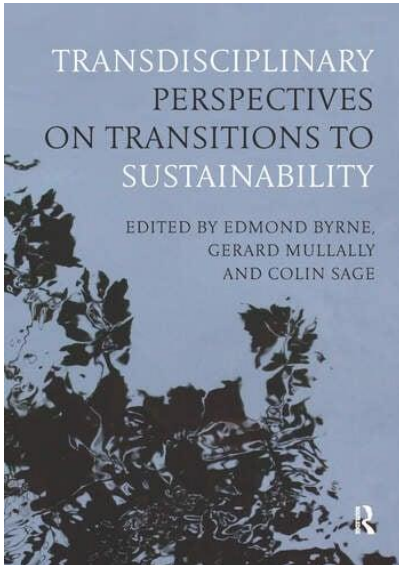


# Technology, Society and Sustainability

## *Some transdisciplinary research perspectives from University College Cork*

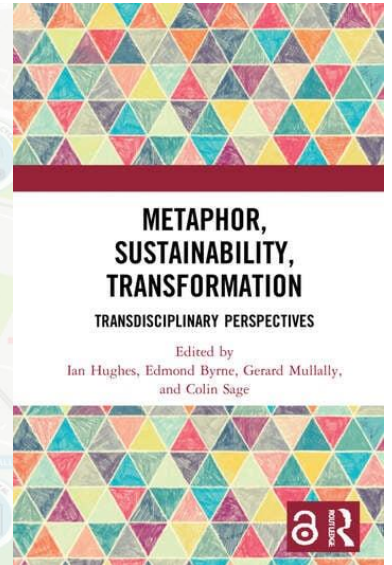
- **Dr Gerard Mullally**, Department of Sociology and Criminology, School of Society, Politics and Ethics, UCC
- **Prof Edmond Byrne**, Department of Process & Chemical Engineering, School of Engineering and Architecture, UCC



### Technology, Society and Sustainability

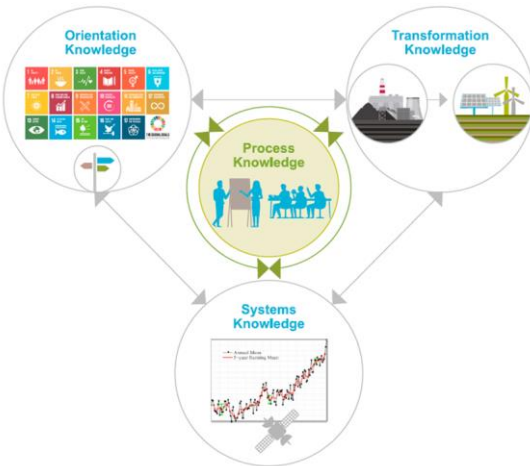
A necessarily transdisciplinary endeavour;

- in practice and in ethos
- requires both: disciplinary knowledge *and* ‘disciplinary humility’



Perspective  
**Characteristics, potentials, and challenges of transdisciplinary research**

Mark G. Lawrence,<sup>1,2,3,4\*</sup> Stephen Williams,<sup>1</sup> Patrizia Nanz,<sup>1,2</sup> and Orwin Renn<sup>1,4</sup>  
<sup>1</sup>Institute for Advanced Sustainability Studies (IASS), Potsdam, Germany  
<sup>2</sup>Institute of Environmental Science and Geography, University of Potsdam, Potsdam, Germany  
<sup>3</sup>Political and Administrative Sciences, University of Potsdam, Potsdam, Germany  
<sup>4</sup>Institute of Social Sciences, University of Stuttgart, Stuttgart, Germany  
 \*Correspondence: mark.lawrence@iass-potsdam.de  
<https://doi.org/10.1016/j.oneear.2021.12.010>



**Orientation knowledge:** the formulation and justification of the goals and objectives of social change processes.

**Transformation knowledge:** involves the understanding and/or development of practical (technical, legal, social, and cultural) means to reach the desired goals or objectives.

**Systems Knowledge:** empirical and theoretical studies ranging from single disciplines to integrative interdisciplinary perspectives on complex relationships between phenomena

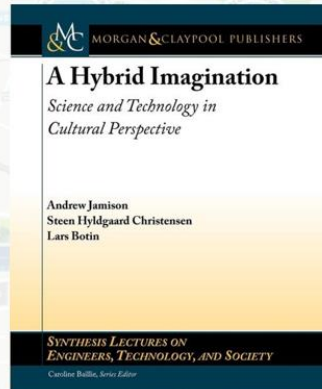
**Process knowledge:** the methodologies and procedures needed to design and carry out TDR projects (2022: 54)

# A Transdisciplinary Imagination?



The **sociological imagination** not only coaxes us to listen to others and imagine the circumstances of individual behavior; it also asks us to consider broader realities that condition and shape a person's life and decision-making. It is a tool with the potential to foster **empathy** across difference and across divides.

[Empathy is Hard. What We Need is \(Sociological\) Imagination - Contexts](#)



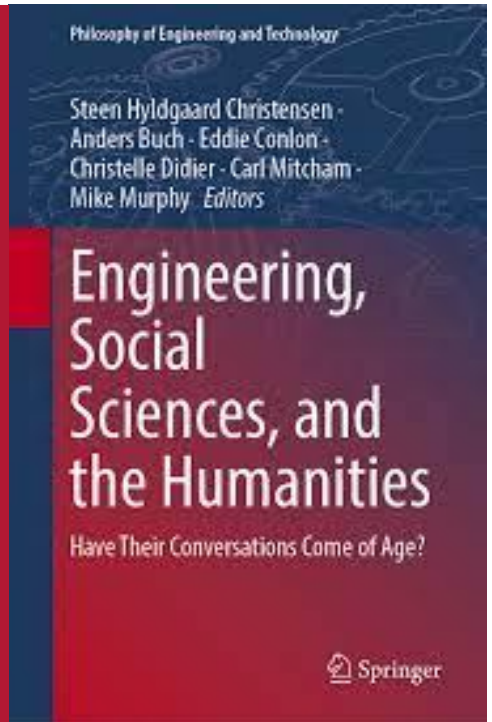
the combination of a **scientific-technical problem-solving competence** with an **understanding of the problems that need to be solved**. It is a mixing of scientific knowledge and technical skills with what might be termed **cultural empathy**, that is, an interest in reflecting on the cultural implications of science and technology in general and one's own contribution as a scientist or engineer, in particular' (Jamison, Christensen, and Botin 2011).

# Engineering with Social Sciences and Humanities; Necessary Partnerships in Facing Contemporary (Un)Sustainability Challenges?

*E. Byrne, K. Keohane, A. Revez, E. Boyle, C. McGookin, N. Dunphy, C. O'Neill, C. Harris, I. Hughes, C. Sage, J. Barry, B. Ó Gallachóir, G. Mullally*

“This chapter draws upon academics and practitioners from both sides of the house in an Irish university context, who have journeyed together upon such pathways. The terrain and nature of some of these journeys are described, including some of the inherent difficulties and challenges. We highlight the need for journeying together with ‘disciplinary humility’, as equal partners, if we hope to make authentic progress.”

In: *Engineering, Social Sciences and the Humanities* (Springer, 2023).



## in an evolving policy landscape...

**NESC** An Chomhairle Náisiúnta Eacnamaíoch agus Shóisialta  
National Economic & Social Council

**COUPL** UCC Department of Sociology  
State of Play Review of Environmental Policy Integration Literature  
Gerard Mullally, Department of Sociology, University College Cork, and Eoin Deery, Climate Protection Promotion Unit, School of Engineering, University College Cork  
Research Series Paper No. 2 July 2022  
A report for the National Economic and Social Council (NESC) prepared by the Green Transition Research and Advisory Group (GT-RAG).  
The NESC Research Series provides analysis of economic, social or environmental policy issues. The views are those of the authors and do not represent the definitive view of the Council.  
All of the full text of NESC publications is available at [www.nesc.ie](http://www.nesc.ie)

**Third Report and Recommendations of the Citizens' Assembly**  
HOW THE STATE CAN MAKE IRELAND A LEADER IN TACKLING CLIMATE CHANGE

**National Dialogue on Climate Action**  
The National Dialogue on Climate Action is an example of how the government actively engages with the civil society. It has hosted a series of regional and local meetings across the country with the aim of:  

- creating awareness, engagement and motivation to act in relation to climate change;
- creating structures and information flows to facilitate people gathering to discuss, deliberate and maximise consensus on responses to climate change, and to enable and empower appropriate action;
- establishing networks for people to meet periodically to consider evidence-based inputs on the economic, social, behavioural, environmental and public aspects of climate and energy policy;
- providing regular input into the prioritisation and implementation of climate and energy policies.

**RTÉ NEWS** SPORT ENTERTAINMENT BUSINESS LIFESTYLE CULTURE PLAYER TV RADIO  
What could a Citizens' Assembly on biodiversity in Ireland do?  
Updated / Wednesday, 16 Feb 2022 14:00

**THE IRISH TIMES**  
Citizens' Assembly calls for referendum on biodiversity loss  
State has "unacceptably failed" to tackle the biodiversity crisis and radical overhaul needed to manage environmental concerns

**Innovative Methods of Community Engagement: Towards a Low Carbon Climate Resilient Future Workshop Proceedings**  
Imagining2050 Project  
The National Environmental Research Council (NERC) funded project  
For full text: [www.nerc.gov.uk/ClimateAction/Imagining2050](http://www.nerc.gov.uk/ClimateAction/Imagining2050) By Amanda Stone, Gerard Mullally, May 2022

**How do we Engage Communities in Climate Action? Practical Learnings from the EPA**  
May 2022  
epa

# ...and research context

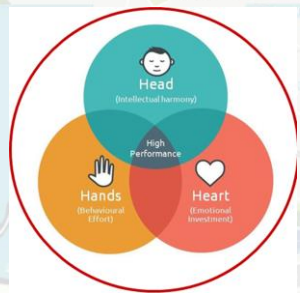


[Addressing societal challenges using transdisciplinary research | en | OECD](#)



[Better together: knowledge co-production for a sustainable society | Royal Irish Academy \(ria.ie\)](#)

# ...connecting to Head, Hearts and Hands



- Fals-Borda shaped two concepts: **senti-pensar (feeling- thinking)** and **participatory action research (PAR)**
  - **senti-pensar** concept, inspired in fishing communities (Fals-Borda 2002), recognizes the inherent inextricability of emotion and cognition; it relates closely to relational themes of embodied experience and reconstructing concepts (West et al. 2020).
  - Fals-Borda's **PAR** work centers on interaction-relations, community-oriented actions, and reflexivity in relationships between researchers and research participants (Gutiérrez 2016).



Base map designed by Amy Dodder. Participant contributions visualized for the first time in 2022.

**Ecosystems and People**

The importance of Latin American scholarship-and-practice for the relational turn in sustainability science: a reply to West et al. (2020)

Carlos Andres Gallegos-Riofrio, Eged Zent & Rachelle K. Gould

To cite this article: Carlos Andres Gallegos-Riofrio, Eged Zent & Rachelle K. Gould (2020) The importance of Latin American scholarship-and-practice for the relational turn in sustainability science: a reply to West et al. (2020), *Ecosystems and People*, 18(1), e18483. DOI: 10.1080/20939181.2022.2139499

Oliver Escobar launching our Deliberative Futures Toolkit remarked: *Talking without action is meaningless, action without talk is mindless*].

‘Much ...Latin American scholarship ....emphasizes that **thinking is an orphan without feeling and action**. Sustainability Science in Latin America has developed with constant infusions from sociocultural forms of relationality’.

The practice of transdisciplinary hermeneutics, both on an individual and on a team level, means **stepping out of the framework of science, entering a frame of combining head, heart and hands**. It will change science into art, as a combination of iterative practices of **cognitive, embodied and enacted** knowledge production

ISSUES IN INTERDISCIPLINARY STUDIES  
No. 35, pp. 170-199 (2017)

**Transdisciplinary Hermeneutics: A Symbiosis of Science, Art, Philosophy, Reflective Practice, and Subjective Experience**

by  
Hans Drielen  
Professor and Environment Program Coordinator  
Autonomous University of Mexico City (UACM)

Sustainability Science  
<https://doi.org/10.1007/s11425-022-01123-0>

**SPECIAL FEATURE: EDITORIAL**

The “How” of Transformation: Integrative Approaches to Sustainability

**Beyond “blah blah blah”: exploring the “how” of transformation**

Julia Bentz<sup>1,2</sup>, Karen O’Brien<sup>3</sup>, Morgan Scoville-Simonds<sup>4</sup>

...different ways of integrating the **means and the manner** in transformation processes: the integration of **meaning making**, the integration of **learning and listening**, and the integration of **different ways of being and becoming**. Drawing on both science and alternative ways of knowing...weave together new narratives and stories about nature, society, and the future, inviting us to embark on the journey of creating sustainability pathways.

## The BIG Question:

- How might communities, civic society and policy-makers better interact with innovators in science and technology in response to climate crisis?

‘The Science bit’ <====> Societal/Policy Implications

### Some findings/insights from our work:

- *‘Engaging, Envisioning, and Co-Producing Pathways for a Low Carbon, Climate Resilient Ireland’ (‘Imagining 2050’)*
- *Corca Dhuibhne 2030 / Dingle 2030*
- *Single Use Plastic free UCC*
- *EESD Conversations and Trends*
- *Consider some ‘Tools for Transformation’*

- *'Engaging, Envisioning, and Co-Producing Pathways for a Low Carbon, Climate Resilient Ireland' ('Imagining 2050')*
- *Corca Dhuibhne 2030 / Dingle 2030*
- *Single Use Plastic free UCC*
- *EESD Conversations and Trends*
- *Consider some 'Tools for Transformation'*

'The Science bit' <=====> Societal/Policy Implications

**Imagining 2050: Engaging, Envisioning, and Co-Producing Pathways for a Low Carbon, Climate Resilient Ireland**

EPA funded (€482.3k; 2018-2022)

Transdisciplinary ERI project

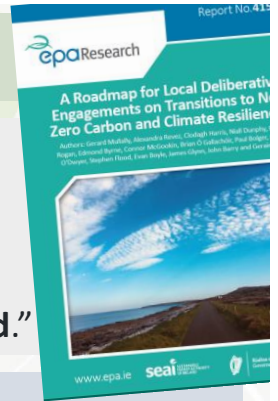
(PI: G. Mullally; also Alexandra Revez, Brian Ó Gallachóir, Clodagh Harris, John Barry (QUB), Niall Dunphy, Geraint Ellis (QUB), Paul Bolger, Evan Boyle, Connor McGookin, Fionn Rogan, Barry O'Dwyer, Amy Dozier, Stephen Flood James Glynn, Edmond Byrne).

**Publications:**

- **Revez et al., 2019.** Innovative methods of community engagement: towards a low carbon climate resilient future. *Environmental Research Institute, UCC.*  
[https://www.ucc.ie/en/media/projectsandcentres/imagining2050/InnovativeMethodsofCommunityEngagement\(lowres\).pdf](https://www.ucc.ie/en/media/projectsandcentres/imagining2050/InnovativeMethodsofCommunityEngagement(lowres).pdf)
- **Revez et al., 2021.** Deliberative Futures Toolkit: toward future-oriented communities and decision-making. *EPA.*  
<https://www.ucc.ie/en/media/projectsandcentres/imagining2050/Imagining2050Toolkit.pdf>
- **Mullally et al., 2022.** A roadmap for local deliberative engagements on transitions to net zero carbon and climate resilience. *EPA.*  
[https://www.epa.ie/publications/research/climate-change/Research\\_Report\\_415.pdf](https://www.epa.ie/publications/research/climate-change/Research_Report_415.pdf)
- **Revez et al., 2022.** Mapping emergent public engagement in societal transitions: a scoping review. *Energy, Sustainability and Society.* 12; 2.  
<https://doi.org/10.1186/s13705-021-00330-4>



# 'Imagining 2050' Research Project:



**Aim of the project:** “a transdisciplinary project seeking to explore new ways ..to **engage with civil society** using **innovative co-creation and deliberative approaches**, and test these approaches, to explore and consolidate **future visions** of and **pathways to a low-carbon and climate-resilient future in Ireland.**”

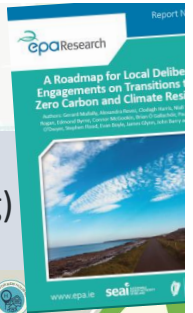
## Context:

- “It is increasingly acknowledged that meaningful public engagement in climate action requires **well-informed, equal and inclusive processes.**”

## Process:

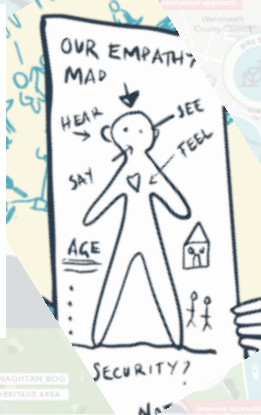
- Project involved “a **highly reflexive process**, using both desk-based and empirical Insights”

# 'Imagining 2050' Research Project:



## Mechanisms:

- Local deliberative Community Engagements (in Athlone, Ballincollig) through Storyboarding, Empathy mapping, Community mapping



## 'Imagining 2050' Research Project:



## 'Imagining 2050' Research Project:

### Results (/decentralized approaches required):

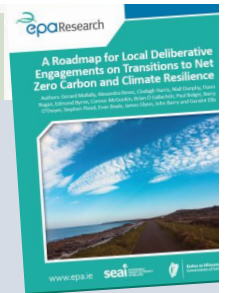
- “Few high-tech futures were proposed, with participants generally favouring **micro-generation** and **nature-based solutions** rather than dominant state led ideas that envision much larger-scale projects”
- “Fostering an understanding that there may be diverging priorities at different scales, which are nonetheless equally relevant, requires further **cross-scale** and **cross sectoral dialogue** and negotiations.”
- “This moves us away from centralised and state-led conditioned thinking to a **more decentralised, reflexive approach.**”
- “Providing more opportunities to engage in local climate action and the local democratic process, involving **local authorities** and other **local structures** of decision-making, has an **important role** to play in **bridging this gap.**”
- These findings also signal the importance of embracing “**human security**” as a core concept, as defined in the UN report Human Security Now (2003)”



## 'Imagining 2050' Research Project:

### Results (/underlying social infrastructure (health, housing) critical):

- “**Unforeseen issues**, such as the economic recession of 2012 and COVID-19 pandemic, have degraded living conditions and have vulnerabilities in **housing and public health provision**.”
- “Communities **rightly prioritise the strengthening of our social infrastructure** to sustain **disruptive change**, build **resilience** and adequately cope with **climate change**”
- “Expectations that communities will embrace a low-carbon future need to ensure that **priorities** such as **health, housing and wellbeing** are **adequately incorporated into long-term plans**.”
- “Climate issues should also be **framed** by taking into consideration the **social, economic and cultural context of communities**. In the context of everyday struggles and concerns, debates over wider climate change issues may seem remote and disconnected from real life.”



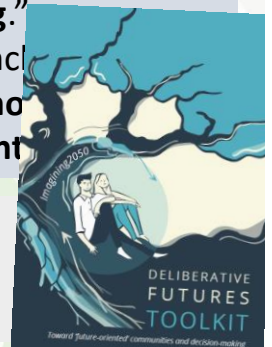
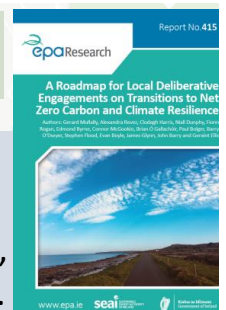
## 'Imagining 2050' Research Project:

### Results (/identifiable priority areas):

- “Prioritisation of **transport** as an area of action with **overarching benefits** in terms of providing for more diverse ways of travelling, health, community engagement and the greening of urban areas. Linked to this is an agreement around developing approaches at the nexus of **sustainable housing, transport infrastructure and planning**.”
- Priority areas to target for increased government regulation include **public and private transport, agriculture, food packaging, innovation and shared-cost arrangements for future flood alleviation/prevention**.”

### Project Output:

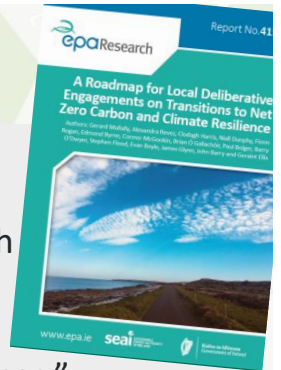
- “Offers a **roadmap for local deliberative engagements on transitions** to a low-carbon and climate-resilient economy.”



## Key 'Imagining 2050' Findings:

### Uncertainty, Expectations and Trust:

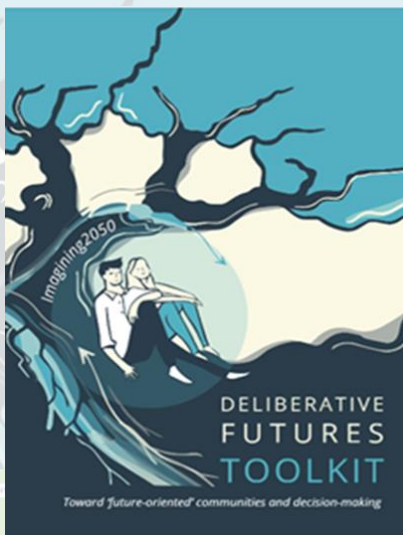
"In establishing tools for future thinking, based on deliberative processes, we tackle difficulties and **uncertainties** associated with the future as **volatile, unstable and unpredictable** by adopting a **multistakeholder** approach. ...**Mismatched expectations** in this context can often lead to **lack of trust in decision-making processes.**"



### "Getting the basics right":

Insights from engagements with local communities reveal a growing concern for building resilience from the bottom up by addressing **core underlying issues**, such as **housing and health**. The **core message** is that, in looking for **agency, innovation and voice**, we must **pay due care to the societal building blocks** that ensure the establishment of a **thriving and resilient society**.

## Deliberative Futures Toolkit



|   |   |  |   |  |
|---|---|--|---|--|
| <p><b>Sense-making</b></p> <p>Explore how people come to define complex and unfamiliar issues</p> <p>Find key anchors for sustaining meaning, and their role as empowering/disempowering drivers for action</p> | <p><b>Empathy Mapping</b></p> <p>Draw out unexpected insights about your audience or users</p> <p>Broaden individual perspectives and shape and transform collective thinking</p> <p>Discover gaps in current knowledge</p> | <p><b>Story Boarding</b></p> <p>Break down a vision into smaller and more detailed elements</p> <p>Explore user system interactions</p> <p>Pilot development of new technologies and practices</p> | <p><b>Community Mapping</b></p> <p>Engage communities in planning</p> <p>Raise awareness</p> <p>Develop a common understanding of emerging risks</p> <p>Provide a platform to explore potential solutions</p> | <p><b>Audience Polls</b></p> <p>Explore implications of individual decisions on collective goals</p> <p>Develop scenarios based on specific group trends</p> <p>Establish levels of consensus around specific issues</p> |
|---|---|--|---|--|

Figure 5.5. Visioning and scenario tools used to enable dialogue and collect data.

- *'Engaging, Envisioning, and Co-Producing Pathways for a Low Carbon, Climate Resilient Ireland' ('Imagining 2050')*
- *Corca Dhuibhne 2030 / Dingle 2030*
- *Single Use Plastic free UCC*
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- *Consider some 'Tools for Transformation'*

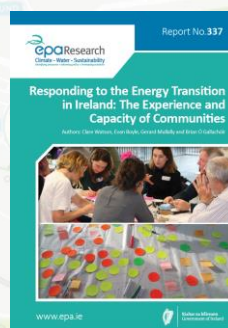
'The Science bit' <=====> Societal/Policy Implications

## Corca Dhuibhne 2030, Dingle Peninsula 2030

<https://dinglepeninsula2030.com/> (SFI funded)

### Some Publications:

- **Watson et al., 2020.** Responding to the Energy Transition in Ireland: The Experience and Capacity of Communities. *EPA*.  
[https://www.epa.ie/publications/research/climate-change/Research\\_Report\\_337.pdf](https://www.epa.ie/publications/research/climate-change/Research_Report_337.pdf)
- **Boyle et al., 2021.** Participatory network mapping of an emergent social network for a regional transition to a low-carbon and just society on the Dingle Peninsula, *Local Environment*, 27:12, 1431-1445.  
<https://doi.org/10.1080/13549839.2021.1936472>
- **McGookin et al., 2021.** Systematically reviewing the use of participatory methods in energy system modelling and planning literature, *MethodsX*, 9, 101862.  
<https://doi.org/10.1016/j.mex.2022.101862>
- **Boyle et al. 2021.** ESB Networks Dingle Project: Activating energy citizenship through collaboration, participation, and technological trials. *MaREI*.  
<https://www.marei.ie/wp-content/uploads/2022/07/Energy-Citizenship-Research-Report-Comp-1.pdf>
- **McGookin et al., 2021.** An innovative approach for estimating energy demand and supply to inform local energy transitions, *Energy*, 229, 120731.  
<https://doi.org/10.1016/j.energy.2021.120731>
- **Boyle et al., 2021.** Reflecting on a collaborative approach to a regional sustainability transition: Dingle Peninsula 2030, *Reflective Practice*, 22:3, 416-43  
<https://doi.org/10.1080/14623943.2021.1911794>



Participatory network mapping of an emergent social network for a regional transition to a low-carbon and just society on the Dingle Peninsula

Evan Boyle, Brian Ó Gallachóir & Gerard Mulally



Reflecting on a collaborative approach to a regional sustainability transition: Dingle Peninsula 2030

Evan Boyle, Clare Winters, Connor McGookin, Aoife Deane, Deirdre de Bhalis, Claire McEligott, Seamus O'Hara, Brendan Tuohy, Brian Ó Gallachóir & Gerard Mulally



An innovative approach for estimating energy demand and supply to inform local energy transitions

Connor McGookin<sup>a,b,\*</sup>, Brian Ó Gallachóir<sup>a,b</sup>, Edmond Byrne<sup>a,b</sup>

<sup>a</sup> Energy Policy and Modelling Group, MaREI Centre, Environmental Research Institute, University College Cork, Ireland

<sup>b</sup> School of Engineering, University College Cork, Ireland



Systematically reviewing the use of participatory methods in energy system modelling and planning literature

Connor McGookin<sup>a,b,\*</sup>, Brian Ó Gallachóir<sup>a,b</sup>, Edmond Byrne<sup>b</sup>

<sup>a</sup> Environmental Research Institute, University College Cork, Ireland

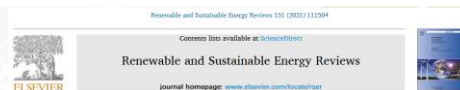
<sup>b</sup> School of Engineering, University College Cork, Ireland

## Corca Dhuibhne 2030, Dingle Peninsula 2030

<https://dinglepeninsula2030.com/> (SFI funded)

### Some Publications:

- **McGookin et al., 2021.** Participatory methods in energy system modelling and planning – A review, *Renewable and Sustainable Energy Reviews*, 151, 111504. <https://doi.org/10.1016/j.rser.2021.111504>
- **Boyle et al., 2021.** Regime-based transition intermediaries at the grassroots for community energy initiatives, *Energy Research & Social Science*, 74, 101950. <https://doi.org/10.1016/j.erss.2021.101950>
- **McGookin et al., 2021.** A compiled dataset of the energy usage indicators and unit energy consumption values available in Ireland, *Data in Brief*, 37, 107204. <https://doi.org/10.1016/j.dib.2021.107204>
- **Boyle et al., 2022.** The diffusion of sustainability and Dingle Peninsula 2030. *UCL Open Environment*, 4, 23. <https://doi.org/10.14324/111.444/000146.v2>
- **McGookin et al., 2022.** Doing things differently: Bridging community concerns and energy system modelling with a transdisciplinary approach in rural Ireland, *Energy Research & Social Science*, 89, 102658. <https://doi.org/10.1016/j.erss.2022.102658>
- **Boyle et al., 2022.** Flexibility & structure: Community engagement on climate action & large infrastructure delivery, *Energy Policy*, 167, 113050. <https://doi.org/10.1016/j.enpol.2022.113050>



Participatory methods in energy system modelling and planning – A review

Connor McGookin<sup>a,b,\*</sup>, Brian Ó Gallachóir<sup>a,b</sup>, Edmond Byrne<sup>a,b</sup>

<sup>a</sup> School of Engineering, University College Cork, Ireland

<sup>b</sup> MUSEI Centre, Environmental Research Institute, University College Cork, Ireland



Regime-based transition intermediaries at the grassroots for community energy initiatives

Evan Boyle<sup>a,b,\*</sup>, Clare Watson<sup>a,b</sup>, Gerard Mullally<sup>a,b</sup>, Brian Ó Gallachóir<sup>a,b</sup>

<sup>a</sup> MUSEI Centre, Environmental Research Institute, University College Cork, Ireland

<sup>b</sup> Department of Sociology, University College Cork, Ireland

<sup>c</sup> School of Engineering, University College Cork, Ireland



A compiled dataset of the energy usage indicators and unit energy consumption values available in Ireland

Connor McGookin<sup>a,b,\*</sup>, Brian Ó Gallachóir<sup>a,b</sup>, Edmond Byrne<sup>a,b</sup>



Flexibility & structure: Community engagement on climate action & large infrastructure delivery

Evan Boyle<sup>a,b,\*</sup>, Martin Galvin<sup>a</sup>, Alexandra Reyes<sup>a,b,c</sup>, Aoife Donohue<sup>a</sup>, Brian Ó Gallachóir<sup>a,b</sup>, Gerard Mullally<sup>a,b</sup>

<sup>a</sup> MUSEI Centre, Environmental Research Institute, University College Cork, Ireland

<sup>b</sup> Department of Sociology, University College Cork, Ireland

<sup>c</sup> School of Engineering, University College Cork, Ireland



Doing things differently: Bridging community concerns and energy system modelling with a transdisciplinary approach in rural Ireland

Connor McGookin<sup>a</sup>, Tomás Mac Uidhir, Brian Ó Gallachóir, Edmond Byrne

UCL OPEN ENVIRONMENT

RESEARCH ARTICLE

The diffusion of sustainability and Dingle Peninsula 2030

Evan Boyle<sup>a,b,\*</sup>, Connor McGookin<sup>a,b</sup>, Deirdre de Shazer<sup>a</sup>, Brian Ó Gallachóir<sup>a,b</sup> and Gerard Mullally<sup>a,b</sup>

## Some Key 'Dingle 2030' Findings:

### Sociological Findings

- Mapping goals in a **co-produced manner**, and the exclusions and partialities which they may entail, ...offer a more reflexive and responsible starting point for future planning within socio-technical transitions (Boyle, Ó Gallachóir & Mullally 2022) [Full article: Participatory network mapping of an emergent social network for a regional transition to a low-carbon and just society on the Dingle Peninsula \(tandfonline.com\)](#)
- From a bottom-up perspective, **intermediaries** play a crucial role in stimulating and facilitating the emergence and continuity of grassroots initiatives ...intermediaries would appear to play an important role in communicating across cultures of compliance (state), of competition (market) and of collaboration (civil society) (Boyle et al 2022) [The diffusion of sustainability and Dingle Peninsula 2030 – UCL Open \(scienceopen.com\)](#)
- ...**collaborative governance** not necessarily more effective in and of itself, but dependent on **characteristics of actors and their interaction** ... something understandable through reflection (Boyle et al. 2021) [Full article: Reflecting on a collaborative approach to a regional sustainability transition: Dingle Peninsula 2030 \(tandfonline.com\)](#)
- At a policy level we recommend that **community engagement** should become a **core aspect** of planning and development at a cross-institutional level concerning climate infrastructure (Boyle et al. 2022) [Flexibility & structure: Community engagement on climate action & large infrastructure delivery - ScienceDirect](#)

## Some Key 'Dingle 2030' Findings:

### Engineering/Technical/Energy Modelling Findings:

- **Limitations** of a transitions approach primarily based on **energy system models**: “adapting energy system models to socio-technical configurations is misguided - risks oversimplifying the messiness of the reality within which the energy system must be placed and is thus inappropriate” (McGookin et al. 2022)
- Modellers need to “be brave in **opening up to inter/trans-disciplinary collaborations** and face up to the limitations of our methods” (McGookin et al. 2022)
- **Local socio-economic context vital**: (un)sustainability issues exacerbated by regional/county/**local development plans** not adequately reflecting **concerns and priorities of the community** (McGookin et al. 2022)  
*All above from: [Doing things differently: Bridging community concerns and energy system modelling with a transdisciplinary approach in rural Ireland - ScienceDirect](#)*
- Greater attention needs to be given to **participatory approaches**: “limited progress to date ..reflective of the fact that climate funding has favoured technical sciences [over] the social sciences” (McGookin et al. 2021)  
[Participatory methods in energy system modelling and planning – A review – ScienceDirect](#)

Base map designed by Amy Cooper. Participant contributions visualised for their own health.

## Science & Climate

Editor: Kevin O'Sullivan  
kosullivan@irishtimes.com  
@kosullivanIT

The Irish Times,  
18 August 2022

### Addressing the key societal dimensions in climate science

Dingle Peninsula is flourishing with examples of locally-led climate action across the community

Evan Boyle,  
Alexandra Revez  
and  
Brian Ó Gallachóir

#### A shared vision for the future

The Imagining 2050 research project found the need for more deliberative and democratic forums that seek to bring together multiple stakeholders in order to develop a shared vision for the future. Not unlike national driven processes such as the Citizens' Assembly on Climate, emphasis on democratic innovation and dialogue with multiple stakeholders has the potential to allow for a more considered, equal and fair decision-making process where the people directly affected have a say and an understanding of the reasons behind the choices made.



The Dingle Peninsula is flourishing with examples of locally led climate action, achieved through the diffusion of sustainability across the community, from dairy farmers developing solar projects and children engaging in energy planning, to community members mobilising around sustainable transport planning and residents associations organising group retrofitting.

Instilling a collaborative approach to engaging with community contexts represents a favourable opportunity to enable this diffusion of sustainability, increasing local capacity to meet decarbonisation targets, with the social dimensions of climate mitigation given the same weight of importance alongside the technical solutions.

ious, this sixth of the IPCC is

engage in dialogue on climate change and responses to it.

(NEWKD), Ireland's electricity distribution system operator (ESB Networks),

Base map designed by Amy Cooper. Participant contributions visualised for their own health.

- *'Engaging, Envisioning, and Co-Producing Pathways for a Low Carbon, Climate Resilient Ireland' ('Imagining 2050')*
- *Corca Dhuibhne 2030 / Dingle 2030*
- *Single Use Plastic free UCC*
- *EESD Conversations and Trends*
- *Consider some 'Tools for Transformation'*

'The Science bit' <=====> Societal/Policy Implications

## Single Use Plastic free UCC Project

Aoife Hughes MSc

**Supervisory Team:** Claire O'Neill (Management and Marketing), Niall Dunphy (Cleaner Production Promotion Unit), Maria Kirrane (UCC Sustainability Officer), Gerard Mullally (Sociology) Edmond Byrne (Engineering)

### Key Findings:

- The persistence of **cost, availability of alternatives, personal preferences** and **unsustainable defaults** as **barriers to sustainable consumption**.
- **Infrastructure** influences behaviour; a lack of supporting infrastructure limits the adoption of sustainable alternatives.
- **Attitude-behaviour gap** a barrier to behaviour change; re-affirms need for **systemic change** rather than relying on individuals to drive change.
- Research showed **importance of leadership** roles in prioritising sustainability, and the importance of **sustainability champions** to drive **middle-out change in behaviours and policies**.
- Need for **stakeholder involvement** and **collaboration** to sustain sustainability initiatives and for their feedback to be used to adopt initiatives.



- *'Engaging, Envisioning, and Co-Producing Pathways for a Low Carbon, Climate Resilient Ireland' ('Imagining 2050')*
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'The Science bit' <=====> Societal/Policy Implications

## Engineering Education for Sustainable Development Trends:

### EESD2021: The Cork Amendment to the Barcelona Declaration (Fenner & Morgan et al.)

We declare that: In addition to the principles of engineering education set out in 2004's Barcelona Declaration, it is necessary that both engineering students and engineering practitioners are able to **urgently** respond to the diverse planetary risks through an understanding of six imperatives: **values, context, uncertainty, change, limits and vision**, by:

- Actively engaging in **rebuttal** of counter-factual information, alternative realities and denial of existing global threats

- Developing an **anticipatory future vision** which embraces the need for **restructuring** of how humans live on the Earth

- Delivering **radical change** through the **co-generation** of solutions **across disciplines** and with **diverse Stakeholders**

- Seeking **resilient, flexible** and **adaptive** engineered systems and essential critical infrastructure capable of operating within **diverse uncertainties**

- Operating within **resource** and **technological limits** whilst seeking innovations that go **beyond "doing no harm"**

- **Challenging orthodoxy** and honestly assess the **risks** and **impacts** that may be associated with some **technological/scientific advances**.

- *'Engaging, Envisioning, and Co-Producing Pathways for a Low Carbon, Climate Resilient Ireland' ('Imagining 2050')*
- *Corca Dhuibhne 2030 / Dingle 2030*
- *Single Use Plastic free UCC*
- *EESD Conversations and Trends*
- *Consider some 'Tools for Transformation'*

'The Science bit' <=====> Societal/Policy Implications

## Tools for Transformation:

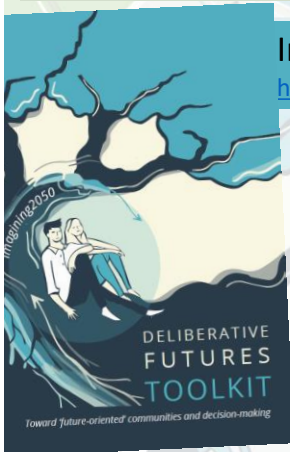
Imagining 2050 Deliberative Futures Toolkit (Revez et al., 2021)

<https://www.ucc.ie/en/media/projectsandcentres/imagining2050/Imagining2050Toolkit.pdf>

Empathy Mapping

Transformative Sustainability Learning

*"Empower individuals by encouraging them to critique status-quo values and social norms and to adopt sustainable principles and ethics by addressing unsustainable practices" (Aboytes and Barth, 2019)*



UN SDG Toolkit  
(Barimo et al., 2021)

<https://www.ucc.ie/en/sdg-toolkit/>





# Integrating research, learning ...

The Dept Sociology and Criminology and the Dingle Creativity and Innovation Hub invite you to

## Walking Conversations: The Art of Paying Attention OR Non-procedural Methodologies

6-7th March  
Venue Skellig Hotel/Dingle Peninsula

10 YEARS CELEBRATION

### University Wide Module: Sustainability - 2022 (UNW005/ CPD1440)

Putting sustainability in its place: putting yourself in the picture.  
Gerard Mulally, Maria Egan and John Fallon

A TRADITION OF INDEPENDENT THINKING

### Sustainable Futures

### Sociology of Sustainability & Global Challenges

Walking Methods in Social Research

Walking, talking, [Re-]imagining socio-ecological sustainability: Research on the move/moving research

Gerard Mulally and Maggie O'Neill  
Sociology & Criminology, University College Cork, Cork, Ireland

Deirdre de Bhalis, Brendan Tuohy, Maggie Breen, and Andrew Duggan  
The Dingle Creativity and Innovation Hub, Dingle, Ireland

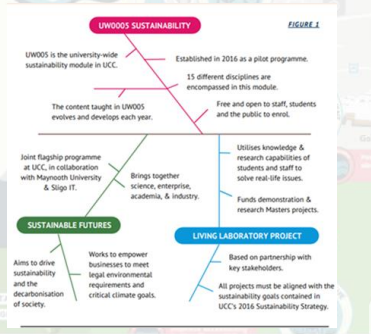
Elaine Ní Loinigh  
Publicist Chorus Dublin, Upper Dargis, Ireland

### Pathways to Sustainability: Walking the talk

14th Irish Behaviour Research Office (IRBO) and IRBO Dublin, Department of Psychology and Environmental Psychology

Abstracts

What is the Energy Transition and the Built Environment? (EBCO-CPT)



### Announcing the Economy and Society Summer School 2023

#### Economy + Society PhD Summer School

Dingle, Ireland  
11 - 14 April, 2023

[Conference 2023 – Economy & Society Summer School \(economyandsocietysummerschool.org\)](http://economyandsocietysummerschool.org)

Base map designed by Amy Clouder. Participant contributions visualised for the first time in 2022.

# ...and engagement

## SUSTAINABILITY SEMINAR

FOR THE SUSTAINABILITY DEVELOPMENT GOALS (SDGs)

1-2 NOVEMBER UMAL CARIBE  
4 NOVEMBER UMAL BOGOTA

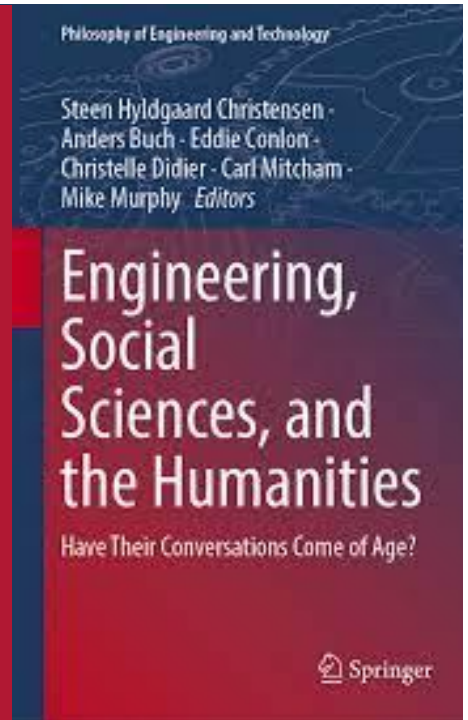
A SEMINAR TO BUILD COMMUNITY ENGAGEMENT AND ENGAGE RESEARCH SKILLS INTO SUSTAINABILITY & CLIMATE ACTION



Base map designed by Amy Clouder. Participant contributions visualised for the first time in 2022.

“The human condition is such that **scientific facts alone serve to leave us cold**. It is in and through **perspectives and worldviews shaped by stories, myths and narratives that we are inspired to act**. When these are imbued and aligned with scientific fact and engineering endeavor, societal passion is aroused and inspired in a way that can make for powerful progress of a positive kind. This fundamental realization is finally coming to pass at the highest levels. For example, the UN Environment Programme Emissions Gap Report warns that despite all we’ve known for quite some time, there is still yet *‘no sign of GHG emissions peaking in the next few years ..deep and rapid decarbonization processes imply fundamental structural changes are needed’*, changes which can only be effected and accompanied by *‘deep-rooted shifts in values, norms, consumer culture and world views [which] are inescapably part of the great sustainability transformation.’* (UNEP, 2019). That is, **the changes needed are largely non-technological but societal**. This reads as a powerful call to arms for **SSH**, and the embedded knowledge, skills and values therein, to work front and center and **as equals with engineering and science, in eliciting transformative, paradigmatic change.**”

Byrne et al. (2023)



# World Café Primer; The BIG Questions..

**Heart**

‘The Science bit’  $\longleftrightarrow$  Societal/Policy Implications ..and Actions!

**Head**

**Hands**

High Performance

Head (Intellectual Learning)

Hands (Practical Ethical)

Heart (Emotional Investment)

# Transformative Sustainability Learning

- “Empower individuals by encouraging them to critique status-quo values and social norms and to adopt sustainable principles and ethics by addressing unsustainable practices” (Aboytes and Barth, 2019)

- Based on Transformative Learning (Mezirow, 1998 & 2003)



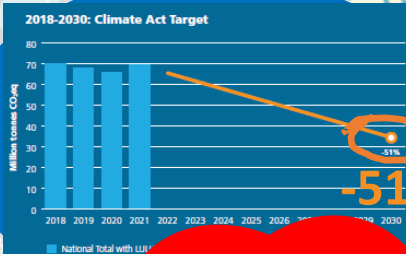
- Disorienting dilemma
- Critical reflection on assumptions, beliefs and values
- Reflective discourse (free & full discourse)
- Revise assumptions
- New outlook → Taking action

**Head**

**Heart Hands**

**Head,  
Hands  
& Heart;**

**Scientific/Technological,  
Action: Policy/Law & Implementation  
& Societal Engagement ..Disconnect?**

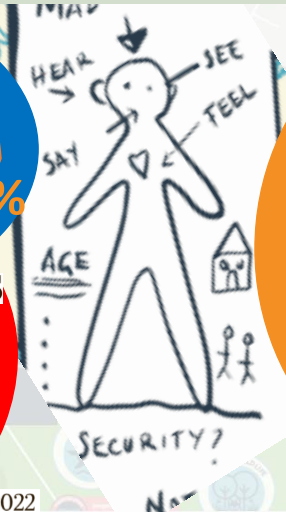


**THE IRISH TIMES**  
**Voters oppose many climate action measures**

Friday, October 8, 2021

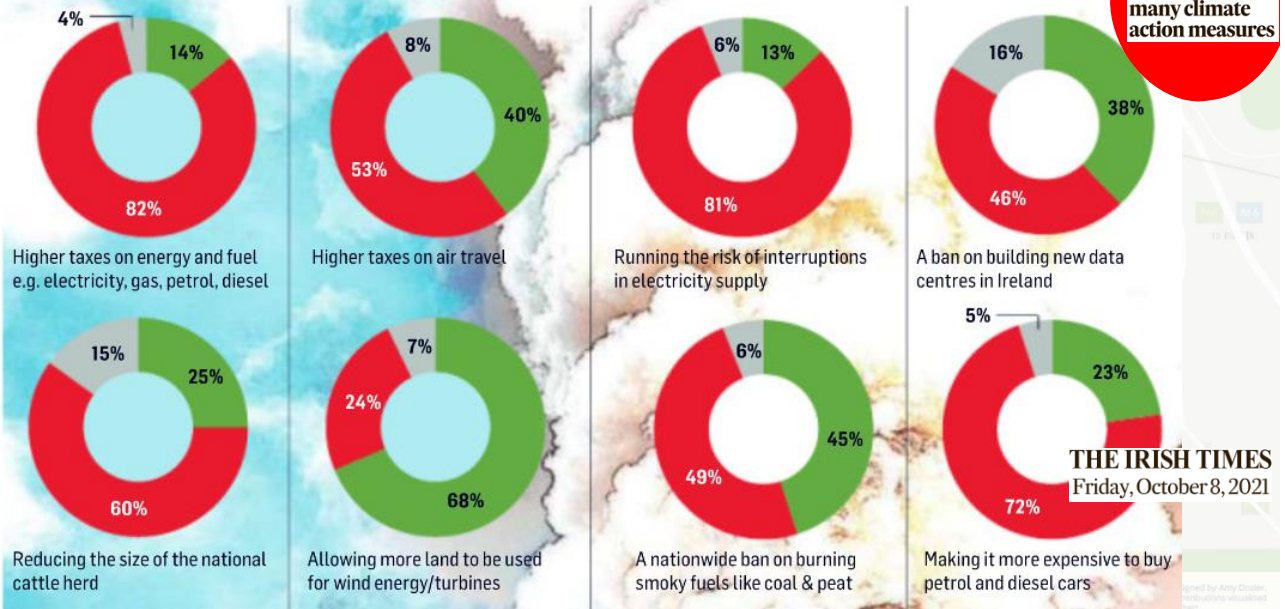
**Under-24s favour domestic flights ban and car-free zones**

Tuesday, November 29, 2022

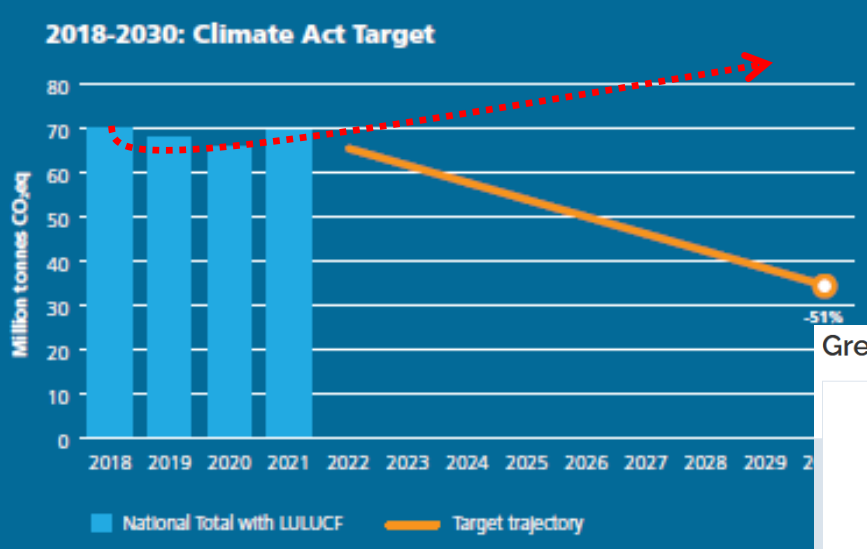


*“The Climate Action and Low Carbon Development (Amendment) Act 2021 commits Ireland to reach a legally binding target of net-zero emissions no later than 2050, and a **cut of 51% by 2030** (compared to 2018 levels).”*

**Climate change:** For each of the following, would you personally support it or would you be opposed to it?



### Evidence of *Head, Hands & Heart Disconnect*



**Rising emissions will demand deeper cuts, says EPA**

THE IRISH TIMES  
Thursday, July 21, 2022

Greenhouse gas emissions Ireland



Key messages

Greenhouse gas (GHG) emissions in Ireland increased in 2021

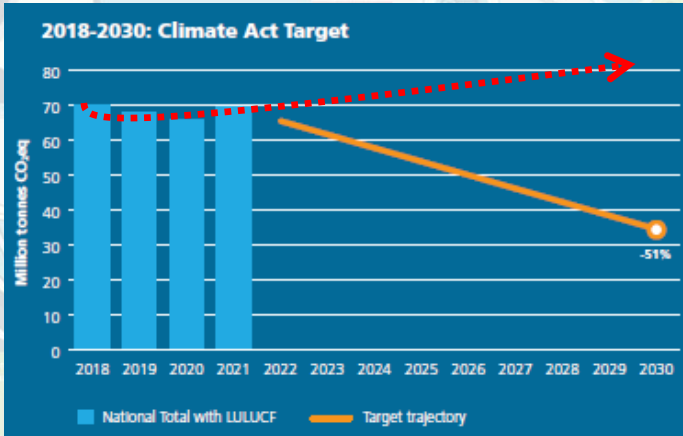
Change in emissions since 2020

**+4.7%**

EPA (2022)

# World Café; The BIG Questions..

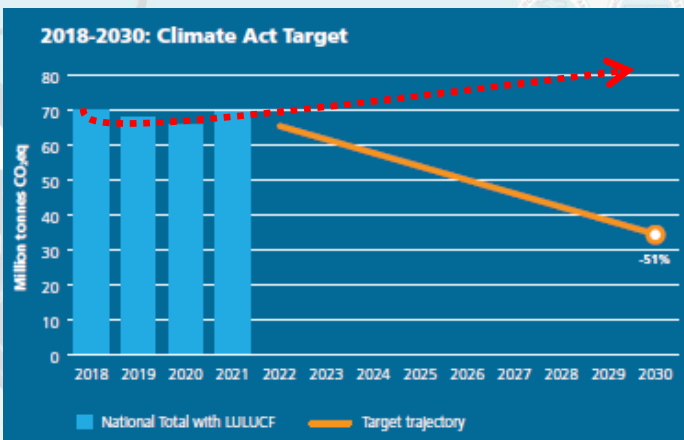
'The Science bit' *Heart* <=====> Societal/Policy Implications ..and Actions!  
*Head*



*Hands*



# World Café; The BIG Questions..



1. Disorienting dilemma; Wrong trajectory ..but our hearts not in it?! 🤔😞
2. Critical reflection on assumptions, beliefs and values
3. Reflective discourse (free & full discourse)
4. Revise assumptions - New outlook
5. Taking action; What action(s) are appropriate?

## World Café; Primer Question..

Go to: **slido**

Enter event code #:

**HHHATU**

## World Café; Primer Question..

What do you understand by  
*'Sustainable Future'*?





# Technology, Society and Sustainability

## *Some transdisciplinary research perspectives from University College Cork*

- **Dr Gerard Mullally**, Department of Sociology and Criminology, School of Society, Politics and Ethics, UCC
- **Prof Edmond Byrne**, Department of Process & Chemical Engineering, School of Engineering and Architecture, UCC

