The possibility of a theory of change to tackle the climate crisis in a UK university

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Structured Abstract

Purpose

The paper discusses the practical dilemmas of institutional change to tackle the climate crisis in a UK university, identifying key assumptions and issues that block meaningful change. The research was part of an initiative to define a theory of change (ToC) to meet the university's institutional climate commitments.

Methodology

Our findings are based on interviews with members of an inter-disciplinary ToC working group, a staff-student climate coalition, and student representatives at the university. Interviewees were purposively selected to gain insights into assumptions about the nature of the university and its role in tackling the climate crisis, which must be addressed for the university to effectively implement its climate plan.

Findings

The paper identified tensions between the university's role as a public and commercial institution, a lack of clarity over decision making processes; and the difficulties in balancing (and being transparent about) actions with commitments to tackle the climate crisis. A democratic and flexible approach to change is essential to mitigate these issues, providing an opportunity to reflect on the diversity of the university community and openly debate goals and commitments.

Originality

In setting out the initial steps of a ToC in a UK university, the paper offers practical insights for higher education institutions looking to change practices. By highlighting assumptions at a particular institution, this paper also contributes a level of granularity to a growing field of research on efforts in higher education institutions to tackle the climate crisis.

Key words: climate change, UK universities, theory of change, institutional change, barriers to change, assumptions

1 Introduction

Universities are well-placed to act as agents of transformation in tackling the climate crisis (O'Neill and Sinden, 2021; Facer, 2020; Croog, 2016; Leal Filho et al., 2015; Ralph and Stubbs, 2014; O'Brien et al., 2013). A recent study found that majority of institutions were committed to sustainability to 'some' or 'great extent' (Leal Filho et al., 2023, 7). Pledges to implement sustainable practices include specific commitments to tackle the climate crisis, and universities are increasingly declaring climate emergencies and publishing climate plans (O'Neill and Sinden, 2021). Yet the bureaucratic and operational characteristics and contexts of 'the university' (in the UK and elsewhere) presents significant barriers to change (Dare et al., 2023; Leal Filho et al., 2020; Leal Filho et al., 2015; Ralph and Stubbs, 2014).

This paper explores the institutional dilemmas of climate action for UK universities. These dilemmas, shed light on barriers (as surmountable obstacles (Antwi-Agyei et al., 2015; Moser and Ekstrom, 2010)) to change and implementation of publicly stated climate and sustainability commitments. Our research reflects on an attempt to define a theory of change (ToC) to guide institutional change towards the achievement of climate action principles at a Russell Group university (hereafter 'the university'). The paper is not about ToC as a conceptual approach, rather it examines the process of attempting to create a coherent ToC. ToC is a methodology associated with planning projects and programmes in international development (Archibald et al., 2016; Vogel, 2012; James, 2011). It emphasises a 'reflexive and adaptive' approach to institutional change, and encourages focus on mapping the route to long-term impacts, examining assumptions and underpinning cause-effect relations, and acknowledging the complexity of the change processes (Valters, 2015; Prinsen and Nijhof, 2015).

Treating a ToC as a reflective process can emphasise learning at an organisational level, questioning 'what [organisations] are doing and why' (James, 2011, 3). In a HEI, this process facilitates critical reflection on structures and practices as the institution navigates important and challenging shifts in operational practices. Moreover, while there is an established literature on complexity and disconnected decision making in organisations (March and Heath, 2009; Weick, 1976; Cohen et al., 1972), a ToC enables organisations to address complexity and establish a framework for institutional change. This includes facilitating cultural change (Azizi, 2023; Dare et al., 2023; Bien and Klußmann, 2022). An effective ToC includes reflection on the consequences of a particular decision and the implications for next steps, speaking to the processes of 'learning' and 'unlearning' essential for transformative change (Schein, 2010, 300-313). However, institutional management

buy-in to institutional transitions is essential for success and is a juncture where the different operating logics can create barriers to change. For instance, Dobson found that one university adopted a 'green growth approach' to reframe tensions between the desire for growth and the need to reduce carbon emissions (2019, 137).

The tension between the imperatives to tackle the climate crisis and those to maintain 'business as usual', can mean radical ideas are not incorporated into climate plans, perpetuating neoliberalism as the dominant paradigm in these institutions (O'Neill and Sinden, 2021, 36). In doing so, 'ideas that were once considered peripheral have become folded into the neoliberal project yet emptied of their radical potential' (O'Neill and Sinden, 2021, 32). The 'neoliberal' university is a product of its own time and context, driven by multiple incentives including student recruitment and ranking systems. The genuine desire to achieve normative goals, such as net zero carbon emissions by 2030, are more than attempts at 'greenwashing' the neoliberal university. Yet to drive genuine transformational change the constituent stakeholders of universities must collaboratively create high-level targets and the plans to meet them. Meanwhile, these targets must reflect the institutional capability and willingness of universities for change.

This paper emerges from the first step at the university, to develop a theory of institutional change. This step identifies the assumptions, complexity, dynamics, and relationships within the institution that enable or constrain progress towards a defined future goal by responding to these research questions:

1) What are the assumptions about the university and its role in tackling the climate crisis?
2) What barriers are likely to impact the university's ability to implement its climate plan?

Our analysis is based on interviews that discussed the university administration's 'seven principles' to tackle the climate crisis (see 'Methods'). Although our findings are institution specific, it is unlikely that they are unique. Our paper consequently offers practical contributions to other universities' efforts to tackle the climate crisis. In this way, our paper offers an approach to address the 'how' of transformative change to tackle the climate crisis in HEIs, which is a growing area of research warranting further analysis (Azizi, 2023).

2 Methods

The university publicly announced its seven principles to address the climate crisis in September 2019. These principles covered the university's intention to produce a plan to reduce carbon emissions; ambitions to incorporate sustainability into investment and operational decisions, the

curriculum and research; and build institutional linkages to support local efforts to tackle the climate crisis. The university's Sustainability Service[1] was tasked with developing a climate plan to guide delivery of the principles. Three working groups of academics and service leads were established in late 2019 to deliberate and plan the required actions for (1) teaching, (2) research, and (3) leadership and theory of change. Groups reported their findings to senior executives in February 2020.

Senior executives tasked us[2] with working across the institution to develop a ToC to support the achievement of the seven principles and ultimately the goal of net zero by 2030 (and zero emissions by 2050). The ToC was initiated through a series of individual key informant interviews and working group meetings undertaken during November 2019-July 2020. This was a period of unprecedented disruption due to the COVID-19 pandemic. This crisis meant that pre-pandemic assumptions about 'normal' operations were suddenly disrupted while institutional resourcing and priorities necessarily shifted to cope with a period of emergency. Indeed, the rapid institutional reorientation to address the pandemic disrupted the planned trajectory between publishing the principles and finalising the Climate Plan, which was published in November 2021. The plan clarifies the institution's goals regarding offsetting and sets out an investment programme to implement overarching targets. The institution also ran an annual review in late 2022 where it invited comment on the plan and progress thus far. Our findings regarding reactions to the seven principles remain relevant for this process and establish a transparent foundation, identifying the assumptions that block meaningful change.

Our research method aligns with other studies that aim to understand assumptions underpinning organisational change (Olsen et al., 2023) and evaluate theory of change programmes (Sridharan et al., 2023; Jackson, 2013). Like Olsen et al, the authors purposively selected interviewees who were familiar with institutional policy and were well-placed to discuss how their assumptions about the institution relate to changing practices. The authors approached a broader range of interviewees reflecting the complexity of the institution and organisational processes, with people who could provide insights to decision making around climate policy in the university (Laws et al., 2013; Burnham et al., 2008; Pierce, 2008).

[1] Part of the university's management structure tasked with embedding sustainability into university operations.
[2] As academics with expertise in institutional change, decision-making, and sustainability (in the UK and in international development).

Fourteen interviewees were members of the ToC working group and were interviewed in the first quarter of 2020. From March 2020, the authors interviewed members of a staff-student climate coalition[3] and representatives from the student executive. The staff-student climate coalition is notable in this context because they have actively held the university executive accountable to verbal commitments to tackle the climate crisis and have written several open letters calling for specific action. Interviews followed a reflective and open model focussing on the challenge of achieving the university's seven principles. Interviewees were asked to reflect on the seven principles; those they thought would be the most challenging or straightforward to achieve and why; the risks facing the university in implementing the principles; and the assumptions underpinning the principles.

Table I: Interviewees' faculty and relevant memberships

Interviewee	**Staff/Student**	**Faculty/Service**	**ToC Working Group**	**Staff-Student Climate Coalition Member***
ToCWG-1	Staff	Engineering and Physical Sciences	Yes	No
ToCWG-2	Staff	Sustainability Service	Yes	No
ToCWG-3	Staff	Environment	Yes	No
ToCWG-4	Staff	Environment	Yes	No
ToCWG-5	Staff	Environment	Yes	No
ToCWG-6	Staff	Sustainability Service	Yes	No
ToCWG-7	Staff	Arts, Humanities and Cultures	Yes	No
ToCWG-8	Staff	Engineering and Physical Sciences	Yes	No
ToCWG-9	Staff	Environment	Yes	No
ToCWG-10	Staff	Environment	Yes	No
ToCWG-11	Staff	University Communications	Yes	Yes
ToCWG-12	Staff	Social Sciences	Yes	No
ToCWG-13	Staff	Social Sciences	Yes	No
ToCWG-14	Staff	Social Sciences	Yes	Yes

[3] Staff and students formed the coalition during strike action in early 2020.

SSCC -1	Staff	Union Representative	No	Yes
SSCC-2	Staff	Business	No	Yes
SSCC-3	Student		No	Yes
SSCC-4	Student		No	Yes
Student representative -1	Student		No	No
Student representative - 2	Student		No	No
Student representative – 3	Student		No	No

*Some interviewees may have joined this group after the interview was conducted.

The authors used qualitative content analysis in NVivo to identify narratives about institutional change and assumptions about the nature of the university. The authors then assessed the implications of these themes for developing a theory of change. Content analysis aims to produce verifiable responses to research questions from a text (Krippendorff, 2019). Similar to Sridharan et al.'s (2023) research evaluating the outcomes of a theory of change where they focused on interviewees' responses to a specific question, the authors used the interview protocol to manually code the documents in NVivo. This approach enabled the authors to identify trends in the data without using prescriptive themes at the outset.

Our narrative analysis revealed four potential barriers linked to:

(1) The university's purpose and its scope of actions in addressing the climate crisis
(2) Responsibility for actions to change practices
(3) Decision making processes
(4) Accountability in practice

3 Results

3.1 Barrier One: Purpose

As noted in the introduction, the tensions between the university's role as a social and commercial actor reflect the extensive influence of its context on both its articulation of normative climate goals and its ability to achieve those goals. Several interviewees highlighted the contradictory aims of the university as a growth-orientated business with the seven principles. Participants from both the working group and the staff-student coalition questioned whether the university could achieve its climate-related goals under the current business plan. For instance:

> The university business model says that we must borrow lots of money, and we have to outgrow that and earn back the investment…How does that work with delivering those environmental and social net gains that we are supposed to deliver? (ToCWG-1)

That a neoliberal model of growth is incompatible with pledges to enact meaningful changes in practices is unsurprising and highlights the challenge of changing within sectoral norms. Nevertheless, several interviewees raised this issue, noting the central tension between climate action and business as usual. The multiple aims and contested boundaries (see below) of the university speaks to particular challenges in pursuing institutional change in a pluralistic organisation (see Denis et al., 2001).

Questions regarding the university's sphere of influence arose in discussions about the university's 'internationalisation' strategy, including:

- The carbon footprint of international students travelling to and from campus.
- The carbon footprint of building a remote campus.
- The carbon footprint of travelling for fieldwork or conferences.
- The risk to academics' careers if they can no longer travel internationally.

Interviewees' concerns about internationalisation were linked to the international growth of the university but also the potential impact on day-to-day activities. A working group member argued that incentive systems for academic staff were at odds with the seven principles, particularly regarding internationalisation. Here, the emphasis on participation in international conferences to demonstrate an international profile was incompatible with efforts to reduce staff's carbon footprint through travel. To mitigate this contradiction, they argued that the university should measure staff success in a way that was compatible with its climate commitments to encourage people to change behaviours.

In the last decade the Times Higher Education (THE) supplement started publishing a list of the 'Top 100 most international universities', while Quacquarelli-Symonds (QS) awards universities 'QS Stars' for internationalisation (Hauptman Komotar, 2019, 305). This type of ranking can have material effects on processes of change. For instance, a researcher in the ToC working group from the social sciences underlined the risks to the university if they dropped in ranking tables. Any measures that affect the organisation's ability to respond convincingly to these metrics could reduce it credibly as an international institution. The pressure to remain competitive thus presents a potential constraint to institutional change. Another interviewee emphasised this challenge,

stating that 'there is a real trade-off between sustainability and internationalisation. Are we going to resolve it? No. We've got to displace and reframe the problem' (ToCWG-12). This requires assessment and alignment of the university's priorities at an organisational level to mitigate the barriers arising from a commercially competitive external context. The contradictions between internal goals and external pressures reflect the disconnect between highly motivated and radical actors and the overarching logics of the sector (O'Neill and Sinden, 2021). This lack of a collective understanding around the purpose of the university is a clear barrier to institutional change, making it harder to engage university members in a coherent, shared vision.

The apparent contradictions between the university's business and climate objectives also speak to wider research on institutional decision-making. For instance, Cohen, March and Olsen have described universities as 'organisational anarchies', operating on the basis of 'inconsistent and ill-defined preferences', 'unclear processes', and 'fluid participation' (Cohen et al., 1972, 1). Seemingly 'incoherent' decision-making stems from the 'loose coupling' of different aspects of the organisation, which may be linked but retain a sense of 'physical or logical separateness' (March and Heath, 2009, 192-3; Weick, 1976, 3). The contradictions in a university's approach to tackling the climate crisis can be understood in the context of these separate but related aspects of the institution. Our findings highlight ongoing contestation between the different aspects of the institution over what the university stands for and how it prioritises actions and resourcing for the future.

3.2 Barrier Two: Responsibility

Interviewees revealed a tendency to refer to the university as a singular actor, 'the University'. This description reflects a lack of clarity over the often-opaque layers of bureaucracy, management, and decision-making processes within a complex institution (March & Heath 2009). Members of the staff-student climate coalition critiqued 'the University's' behaviour, with a student commenting on 'a lack of the University wanting to address' various issues such as international travel. Or arguing that 'the University portrays that they seek collaboration with students on [the climate plan] but they don't' (SSCC-3). References to 'the University' revealed frustrations about the nature of decision making within the institution and were directed towards senior management. For instance, a researcher from the Faculty of Engineering and Physical Sciences raised the question of 'who in the university is in control of driving these changes' (ToCWG-1). Similarly, a member of the Faculty of Environment stated:

> I find it hard to understand the decision-making processes and how they overlap with existing structures. If X makes a decision, I don't know who signs that off, I don't know if that has priority.

> But this is a problem across the university, you can never find who is responsible for something. It's collective non-responsibility. (ToCWG-3)

As a large, complex institution the university is a dynamic aggregation of diverse actors and necessarily contains their competing views on what the institution represents and what its responsibilities are (March & Heath 2009). The tension between understandings of 'the University' (as senior management) and the university (as a complex institution) is an important factor in understanding institutional change and the challenges of achieving radical proposals for action. What emerges clearly from the data is that the university has an imperative to act: 'the underlying belief is that there is a crisis or emergency and that we have a duty to do something about it' (ToCWG-2).

Other interviewees remarked on this responsibility, but there was a range of assumptions about the nature of the university's obligations, and how far its role extended beyond its own operations. Ambiguity over the university's role and associated obligations could create a barrier to transformative change, revealing a lack of collective understanding of the university's purpose discussed above. Two direct primary responsibilities were identified: to the city and to students.
In relation to the city, a member of the Student Executive felt there was 'an assumption that we are quite responsible within the city to take a lead and work with the local council on these kinds of things' (Student representative-1). Similarly, a member of the staff-student climate coalition suggested that 'as one of the largest employers in [the city] we are responsible for a huge amount of carbon emissions and we can lead the way in organisational practices' (SSCC-2). Several interviewees argued that this responsibility to the wider city represented an opportunity to showcase achievements of graduating students (SSCC-1) or research (SSCC-2; ToCWG-12; ToCWG-4). A key part of the Climate Plan is to lead and fund a Regional Climate Assembly, addressing these concerns about the University leading on climate action and clearly moving beyond rhetoric.

Student members of the coalition highlighted the institution's obligation towards students, providing them with future skills and safeguarding their future with relation to climate action. Students' concerns explicitly drew on neoliberal logic such as 'value for money'. For example, 'I don't think anyone wants to be a customer of universities but when things are really going wrong it feels like an extra kick in the teeth to be paying nine grand for it' (SSCC-4). Although our study included five students, studies with more participants have reported similar findings regarding the emergence of the 'consumer' student (for instance Kandiko Howson and Mawer, 2013; Nixon et

al., 2018). These student's sentiments reiterate the tensions between the university as a social actor with an 'obligation' to act on climate change, as opposed to a commercial actor, driven by growth, and attracting students as consumers.[4]

The seven principles will have impacts beyond the physical fabric of the university. They place significant emphasis on all staff and students to engage in the transformation, changing the way people use facilities and deliver their roles. They also potentially place some jobs at risk, especially the principle on 'reorienting research' away from fossil fuels. This is a particular concern for geosciences departments, where research has been funded by fossil fuel companies and relating to fossil fuel exploration. Several interviewees thought that this principle would be one of the most challenging to implement, largely due to the human impact. Interviewees indicated that this principle came as a surprise to academics in geosciences, raising concerns over job security (ToCWG-5; ToCWG-9). According to an interviewee who represents a group of academics in geosciences,

> There was a panic in this department and there still is an underlying panic/anxiety sitting…because people make assumptions when you're unsure and then you think you should leave [the university] because you are unsure if there is a place for you. (ToCWG-5)

This comment highlights the emotional repercussions of insecurity on staff. In this case insecurity was heightened by an apparent lack of consultation with staff in vulnerable disciplines. If policies make staff feel unwelcome or that there is no 'place' for them, they are less likely to buy-in into policies to enable the transition. Senior leaders recognised that the perception that some people would be 'left behind' in the transition was 'being used in a divisive way'. Instead, they underlined the importance of collective participation in the delivery of principles:

> We really need to make sure that we do this properly and have an internally just transition. So that's the other challenge. That we do this in an inclusive manner that is fair and just and not just driven blindly by activism and politics. (ToCWG-2)

Almost all interviewees shared this sense that there had to be collective and negotiated approval and participation in the climate plan. Beyond underscoring the importance of transparently communicating strategies, collective participation also emerged as a potential mechanism to create policies themselves. The Climate Plan includes funding for a centre to support colleagues to

[4] Since these interviews took place the university administration launched a sustainable curriculum project with funding for posts to support its implementation.

transition away from research on fossil fuel extraction, including funding for new research and academic posts to support this reorientation.

3.3 Barrier Three: Decision making processes

Although the principles created uncertainty for staff in geosciences, they also prompted an internal effort to adjust practices, including re-framing teaching:

> [W]e have a masters in structural geology. The core skills – the teaching – is the same but we've changed the examples… We are using a lot more of the geothermal, CO2 sequestration examples, wind farms and so on…on the bachelor's degree, we have a new twenty credit, which is geology and society, which goes into sustainability and so on. (ToCWG-5)

This reflects a proactive response to the principles among staff. However, the interviewee noted operational challenges to implementing these changes within existing bureaucratic systems. They noted that changes to curricula take a long time to implement, while a lack of control over marketing courses made it difficult to reflect changes that have occurred; 'we can't market our new bachelors like we want to, which means that the perception of it is 2-3 years old to the outside world' (ToCWG-5). Bureaucratic hurdles present reputational risks from advertising outdated material and frustrate staff, which may reduce their interest in participating in institutional changes.

Current practices, beyond formal procedures can also hinder progress in achieving the principles. For example, a member of the ToC working group referenced the lack of cross-university ownership of integrating sustainability into the curriculum noting that 'we are one organisation working on a problem' (ToCWG-10). Achieving this sense of unity means overcoming an isolated working culture and conflicting disciplinary perspectives. Senior academic staff identified the finance and planning structures of 'the University' as one of the most significant barriers to institutional transformation to implement the climate principles. Interviewees argued that the senior executive of 'the University' have a specific responsibility to create a facilitating environment for transformational change, and that without a serious leadership and resourcing commitment the application of the climate principles would be shallow. According to an interviewee from engineering:

> As the university moves towards a managerial culture, that creates a buffer between the people who are coming to these meetings and the senior management… If the university is serious about change then they have to be sending these people to the meetings and saying, 'yes, we can change how the university operates'. (ToCWG-8)

However, limited trust in leadership, alongside 'environmental constraints' in the form of business strategies that are incompatible with climate plans, are key barriers to institutional change.

3.4 Barrier Four: Accountability in Practice

Setting meaningful and achievable goals is a significant challenge in relation to the complexity of the climate crisis. A core element of the seven principles is the goal to achieve 'net zero carbon emissions by 2030' and 'although we cannot yet guarantee to achieve it, it is our aim as an institution to have no direct carbon emissions by 2050'. Our interviewees had several concerns over the clarity and definition of the principles. Several interviewees expressed concerns particularly relating to accountability and follow through. One interviewee remarked; 'those principles are still quite vague and have a lot of open avenues for expecting failure. Are you going to commit to it or not? It doesn't read as if they are responding to an emergency' (ToCWG-13). Regardless of the intent behind the commitments a member of the staff-student coalition, identified that the lack of firm commitments gave the *impression* that the principles were insincere and akin to 'greenwashing' (SSCC-4). These responses reflect a sense among participants of paying 'lip service' to commitments. Moreover, the dilution of targets risks antagonising and disenfranchising actors on campus, creating a sense of an 'us' (the university as collective) versus 'them' (university management). This disconnect is again linked to the underdeveloped sense of a collective vision.

Net zero itself is a widely contested and poorly defined term. The 'net' part of net zero allows for the reduction of emissions, by mitigating those generated through current activities, and for removal of emissions that have already been released. There is no clear definition in the seven principles of whether these two elements are fungible and whether removal is conceived as an alternative to reduction or additional. This is important beyond the general normative thrust of the climate principles; specific targets such as net zero require quantification. Decisions must be made on the data to be used, the scope of the calculations and the underpinning assumptions. Different methodologies of calculation and scope will generate different results, and therefore embody choices. Such choices and their attendant assumptions must be transparent and open to refinement and scrutiny. Some concern was voiced that vagueness might invite the gaming of metrics and the over-reliance on contested methodologies such as carbon removal (often called off-setting) (Taylor, 2021). According to a senior academic:

> Everyone says they'll offset but if you add everyone's offset together, it's not possible…It would be useful if they actually pinned down to say that we will provide a percentage after some investigation to a maximal offset figure so they don't pin failure on offsetting. (ToCWG-3)

Even if this is unintended, an unclear goal obscures the extent of reliance on off-setting and carbon removal, resulting in suspicion and mistrust in interviewees (Bekessy et al., 2007). On this issue, working group members noted that offsetting 'opened another can of worms' and avoided making meaningful changes to practices (ToCWG-8; ToCWG-3; ToCWG-4). According to the Climate Plan, offsetting accounts for roughly a third of the university's strategy to reduce emissions. The substantial role that offsetting will play in reaching the net zero target reflects the ongoing relevance of concerns regarding steps to meaningfully change practices.

4 Discussion: Towards a theory and process for transformative change

Our analysis reveals several significant challenges to achieving the transformational change necessary to act on the climate crisis. This section discusses how these challenges can be addressed through: (1) creating meaningful and inclusive spaces for 'the university' as a complex institution to deliberate on its role in climate action; (2) clarifying the role of the university beyond its campus; (3) considering how 'the University' as senior management can provide effective leadership; and, (4) selecting appropriate metrics to report on progress.

4.1 Developing processes for meaningful engagement

The potential for unequal and negative social impact of some of the climate crisis principles, requires a democratic and flexible approach to change (Landemore and Ferreras, 2016; Frega et al., 2019; Cumbers et al., 2019). All stakeholders must be meaningfully involved in decisions about change, but also need the capabilities and resources to engage (Cumbers et al., 2019). This can be problematic in relation to issues as complex as the climate crisis, particularly where some of the key assumptions about goals, scope and influence are highly contested, as our interview data shows. This would suggest that a more deliberative form of democracy is needed to debate complex issues and to build capabilities to engage (Roelich and Litman-Roventa, 2020). Whilst this can be time consuming, there is intrinsic and instrumental value in this form of democracy (Frega et al., 2019).

Elements of the implementation of the seven principles provided opportunities for engagement. These included a climate plan roadshow, seeking comments on a draft climate plan, and a living lab to explore, research and trial solutions for food waste, packaging waste and behaviour change.

The governing body managing the delivery of the principles (through the climate plan) invited comments on the Climate Plan as part of an annual review process in November 2022. However, no opportunity has yet been provided to debate and challenge key assumptions underpinning principles and subsequent action. Identifying situational assumptions is a key part of a ToC. When applied in an international development project, 'assumptions represent the values, beliefs, norms and ideological perspectives, both personal and professional, that inform the interpretations that teams and stakeholders bring to bear on a programme' (Vogel, 2012, 26). When seeking to change institutional culture, identifying assumptions helps understand why practices happen and how it may be possible to change them (Olsen et al., 2023). In the university the failure to openly debate and address these assumptions has fuelled a perception of secrecy which is creating disengagement from the process. This has resulted in several formal petitions from the staff-student coalition to make the climate plan more inclusive and points to the sense that different groups within the university believe that they are working towards different objectives.

4.2 The university's responsibilities in the climate crisis

It is argued that universities should take a proactive local role text as an 'anchor institution', a 'civic university' or as a 'place-based leader' (Goddard et al., 2014; Civic University Commission, 2019; Kempton, 2019). Plans to invest in leadership and the delivery of a Regional Climate commission offers increased clarity over how the university might do this. However, more work is needed to understand how different actors within – and outside – the university understand its responsibility in tackling the climate crisis.

The seven principles reflect the university's desire to fulfil its civic role in relation to the climate crisis covering operations (including procurement and human resources practices); teaching (including recruitment and delivery); research; collaboration; and cultural wellbeing. Several interviewees outlined these civic responsibilities, reflecting on the possibilities for the university to act as a force for change through procurement practices and participation in local networks. Another working group member from operations emphasised the positive influence that the university could have in the city, and the importance of links to local government bodies to participate in programmes such as city-wide offsetting schemes. These suggestions speak to the need to clearly identify stakeholders in the university's transition and their relationship to the university. Despite these possibilities and the potential offered by leadership of the Regional Climate commission, our interviews shed light on the internal and external challenges that would stifle change and are particularly relevant to the university's civic climate role.

The ToC working group member cited above felt that despite the opportunities for the university as a *local* civic institution the internationalisation strategy and focus on establishing a reputation as an international university undermined this potential (ToCWG-8). Externally, the nationally controlled and spatially blind system that recognises and rewards academic excellence, is unlikely to stimulate local orientation (Kempton, 2019). Internally, recognition and rewards systems are tied to academic or teaching excellence and not tied to local impact, which disincentivises academics from engaging with civic activities. This divide, and the varying assumptions about the role of the university could limit the ambition and engagement of university members and constrain change.

4.3 Creating an enabling and accountable environment

'The University' in the form of senior management must address the creation of an authorising environment for transformative institutional change (Andrews et al., 2017). This is necessary to engage people from across the university and enable 'bottom-up' initiatives to change practices. Decentralising decision making across a complex institution requires the review of structural organisational barriers and processes which block action. This entails shifts in organisational governance that review key strategic activities of the university against the climate principles, but this can only happen if more powerful actors commit to this process. There will necessarily be decisions that require trade-offs with the financial bottom line. Inspired, inclusive, accountable and effective leadership is required as is already recognised in work on the potential for universities to drive regional regeneration (Benneworth et al., 2017). In parallel with changes in governance, universities must also develop capabilities to support transformational change, in both individual and collective decision making and in meaningful participation (Fazey et al., 2021).

4.4 Clarifying goals and narratives

Underscoring concerns around transparency and the university's commitment to its goals, Bekessy, Samson and Clarkson have argued that non-binding declarations result in a lack of accountability for failure to deliver targets, making changes less likely (2007). Our interviewees found the narrative around net zero problematic, particularly in relation to the lack of detail on timescales of reduction (which is urgent) and removal (which has no timescales associated with it). Removal is often talked about with false certainty, despite the effectiveness of interventions being complex, poorly evidenced and vulnerable to future leakage (Dyke et al., 2021). The university's climate plan does outline removal and emission targets. However, further clarification is needed on how the

boundaries of influence were decided and how progress towards this target will be calculated. It is important to link technological interventions to cultural changes as both are needed for transformative change (Azizi, 2023).

There have been calls globally to increase transparency around both the goals and accounting of net zero, including the separation of emissions reduction and removal (Peters and Geden, 2017; McLaren et al., 2019). This can ensure evaluation of the practicalities of each element and expose any back-tracking on emissions reduction (McLaren et al., 2019). To support this, the methodology for calculating the university's carbon emissions must be transparent with all underpinning assumptions clearly articulated, particularly around the substitution of reduction for removal. This methodology may well evolve, and transparency about data, calculations and working assumptions must be visible to build trust in the process. The flexibility of a ToC could work towards addressing this challenge by providing opportunities to reflect on different stages and adapt strategies to address new data (Vogel, 2012). A key challenge when setting goals relating to the climate crisis is the complexity of issues. Clear definitions and methods must be supported by opportunities for staff and students to debate and engage with this complexity.

5 Novel methods and limitations

A ToC approach shed lights on the 'how' of transformative change to tackle the climate crisis. It revealed assumptions about the university, which in turn enabled us to identify potential barriers to change. This is the initial step in creating an institutional ToC.

We acknowledge that the interview sample is relatively small and includes people who are actively involved in university climate policy, and do not suggest that they fully represent perspectives across the university population. Nonetheless, this interview data enabled us to trace emerging narratives on the challenge of institutional change and to identify barriers to change that will require action beyond operational 'business as usual'.

6 Conclusions

Despite the clear imperative for universities to act on the climate crisis, implementing change in complex institutions serving both societal and commercial roles is fraught with obstacles that go beyond operational characteristics. The recent rush of declarations, goals and plans from UK universities is important, but insufficient if we do not consider institutional capability to enact the change embodied in those goals and plans. Our paper draws theoretical insight from international

development thinking on theory of change and institutional capability (Andrew et al 2017), and applies this in a novel way to a UK HE institution producing a climate plan to reach net zero. This builds on and extends theoretical approaches to institutional change focussed on complex and normative external goals, as is often the case in the international development space. Whilst these findings have emerged from analysis of one institution's activities, there are insights relevant to other UK higher education institutions.

A central dilemma in the higher education sector is the tension between the neoliberal imperative of growth and internationalisation and the imperative to tackle the climate crisis, and in this sense, the authors reconfirm and build on the findings of others (Azizi 2023; Dare et al 2023). This tension manifested itself in many ways throughout our analysis. Engaging *honestly* with these dilemmas and assumptions will be essential to overcoming barriers to change and meeting the institution's commitments to tackle the climate crisis. (1) Firstly, the university's scope of action in addressing the climate crisis and its role as a social actor was frequently in conflict with its role as a commercial actor. This lack of clarity and misalignment of priorities at an organisational level creates barriers to change. It is unlikely that competing priorities will ever be fully reconciled, nonetheless the need to define a collective vision for transformative change remains. (2) Differing understandings of 'the University' (as senior management) and as the university (as a complex community) obscure the drivers of institutional change. This can undermine progress and cause staff and students to disengage from the process of change. This is particularly important as the necessary speed and scale of change will have real impacts on the lives of staff and students. (3) Institutional structures and processes do not support the speed and scale of change required to address the climate crisis. Clarifying decision making processes is necessary to improve transparency of efforts to change institutional practices, as well as engaging university members in working towards a shared objective. (4) It is very difficult to balance flexibility and accountability goals and measuring progress, nevertheless, this is essential to demonstrate commitment, whilst recognising the complexity of action on the climate crisis.

A democratic and flexible approach to change could mitigate some of these issues, while the paper proposes several ways forward to address these dilemmas and enable institutional change to address the climate crisis. Recognising the complex multiple constituencies that make up the university, it is important that meaningful and inclusive spaces are created to support deliberation of complicated and contested issues and key assumptions. The spaces must enable the university collectively to be involved in decision making about change. As the university moves forward with

its climate plan, it remains important to transparently deliberate appropriate goals and metrics, and the university's responsibilities. There is also a specific role for senior managers to provide appropriate leadership and processes to incentivise and enable transformative change. This needs a shift in organisational governance to review key strategic actions in relation to the climate crisis to remove structural barriers. The COVID-19 pandemic showed that such a shift is possible to protect staff and students from an immediate crisis. This needs to be translated to a longer-term, but no less severe crisis.

From a wider institutional perspective, the competing institutional incentives at play within the university are those that can be see across all large complex institutions in addressing normative external goals. Finding deliberative and discursive spaces will be essential to addressing this, however, as is characteristic of international development, institutional incentives tend to work against *honest* and complete problem analysis.

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