nearly 180 kilograms) a year. To combat transport CO2 emissions, they have a car-share club which uses only carbon neutral electric vehicles. They have published The UKs first technical guide to Ecological Housing.

provide a United Nations-accredited training programme, consultancy to ecovillage projects, workshops on sociology and ecology, and an annual conference. The village therefore has green infrastructure in place for eco-village education, ecological buildings, organic food, renewable energy sources and green and digital transitions in its water systems.

The Findhorn story is one of developing a community around a core set of beliefs and ethical values, and imaging a better future for their community – what core beliefs will you bring to your ecovillage design? What infrastructures need to be put in place to support community life and social and climate justice in your eco-village in Ireland in 2050?

They offer educational programmes like the permaculture design certificate course, in partnership with GAIA education, enabling people “to become a certified permaculturist, capable of creating and implementing designs aligned with the ethics of Earth Care, People Care and Fair Share” (Gaia Education 2024). “The permaculture philosophy, working with rather than against nature, and the permaculture principles are a lens through which to see the world and make our key decisions” (Gaia Education 2024).

Today, with 400 residents and 4,000 annual visitors, the Findhorn eco-village is larger than the Cloughjordan Ecovillage. As home to the Global Ecovillage Network, they

Findhorn Ecovillage, Scotland:

Located in Findhorn in the northwest of Scotland, the Findhorn Ecovillage was founded in 1985. The story of the village and how it evolved is a story of dedicated and inspired people who wanted a holistic lifestyle tied to their spiritual beliefs and values and wanted a sustainability linkage that stretched from social, ecological to economic aspects of life.

The Ecovillage began as a 4 star hotel in 1962, founded by Eileen Caddy, Peter Caddy and Dorothy McClean. They ran the hotel for a number of years. They then went on to buy the Findhorn caravan park and later grew vegetables, turning the once sandy, dry land of the caravan park into a flourishing garden. They grew vegetables, plants, herbs, flowers and their now famous 40 pound cabbages. Word of

the flourishing garden spread, and attracted horticulturalists from far afield, as the village community continued to thrive.

By the end of the 1980s the Findhorn community grew to 300 people. Today, Findhorn is known as one of the frontiers of sustainability [https://www.ecovillagefindhorn.com/]. They were a founding member of the Global Ecovillage Network (GEN) in 1990. Findhorn is also the headquarters for Gaia education, providing sustainability education to community members and visitors from all over. The village also received the “Best Practice Design” award from the United Nations centre for human settlements (Findhorn Ecovillage n.d.).

As well as being a major centre for holistic sustainability education, Findhorn also has a carbon footprint that is half of the UK village average. All of its electricity needs are provided for by 4 wind turbines. They have implemented a



Sólheimar

Ecovillage, Iceland

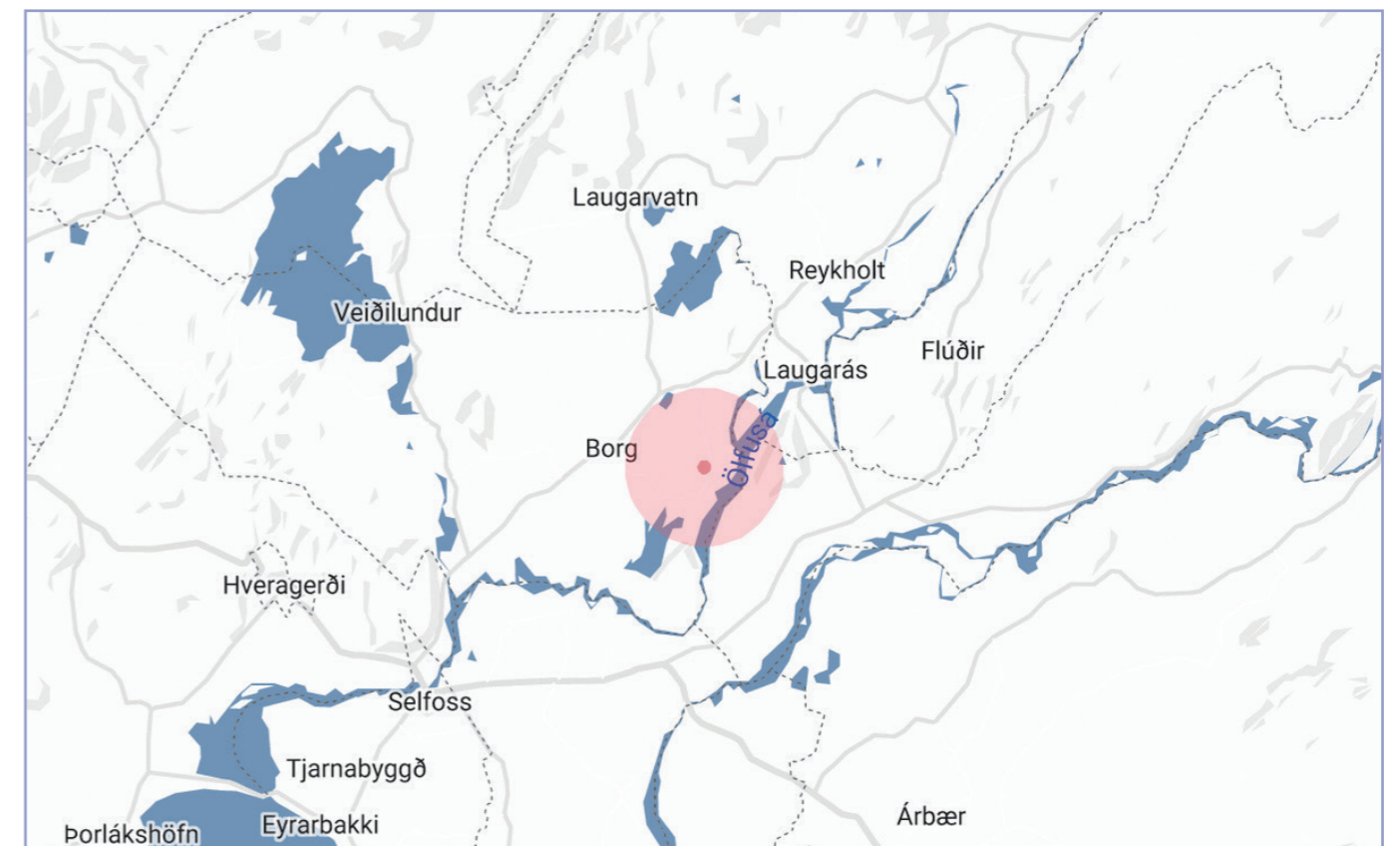


on-site and online in which they sell handmade figurines, mementos, art as well as herbal soaps and remedies and traditional rugs and household items [see link to website: <https://stayinsolheimar.is/>].

The people of Sólheimar believe that “we do not inherit land from our ancestors, we borrow it from our children” (Sólheimar 2024). What core beliefs and values do you want to bring to your ecovillage? How will these beliefs and values affect your design?



Map of Sólheimar Eco Village, Iceland:



Sólheimar Eco Village, Iceland:

Located in Selfoss, in the southwest of Iceland, Sólheimar was founded in 1930 and is one of the oldest ecovillages in the world. It is famously known as Iceland’s first and only ecovillage. Its name means “home of the sun”. The village has a population of roughly 800 people. The founders of Sólheimar have developed a sustainable community based on the work of Sesselja Hreindís Sigmundsdóttir.

The community was shaped by circumstances in Iceland during the early 20th century. Iceland was a largely uninhabited island until Norsemen settled on the island in 870 A.D (Arnórsdóttir 2019). Icelanders officially became subjects of the Norwegian crown in 1264 A.D (Arnórsdóttir 2019). In the year 1380, Denmark and Norway were united under one crown. Thus started that Danish rule of Iceland (Arnórsdóttir 2019). This rule continued until the early 20th century. In the year 1871, the Danish parliament granted Iceland constitutional status, which continued until the end of the Second World War. This was a turbulent time in Iceland as it was for the rest of the world. In the year 1940,

German forces occupied Denmark allowing Iceland to gain independence as a sovereign state in the year 1944. It was these turbulent political circumstances that drove the creation of the Sólheimar eco-village community. The Icelandic people wanted to create a better way of life during the turbulence of the times (Arnórsdóttir 2019b).

The core ideology of the village had remained unchanged since its foundation in 1930; ‘to give individuals opportunities’. Sólheimar provides its members with opportunities to grow and develop into active members of a dynamic community (Sólheimar 2024). As people’s needs change and develop as we move further into the 20th century, so does the village.

The village generates income to support its community members in many different ways. The main source of income for the community is tourism. The village is equipped with guest houses which anyone can book and stay in. The village attracts travellers and visitors from around the world who come to discover its unique innovation and ecological concept (see www.dventures.ie). They also have a shop

Chapter 5

Changing Demographics in Ireland



Chapter 5 Changing Demographics in Ireland

Our Eco-Village partnership project opens the question of what local and well-informed citizenship needs to look like in a sustainable eco-village in Ireland in 2050 [for a green and digital transition for the greater good of society, the economy and planet]. What will the public forum in the village look like - will it be vibrant, dynamic and inclusive of all voices? This leads us to questions about the capacity for the villagers to act as a social and civic collective to contribute, contest, and negotiate and to hold their own with other regional, national, European, and global influencers and political agendas.

- What role will Science, Mathematics, Engineering, Technology, design thinking and digital competency play in the design, planning, labor force, lifestyle, community building, civil society and wellbeing in the village?
- What role will the arts and humanities, politics, ethics, business studies and other ways of knowing (situated and experiential knowledge) play in the design, planning, labor force, lifestyle, community building, civil society and wellbeing in the village.

The voice of the participating citizen will be looked at very differently by policymakers if seen either as that of a 'customer' or as someone speaking for the greater good of society. There are crucial differences. If the speaking person is seen as a 'customer' then their voice will be interpreted as a voice in a market [marketplace]. The solution will then be to ensure a better service delivered as a private good to that individual. However, if the speaking person is seen as having a voice concerned with public interest values in a 'democratic society' [the greater good of society], then their voice will be interpreted as making an active contribution for the greater good in the public forum, and this will be framed as a constantly moving political space with in-built capacity to change in a democracy of the people.

This felt sense of the need for schools to offer the experience of democracy is at the heart of the American philosopher of education, John Dewey's work "Education and Democracy" (Dewey, 2024/1916). Dewey argued that democracy always needed to change with the changing needs of society and needed to be reborn with each new generation. Dewey was suspicious of either/or positions and while advocating for experience, inquiry and reasoning, he wanted young people to have the capacity to hold in play contradictory thoughts at the same time. Dewey argued for a both/and view of a democratic society. In this way the purpose of schooling was about having capacity to do at least two contradictory things: (a) to conserve culture and heritage and (b) to make space for something new to emerge.

In this way, a dynamic democracy in a Sustainable Eco-Village in Ireland in 2050 will need to be felt at the level of the village and will need to be greater than the collective sum of individual votes and greater than a majority rule. The village will need to have laws and human rights, especially for the protection of minority rights and at the same time need to embrace a view of democracy that is upstream of the laws and regulations of the state.

In a changing Ireland in 2050, problems of sustainability, energy conservation, housing, transport, health, climate change and infrastructure will need to be framed as issues of the wider society and will need not only individual, but also collectively agreed moral and political solutions. They will be more than issues of the individual or the individual student.

Data on a changing demography in Ireland in 2050

The Central Statistics Office (CSO) is the official public body in Ireland charged with conducting a census of the population every few years and providing reliable data on the changing shape of the population of Ireland, labor force patterns and migration patterns.

The CSO uses mathematical modeling and assumptions based on current trends to predict future trends. Even though the future is uncertain and volatile, and the data often depends on things moving along as expected, this data can be a great source of reliable information to assist us in understanding what we now need to start working on to be 'future ready'.

For this eco-village project, where social and environmental justice and care is a key principle and needs to be taken into account, the CSO data is worthy of note. The CSO predicts that the population of Ireland is set to grow in the period 2017 to 2051, with an increase of almost 2 million people, to greater than 6 million people by 2050. Throughout history, Ireland experienced periods of strong net outward migration [e.g. 1950s] and periods of net inward migration [e.g. 2000s]. The CSO predicts that for the period 2017-2051 Ireland will experience a constant inward migration. Based on a thriving economy they predict that this number is set to grow by 30,000 per annum.

These CSO predications offer a projected labor force for Ireland. They do not take into account the arrival of newcomers from war torn and oppressed parts of the global world, refugees and people seeking asylum from war, hunger and other forms of oppression. This is an important question for the future of peace, inclusion, wellbeing, social cohesion in a fast-changing Ireland. How do we plan to live well with a diverse population, people who are different from our

indigenous culture? Wearing a social justice and care hat, how should we take responsibility as a society for newcomer people who are left behind by society, societal structures and circumstances and cultural contexts? How should we take responsibility for ensuring that we have a national and a village floor below which no one falls (e.g. a living wage and socially agreed minimum standards for housing for all) and a national and village ceiling on greed and pollution?

Here we can think of the political activist work of the Swedish teenager Greta Thunberg who brought this social responsibility to light in relation to climate change. Michael Sandel, a philosopher in Harvard reminds us there are big moral questions that need to be collectively answered at the level of society that are in addition to the societal need for higher levels of knowledge. Read more about his thinking in his book 'What Money Cannot Buy'. One of these big moral questions is about what each of us need to do individually to play our part in the mitigation and eradication of climate change, and at the same time what we need to do as a collective and as a society for a just green and digital transition.

Age Friendly Ireland

As well as thinking about the change in the size of the population there is clearly a need to think about the diversity of the population, and this includes the age ranges in the society. For example, Age Friendly Ireland are a local government service, whose aim is to promote the voice of the aging population and to make Ireland a great country to

grow old in (Age Friendly Ireland 2023). The idea of designing for the elderly, as encouraged by Glen Miller, forms a more inclusive Ireland, helping everyone (Age Friendly Ireland, 2023). A need for accessible spaces, inclusivity and support systems is recognized.

By 2031, it is expected that there will be 1 million people over the age of 65 (Social Justice Ireland, 2020). This aging population will need to have their voice heard and have services in place to aid their lives. More healthcare services, social services, age-friendly housing, caregiver support, accessible transportation and pensions are just a few services that are required to support an aging population have a decent and comfortable lifestyle.

Today we have 17 United Nations goals that can support your efforts in relation to thinking a sustainable Eco-Village in 2050 in Ireland. What ones do you think are important for your project? See the list below:

- How will we live in associated living in Ireland, in a fast changing and plural democratic society and do this in ways that are fair, equal, just and caring for all?
- Will we confine the solutions to what we can do individually [e.g. cups, electric bicycles and cars, solar panels] and is it in the words of John Dewey a both/and solution where we also make radical new changes as a collective society [e.g. public infrastructure and public services]?

SUSTAINABLE DEVELOPMENT GOALS



What the Educationalists tell us?

Here we are interested in opening for question our capacity in the eco-village to live well and fairly alongside newcomer people, of difference age, race, religion, gender, class and in ways that maintain human dignity and respect for all and a celebration of diversity and difference.

While we will need laws, regulations and human rights, will that be sufficient. Perhaps we need something more, a spirit of abundance that is upstream of the legal system to do this well. This care and community thinking in relation to the proper inclusion of Diversity in schools and in society runs throughout critical and feminist writings and can be found in the philosophy of education by Paulo Freire (2018/1971) and bell hooks (1994). Both advocated the primary purpose of education was one of emancipation and was not about transmission and learning to be compliant. They would clearly be disappointed with the global reform emphasis today in relation to the formulaic way education policies list outcomes in advance.

Another renowned educator from the arts and humanities, Maxine Greene pointed to the need for developing a critical social and planetary consciousness which she called 'wide awakeness'. This is an important concept today when there is often a tendency for debate to be reduced to polarized positions that bypass the work of seeking the world through the eyes of the other. 'Wide-awakeness' speaks to the importance of empathy, trust building, care and compassion in relation to securing a decent democracy underpinned by care and justice

Chapter 6

Securing a Green & Digital Transition for Climate Justice & Sustainability

Chapter 6

Securing a Green & Digital Transition for Climate Justice & Sustainability

Every issue today is an issue of climate action and climate justice. We need to inspire a realistic hope in our capacity as inhabitants of planet Earth to arrive at the collective decision-making power needed to make the right collective and individual decisions in this regard. We will need to use our Science and STEM literacies to work alongside our ethical and value-based judgments in order to persuade our politicians to put the public money and the investments in the right places so that we can halt the crisis and turn it around for a just and fair green and digital transition that is just and fair for all.

Petersen et al. (2024) and other educationalists and activists remind us that while governments are making changes, and new global agreements are being enacted, that the pace of change is far too slow and that there are very powerful vested interests constantly seeking to block and slow down progress such as fossil fuel providers. It will be instructive to understand something of the sources of opposition to the Climate Justice movement, to have a clearer understanding of the motivation from these sources and the lengths they might go to keep things the way they are [to secure the status quo].

In this chapter we will share a number of social movements across the globe that are trying to do something different in this regard. After that we will go more deeply into the definition of climate justice today, how it affects what is called the Global North and the Global South differently and the efforts at the level of the United Nations (UN) to tackle the issue through the UN Sustainable Goals and through The UN Human Rights Charter.

New Social Movements

Today there are numerous social movements across the world that are seeking to make a difference in relation to collective consciousness raising and activism in relation to climate justice and sustainability. For example, Project Dandelion is a woman-led global campaign for climate justice that is committed to leadership and action in relation to raising the issues and speaking out with advocacy for climate justice and change. While governments are beginning to take seriously their responsibilities, the speed of change is too slow and populist movements are seeking to derail much of what has been completed successfully (see link for Project Dandelion: <https://www.projectdandelion.com/learn>). One of the leading women for Climate Justice in Project Dandelion is the former President of Ireland, Mary Robinson, a former UN High Commissioner for Human Rights and a member of the UN Elders.

The adoption of the 'dandelion' symbol for the project is imaginative and symbolically powerful. The dandelion is a resilient plant, its roots are regenerative of soil, all parts of the dandelion can be consumed, and it spreads by blowing

in the wind. Its goal is to seed more dandelions. This is also the expressed goal of Project Dandelion. The dandelion is the connecting link between all the elements across the world of a climate justice social movement, whether that is school children with Fridays For Future, young people protesting, indigenous people with their wisdom, local communities, progressive business leaders, religious leaders, artists, local philanthropists, the list is endless and a source of inspiration.

Sustainable Systems of Transport

Here the challenge is to know the science related to climate change and at the same time to understand the citizenship responsibilities that go with lessening (e.g. mitigation and adaptation) and in certain instances removing the cause of the problem. For example, this might involve taking a political decision at national level, to change the railroad system from diesel trains to an electric train infrastructure. This is exactly what is happening today in Spain, a country with one of the highest number of electric train infrastructures in the EU that is attributed to a social and political consensus among other factors (see link: <https://www.ineco.com/ineco/en/communication/news/spain-produces-most-efficient-high-speed-world>).

There are new and innovative solutions popping up all the time, with the increasing use of technology making for a better quality of life whether in health, housing, or transport. While not a public service, the zip car option in London is an example of a smart system in a city already overcrowded with cars that has at least a reliable underground system of transport. The zip car option is interesting in that instead of owning a car, and paying for parking etc. the person can download the app and hire a car by the hour for whatever purpose and whenever a car is needed [see the link: <https://www.zipcar.com/en-gb/car-hire/london>].

Energy Conservation in Denmark

It might also be about the collective capacity for democratic decision-making for people to decide to do something in relation to energy as a public good for society rather than solely as a private service to the individual. The capacity to make these political decisions can be seen in the way that Denmark today has a Wind Energy programme, where the state insists that wind farms have at least 20% community-based ownership. You can find out more about this successful public policy at the following link: <https://www.iea.org/policies/17800-denmark-community-ownership-of-renewables>.

While there is an urgent need today for individuals to be involved in mitigating, adaptation and removal of the causes of climate change in their personal lives, it is imperative that we find new ways to work together in our local communities, in society, and in the wider world to address these issues as a collective.

Countries like the Nordic countries have stolen a march on the rest of the world in that they have been more successful than most at democratic decision-making, in combining visionary politics with pragmatic policymaking. You can read a chapter by Rinne Van Est (Chapter 3) in relation to the Danish system of wind energy in the book entitled *Successful Public Policy in the Nordic Countries*, published by Oxford University Press.

Samsø is an island off the coast of Denmark that relies entirely on renewable energy sources to fuel its small population of 3700. This is achieved by the implementation of 21 wind turbines, 4 local biomass-fueled heating plants, solar panels and electric cars, all working together to make the island carbon-neutral.

There is no denying that a project of this scale could not have succeeded without unanimous participation from all the residents of the island, as well as a strong community spirit, government funding, and extensive planning that aligns with national energy goals (Sperling, 2017). Samsø began the transition towards renewable energy by slowly phasing out its use of fossil fuels on the island, particularly in the transportation sector. This involved changing all public transport to electric vehicles, such as electric buses and cars, and encouraging car-pooling within the community (Andersen et al, 2013).

Due to its success, Samsø has the ambitious target of becoming carbon-free by 2030, which involves further assessment of how to exclude fossil fuels entirely, and from transportation such as the ferry that travels to and from the mainland.

What these examples tell us is that here is clearly a need for a rich interplay between the foundational knowledge of climate science and the ethical values and critical consciousness (moral, political) needed for collective action (activism, active citizenship) for the greater good of society, the economy and the environment.

Power of words and categories: Explanation of the terms Global South and Global North

Climate Action for Social Justice and Sustainable Development underpins the principle of your project's objective when designing your eco village in Ireland for 2050. The development of a just and sustainable society development necessitates inclusive language and equitable practices. This means ensuring that your project benefits all community members, particularly marginalized groups, and promotes environmental sustainability. The terms and

categories we use can shape perceptions and construct and/or reinforce hierarchies. Terms like "First World" and "Third World" are outdated and can perpetuate stereotypes and inequalities and give meanings of hierarchies. For example, in global terms, 'First World vs Third World' imply racism in terms of hierarchy, and the notion that some are first, and others are behind and are best avoided (Silver 2021, for more information:

<https://www.npr.org/sections/goatsandsoda/2021/01/08/954820328/memo-to-people-of-earth-third-world-is-an-offensive-term>).

The Global South and Global North dichotomy of the world is another hierarchical construction that underlies political action. The Global North is associated with modernity, development, power and wealth. In contrast, the Global South is viewed as 'other', as 'less', and as subordinate. This use of the terms Global North and Global South in this chapter is only for the effectiveness of demonstrating inequalities. Global South and Global North are not to be seen as the weakness of one and strength of the other, but instead they represent social disparities, power dynamics and historical inequalities (Prys-Hansen, 2024).

The Global South – a term that refers to countries located mostly in the southern hemisphere, with generally low-income levels and facing different structural problems.

The Global North – a term that refers to countries concentrated in the northern hemisphere, characterized by high levels of income, well-developed infrastructure, and macroeconomic and political stability.

Aim of this section:

- Students learn insights about injustices to support building their competence for how to work for change.
- Students learn about the relationship between politics and societies and power.
- Climate injustice is social injustice.
- Students learn how to critically examine why the climate situation has become as it is.

Climate Action:

Climate Action is the 13th of the 17 Sustainable Development Goals (SDG) adopted by all United Nations members in 2015 to create 'peace and prosperity for people and the planet' while tackling climate change. Climate action involves efforts to reduce greenhouse gas emissions, enhance resilience to climate impacts, and promote sustainable practices to preserve the planet. [More information on Climate Action at the following Link: <https://www.youtube.com/watch?v=jhoa3OHivN8>]

Climate refers to the weather conditions that characterize a given place, including temperature, humidity, and wind. Each year is hotter than the last, and levels of carbon dioxide and

other harmful greenhouse gases continue to rise. The United Nations has made climate action one of its main sustainable development goals because climate change affects all countries without exception. Sea and ocean levels are rising, and weather phenomena are becoming more extreme. There is an increased need to be aware of the climate change our planet is undergoing and try to minimize its effects as much as possible (UN website).

Past Influences on today's Climate Crisis:

Since 2000, the word 'Anthropocene',- 'anthropo' for human and 'cene' for new – has gained prominence to highlight the impact of human activities on the Earth's land, atmosphere, and oceans, damaging its natural ecosystems and creating the climate crisis we have today (from: <https://www.nhm.ac.uk/discover/what-is-the-anthropocene.html>). The Anthropocene is characterized by significant human impacts on the Earth's geology and ecosystems. Scientists now agree that human activity rather than any natural progress is the primary cause of accelerated global warming. The following is a historical mapping of key periods of human activity that impact climate change today:

1. **Colonialism** has had a profound and lasting impact on climate change and injustice today. Here are some points that illustrate this connection:

a. **Resource Exploitation:** Colonial powers exploited natural resources in colonized regions, leading to environmental degradation. This exploitation includes deforestation, mining, and intensive agriculture, which have disrupted local ecosystems and contributed to long-term environmental damage.

b. **Land Dispossession:** Indigenous peoples and local communities were frequently displaced from their lands, which were then used for resource extraction or commercial agriculture. This displacement not only disrupted traditional land management practices but also increased the vulnerability of these communities to climate change. Potawatomi philosopher and climate justice scholar, Kyle Whyte, researches about the direct links between dispossessing Indigenous people of their land and environmental damage (e.g. Whyte 2018). The colonial displacement of Indigenous people from their lands disrupted traditional land management practices e.g. the Aboriginal people who were displaced from their land by the British colonists in the 18th century use to skillfully use control burning to help landscapes and wooded areas flourish (Bowman 2008). But with this practice eliminated and ignored and with climate change, the result today is large scale bushfires. Colonisation disrupted traditional knowledge systems and practices that were sustainable and adapted to local environments. This loss of traditional ecological knowledge has hindered efforts to address environmental challenges in many regions (Bowman 2008).

c. **Environmental Degradation:** The exploitation of natural resources by colonial powers often led to environmental degradation, including deforestation, soil erosion, and pollution. These environmental changes have had lasting impacts on the ecosystems that Indigenous people rely on.

d. **Economic Inequality:** Colonialism established economic systems that favored the colonizers and marginalized the colonized. This created a legacy of economic inequality that persists today, making it harder for formerly colonized nations to adapt to and mitigate the effects of climate change. Furthermore, colonialisation limited and/or denied Indigenous people access to resources and opportunities. This created Economic Marginalization, persistent economic disparity, and ongoing poverty and inequality in many Indigenous communities.

e. **Infrastructure Development:** Colonial powers often built infrastructure to extract and transport resources, such as railways and ports, without considering the environmental impact. This infrastructure has sometimes exacerbated environmental problems and made it difficult for local communities to adapt to changing environmental conditions.

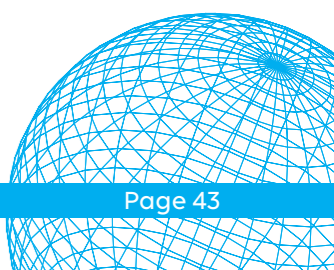
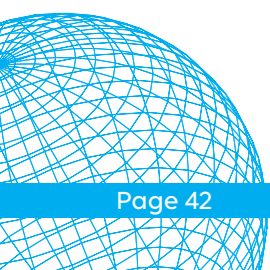
f. **Climate Vulnerability:** The historical and ongoing impacts of colonialism have increased the vulnerability of certain regions and communities to climate change. For example, the displacement of Indigenous people from their lands has often left them in more vulnerable positions, with less access to resources and support.

g. **Health Impacts:** The introduction of new diseases by colonizers had devastating effects on Indigenous populations, who had no immunity to these illnesses. Additionally, the disruption of traditional diets and lifestyles has led to long-term health issues.

h. **Social Disruption:** Colonialism disrupted social structures and governance systems within Indigenous communities. Traditional leadership and decision-making processes were often undermined or replaced by colonial authorities.

i. **Legal and Political Marginalization:** Indigenous people were often excluded from political processes and decision-making, and their legal rights were frequently ignored or undermined. This has led to ongoing struggles for recognition and self-determination.

[Further Reading Links: <https://news.climate.columbia.edu/2022/09/21/how-colonialism-spawned-and-continues-to-exacerbate-the-climate-crisis/> The historical consequences of colonialisation: <https://www.carbonbrief.org/revealed-how-colonial-rule-radically-shifts-historical-responsibility-for-climate-change/>]



Following from Colonialism, other periods in which mankind has a profound and lasting impact on the planet include:

- **Agricultural Revolution (10,000 years ago):** The development of agriculture led to large-scale land use changes, deforestation, and the domestication of plants and animals, significantly altering natural ecosystems.
- **The Industrial Revolution (late 18th century):** Marked by the transition to new manufacturing processes, this period saw a massive increase in the use of fossil fuels, leading to significant carbon emissions and environmental changes.
- **Atomic Age (mid-20th century):** The detonation of atomic bombs, starting in 1945, left a distinct layer of radioactive particles in the Earth's strata, marking a clear geological boundary (Than 2016).
- **The Great Acceleration (After WW2):** This period saw a dramatic increase in human activity, including population growth, industrialization, and consumption, leading to accelerated environmental changes such as global warming, deforestation, and biodiversity loss (MacNeill & Engelke 2014).
- **Plastic Pollution (mid-20th century onwards):** The widespread production and disposal of plastic has left a significant mark on the environment, with plastic debris (microplastics) now found in oceans and sediments worldwide.

Cutting across these key periods are many man-made markers that contribute to climate change, such as:

- Concrete:** The use of concrete has dramatically increased, leaving a distinct layer in the geological record. This material is now a common component of urban landscapes worldwide.
- Soot and Pollution:** Emissions from industrial activities and fossil fuel combustion have deposited layers of soot and other pollutants in the atmosphere and on the Earth's surface.
- Fertilizers:** The extensive use of synthetic fertilizers in agriculture has altered the nitrogen and phosphorus cycles, leading to nutrient pollution in water bodies and changes in soil composition.
- The increase in **Greenhouse Gases**, particularly carbon dioxide and methane, has led to global warming, resulting in melting ice caps, rising sea levels, and more frequent extreme weather events.
- Mass Extinction:** Human activities have accelerated the rate of species extinction, leading to a significant loss of biodiversity. For example, see 'The impact of

Climate Change on Bees in Ireland' - <https://www.beebombsireland.com/bee-blog/2024/9/8/the-impact-of-climate-change-on-bees-in-ireland-a-growing-concern>.

These markers highlight the profound and lasting impact humans have had on the planet.

Climate Justice:

This concept refers to the inequalities surrounding the causes, consequences, and proposed actions related to climate change. It emphasizes the disproportionate impact on vulnerable populations, particularly in the Global South, women, and Indigenous communities. The success of the Global North has often come at the expense of the Global South, worsening global inequality.

Climate justice and social justice are two sides of the same coin and addressing both is vital to creating a more equitable and sustainable future for all. Climate justice is rooted in recognising that climate change is causing a multitude of detrimental social, economic, health, and other impacts on vulnerable communities who have contributed the least to the climate crisis. In short, the climate crisis is making existing inequalities and injustices a whole lot worse (<https://www.greenpeace.org/international/story/58334/climate-justice-and-social-justice-two-sides-of-the-same-coin/>).

Social Injustices in Climate Change:

- People in the Global North have released significantly more carbon dioxide than those in the Global South countries. For example, the average Irish person uses about 15 times the energy of an average person living in Bangladesh (Golden 2023).
- The richest 10% of people in high-income countries emit roughly eight times more CO2 per person than the poorer half of the population. This links shows the emission of CO2 across nations over a period of time: <https://www.carbonbrief.org/>
- It is an injustice that it is the Global South countries who bear the brunt of climate change and environmental degradation largely caused by historical and ongoing exploitation by richer nations in the Global North.
- These injustices highlight several critical issues, all of which were discussed previously:

Historical Exploitation

Countries in the Global South have been exploited for their natural resources with little regard for the environmental and social impacts. This exploitation has left these countries with weak economies and degraded environments.

Economic Inequality

Poverty is often portrayed as 'natural', but we must recognise that poverty is the outcome of policy and political decisions and can therefore be changed (Adeyke & Donnelly 2023, pp. 30-31). For example, the economic systems established during the colonial times favoured the colonizers and marginalised the Indigenous people. This has led to economic inequalities against climate change that persist today.

Climate Injustice

The countries that contributed least to global greenhouse gas emissions are the most vulnerable to the impacts of climate change. A clear example of climate injustice is where countries such as Somalia, Chad, Malawi, and Niger are hit hardest by climate change, suffer the most and yet are the least responsible for the problem of global greenhouse gas emissions (www.concern.net/news/climate-injustices).

Dependence on Aid

The Global South countries are left reliant on international aid to cope with the impacts of climate change. While aid provides much-needed support, it is insufficient and comes with conditions that do not always align with the local needs and priorities of the affected communities. Furthermore, these communities are not asked for their advice and input on practices, and controls implemented can lead to ineffective and/or harmful outcomes.

What do you think could be done to ensure that the voices of these communities are heard, and their needs are met more effectively?

How Global Inequities continue today

The whole story - debt crisis in the Global South and its link to colonialism: <https://debtjustice.org.uk/wp-content/uploads/2022/08/Colonialism-and-Debt-briefing.pdf>
The exploitation of Global South countries continued after they gained independence from colonial rule through unfair trade rules, the imposition of debt, and tax avoidance measures (Hickel et al. 2022). Countries that grew rich during the colonial period now leverage their economic dominance to lower the costs of labour and price of resources extracted from the Global South. In other words, the Global North countries (wealthier industrial nations) benefit from the economic structures that keep the prices of resources and labour in the Global South countries below the global average level. Northern firms leverage monopoly power to depress Southern suppliers' prices while setting final prices artificially high (ibid). Patents play a key role here: 97% of all patents are held by corporations in high-income countries (Chang, 2008:141). We can see how this plays out in the case of major products like Phones. The iPhone is produced almost entirely by suppliers in the Global South. Apple,

headquartered in the Global North, forces its suppliers to compete to drive prices down to cost, with wages depressed to the level of subsistence. This allows Apple to produce the iPhone cheaply, and then, leveraging its patent monopoly (a privilege granted by the state), mark up the final price by over 100% (Smith 2016 cited in Hickel et al. 2022).

Geopolitical power also enables inequalities, e.g., high-income nations exercise monopoly power in the institutions of international economic governance such as the World Bank, The World Trade Organisation (WTO) and the International Monetary Fund (IMF) (Chang 2008). Bargaining power at the WTO (controls tariffs, subsidies and patents) is determined by market size and hence, enables high-income nations to set trade rules in their own interests (Hickel et al. 2022). The WTO have forced global South governments to remove tariffs (tax on goods imported/exported), subsidies (sum of money granted by a state/public body to help keep price of a commodity or service low) and other protections. Are such tariffs and subsidies removed from the wealthy Global North countries?

The inequalities experienced by the Global South are compounded by external debt service obligations, which drain their government's revenue and require further submission to economic policies dictated by creditors in the Global North (Hickel et al. 2022). In addition, structural dependence on foreign investors and access to Northern markets force Southern governments and firms to compete with one another, by cutting wages and resource prices (as discussed previously) in a race to the bottom. As Hickel et al. 2022 (p.9) highlight, 'Cheap labour and raw materials in the global South are not "naturally" cheap, as if their cheapness was written in the stars'. They are actively cheapened because these countries are integrated into the global economy on fundamentally unequal terms (ibid).

Steps to Rectify Inequalities:

- Democratize institutions of global economic governance, such as the World Bank, IMF, and WTO, so that Global South countries have more control over trade and finance policy (Hickel et al. 2022). For example, as McEachrane (2021) has pointed out, there are former colonial powers who refuse to give up their domination at the UN, World Bank and International Monetary Fund. Many European nations either oppose and/or ignore UN resolutions that call for democratic and equitable international order (McEachrane 2021). (More information is on link: Will European countries ever take meaningful steps to end colonial legacies? (theconversation.com) Check out how Ireland has voted at the UN resolutions, remembering that Ireland was a colonised country and experienced great poverty.
- End the North's use of unfair subsidies for agricultural exports and remove structural adjustment conditions on

international finance (Hickel et al 2022). This includes, implementing a global living wage system and a global system of environmental regulations (ibid).

- It is estimated that \$430 billion (about \$1,300 per person in the US) flows out each year in debt interest repayments from poorer Global South countries on loans (Grynspan 2023 cited in Golden 2023, p.30) – therefore, decrease interest rates for countries that have suffered from historical exploitation.

Although climate change is a threat to all of us, we must remember that it does not affect everyone equally. Climate change perpetuates and magnifies structural inequalities. Climate justice is about putting equity and human rights at the core of all decision-making and action on climate change.

<https://climatepromise.undp.org/news-and-stories/climate-change-matter-justice-heres-why>

Human Rights

What are Human Rights? Go to <https://humanrightssociety.org/> (youth for human rights internationally). The following is from humanrights.com

Human rights are based on the principle of respect for the individual. Their assumption is that each person is a moral and rational being who deserves to be treated with dignity. They are called human rights because they are universal. Whereas nations or specialized groups enjoy specific rights that apply only to them, human rights are the rights to which everyone is entitled—no matter who they are or where they live—simply because they are alive.

Yet many people, when asked to name their rights, will list only freedom of speech and belief, and perhaps one or two others. There is no question these are important rights, but the full scope of human rights is very broad. They mean choice and opportunity. They mean the freedom to obtain a job, adopt a career, select a partner of one's choice and raise children. They include the right to travel widely and the right to work gainfully without harassment, abuse and threat of arbitrary dismissal. They even embrace the right to leisure.

In ages past, there were no human rights. Then the idea emerged that people should have certain freedoms. And that idea, in the wake of World War II, resulted finally in the document called the Universal Declaration of Human Rights and the thirty rights to which all people are entitled.

A Brief History of the Declaration of Human Rights

The United Nations (1945)



Fifty nations met in San Francisco in 1945 and formed the United Nations to protect and promote peace. World War II raged from 1939 to 1945, and as the end drew near, cities throughout Europe and Asia lay in smouldering ruins. Millions of people were dead, millions more were homeless or starving. Russian forces were closing in on the remnants of German resistance in Germany's bombed-out capital of Berlin. In the Pacific, US Marines were still battling entrenched Japanese forces on such islands as Okinawa.

In April 1945, delegates from fifty countries met in San Francisco full of optimism and hope. The goal of the United Nations Conference on International Organization was to fashion an international body to promote peace and prevent future wars. The ideals of the organization were stated in the preamble to its proposed charter: "We the peoples of the United Nations are determined to save succeeding generations from the scourge of war, which twice in our lifetime has brought untold sorrow to mankind." The Charter of the new United Nations organization went into effect on October 24, 1945, a date that is celebrated each year as United Nations Day.

The Universal Declaration of Human Rights (1948)



The Universal Declaration of Human Rights inspired a number of other human rights laws and treaties throughout the world. By 1948, the United Nations' new Human Rights Commission had captured the world's attention. Under the dynamic chairmanship of Eleanor Roosevelt—President Franklin Roosevelt's widow, a human rights champion in her own right and the United States delegate to the UN—the Commission set out to draft the document that became the Universal Declaration of Human Rights. Roosevelt, credited with its inspiration, referred to the Declaration as the international Magna Carta for all mankind. It was adopted by the United Nations on December 10, 1948.

In its preamble and in Article 1, the Declaration unequivocally proclaims the inherent rights of all human beings: "Disregard and contempt for human rights have resulted in barbarous acts which have outraged the conscience of mankind, and the advent of a world in which human beings shall enjoy freedom of speech and belief and freedom from fear and want has been proclaimed as the highest aspiration of the common people... All human beings are born free and equal in dignity and rights."

The Member States of the United Nations pledged to work together to promote the thirty Articles of human rights that, for the first time in history, had been assembled and codified into a single document. In consequence, many of these rights, in various forms, are today part of the constitutional laws of democratic nations.

In summary, the history of human rights has been shaped by all major world events and by the struggle for dignity, freedom and equality everywhere. Yet it was only with the establishment of the United Nations that human rights finally achieved formal, universal recognition. Click on the links below to learn about the history of Human Rights that led to the establishment of the United Nations and where we are now.

<https://www.youthforhumanrights.org/videos/documentary/what-are-human-rights.html>

<https://www.youtube.com/watch?v=AGcy-tP3YOQ>

<https://www.youtube.com/watch?v=eYc4aFbW338>

https://wrap.warwick.ac.uk/id/eprint/76707/3/WRAP_1473860-la-010216-educating_about_through_for_human_rights.pdf

https://humanrights.gov.au/introhumanrights/resources/lesson_2.pdf

The procedural values which underpin Human Rights are freedom, toleration, fairness and respect for truth and for reasoning:

- Respect the rights and fundamental freedoms of all its members, including the students, acknowledging that the members have these rights and fundamental freedoms by virtue of their common humanity.

- Every human is entitled to these rights and freedoms because of their common humanity, and there will be no discrimination against anyone on grounds of race, religion, social class or gender. Guard against 'unconscious' and 'unintentional' racism and sexism.

- We must always recognise that everyone has duties and obligations, as well as rights and freedoms, and that these will include duties to the community and obligations to respect the rights and freedoms of others. (Ian Lister, Teaching and learning about human rights, School Education Division, Council of Europe, Strasbourg, 1984)

A Brief Overview of Ireland's Policy Response to Climate Change

Ireland's climate track record is characterised by huge gaps between climate aspirations, policy and actual Green House Gas emissions reduction (Robbins 2020). Despite commitment to climate and ecological action, greenhouse gas (GHG) emissions in Ireland increased by 4.7% in 2021, 'driven by increased use of coal and oil for electricity generation and increases in both the agriculture and transport sectors' (McLoughlin, 2023).

It was not until 2000 when Ireland first published its National Climate Change Strategy (DELG 2000). The 1990s and 2000s was the beginnings of a policy response to climate change, however Ireland's momentum to addressing climate change was not significant until 2017. An important driver for climate action was the Citizens' Assembly of 2016-2018 which considered among other topics, the questions of 'How the state can make Ireland a leader in tackling climate change'. Furthermore, the school strikes movement inspired by Swedish teenager Greta Thunberg brought young people and older to the streets to protest for stronger government action on climate change.

Links to Ireland's data on energy consumption and its relation to climate change.

Ireland's Energy System:
<https://www.iea.org/countries/ireland>

Ireland's climate resilience indicators:
<https://www.iea.org/articles/ireland-climate-resilience-policy-indicator>

ESB's Environmental Performance Report 2023:
https://www.esbnetworks.ie/docs/default-source/publications/esb-networks-environmental-performance-report-2020---doc-160721-gxf.pdf?sfvrsn=ecb8ae29_12
 Ireland's Energy Targets: <https://www.seai.ie/about/irelands-energy-targets>

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MAKE NO MISTAKE...THE CLIMATE CRISIS IS A COMMUNICATIONS CRISIS.

TOO COMPLEX: too academic and inaccessible to mainstream audiences	<p style="text-align: center;">“</p> <p style="text-align: center;">WE ARE CHALLENGED BY PROGRAMMATIC FUNDRAISING TO ACHIEVE CHANGE AT SCALE. PROGRAMS END.</p> <p style="text-align: center;">— <i>Compact for Status of Women</i>, March 2024.</p>
TOO LITTLE FUNDING: from climate funders on advocacy	
TOO QUIET: the climate movement is siloed and is not reaching AND engaging enough people and enough new people	
TOO MUCH RESPONSIBILITY: grassroots climate organizations prioritize their programmatic deliverables. AS THEY SHOULD!	
TOO MUCH MISINFORMATION: fossil fuel companies are driving the narrative - spending billions and reaching billions	

OUR APPROACH MUST EVOLVE

FROM		TO
COMPLEX	The climate crisis is too distant, too hard and too often climate related communications are academic, complex and inaccessible to a mainstream audience.	FOCUSED
POLITICIZED	Self interest takes priority over science and facts. Big oil and gas companies are paying millions to influencers on social media and PR firms to market their companies to a younger audience.	SHARED UNDERSTANDING
UNDER-RESOURCED	Many grassroots climate justice focused organizations lack capacity for marketing and communications and the time to prioritize unifying messages.	COLLABORATIVE
A VOCAL MINORITY	Too many one-offs, too activist. Green Peace, Extinction Rebellion, Fridays for the Future are the vocal minority. We want to attract the vocal majority...a place for everyone.	MOBILIZED MAJORITY

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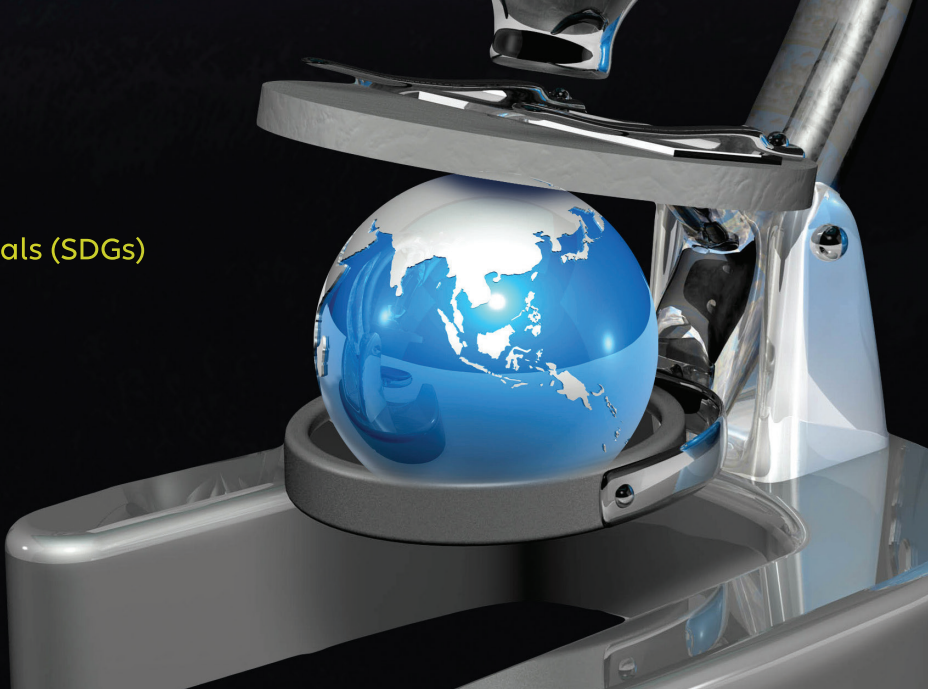
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Appendix I

The 17 Sustainable Development Goals (SDGs)

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1. No Poverty – End poverty in all its forms everywhere
 2. Zero Hunger – End hunger, achieve food security and improved nutrition and promote sustainable agriculture
 3. Good Health and Well-Being – Ensure healthy lives and promote well-being for all at all ages
 4. Quality Education – Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
 5. Gender Equality – Achieve gender equality and empower all women and girls
 6. Clean Water and Sanitation – Ensure availability and sustainable management of water and sanitation for all
 7. Affordable and Clean Energy – Ensure access to affordable, reliable, sustainable and clean energy for all
 8. Decent Work and Economic Growth – Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
 9. Industry, Innovation and Infrastructure – Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
 10. Reduced Inequalities – Reduce inequality within and among countries
 11. Sustainable Cities and Communities – Make cities and human settlements inclusive, safe, resilient and sustainable
 12. Responsible Consumption and Production – Ensure sustainable consumption and production patterns
 13. Climate Action – Take urgent action to combat climate change and its impacts
 14. Life below Water – Conserve and sustainably use the oceans, seas and marine resources for sustainable development
 15. Life on Land – Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
 16. Peace, Justice and Strong Institutions – Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
 17. Partnerships for the Goals – Strengthen the means of implementation and revitalize the global partnership for sustainable development

Source: <http://www.un.org/sustainabledevelopment/sustainable-development-goals>

Appendix II

Universal Declaration of Human Rights (Summary Version)

1. We are all born free and equal. We all have our own thoughts and ideas. We should all be treated in the same way.
 2. These rights belong to everybody, whatever our differences.
 3. We all have the right to life, and to live in freedom and safety.
 4. Nobody has any right to make us a slave. We cannot make anyone else our slave.
 5. Nobody has any right to hurt or torture us or treat us cruelly.
 6. Everyone has the right to be protected by the law.
 7. The law is the same for everyone. It must treat us all fairly.
 8. We can all ask for the law to help us when we are not treated fairly.
 9. Nobody has the right to put us in prison without a good reason, to keep us there or to send us away from our country.
 10. If we are put on trial, this should be in public. The people who try us should not let anyone tell them what to do.
 11. Nobody should be blamed for doing something until it has been proved. When people say we did a bad thing we have the right to show it is not true.
 12. Nobody should try to harm our good name. Nobody has the right to come into our home, open our letters, or bother us, or our family, without a good reason.
 13. We all have the right to go where we want to in our own country and to travel abroad as we wish.
 14. If we are frightened of being badly treated in our own country, we all have the right to run away to another country to be safe.
 15. We all have the right to belong to a country.
 16. Every grown up has the right to marry and have a family if they want to. Men and women have the same rights when they are married, and when they are separated.
 17. Everyone has the right to own things or share them. Nobody should take our things from us without a good reason.
 18. We all have the right to believe in what we want to believe, to have a religion, or to change it if we wish.
 19. We all have the right to make up our own minds, to think what we like, to say what we think, and to share our ideas with other people.
 20. We all have the right to meet our friends and to work together in peace to defend our rights. Nobody can make us join a group if we don't want to.
 21. We all have the right to take part in the government of our country. Every grown up should be allowed to vote to choose their own leaders.
 22. We all have the right to a home, enough money to live on and medical help if we are ill. Music, art, craft and sport are for everyone to enjoy.
 23. Every grown up has the right to a job, to a fair wage for their work, and to join a trade union.
 24. We all have the right to rest from work and to relax.
 25. We all have the right to enough food, clothing, housing and health care. Mothers and children and people who are old, unemployed or disabled have the right to be cared for.
 26. We all have the right to education, and to finish primary school, which should be free. We should be able to learn a career, or to make use of all our skills.
 27. We all have the right to our own way of life, and to enjoy the good things that science and learning bring.
 28. There must be proper order so we can all enjoy rights and freedoms in our own country and all over the world.
 29. We have a duty to other people, and we should protect their rights and freedoms.
 30. Nobody can take away these rights and freedoms from us.
- Source: This version of the Universal Declaration of Human Rights has been simplified by Amnesty International UK and is especially useful for younger people.
- For the full version of the Declaration of Human Rights see: [amnesty.org.uk/universal](https://www.amnesty.org.uk/universal)

Appendix III

Useful links

Architetti, Forest stories, available Vertical Forest | Milan | Stefano Boeri Architetti

Climate leaders such as Samsø, Denmark: <https://unfccc.int/climate-action/un-global-climate-action-awards/climate-leaders/samsø>

Colonialism and its link to climate change: <https://theconversation.com/colonialism-why-leading-climate-scientists-have-finally-acknowledged-its-link-with-climate-change-181642>

International Energy Agency (IEA) report on being Net Zero by 2050
<https://www.iea.org/reports/net-zero-by-2050>

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Find out about your use of ecological footprint and link to calculating your ecological footprint: <https://www.footprintnetwork.org/>

For more detail on the passive and sustainable social housing scheme: <https://passivehouseplus.ie/magazine/new-build/stirling-work-the-passive-social-housing-scheme-that-won-british-architecture-s-top-award#:~:text=Early%20in%20October%2C%20Norwich%20City,purest%2C%20most%20environmentally%20and%20socially>

Spain's electric railway system: <https://www.ineco.com/ineco/en/communication/news/spain-produces-most-efficient-high-speed-world>.

Zip Cars London: <https://www.zipcar.com/en-gb/car-hire/london>

Gender Equality, World Data: <https://ourworldindata.org/sdgs/gender-equality>

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