



University
of Glasgow

Centre for
Sustainable Solutions



GREEN RECOVERY DIALOGUES

FROM COVID19 to COP26
FORGING A JUST AND SUSTAINABLE FUTURE

DIALOGUE 1

**Implementing
Green Futures**

DIALOGUE 2

**Raising Ambition
to Net Zero**

DIALOGUE 3

**Re-Thinking
Consumption**

Green Recovery Dialogues: From COVID19 to COP26

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EXECUTIVE SUMMARY

INTRODUCTION & BACKGROUND

In Autumn of 2020, Glasgow City Council partnered with the University of Glasgow's Centre for Sustainable Solutions along with Policy Scotland to deliver a series of three Green Recovery Dialogues (GRDs). The primary aim of these dialogues was to ensure a just and sustainable recovery from the extremely challenging period of the COVID-19 pandemic, in a context of increasing awareness of the relationship between human and planetary wellbeing. The University of Glasgow and Glasgow City Council working together on this agenda highlights a significant partnership where the knowledge and research ability of the University is combined with the Council's capacity to implement change.

The financial difficulties experienced throughout the COVID pandemic meant that a key priority has revolved around economic recovery and subsequent growth. The revival of the Scottish economy poses an opportunity to draw on lessons learnt from the 2008 financial crisis, where recovery packages were offered. However, the COVID crisis has had structurally different impacts on the supply and demand side. The widely discussed transition to net-zero emissions has been at the forefront of global political discourse since the Paris Agreement in 2015, and although COVID-19 brought a wealth of negative consequences, it also saw measures taken that helped to decrease greenhouse gas emissions and presents an opportunity to accelerate the transition to net-zero emissions. The aim of the dialogues was to assist in enabling better-informed partnership working for the City's and the University's carbon neutrality targets of 2030.

THE DIALOGUES

The 2020 Green Recovery Dialogues were active discussion events with the objective of mobilising academic and practitioner communities to identify common issues and generate potential solutions to the exponentially growing threat of climate change. Three primary themes were identified for discussion, with a degree of flexibility provided for input concerning related issues. These are pertinent both in the context of COVID-19, and its subsequent impacts, as well as for specific climate challenges that would be addressed at COP26 in Glasgow, November 2021.

The themes:

- **Implementing Green Futures:** Increasing urban green space and implementing nature-based solutions
- **Raising ambition on Net Zero:** Providing low-carbon energy and housing solutions
- **Re-thinking Consumption:** Achieving sustainable recovery through green and/or circular economies

DIALOGUE FORMAT: The GRDs welcomed a range of expert individuals to deliver multiple, transdisciplinary perspectives on solutions for implementing business models and policy initiatives. The dialogues aimed to create an ethos of co-creation around a sustainable transition that was recognised to go hand-in-hand with a just transition. Each dialogue explored sub-themes via breakout rooms (dialogues took place virtually via Zoom due to COVID restrictions) with the appropriate individuals directed to their area of expertise. As an example, individuals from SEPA, Glasgow City Council, and the College of Medical, Veterinary & Life Sciences among others entered the breakout room for the dialogue on the 'promotion of biodiversity through the strategic use of natural assets'. In preparation for the dialogues, each participant viewed a series of pre-

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recorded videos from field experts, providing base knowledge to scaffold everyone to the same starting point and provoke conversation. Each breakout room hosted ca. 10 speakers (some observers), with participants highlighting practical steps that could be taken immediately, or in the near future, with eventual solutions being offered to senior leaders as options to consider. The proposed solutions derived from these dialogues were put forward to a Senior Leadership Roundtable in February 2021. This round table included prominent figures from Glasgow City Region's public and private sector who possess the ability to facilitate change through leadership and partnership, such as University of Glasgow Principal, Professor Sir Anton Muscatelli, Leader of Glasgow City Council, Susan Aitken, and the Director of the Centre for Sustainable Solutions, Professor Jaime Toney.

SETTING THE TONE: Facilitators introduced the dialogues to stress the importance behind the discussions, not only for the sustainable future of Glasgow, but globally, and what they could mean for the sustainable and economic future of Glasgow and other global cities. In the context of the pandemic:

'as we look to emerge from the COVID crisis, while we also endure a climate emergency (which has been looming for some time), our success greatly depends on mobilising our collective efforts', [the 2020 dialogues will] 'provide an impetus for our ambitions and material for our work'. Cllr Susan Aitken, GCC

In looking at the importance of these dialogues:

'There are a whole range of issues that must be considered and brought to this roundtable of policymakers both from the university and the city to see how we can develop a systemic approach to improving our climate performance'. Des McNulty, Policy Scotland

A just transition also needs to be considered:

'Social justice and sustainability need to go hand in hand, as People Make Glasgow is not just a motto – it is a truth about our greatest asset – one which will be integral to our climate ambitions'. Gavin Slater, GCC

A key element of the GRDs was the lead-up to COP26 in Glasgow and how the city can address issues that might also arise at the global conference. In the weeks and months prior to the event in Glasgow, these dialogues aimed to help Glasgow and the UK provide guidance and methodologies to help with proposed recovery packages and strategies for the recovery from COVID-19. This assistance could include guidance on net-zero building, energy storage, transport alternatives and restoration of green space, city wildlife and biodiversity, all of which were prominent outputs of the GRDs. The Green Recovery Dialogues were initiated with several different objectives in mind, summarised by Professor Jaime Toney: 'the goal is to take action to move forward towards carbon neutrality, but also climate resilience, and we see Glasgow as a city that can be a driver for this sort of change'.

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1 IMPLEMENTING GREEN FUTURES (DIALOGUE 1)

DIALOGUE 1 OVERVIEW		
FOCUS	How can Glasgow implement green futures by increasing urban green space and delivering nature-based solutions?	
KEY FACILITATORS		
Professor Neil Metcalfe	Institute of Biodiversity, Animal Health & Comparative Medicine	University of Glasgow
Gillian Dick	Spatial Planning Manager, Development & Regeneration Services	Glasgow City Council
PRE-RECORDED VIDEOS		
Pre-recorded videos were provided to the participants in advance, to gain topical background knowledge provided by the following field experts.		
Professor Sebastian Chastin	Glasgow Caledonian University	
Dr Willie Yeomans	Clyde River Foundation	
Dr Larissa Naylor	University of Glasgow & Royal Botanic Gardens (Edinburgh)	
Available at:	https://policyscotland.gla.ac.uk/green-recovery-dialogues-experts-videos/	

Professor Sebastian Chastin offered insights into why certain temporary measures put in place during the Covid pandemic provided an invaluable opportunity for us to recover economically from the pandemic whilst also offering sustainability-based benefits. There are various health issues in modern society, with physical inactivity and consequent obesity being a pandemic of its own. To remedy these problems, organising our urban assets more appropriately would bring a wealth of benefits to health and environment. As an example, Professor Chastin highlighted new cycle lanes that improved mobility around the city throughout the pandemic and posed the question ‘can we continue to implement these measures post-pandemic, providing opportunities for experimentation?’. The video asks whether, rather than starting building things in hard bricks that are permanent fixtures of the city, we can think of these measures more in terms of Lego bricks, as temporary infrastructures that can be moved around and adapted.

The next pre-recorded video for Dialogue 1 was provided by Dr Willie Yeomans. The return of wild salmon to the Clyde proved to be a strong indicator of the improvements to water quality in the Clyde over the last 30 years and current excellent water and habitat quality. The video asked how we can educate children for the future on important matters regarding sustainability. He points to a project where local school children are given trout eggs to take care of for 5-6 weeks before they hatch. The children are walked to the river and release their hatched fish into the river. This can potentially be a powerful action for children to undertake, with hands-on involvement instilling a sense of ownership and stewardship. It was hoped that this education and engagement with nature could inspire a positive behaviour change.

The final video came from a NERC-funded public engagement project led by Dr Larissa Naylor and the Royal Botanic Gardens Edinburgh, titled ‘Greening the Grey’. The project’s aim was to investigate how we could make constructed grey assets, that must remain grey for their primary function, more sustainable, or ‘green’ them. Coastal sea walls were used as an example of how greening can transform sea walls to make them multi-functional - providing

various habitats and consequently improving the ecosystem that they provide for society's biodiversity. One of the key rationales for the significance of this project is the increasing urbanisation of coastal areas, tied in with rising global sea levels, resulting in damages and losses to a multitude of wildlife habitats along the coastline. It is suggested that in instances where we build hard structures, we can optimise them to improve their multifunctionality through incorporating various habitats for species. This will allow us to help maintain some of the integral ecosystems as these habitats are disrupted by the increasing threat of climate change.

1.1 DIALOGUE 1 - SUB THEME A: Promoting biodiversity through strategic use of natural assets.

Sub themes for breakout room discussions in Dialogue 1 (Theme A) featured:

- Biodiversity, ecology and geodiversity
- Natural assets and their quantity, quality and fit for purpose

Theme A key outputs:

- Re-engineering the banks of the Clyde is essential, as is consultation of appropriate people (aquatic ecologists, etc.) on planning and riverside developments.
- The public connection with the river is important and education/awareness of the Clyde can start as early as primary school with field trips, etc.
- The Clyde needs to be opened up to less affluent areas.
- A softer landscaping of riverside areas will increase biodiversity, while potentially improving the health of the public (as the banks will be more attractive if they are less concreted).
- Councillors and local authorities need to continue to be educated on environmental issues.
- Lighting can be a form of pollution and a detriment to environmental and ecosystem outcomes, therefore appropriate people need to be involved at the start of the process.
- While smart lighting systems may be more expensive to install, they save money in the long-term due to lower electricity consumption.
- Interdisciplinary collaboration is pivotal.

UNDERLYING QUESTION

How can we promote biodiversity and natural assets as a means to achieving carbon neutrality?

Part of the discussion revolved around the River Clyde in Glasgow, focusing on the connection with nature, educating the local community, and the river's history and potential regeneration. It was unanimously agreed that the river is an integral part of Glasgow's cultural history yet was neglected after the collapse of the shipbuilding industry. Even at the peak of ship production, access was largely denied to the public, inhibiting the ability for many to establish a connection to the Clyde. A lot of these restrictions are still in place today and the river remains perceived as a site of possible danger. The fences and barriers restrict public access and impose a sense of 'river fear' on the public. One participant stressed that the people of Glasgow will rarely walk along the Clyde unless purposely going. By comparison the River Seine in Paris serves as a massive city attraction; whereas the Clyde offers little in terms of cafes, bars or any other form of entertainment.

Undoubtedly a degree of investment would be required to improve these spaces around the river for aesthetic reasons, however it would also be of benefit to begin re-naturalising the river. For this re-naturalisation, a widespread redevelopment is likely to be necessary to make space for the water but also to bring back some of the natural habitats in the river that have been lost due to a lack of functioning sediment systems amongst other issues. Having a diverse range of geomorphological landscapes is important in helping to underpin and provide the dynamic natural habitats that biodiversity thrives in. There is a lot that can be done regarding the river, with other potential improvements being greening the riverbank to make it less concreted or dealing with and improving the riparian zone (the interface between land and river). If we allow space for these natural developments, then we will be more climate resilient, but costs will also be reduced as we are not building any big walls/barriers or implementing any artificial systems.

A prominent theme throughout this breakout room's discussion was the focus on connecting the people of Glasgow with nature, with one solution being educating the public on the city's green spaces and urban wildlife. There are ways to use eco-pedagogy to help others understand that we need space for the development of natural process and to free up money for other priorities. Engaging Glasgow's school children with the Clyde was emphasised, perhaps focusing on the river's historical importance to the city. A significant proportion of children in school have never even seen the Clyde, likely as they had no reason to. This minimal level of engagement with one of the city's key natural elements does pose some concern regarding public environmental awareness. It is possible that there are not enough spaces for the public to safely interact with the river and therefore engagement is low, and so we need to make a push to get children to surrounding burns and green spaces for education. If we can get people into the rivers, and teach them about its significance, interest and engagement will rise.

This topic led to the discussion of how the 'Govan young' could open these natural spaces (like the river) to less affluent areas, highlighting a potential to change the lives of young people for the better. The City needs to make it easy for the public to become interested in Glasgow's environmental issues and for them to get involved and understand the policies. This engagement can be initiated as early as school-age children, whether as weekly lessons on sustainability and natural process, or field trips to the Clyde and getting physically involved with nature. Alternative avenues were highlighted such as improving the river information and education at Glasgow Science Centre. The Centre has nothing about the tides on the river and various changes could be made. There is also an app called Spotabee, utilising citizen science and focusing on the River Crane in London. The app brought a high level of engagement to the river with communities using monitoring systems all along the waterway. There is potential to think about this in the context of the River Clyde.

Local and national authorities are having to make difficult choices with constrained budgets and balancing economic prosperity with national sustainability goals. It would be useful to help councillors develop an understanding of how the different agendas they are grappling with (climate emergency, budgets, economic growth) can be progressed effectively by embedding place-making and nature-based solutions within council services and targets to achieve more environmentally friendly, biodiverse places and sustainable, healthy communities. Glasgow is one of the first cities to launch a carbon literacy training programme for its councillors. This ensures that not only are the public educated on these issues, but that the authorities have the relevant information on the climate crisis.

Participants moved on to the issue of lighting in urban green spaces. The lighting in parks and pathways has various positive and negative effects. Light pollution is bad for animals and

biodiversity, both because a range of species tend to thrive in the darkness and because the daily rhythm of many daytime species is disrupted by artificial light at night. There are also monetary costs of keeping these areas lit throughout the night. Suggestions to dim the lights or switch them off completely were contested with arguments surrounding public safety, particularly women walking alone, as black corridors create anxiety with regard to crime. Public safety is, rightly, at the forefront of authorities' considerations and so ecological considerations are perhaps a secondary thought. However, illuminating these pathways throughout the night is not sustainable and solutions need to be considered. Participants suggested dimming the lights, tuning the colour of the lights (more energy efficient and potentially less disruptive to wildlife) or installing reactive LEDs in places across the city where lights dim as people come and go (however safety concerns were expressed again here).

The lighting issue aligns with one of the consistent themes throughout the GRDs, which is cross-sector-collaboration and trans-disciplinary work. The council cannot effectively implement a lighting plan that satisfies ecological demands as well as consideration for public safety, and so biodiversity experts and lighting experts need to be involved in these discussions. Appropriate individuals and companies need to be around the discussion table at the very beginning of these plans to ensure the correct solutions are implemented. There is also the potential of using university resources in these scenarios, for example coordinating work placements and student projects from a range of disciplines to tackle the issues presented.

1.2 DIALOGUE 1 - SUB THEME B: How we can learn from green, Covid measures and extend good practice alongside transformation plans for activities and safe travel that also encourages the use and greening of open space?

Sub themes for breakout room discussions in Dialogue 1 (Theme B) featured:

- Temporary interventions
- Stalled spaces
- Community engagement/empowerment
- Health impacts of green space
- Active travel
- Greening the grey

Theme B key outputs:

- Steps need to be taken to lessen the city's inequalities and to move the urban transport planning away from cars and towards people.
- Research needs to take place on the public's micro-journeys (for non-work reasons) so that transport infrastructure can be altered to support these needs.
- Current temporary interventions should be mapped to determine which can be made permanent or where temporary structures could be relocated to reduce socio-economic inequalities.
- Public support and engagement are needed alongside input from universities and field experts if data is going to be collected and utilised to maximum effectiveness.

UNDERLYING QUESTION

How can we capture the impacts of the temporary interventions and learn from them? How do we make interventions permanent?

One of the pre-dialogue messages stated that the path to carbon neutrality needs to redress the underlying socio-economic inequalities in access, quality, and use of natural assets. We need to be very cautious to not exclude or negatively impact different communities when implementing measures. It was suggested that the interventions installed throughout Covid were not focused on, or accessible to, the more deprived areas of the city. The example of the measures carried out on Kelvin Way was used. Here temporary barriers to traffic were put up to pedestrianize walkways. Participants questioned how that decision was made. Why was it there and not somewhere else? Similar efforts and material commitments are needed for improvements across the whole city, not just in one affluent area.

One of the key barriers to ensuring that all communities are attended to is the lack of information on what the needs of different areas are, but also the lack of data for how transport links are used throughout the city. Dealing with these inequalities can be complicated and often multi-layered, however it is possible that the Covid pandemic presented an opportunity to mitigate these problems. The lack of planning needed for measures since Covid (living lab type notions) can perhaps reduce these inequalities by cancelling out the need for the 2-year consultation period that has been a requirement in the past. The temporary Covid interventions (such as cycle paths, closed-off roads) can be made permanent, while additional temporary interventions can be implemented. These temporary measures can be installed in more deprived/neglected areas as experiments, be modified appropriately and then made a permanent fixture, further lessening city-wide inequalities. A clear roadmap was set out in this discussion, suggesting that we map current temporary interventions, determine which can be made permanent, and then relocate temporary structures to reduce socio-economic inequalities.

A further issue restricting progress and furthering inequalities is city transport planning and the current infrastructure being designed around cars and economy rather than people. Glasgow's inner-city motorway and trunk road layout has arguably had destructive effects on poorer areas, which stems from the urban planning focus on cars, and needs to be addressed. We now have an increased capacity to use data science, for example pedestrian patterns via CCTV data. This can be less expensive, real-time and kept updated, and can help us to determine what physical space is allocated to what purpose on the street or how street furniture is built – it is a regular stream of valuable data.

Citizen science is an important dimension. Technologies like geolocation devices, which are cheap and can record people's movements will help with the collation of data on the public's journeys and micro-journeys which are made for non-work reasons. This data can then be used for transport planning and help shift the focus of urban travel away from cars and towards people, with benefits in terms of reductions in carbon emissions and improvements in well-being and health inequalities.

All the measures and interventions demand a degree of cross-sector collaboration. The participants agreed that building public support and buy-in for any actions and enabling communities to curate data from the emerging system is an important first step. Co-production of new systems with local communities will create powerfully positive impacts. Collating and monitoring outcomes is important to evidencing outcomes and potentially offers a unique opportunity for university PhD students, if funded. Furthermore, different disciplines within the University (computer science, geography, social science) could collaborate to maximise the knowledge gained and to fully understand the implications of the data. There are various problems that need to be addressed here by different people, with different agendas, and so there is a certain importance placed on bringing these parties together to fully utilise the city's knowledge capacity.

1.3 DIALOGUE 1 - SUB THEME C: A place-based approach with a nature-based solutions lens. Looking at stories of Glasgow’s spaces focusing on the River Clyde and the development of walkways and zoning of waterway land.

Sub themes for breakout room discussions in Dialogue 1 (Theme C) featured:

- Open space strategies
- Place-based approaches
- Nature-based solutions
- Creative use of spaces
- Vacant and derelict land

Theme C key outputs:

- Recognition that pre-existing socio-economic inequalities in the use of open spaces was likely made worse by the Covid restrictions and many spaces were inaccessible to less affluent in society.
- Spatial problems equate to social problems.
- Engagement with local communities is pivotal to ensuring that interventions and improvements align with what is truly needed.
- Redeveloping derelict land is a possible mechanism for improving urban green spaces.
- Making spaces into places should happen through consultation with communities, leading to improved use and a subsequent sense of ownership.

UNDERLYING QUESTION	How can we understand the social, health and wellbeing, economic and environmental benefits that spaces and places can bring to the journey towards carbon neutrality?
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There are a multitude of barriers in place to different community’s access to Glasgow’s natural spaces and places. There is vast potential for open spaces in the city, but without explicit place-making design, they do not provide adequate benefits to the surrounding communities. Communities are often overlooked and undervalued in decision-making. The pre-existing socio-economic inequalities regarding the use of open spaces was made worse by the Covid restrictions and the inability for many to access these spaces. One of the advantages of the Covid pandemic is that there was a widespread realisation that spatial problems are social problems and changes need to be made to remedy these issues.

Engaging with communities needs to be done considerately to find appropriate solutions to their problems. Discussions are required to establish what the problems are, before developing solutions. Solutions should be collaborative rather than imposing changes onto communities unilaterally. Different communities have different needs and varying experiences which can contribute to thinking differently and creatively. There is an emerging theme throughout the dialogues that collaboration and co-production is required. In this case it relates to understanding the lived experiences of communities and building on the past. One participant suggested that a post-occupancy evaluation could be a good way of doing this. We can start with the aspirational goals of the community and then work backwards to try and achieve them.

Restoring derelict land was another of the key suggestions in discussion. We can take land off the derelict land register if it is 'self-naturalised' however, it is still seen as derelict land, especially if there is no intention or human intention behind it. This can be hard to sell to communities as a positive thing. If there is a way that we can take an approach with 'human intention' behind it and keeping the land semi-wild, for example incorporating decorative elements, then it will be of more value to the community. Glasgow is already spending money from its vacant derelict fund to turn vacant sites into sites of more natural interest without altering the site too dramatically and doing enough to show people that it has changed. This improved use of derelict land can benefit both the wildlife and the local community.

The idea of spaces and places was also discussed in depth, with a need for designing interventions and improving green areas being emphasised. However, there needs to be a consideration of the local community when doing so, and this is done through simple communication with those concerned. Currently, we don't ask people what they want to do and achieve in their area, and how the local authorities can help achieve that mission. There needs to be a transition from spaces, which could just be green areas, to places, where an area becomes an integral part of how people live in their local community. If the public are actively involved with the design considerations and the creation of these green spaces, then a greater sense of ownership and sense of care for the space will follow. Community involvement in these projects is pivotal to the success not only for the greater health and well-being of the public (due to accessing open spaces) but knowing what is truly happening within their community can enable people to turn a space into a place and consequently attach some real value to the area.

2 RAISING AMBITION TO NET ZERO (DIALOGUE 2)

DIALOGUE 1 OVERVIEW		
FOCUS	Providing low carbon energy and housing solutions across Glasgow	
KEY FACILITATORS		
Professor Gioia Falcone	Rankine Chair of Engineering	University of Glasgow
Gavin Slater	Head of Sustainability	Glasgow City Council
PRE-RECORDED VIDEOS		
Pre-recorded videos were provided to the participants in advance, to gain topical background knowledge provided by the following field experts.		
Professor Gioia Falcone	HotScot Project, University of Glasgow	
Barry Morton and Gillian Brown	Sustainability Working Group, University of Glasgow	
Available at:	https://policyscotland.gla.ac.uk/green-recovery-dialogues-experts-videos/	

Prof. Falcone's video offered insight into the concept of geothermal water as an energy source. Abandoned mine workings can act as a source or store of thermal energy and there are ca. 23,000 abandoned coal mines in the UK. This means that minewater geothermal energy is a potential game changer towards the decarbonisation of heating and cooling. The HotScot project was established to unlock minewater geothermal energy within former mining areas of Scotland's Central Belt. This could create a new industry, economic growth, and prosperity for the central belt of Scotland, with local communities assisting in project design resulting in further skills and job creation in Scotland. With robust legislation planned by Scottish Gas to meet the 2030 carbon targets, there is potential for low carbon heat to create approximately 80,000 jobs and 120,000 indirect jobs by 2030 in Scotland.

Barry Morton and Gillian Brown offered information from the University of Glasgow's Sustainability Working Group and how they are developing a sustainability strategy. Integral to enabling any reductions in utility usage is understanding where the energy is used both at the full estate level and specifically within the buildings themselves. One of the working group's projects is the creation of nearly 20 building-level digital energy models. The building management system information and energy metering data are key digital resources that ensure the model accurately reflects the energy consumption profile of the real building. Once accurately calibrated, these models open a wealth of possibilities to assist in reducing energy and water usage. The models also indicate specific energy consuming systems or areas of a building in need of improvement. This information is used in decision-making around physical onsite adjustments to energy use. Once these models are fully functional, the network will provide the University with usable and very detailed energy profiling, to allow setting of strategic and realistic energy and carbon reduction targets. With the integration of district networks for heat, power and cooling becoming more prolific, it is clear that accurate management of energy can no longer be undertaken at a single-building level as these buildings are part of an infrastructure with many internal and external influences.

2.1 DIALOGUE 2 - SUB THEME A: How we can transform existing buildings into more energy-efficient homes and spaces?

Sub themes for breakout room discussions in Dialogue 2 (Theme A) featured:

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- Participants agreed that decarbonising heat is one of the crucial tasks facing Glasgow on its path to meeting its 2030 target for carbon neutrality.
- The built environment (homes and non-domestic buildings) is a vital area for innovation in technology and in how partners work together across industries/sectors.
- Part of the discussion should also be on how the city is addressing challenges surrounding Glasgow's older, tenemental housing stock.

Theme A key outputs:

- Scaling up is an issue – one way to accelerate progress is to promote prefabricated components for building retrofit to enhance the efficiency of the built environment, which will minimise embedded carbon in construction processes and reduce unnecessary waste.
- Ensuring collaboration and competency between all parties involved is crucial.
- Abandoned underground tunnels provide a potential way of distributing heating throughout Glasgow via insulated pipes.
- Building owners need to be compelled to connect to renewable heating systems.
- Those vulnerable to fuel poverty need to be continually cared for.

Heating is a primary concern when it comes to carbon action, fuel consumption and climate action, and there are several challenges associated with it. Scaling up projects were an issue, with there being a disconnect between piloting initiatives and then scaling these up to full projects. Currently, 2.5 million Scottish houses need retrofits within 30 years (if we are to meet targets), and that is unfeasible with current processes. Glasgow City Council use traditional methods, beginning with an architect, and then workmen turning up on site with scaffolding, and with this method it is thought almost impossible to scale up enough to get what we need done with these buildings. Solutions stemmed from discussion such as increasing the amount of renewable heat in the city as a matter of priority because heat consumption is likely to never reach zero. Regarding scaling up, we need something more radical, like automated and digital scanning processes, where it can be done in days. Furthermore, we can promote prefabricated components for building retrofit to enhance the efficiency of the built environment, which will minimise embedded carbon in construction processes and reduce unnecessary waste.

The topic of collaboration was again raised, outlining that everyone agrees with the carbon targets, but there are issues with determining where, how, and when to take action. Vital components of these collaborations prove important like getting the right people together (can universities play a further role?), at the right time, but questions were also raised regarding the expertise of certain partners. For example, will the accountants involved be up to speed with carbon management and carbon budgeting? The competency of the individuals in these roles is integral to the success of the overall processes.

The topic of underground piping to distribute heating was introduced, stating that most of the heat requirements in Glasgow are within 1000m of open water. After analysis, the largest lifecycle cost in Glasgow is the cost of electricity to drive heat pumps for the heating systems. Further, the reality is that you cannot get enough heat to buildings in Glasgow from within every community – you need to go outside the community. This is where district heating comes in, not just for homes, but for all buildings. It was suggested that abandoned tunnels under Glasgow could be used to distribute heating via insulated pipes. This would save significant costs in tunnelling while being an interesting and innovative way of using existing architecture to support the transition to carbon neutrality without creating more wasted emissions through the embedded carbon in the infrastructure. There are a multitude of abandoned tunnels

underneath Glasgow, so it was proposed that we make a start on locating and mapping them. This way, contractors will not encounter problems when they begin work.

One of the most prominent issues in Glasgow is that buildings often have 6-8 flats and are a mixed tenure of social rent, private rent, and owner occupiers. As a result, questions arise surrounding the decision-making process and around who pays for alterations. Private owners tend to be less inclined to contribute to holistic 'whole building' approaches and will often go for the most practical option for them, posing problems for other tenants. However, the participants noted that climate change is everybody's problem and everybody needs to be part of the solution. The Scottish parliament have previously talked about an obligation for people to connect to renewable heating systems, however they were cautious as they believed it may be perceived as bullying people into it. Participants suggested that building owners should in fact be compelled to connect to these systems, providing surety of supply and being key to getting district heating developers to invest into new infrastructure in the city. Measures that push people out of current norms and out of their comfort zone are likely a requirement of carbon action. Making plans that are optional rather than compulsory will delay progress on the transition and make it impossible to reach goals for 2050.

There is also the pivotal matter of Scotland's fuel poverty. At the time of these dialogues, 10-15% of the Scottish population lived in fuel poverty, with the majority living in vulnerable areas defined by the Scottish Index of Multiple Deprivation (SIMD), however these figures have likely worsened since then. We need to ensure that this transition is a just transition and that we are appropriately looking after the vulnerable throughout the process.

2.2 DIALOGUE 2 - SUB THEME B: Using digital technology to inform better energy management decisions and communication.

Sub themes for breakout room discussions in Dialogue 2 (Theme B) featured:

- Smart city technologies and improved use of data analytics have come to characterise urban approaches to the sustainability agenda across the world.
- This comes as policymakers, researchers and practitioners explore their potential to support long-standing aims and objectives.

Aims:

- To highlight the role of digital technology in informing energy management decisions and communication
- To draw on the considerable work which has been undertaken in Glasgow to map the sub-surface of the city, revealing its potential for capturing energy
- To consider more localised work that aims to link data, renewable energy and affordable warmth for local residents

Theme B key outputs:

- If ScottishPower and other energy suppliers can collect more nuanced information about their consumers regarding peak times, etc., carbon and financial benefits will undoubtedly follow.
- University campuses can be used for analysis, while students and academics may also prove valuable resources with regards to energy management.
- We need a procurement system that benefits all parties, where buyers and sellers can solve each other's problems.

The use of digital data in relation to energy management was a primary topic of discussion, particularly relating to ScottishPower. In the past, ScottishPower has focused on making sure power was consistently and efficiently supplied to the consumer with the guarantee of supply being an integral component of their business. Previously, information needs were focused on having sufficient capacity to meet peak demand. However nowadays, where people have batteries, EV chargers, etc., consumers often wish to have a more flexible 2-way relationship that permits them to manage their energy more efficiently. Energy suppliers will need to align business practices with consumer behaviours and will need to know more about customers than simply their billing information or levels and timings of peak demand. They will need to have much more nuanced information about the character of their consumers usage as it will benefit the decisions they make, for example, if someone is a domestic user or a large consumer, or how many people reside in the building(s). If these companies can predict what the demand will be, then they will not need as much generation capacity, or they can manage it more efficiently. This will enable smarter use by customers and institutions, which will have a further carbon benefit.

Universities can be involved in the city's energy solutions, with campuses being used as experimental or demonstration sites for proof of concept. The diversity of buildings, the intensity of their use, the combination of new and old buildings, and their capacity to manage their energy systems, combined with the calibre of staff and resourcefulness of students can prove to be helpful in further understanding energy management.

We need to involve academic researchers more in the city's energy issues. Universities possess a variety of disciplinary expertise that is currently siloed, however, energy management can be a vehicle for interdisciplinary projects including mechanical engineering, architecture, but also business and geography. Furthermore, we can take student ideas on board that can stretch the imagination and the parameters of what is possible.

The conversation shifted to procurement with a recognised need for collaboration. There is a need for a procurement system that benefits all parties, where buyers and sellers can solve each other's problems. For example, if we have a contract with ScottishPower, are we going to measure success solely based on price per unit, or are there things they can do that reduce our usage or enable us to manage our energy more effectively? These kinds of social gain calculations can be applied to public estates of various kinds, like hospitals and schools. In these buildings, energy procurement decisions could potentially be informed by a wider benefits agenda and by contributing to building up the market for low carbon solutions which would necessitate a whole-system framing when looking at city-scale levels. Procurement is challenging, as often policy ambition will exceed the capacity to deliver. Further solutions suggested that we incentivise building more in the city centre, potentially with more affordable pricing, sustainable transport links to and from the suburbs and the minimisation of private transportation.

2.2 DIALOGUE 2 - SUB THEME C: How we can harness the geothermal energy that is under the city to deliver green energy and job solutions?

Arguably one of Glasgow's most under-used assets is trapped water from mine workings, which can be used as a source for renewable heat. Discussions focused on using these assets to deliver multiple benefits including green energy, local regeneration, and contributions to a just transition through novel job opportunities.

Unfortunately, the breakout room recording for this group was not available to compile detailed notes from.

3 RE-THINKING CONSUMPTION (DIALOGUE 3)

DIALOGUE 1 OVERVIEW		
FOCUS	Achieving sustainable recovery through green and/or circular economy	
KEY FACILITATORS		
Professor Deirdre Shaw	Professor of Consumer Ethics and Sustainability	University of Glasgow
Duncan Booker	Chief Resilience Officer and Sustainability Manager	Glasgow City Council
PRE-RECORDED VIDEOS		
Pre-recorded videos were provided to the participants in advance, to gain topical background knowledge provided by the following field experts.		
Katherine Trebeck	Wellbeing Economy Alliance	
Professor Juliet Schor	Boston College	
Professor Giana Eckhardt	King's College London	
Dr Kersty Hobson	Cardiff University	
Available at:	https://policyscotland.gla.ac.uk/green-recovery-dialogues-experts-videos/	

Dr Katherine Trebeck's video focused on the wellbeing economy, and the lack of care going into the Covid pandemic in 2020. Trebeck insisted that as an economy we did not care enough about our peers or about the environment. The economy should be designed in a way that meets higher order goals which is described as a wellbeing economy, which is about social justice on a healthy planet. Throughout the year of the pandemic, it was not GDP that kept people going, it was people caring for each other and reaching out to help. The provocation posed the question: How can we have an economy that celebrates, rewards, and enables caring? Topics stemming from this question include shifting to shorter working weeks, paying good wages, work-life balance, and the design of the cities.

Prof. Juliet Schor focused on rethinking consumption and envisioning a transition to a caring economy that is inclusive, just, and one that puts wellbeing at its heart. A regional economy can shrink the scale for where we produce and consume, and bring that production and consumption closer together spatially, therefore making it easier for us to fully realise the impacts of what we are doing. This is perhaps a reality that we were forced to live with and adapt to during the pandemic. However, we do not want to solidify the inequalities of the global system, in which rich regions stay rich and poor regions stay poor, so we also need some equalising mechanisms.

Access-based consumption was the focus of Professor Giana Eckhardt's video (e.g., renting cars instead of owning them, etc.). This type of consumption can lead to increased materialism, fuelled in part by the attention economy. But this can have benefits with regards to potential increases in sustainable behaviour. What tends to drive a lot of the consumer behaviour on sharing platforms is things like cost and convenience. For example, using a bike-sharing system in a city, people are not really using it because it is more sustainable, they are using it because they cannot fit/afford their own bike in their flat. Convenience is the main motivator. When motivation comes from being more sustainable/green, it is likely that it will be when the other people who you are sharing the platform with are not anonymous but rather

people you know. You can gain cultural cachet from engaging in these green behaviours from your local communities, perhaps presenting a case for the localisation of economies.

Dr. Hobson's video centred on whether 'circular' and 'smart' economies solved the problems we are facing now. Research indicates that if we are trying to create markets for reused, remanufactured goods, then what is happening is that they are creating secondary markets on top of primary markets. Unfortunately, some of the best intentions of the use of circular manufacturing is driving consumption upwards. Absolute decoupling and sufficiency-orientated strategies are a change from thinking about the kind of scenarios in which we can grow the economy, keep consuming all whilst saving the planet. The notion of sufficiency is really acknowledging, for the first time within mainstream policy, that we must bring absolute consumption levels down.

3.1 DIALOGUE 3 - SUB THEME A: A Caring Economy - Transformation to a caring economy that is inclusive, localised and just, with wellbeing at its heart.

Sub themes for breakout room discussions in Dialogue 3 (Theme A) featured:

Theme A key outputs:

- The transition to a caring economy is a pivotal step in the fight against climate change, and we need to begin to translate our good intentions into practical action.
- A four-day working week with universal basic income was suggested.
- Different communities have different needs. There is a need to foster community/citizen bottom-up dialogue to ensure the needs of diverse communities are met in a just transition.
- Design around 15-minute cities are a potential way forward.
- We need to celebrate local businesses that are following the circular economy agenda. Can we offer financial and logistical support to these initiatives as a form of incentivisation?
- Need to support emerging secondary sustainable markets to become primary markets, which can be done through supportive regulation, infrastructure (utilising vacant spaces) and rewarding sustainable practices.
- Society-wide education and awareness of the caring economy needs to be addressed.

One of the pre-dialogue messages was that the pre-Covid economy was misaligned with the needs of the people and of the planet. There are increases in poverty, in work poverty, in hopelessness and a decrease in dignity at work, and so there has never been a more appropriate time for us to make the transition to a caring economy. The caring economy is perceived as a big intangible concept and there is ambiguity concerning how it can be truly achieved. Participants suggested that this is similar to climate change, for instance, when they talk to local businesses about the climate emergency, the sheer vastness of the problem leads many to question whether their behaviours have any real impact. This reflects a society-wide issue – people do not think that their actions have any significance, however every small action can make a big difference in the fight against climate change.

An economy that is truly caring is one where social justice and environmental sustainability are deeply intertwined, which is embraced here in Scotland. In England, sustainability is centred around technology, whereas in Scotland the sustainable transition is a just transition, with the needs of the people being widely embedded in the Scottish Government's strategies. The question was posed whether we can further create regulations that support and enable sustainability and accountability, that also meets the needs and values of the public. We need

to begin translating our good intentions into practical action that will have tangible benefits. A potential solution lies in the form of creating a 4-day working week accompanied by universal basic income.

Participants were concerned with the wide-ranging inequalities that exist within the city of Glasgow and what needs to be done to address these issues, focussing on access to travel routes and connectivity. It is easy to get access to the motorway to get to work, for example, as it cuts directly through the city, but it is more difficult for parents to take their children to school as the pavement is not wide enough, meaning many have to drive to school. Is it possible that we can push towards a more localised, 15-minute city to try and encourage more sustainable methods of transport? This, however, may not be a city-wide issue and strengthens the point that each community is different with different needs. Each community needs to drive their own decisions which appropriately address the problems in their own areas, and this may require an alternative model being built which benefits from a closer relationship between local councils and national authorities.

The notion of a circular economy was discussed, and alternative business models and start-ups across the city. There are several businesses striding ahead with the circular economy agenda, such as leather producers working on waste/landfill related issues, as well as an organisation based at Strathclyde University that is using coffee ground derivatives to replace palm oil. At the time of these dialogues there was a multitude of re-making and repair stores opening throughout the city. Furthermore, some existing traditional businesses may be circular but not realise it or promote that fact. We should be bringing these people together, talking about their businesses and celebrating their success as environmentally friendly organisations. This is something that Glasgow needs to improve upon – shining a spotlight on the positive stories throughout the city. These businesses and initiatives are often set up individually, which can be extremely exhausting and lonely to get going, and we need to help nurture and cultivate what these individuals are doing. They are often overlooked by the existing infrastructure and other businesses (perhaps due to lack of investment), and so there needs to be a push to make these ‘circular’ businesses more mainstream, perhaps crowding out any environmentally toxic businesses.

Aligned with celebrating the work of these exceptional individuals and businesses, the idea of incentivisation was also raised. A structure which offers financial and logistical support due to the high risk involved in these start-ups is pivotal if we are to see more circular-orientated businesses. Many people making the decisions in this city may not fully comprehend the situation and circumstances of these businesses, and so when someone wants to start one of these initiatives, they are given the standard traditional advice. There needs to be a further education programme delivered to policymakers, etc., that steers them away from working with the old economic models and targets towards a more sustainable, circular economy that encourages environmentally friendly practices.

The idea of education is a pivotal one when thinking about making the transition to a caring economy and there will undoubtedly have to be different methods of learning for different groups of people. For example, habits are entrenched and can be difficult to change. The participants suggested that the younger generation may be more enlightened, but there needs to be an education programme starting at school to ensure the message is clear. Furthermore, we need our city leaders to step forward and be held accountable. This needs to be done through a change in the traditional paradigms of power, which allows communities to be empowered to be more involved in decisions that affect them.

3.2 DIALOGUE 3 – SUB THEME B: Doing consumption differently - Rethinking consumption to advance transformation of current approaches and expand conversations around circular and digital solutions.

Theme B key outputs:

- There is a need to shift the focus in the global North from a growth-based productivity economic model to an ecological-based model.
- A transition to a more regional economy would be favourable.
- Working hours can be reduced, giving people more free time and more people are given a pathway into employment.
- Production levels in the global North can be kept at the same level, while reducing resource usage through efficiencies and technological innovation. This would lead to a stabilisation of GDP.
- A redistributive economy also needs to be addressed to balance out inequalities.

One focus of this discussion was ‘working time’ within the sustainability debate, particularly in reference to the macro economy. Unquestionably, the global North has predominantly contributed to most of the planet’s ecological damage via mass productivity (increased emissions, deforestation, etc.) and consequently became vastly wealthy through this process. To redress this ecological damage caused by development, there is a need to shift the focus in the global North from a growth-based productivity economic model to an ecological-based model. Additionally, we need to allocate the remaining ‘ecological space’ to the global South so that they can develop their economies, recognising and addressing existing and previous unfairness and inequalities. A transition to a regional economy appeared to be a solution here.

There needs to be sacrifices in this transition, with businesses likely being asked to put aside short-term profit gains for the collective benefit. What do the global North get in return for making this change? It is suggested that working hours are reduced, giving people more free time and more people are given a pathway into employment. It is thought that production levels in the North can be kept at the same level, while reducing resource usage through efficiencies and technological innovation. This transition can also go some way to stabilising GDP, with the example from the Netherlands in the mid-1990s being cited. In response to the country’s 1980s recession, the Dutch stabilised their GDP for 15 years through reduced working hours and increased employment.

We also need to address the politics of redistribution if we are going to effectively address climate change issues. The above approach should be accompanied by a redistributive agenda so that those in the lower half of the distribution get more/equal income and more free time. These reduced working hours need to be accompanied by other initiatives such as universal basic income and protection of workers’ rights. Inclusion, fairness, and equality within and across countries is pivotal if this transition is to be successful.

The group’s focus then shifted to the public sector and whether organisations can provide new roles to support, develop, and foster new innovations. For example, Scottish Water has public values, has adopted sustainability and climate change drivers, is under public ownership, but operates within the market. Scottish Water should not be run on commercial grounds and perhaps this is something that needs to be studied in more depth. The democratisation of public ownership and the state is something that needs to be addressed. There needs to be a different, citizen-driven state, as opposed to a top down one.

4 OVERARCHING THEMES

Throughout the dialogues and the subsequent review of their outputs, there are several themes that consistently arose in the discussions. The recurrence of these topics is crucial to highlight as it points to a clear need to address these issues that are prominent in Glasgow's challenges in addressing the climate emergency. Three consistent themes have emerged:

- Cross-sector collaboration – getting the right people together at the right time
- Addressing city-wide inequalities
- Public engagement/education with nature and authorities

4.1 CROSS-SECTOR COLLABORATION

In Autumn of **Dialogue 1 – Theme A** looked specifically at promoting Glasgow's biodiversity and natural assets and focused on which people are needed to address these issues. When re-engineering the banks of the River Clyde to help with re-naturalisation, various expertise from various disciplines will be needed to effectively carry out this process, including engineers, aquatic ecologists, and councillors.

Additionally, the issue of lighting in parks and pathways at night reinforced the need for effective cross-sector collaboration. Lighting specialists and biodiversity experts are among the people who need to be involved in discussions from the start to ensure successful outcomes. University engagement through incorporation of projects into work placements or student projects would be beneficial. Cross-sector collaboration was also a pivotal component in discussions of temporary interventions and public transport. The array of solutions that was offered included collecting and analysing a wealth of data, and the effective use of these data requires cooperation between field experts, data collectors and potentially, willing university students.

This theme arose in **Dialogue 2** regarding carbon management. All participants agreed with the set carbon targets, however issues stemmed from an inability to nail down the finer details of where, how, and when. Questions were also asked regarding the competency of all individuals involved, with it being stressed that everyone needs to be fully up-to-speed with the processes and plans to ensure the overall success.

The issue of cross-sector, interdisciplinary collaboration is evidently significant in implementing solutions to climate challenges. We need to set out clear plans at the start of these processes, which get the right people together, at the right time, to ensure that all parties are fully aware of their role and have the appropriate skills to carry this role out. Honest, open communication and cooperation is integral across the board if these solutions are to prove a success.

4.2 INEQUALITIES

The ever-present issue of inequalities throughout a city is one that arises in these dialogues numerous times. Returning to the redevelopment of the River Clyde, many of the problems concerned a lack of access to the waterway, with mention of the 'Govan young'. There is potential to change the lives of people through engagement with nature simply by opening the

river to less affluent areas – opportunities that are perhaps more accessible to others in the city.

This theme continues into **Dialogue 2 – Theme B** regarding temporary measures implemented during Covid and transport planning in the city. The example of the pedestrianisation of Kelvin Way raised questions concerning why these kinds of measures were not implemented in less affluent areas of the city. This is partially due to existing inequalities in the city, but also down to a lack of data that the city has for other areas. There is a need for individuals from poorer areas to be actively involved in these plans if we are to reduce socio-economic inequalities, and this will likely require councils reaching out to these individuals.

The lack of access to open spaces throughout Covid was another issue that highlighted inequalities. Covid lockdowns and restrictions inhibited access to open green spaces, perhaps due to a lack of a private garden, or the inability to travel to parks or hills. This prompted the realisation that spatial problems were also social problems and changes are required. Again, calls for communication with these less-affluent areas followed, suggesting that we need to stop doing things *to* these communities and begin doing things *with* them.

Dialogue 3 – Theme A also pointed to the issue of inequalities in the form of fuel poverty, stating that over 15% of the Scottish population lived in fuel poverty. There is a distinct need for us to ensure that as we are making a green transition it is also a just transition and that we are looking after society's vulnerable.

The politics of redistribution in this 'just transition' centred on a shift to reduced working hours and increased free time for the public. It is pivotal that everyone is treated equally in this transition and that these changes are accompanied by other initiatives such as universal basic income and the protection of workers' rights.

Clearly, there is a strong concern for the inequalities that persist throughout Glasgow and there is much work to be done. Not all of the existing social issues can be addressed through these solutions, however it must be guaranteed that when green transitions are carried out, the transition has to be 'just', and the less-affluent areas of Glasgow need to be considered as much as every other area.

4.3 PUBLIC ENGAGEMENT & EDUCATION

Public engagement with nature is a prominent issue in relation to the River Clyde for a few reasons. The most glaring explanation for a lack of attraction to the Clyde is the restricted access that is enforced by barriers and fences at various points along the river. The river is not perceived as an inviting place for people to leisurely walk due to the lack of cafes, bars and other forms of entertainment. Furthermore, there are children in the city who may have never seen the Clyde. Education and engagement with regards to the river is a pivotal step in raising awareness of the importance of nature and current issues we are facing.

Community engagement with authorities and local planners is also of importance when we are looking for solutions across the city. The issues with inequalities and transport links could be remedied through communication between communities and the city councils. One of the key barriers to ensuring that all communities needs are met is the lack of information and data that governing bodies have on different areas. Problems also stem from the fact that communities cannot think of solutions to their problems, and so discussions need to take place to fully understand the complexity of local problems before moving onto potential solutions.

In this 'just transition' different communities are going to have different needs at different times, and communication between public and government will be pivotal throughout. For community needs and challenges to be properly identified, there needs to be a degree of awareness of nature and climate challenges throughout the city. Awareness can only stem from awareness campaigns and education programmes. Measures should not only aim to target and educate the public, but government and council officials, too, so they are in an apt position to deal with these problems.

5 CONCLUSIONS & RECCOMENDATIONS

The Green Recovery Dialogues of 2020 aimed to ensure a just and sustainable recovery from the Covid-19 pandemic. Practitioners, field experts, academic researchers and members of Glasgow City Council came together and offered their views and opinions. Three dialogues consisting of 2-3 discussion themes provided a wealth of information and potential solutions to be reviewed. Identification of the city's problems and their complexity led to substantive discussions and a range of potential solutions. Three consistent, overarching themes were identified that suggest cross-sector collaboration, attention to inequalities and engagement and education need to be at the forefront of any interventions that aim for progress.

Alongside these overarching themes, it is important to highlight some potential solutions/measures that can serve as recommendations for city decision-makers. Each dialogue and overarching theme offers solutions, that are summarised below:

5.1 DIALOGUE 1 – THEME A: Promoting biodiversity through natural assets.

- Re-engineer the banks of the river Clyde to provide greening, make it less concreted, and improve the riparian zone.
- Consult aquatic ecologists and geomorphologists on planning and riverside developments.
- Remove barriers that restrict public access to the river.
- Create educational programmes at school (and beyond) to raise awareness of the Clyde and improve public appreciation of aquatic environment.
- Lighting and ecology experts need to be involved at the start of the process.
- Consider alterations in lighting that can better address safety and ecological concerns, such as dimming lights, tune the colour of lights, make lights more energy efficient, install reactive LEDs across the city where lights dim as people come and go.
- Smart lighting systems may be more expensive to install than conventional lighting, but they save money in the long-term due to lower electricity consumption.
- Cross-disciplinary collaboration is pivotal.

5.2 DIALOGUE 1 – THEME B: How can we learn from green covid measures and extend good practice, alongside transformation plans for activities and safe travel that also encourages the use and greening of open space?

- Steps need to be taken to move urban transport planning away from cars and towards people.
- Map current temporary, Covid interventions and determine which can be made permanent.

- Relocate temporary/experimental structures elsewhere to help with socio-economic inequalities.
- Research micro-journeys so that transport infrastructure can be appropriately altered and 'individual' journey centred.
- Collaboration with field experts and universities to collect and analyse data.
- Discussions with local community representatives need to take place to ensure their needs are being met.

5.3 DIALOGUE 1 – THEME C: A place-based approach with a nature-based solutions lens.

- Engagement with local communities is pivotal in ensuring that interventions and improvements align with what is truly needed and what they want to achieve.
- More place-making is needed to deliver a greater use of space by the local communities, and involvement in its creation, leading to better ownership and sense of care.
- Consider funding for community stewardship in the planning and development of land.
- Improve the use of derelict land in a way that benefits biodiversity and local communities.

5.4 DIALOGUE 2 – THEME A: How can we transform existing buildings into more energy-efficient homes and spaces?

- Promote prefabricated components for building retrofit to enhance the efficiency of the built environment.
- Investigate the potential use of underground assets as a way of distributing heat throughout Glasgow via insulated pipes.
- Investigate 'heat as a service' as a potential new model for the built environment in the city.
- Require building owners to connect to renewable heating systems.
- Consider and care for those in fuel poverty.

5.5 DIALOGUE 2 – THEME B: Using digital technology to inform better energy management decisions and communication.

- Collection of more nuanced information by energy suppliers about their consumers regarding peak energy use times, etc., will lead to financial benefits.
- Universities should be engaged more as demonstrators and data analysis that can lead to innovation in energy management.

5.6 DIALOGUE 3 – THEME A: Transformation to a caring economy that is inclusive, localised and just, with wellbeing at its heart.

- Transition to a caring economy through implementation of a four-day working week and universal basic income.
- Need to foster community through citizen, bottom-up dialogues to ensure the needs of diverse communities are met in a just transition with a recognition that different communities have different needs.

- Celebrate local businesses that are following the circular economy agenda and where possible, offer financial and logistical support to these initiatives as a form of incentivisation.
- Support secondary sustainable markets to become primary markets through supportive regulation, infrastructure (utilising vacant spaces) and rewarding sustainable practices.
- Create structures that facilitate sustainable choices.

5.7 DIALOGUE 3 – THEME B: Rethinking consumption to advance transformation of current approaches and expand conversations around circular and digital solutions.

- Make it cost more to engage in unsustainable practices.
- Agree principles of the caring economy and embed them in education (primary, secondary, higher education, and community).
- Explore a transition to a more regional economy.
- Reduce working hours to give people more free time and more people a pathway into employment.
- Consider keeping production levels in the global North at the same level rather than driving toward growth, while reducing resource usage through efficiencies and technological innovation.