# Management control, target setting and target attainment - GHG Emission Targets in Higher Education Institutions

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## Abstract

The achievement of ambitious greenhouse gas emission targets presents a multifaceted challenge for organisations, and target setting is a core management control tool used within organisational management control systems. Within non-financial target setting, a particular challenge is how organisations can set and achieve long term goals, given challenges related to uncertainty, goal erosion and a lack of motivation. Through a case study, we explore a conceptual model for how organisations design and achieve climate change targets. We propose a target design framework that advances Dahlmann et al (2019), outlining the process of setting and achieving greenhouse gas emission targets in UniX by incorporating the role of the interplay between symbolic and substantive targets. Second, we observe that the case organisation is in the process of transitioning between two phases of sustainable development and the role of accounting controls (target setting) in effecting this movement from the second sustainability wave to the third wave. Third, we explore the role of representational control in advancing the efficacy and operation of the objects of control in the context of Merchant and van der Stede's object of control framework, especially action controls.

Keywords

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# 1. Introduction

Globally, we are already experiencing the consequences of climate change (Ge & Friedrich 2020). The Paris Agreement came into effect in 2016, signed by 195 countries, with the target of limiting the global temperature rises to two degrees Celsius. With a view to coordinating the achievement of this target, countries established Nationally Determined Contributions (NDCs) in accordance with their national conditions and capabilities (Dong et al. 2018). For example, Australia declared a national target to reduce greenhouse gas (GHG) emissions by 26-28 per cent below the 2005 levels by 2030, which they defined as an '…ambitious, fair and responsible contribution to global efforts toward meeting the objective…' (UNFCCC 2016). To avoid disastrous and far-reaching effects of climate change, GHG emission levels would have to be halved by 2030 and reach carbon neutrality by 2050 (Ge & Friedrich 2020). Reaching agreements on climate change at a global and national level can be a complex and slow process that does not necessarily lead to effective action, resulting significant responsibility on organisational actors (Krabbe et al. 2015).

Higher education institutions (HEI) have long been identified as holding an important role in the fostering of sustainable development (Bien & Sassen 2020). HEI characteristically possess vision, knowledge and power that can lead a transition, responding to the needs of society. Ultimately being left with the responsibility to lead the shift toward sustainability (Ramisio et al. 2019). Despite a growing number of HEI adopting sustainability declarations, achieving ambitious GHG emission targets presents multifaceted challenges which vary largely depending on the institution (Udas et al. 2018). Whilst there are several cases of carbon-neutral universities in Australia and globally, a particular challenge remains of how organisations can set and achieve long term goals given challenges related to uncertainty, goal erosion and a lack of motivation. Investigating this setting informs the more general question of how targets are set and utilised within organisations to achieve long term non-financial targets.

Target setting is a core management control tool within organisational management control systems (Aranda et al. 2017; Ioannou et al. 2016). They are integral to providing performance evaluations of organisational success and failure (Fischer et al. 2007). Target setting interacts with the complete management control system (MCS), and therefore cannot be studied in isolation (Journeault et al. 2016). It is part of the larger strategic planning literature, requiring an acknowledgement of strategy management and performance measurement in target design. In general, target setting has a crucial role in performance measurement (Reitbergen et al. 2015). Furthermore, it is generally perceived that

with non-financial targets, long term goals result in higher environmental performance (Dahlmann et al. 2019). However, empirical evidence debates in a financial setting, that long term targets result in uncertainty, goal erosion and a lack of motivation (Gary et al. 2017). While the literature draws a relationship between improved environmental performance and target setting, it fails to observe how targets are achieved (Dahlmann et al. 2019). A fruitful area of research is the process of achieving GHG emission targets in HEI.

Dahlmann et al. (2019) build a conceptual model of climate change targets, determining a relationship between them and environmental performance. Further, if institutions are going to achieve climate change targets, they will require a multitude of resources and capabilities, internal and external to the organisation, to move alongside them in order to enable organisational change processes (Brown & Bajada 2018). This highlights the interdependence of target setting with a web of actors within and external to the organisation. It is important for institutions to understand the holistic nature of MCS and synergies between organisational, managerial and technical functions to achieve sustainability (Lozano et al. 2018). With the aforementioned as context, the object of this paper is to explore the question, '*How can greenhouse gas emissions targets be set and achieved in higher education institutions?*'.

The empirical evidence is based on data collected from a single-case study of UniX. We observe the process of setting and achieving climate change targets at UniX. We find that in addition to implicating performance, symbolic and substantive targets can be used symbiotically by institutions to drive actionable target setting. Additionally, we find that UniX is currently transitioning between the second and third wave of the Benn et al. (2014) sustainability phase model. We observe the role of uncertainty, negotiation and the challenges of local area disconnect as facets of this transition. Finally, we identify and explore gaps in the MCS at UniX which affect the institution's performance in sustainability (Malmi & Brown 2008; Merchant and van der Stede 2012; Simons 1995).

This paper claims three contributions. First, we contribute new empirical evidence by developing a target design framework (Figure 4) that advances Dahlmann et al (2019). This framework crucially captures the role of the interplay between symbolic and substantive targets identified by Dahlmann et al. (2019), but advances their framework to outline how symbolic, aspirational external targets translate to internal targets. Our framework builds from the case evidence in the study outlining how setting and achieving GHG emission targets, extending prior research on how non-financial operational targets can be attained.

Second, we observe that the case organisation is in the process of transitioning between two phases of sustainable development. The Benn et al. (2014) sustainability phase model identifies three waves in sustainable development for organisations, in which UniX is transitioning between the second and third wave. This study is the first to observe the transition between phases of sustainable development and explore the role of target setting in enabling this process.

Finally, and third, we explore the role of representational control in the context of Merchant and van der Stede (2012) object of control framework. Representational control links the organisational champions literature, transformational leadership and control system literature (Achilladelis et al. 1971 in Heng et al. 1999, p.22; Nguyen et al. 2017) to sustainability performance. We claim that representational control aids the efficacy and application of the other objects of control, as observed from our study.

The remainder of this paper will be organised as follows. In the next section, we will review the background literature on sustainability, target setting, strategy, MCS and, strategic agility and uncertainty. This is followed by a description of the research design, including the methods used to conduct the study. We then present and discuss our findings. Finally, we conclude and outline suggested directions for further research.

# 2. Theoretical Background

## 2.1 Sustainability

Sustainable development first became a popular concept in the 1980s with the release of the Brundtland Report (Cardoso de Oliveira Neto et al. 2018). The Brundtland Report defines sustainable development as '…[ensuring] that it meets the needs of the present without compromising the ability of future generations to meet their own needs…' (WCED 1987). Since then, sustainable development has emerged arguably as one of the major issues to concern organisations in the twentieth and twenty-first century (Ramisio et al. 2019). However, sustainable development has managed to resist a single and widely accepted definition and interpretation in the extensive literature addressing its role in society, environment and business (Dietz & Neumayer 2007). Though, the understanding that the ultimate aim of sustainable development is that it 'lasts' is not commonly disputed (Dietz & Neumayer 2007). In the 1990s, Daly contributed to the definition of sustainable development when they proposed a system that distinguished three types of sustainability; weak, intermediate and strong (Cardoso de Oliveira Neto et al. 2018; Daly 1991).

In weak sustainability; economic, environmental and social capital are considered substitutable, whereas within strong sustainability; economic activity must preserve natural resources (Cardoso de Oliveira Neto et al. 2018). Strong sustainability aligns with the original definition of sustainable development from the Brundtland Report (Pham et al. 2020). Strong sustainability has two principal components; [1] the four forms of capital (renewable natural, non-renewable natural, manufactured and human) in which we should maintain natural capital, and [2] a necessary differentiation between non-renewable and renewable natural capital in decision making processes (Pham et al. 2020).

The continuous failure of organisations to embrace sustainability in strategy and operations calls into question the focus and objectives of current policy (Fischer et al. 2007). Sustainability in business is characterised as extremely difficult to achieve and requiring an adjustment from a 'business-as-usual' mindset towards a vision that represents the organisation's sustainable objectives. Moreover, it requires that vision be internalised in the institution through strategic planning and target setting (Bebbington & Gray 2001). Benn et al. (2014) developed a sustainability phase model that highlights the seemingly convoluted and extensive process organisations' often undergo to become sustainable businesses. The Benn et al. (2014) model presents three waves of sustainability development that allude to six stages organisations go through to become sustaining corporations (see figure 2 below). There are only a handful of organisations we know of that have reached the third wave, implying it is a significant challenge to move from the second wave to the third wave (Benn et al. 2014).

Sustainability is often thought about in the context of 'longevity' or the 'long-run', as sustainable development is about preserving the environment for future generations (Roostaie et al. 2019; Baumgartner & Quaas 2009). However, within organisations, the 'long-run' is often associated with uncertainty and risk (Baumgartner & Quaas 2009). Comparatively, the literature on target setting and stretch goals hosts a debate on long-termism and the effects of uncertainty of organisational goals (Dahlmann et al. 2019; Gary et al. 2017). Existing literature broadly states that organisations do not have the understanding of how to navigate emergent changes that occur over long-term targets, which can be problematic in non-financial target setting as it is approached with a

## Waves of Sustainability

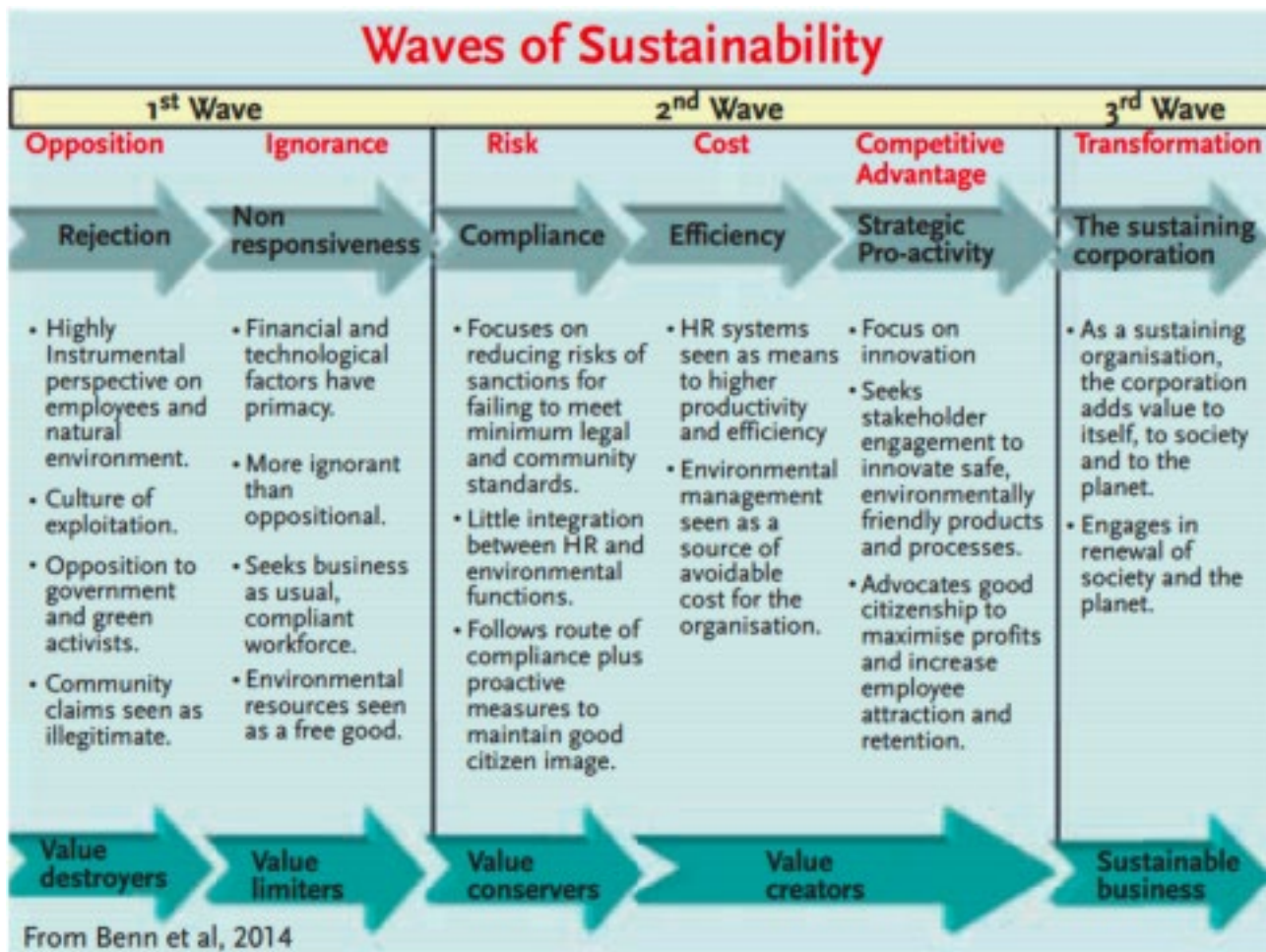| 1st Wave | | 2nd Wave | | | 3rd Wave |
|---|---|---|---|---|---|
| **Opposition** | **Ignorance** | **Risk** | **Cost** | **Competitive Advantage** | **Transformation** |
| Rejection | Non responsiveness | Compliance | Efficiency | Strategic Pro-activity | The sustaining corporation |
| • Highly Instrumental perspective on employees and natural environment.<br><br>• Culture of exploitation.<br><br>• Opposition to government and green activists.<br><br>• Community claims seen as illegitimate. | • Financial and technological factors have primacy.<br><br>• More ignorant than oppositional.<br><br>• Seeks business as usual, compliant workforce.<br><br>• Environmental resources seen as a free good. | • Focuses on reducing risks of sanctions for failing to meet minimum legal and community standards.<br><br>• Little integration between HR and environmental functions.<br><br>• Follows route of compliance plus proactive measures to maintain good citizen image. | • HR systems seen as means to higher productivity and efficiency<br><br>• Environmental management seen as a source of avoidable cost for the organisation. | • Focus on innovation<br><br>• Seeks stakeholder engagement to innovate safe, environmentally friendly products and processes.<br><br>• Advocates good citizenship to maximise profits and increase employee attraction and retention. | • As a sustaining organisation, the corporation adds value to itself, to society and to the planet.<br><br>• Engages in renewal of society and the planet. |
| Value destroyers | Value limiters | Value conservers | Value creators | | Sustainable business |

From Benn et al, 2014

Fig. 2: Sustainability Phase Model (source: Benn et al. 2014, p.22)

predominantly long-term perspective (Bui & de Villiers 2017; Gary et al. 2017; Ivory & Brooks 2018).

## 2.2 Target Setting

Figure 1 articulates the interrelationship between four major levels of society and subsequent emissions reductions objectives. If the individual and institution cannot perceive the possibility of achieving GHG emission reduction targets, it would seem relatively unlikely for national and global targets to be met. The diagram shown in fig. 1 contextualises the importance of understanding how institutions set and achieve their GHG emission targets, highlighting the broader impact this study could have.
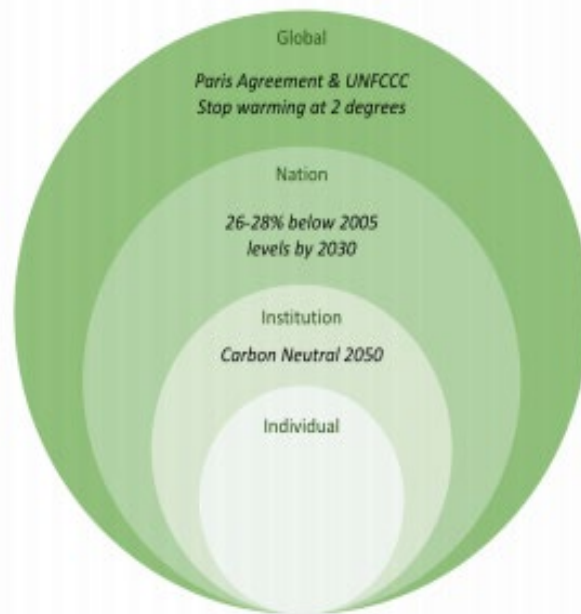
Fig. 1: Interrelationship of climate change target setting (source: author)

Target setting is a key management control tool used by organisations (Ioannou et al. 2016). A large volume of target setting literature focuses on financial performance within organisations. Financial targets are often characterised by their short-term nature, reliance on past financial performance, and incentivising middle managers to perform by offering bonuses when targets are achieved (Ioannou et al. 2016). There is a distinct difference in the processes of setting financial and non financial targets, and moreover, a considerable difference in the way they operate (Ioannou et al. 2016; Dahlmann et al. 2019). Science-based target setting is commonly used as a substitute for past performance when setting non-financial goals (Ioannou et al. 2016). However, one consistent characteristic of financial and non-financial targets, whilst interpreted differently, is motivation or aspiration. Aspiration points are crucial for organisations to measure performance, and influence performance evaluation, strategic decision-making and willingness of organisations to take risks (Aranda et al. 2017). Literature accentuates the influence of motivation and engagement in target setting. In non-financial target setting, there is a fine line between where motivation is either captured or dissipates. It is often related to the difficulty of the target, and uncertainty of how to achieve it (Gary et al. 2017). Challenging targets can motivate innovative thinking, push boundaries, and encourage persistence to work towards accomplishing goals (Ioannou et al. 2016; Dahlmann et al. 2019). Within climate change target setting literature, a positive relationship between stretch targets and environmental performance has been confirmed, though the targets often result in goal erosion, a lack of organisational motivation and performance variance (Gary et al. 2017; Dahlmann et al. 2019). There is a lack of understanding on the relationship between long term targets and short term strategy implementation for achieving non-financial targets which needs to be addressed (Fischer et al. 2007; Tukker 2013).

## 2.2.1 Climate change targets

Climate change, or non-financial targets, are constructed through a different process to financial targets. Dahlmann et al. (2019) constructed a conceptual model of climate change target setting. Figure 3 shows an overview of the conceptual model, which we build off in this research. Prior to the work of Dahlmann et al. (2019), literature was relatively fragmented and painted an incomplete picture of climate change target setting. Companies can set targets for two purposes; [1] to represent a desired future, also termed 'backcasting', or [2] for the purposes of improving their current image (Dahlmann et al. 2019; Fischer et al. 2017; Pinkse & Busch 2013; Robert 2017). In cases of improving current image, organisations' are often found to be greenwashing (Berrone et al. 2017; Dahlmann et al. 2019). Target setting behaviours differ significantly between organisations', considering time frame, sustainability content and difficulty, symbolic targets predominantly focus on short-term outcomes (Maas & Rosendaal 2016). Failing to reduce carbon emissions through target setting is often deduced to short-termism and a desire to avoid uncertainty, which has been broadly criticised as a barrier in environmental performance (Bui & de Villiers 2017; Fischer et al. 2017; Slawinski et al. 2017).

Climate change target setting literature has highlighted several definitive characteristics. Hoffman & Bush (2008) identified four types of carbon indicators used in decision making; [1] carbon intensity, [2] carbon dependence, [3] carbon risk and [4] carbon exposure. Prior research has identified target purpose, target coverage, organisational and geographical scope and target intensity as determining characteristics of climate change targets (Pinkse & Kolk 2009). However, the most developed and relevant model of target setting characteristics comes from Dahlmann et al. (2019), building off prior theoretical and empirical findings. The four characteristics in the model are; [1] target type, [2] target scope, [3] target ambitiousness and [4] target time frame (see Appendix A). Characteristics of targets are integral in understanding environmental performance, and furthermore deciphering the process of achieving those targets (Dahlmann et al. 2019).

Climate change targets should have a substantive construction, as this empirically links to improved environmental performance (Dahlmann et al. 2019). The literature is yet to consider how substantive climate change targets overcome challenges and assist in achieving objectives in a set time frame, which is where this research will continue.

| CLIMATE CHANGE TARGET | SUBSTANTIVE | SYMBOLIC |
| --- | --- | --- |
| TARGET TYPE | Absolute | Intensity |
| TARGET SCOPE | Doesn't influence | |
| TARGET AMBITIOUSNESS | More difficult | Easier |
| TARGET TIME FRAME | Long-term | Short-term |

Fig. 2 Substantive & symbolic targets based on environmental performance (Dahlmann et al. 2019)

### 2.2.2 Stretch Targets as a means of achieving organisational goals

Stretch targets are, by definition, difficult to achieve (Gary et al. 2017). They are goals that are constructed so an organisation must innovate and push the boundaries through strategy, incentives and novel ways of achieving their purpose (Rose 2012). Long-term goals are considered necessary in sustainability objectives to allow time for an organisation to achieve a goal and ensure it has a positive impact on the broader society (Dahlmann et al. 2019). Though a bulk of the literature on stretch goals is in the context of financial performance, contingencies impacting organisations intersect with challenges faced in non-financial climate change targets (Dahlmann et al. 2019; Gary et al. 2017; Ioannou et al. 2016). Particularly within complex settings, the application of new strategies will often result in failure and subsequent poor performance (Gary et al. 2017). The uncertainty and risk factors that accompany new strategies and approaches lead to challenges such as goal erosion, wherein the current performance level and aspiration level converge so as to represent an image of satisfactory performance (Gary et al. 2017). Within the literature on climate change targets, there have been multiple calls for long-termism and short-termism to be coupled to address the complexity of the sustainability problem (Dahlmann et al. 2019; Fischer et al. 2007; Ivory & Brooks 2018; Tukker 2013). Moreover, coupled with the longevity of performance outcomes, stretch targets often result in a downturn of organisational motivation and engagement with the target (Gary et al. 2017). Although empirical evidence has determined that in order to meet the needs of the global target (limiting warming to 2 degrees Celsius) in such a complex and emerging environment, long-term targets are necessary, there remains a lack of correlation between short strategy and long term goals and how they can work in parallel to achieve climate change targets.
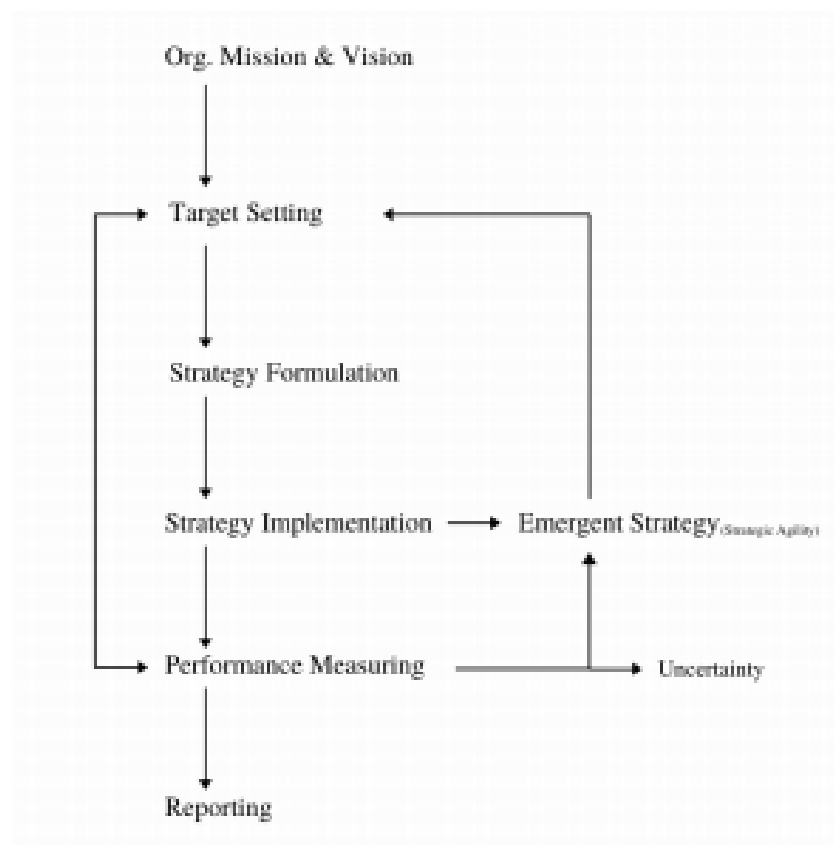
Fig 3. Process of Setting and Achieving Targets (source: author)

## 2.5 Strategy management and the environment

MCS are a complex web of target setting, strategy management, measurement and reporting. To comprehend and extend on the target setting literature, it is important to consider the informative roles that strategy and performance measurement play. Mintzberg & Waters (1985) first defined strategic management as having two important phases; strategy formulation and strategy implementation (Engert & Baumgartner 2016). Strategy formulation encompasses the process of developing strategy. Strategy implementation is the act of achieving the objectives set by the organisation (Engert & Baumgartner 2016; Mintzberg & Waters 1985). The challenge of environmental strategy implementation has been explored prior research (Engert & Baumgartner 2016; Garces-Ayerbe et al. 2016; Journeault et al. 2016; Latan et al. 2018), though it still serves an important role in the target design. Target setting is designed to allow for tacit knowledge beyond what is explicitly stated in an organisation, supporting the emergence of strategy implementation informed by an organisation's complex, changing environment (Aranda et al. 2017). Studies have found that environmental strategies are largely used for the purpose of achieving traditional business outputs, as part of the business-as-usual culture and lack of commitment to achieving sustainability outcomes (Higgins & Coffey 2016). A transition is necessary to consider strategy as a means of achieving environmental targets rather than environmental strategy being used to achieve traditional business objectives. This shift in mindset is integral to the progression of MCS practice and theory. Strategy should be designed around internal and external conditions of an organisation, embracing the uncertainty and complexity of climate change objectives (Wolf & Floyd 2017).

## 2.6 The role of MCS

MCS at the organisational level have been well-established as important internal mechanisms for effecting strategic change (Chenhall & Euske 2007; Narayanan & Boyce 2019). Moreover, recent literature has begun to explore MCS in sustainability and its role in an organisation's move toward sustainability (Henri et al. 2016; Narayanan & Boyce 2019). Research argues that MCS have an integral role in addressing the complexities associated with sustainability strategy implementation (Arjalies & Mundy 2013; Wijethilake 2017). The primary goal of management control and organisational incentive systems is to motivate (Merchant et al. 2003). Although, attempts to adopt MCS and introduce performance measures in HEI can be ineffective as there is an inability to capture the complex nature of university activities (Pilonato & Monfardini 2020).

There are three dominant frameworks in the current management control literature. Simons (1995) levers of control framework has four control areas; [1] *belief systems* which are an organisation's explicit values and purpose, [2] *boundary systems* which are limitations that prevent employees pursuing unaligned projects, [3] *diagnostic controls* which assess and incentivise achievement of goals though traditional mechanisms of control such as key performance indicators (KPIs) and [4] *interactive controls* which are designed to improve managers abilities to learn from events and support them in risky contexts (Pilonato & Monfardini 2020; Wijethilake 2017). Simons (1995) model examines how dualism between enabling and coercive controls can be used to create tension in all systems (Pilonato & Monfardini 2020; van der Kolk et al. 2019).

Merchant & van der Stede's (2012) object of control framework is instead framed around objects to which management control is directed to classify the elements (van der Kolk et al. 2019). The object of control framework also articulates four different types of management control elements built on the objects they aim to control. The four types of elements are; [1] *personnel control* which is the training and hiring of people, [2] *cultural control* which is enabled through shared norms and values of employees, [3] *action control* through specifying and monitoring actions that need to be executed and [4] *results control* which focus on examining desired and achieved results (van der Kolk et al. 2019). Finaly, Malmi & Brown (2008) MCS package conceptual framework is a broad model that defines five types of controls in the typology; [1] *planning control* which sets out the goals of the organisation and standards to be achieved, [2] *cybernetic control* which measure and evaluate organisational performance through budget and measurement systems, [3] *culture control* as the communication of values, recruitment of employees and guidelines, [4] *rewards and compensation control* which motivate employees and [5] *administrative controls* which includes

division of responsibility and decision-making (Malmi & Brown 2008; Svensson & Funck 2019). All three frameworks contribute something unique to the management control literature and are important to consider in the system of achieving organisational objectives, and specifically climate change targets which are defined by their uncertain and ambiguous nature.

## 2.7 Strategic agility and uncertainty in organisations

Strategic agility is "the ability of management to constantly and rapidly sense and respond to a changing environment by intentionally making strategic moves and consequently adapting…" (Weber & Tarba 2014, p.7). The emergent and 'fleet of foot' nature of strategic agility accentuates the issues of uncertainty and motivation in target setting and strategy management. Strategic agility is a predominantly emergent force which constitutes making strong strategic objectives and simultaneously adjusting to change (Ivory & Brooks 2018). Sustainability is considerably complex and planned strategies are not suitable in addressing the problem of sustainability in any context and that is when it is necessary for strategic agility and emergent strategy to drive organisational decision making (Ivory & Brooks 2018). However, in applying the theory of emergent strategy, the challenge of uncertainty arises. GHG emissions are considered a key uncertainty in strategic planning, hence the complexity of developing strategies that can achieve targets (Bui & de Villiers 2017).

Literature has been able to identify this gap and acknowledge that enacted strategy is driven by emergent forces. Top management plays the role of establishing a deliberate and controlled plan, where middle managers have an emergent influence on the organisation and implementation of strategy (Wolf & Floyd 2017).

# 3. Research Method

To address the research question '*How can greenhouse gas emission targets be set and achieved in higher education institutions?*' we adopted a qualitative methodology based on a single case study (Yin 2009). The case study method enabled me to answer a 'how' research question in an exploratory manner and provide an in-depth study in a specific context (Albertini 2018; Yin 2009). The case study approach is a popular research design in business and management research (Bryman & Bell 2011, p.59). Furthermore, a case study approach is a systematic way to provide value to practitioners (Albertini 2018; Cooper & Morgan 2008).

The case study combines data from multiple sources including interviews, archival documents and participatory-action research. An in-depth single case study approach requires multiple sources of data (Engert & Baumgartner 2016; Yin 2009) to develop converging lines of inquiry and triangulation of data to minimise any risks of bias during data analysis (Albertini 2018; Engert & Baumgartner 2016; Yin 2009).

## 3.1 Case selection

The criteria used to select the case study was informed by Albertini (2018) approach and criteria dictated by the literature and contextual circumstances. First, identifying an industry that has a significant influence on broader society and the power to induce changes in sustainable development. Second, identifying an institution who has declared a climate emergency. Third, identifying an institution that has a substantive climate change target. And fourth, identifying an institution who wants or needs to redevelop their sustainability strategy plan.

Higher education institutions are characterised as responsive to societal needs and possessing a key role in leading the paradigm shift to sustainable development and their GHG emission consumption (Ramisio et al. 2019). UniX declared a climate emergency in 2019 and simultaneously set an aspirational target of 'carbon neutrality'. The target set by UniX is an absolute GHG emission reduction target, which happens to be in line with the science-based targets initiative. It boasts a difficult goal that must be achieved over a long period of time and under Australian regulations, must report a minimum of scope 1 and 2 emissions. Under the conceptual model established by Dahlmann et al. (2019), UniX has a substantive climate change target. Furthermore, UniX is currently developing their sustainability strategy plan for 2021-24, allowing for the opportunity to co-construct and engage in participatory-action research.

## 3.2 Data Collection

We obtained different data types through archival analysis, interviews and participatory-action research. Semi-structured interviews were conducted with 22 employees of UniX. They were between 15 minutes and a maximum of 1 hour in duration, were audio-recorded and fully transcribed using NVivo Transcription software. Interviews are an essential component of case study sources of information (Yin 2009). Interviews were constructed in a semi-structured format to allow for open-ended conversation to support the emergence of novel insights during data analysis (Albertini 2018). The five archival documents collected were from both confidential and public sources. Triangulation of data is important in internal validity (Albertini 2018; Bamford 2008). To

meet this criteria, interviews were supported by archival data and participatory-action research (PAR). PAR is a unique mode of observation in which the researcher is more than a passive observer (Engert & Baumgartner 2016). For this style of data collection, we held a workshop with participants which enabled co-construction through discussion and sense-making. Participants were provided with an explanation and and questions based on the findings gathered. Participants were then given 30 minutes to contribute before sense-making and discussion. PAR enabled me to gain revelatory insights from the institution that would not otherwise be accessible. Formal archival data included the complete UniX Sustainability Strategy 2017-20 and the internal review of UniX strategy progress in 2018. Public archival data included the UniX sustainability policy, the 2019 Annual UniX Sustainability Report and the press release where the institution made a public climate emergency declaration. For case studies, archival documents are important to support or argue evidence gathered from other sources, and allow insights to be gained from them (Albertini 2018; Yin 2009).

## 3.3 Data Analysis

Data analysis was conducted by grouping and comparing multiple sources of information: interview transcripts, archival documents and observations made during PAR. By categorising the data, it enables a deep-dive into the interpretations from the data collected (Albertini 2018). Using Miles & Huberman (1994) methodology for categorisation based on key concepts and themes, we analysed the data with key themes which were determined by the literature. Those codes were then arranged, classified and refined in accordance to larger themes through a process informed by open, axial and selective coding (Corbin & Strauss 2015). we used the qualitative data software NVivo 12 to code all data collected based on the key themes and sub-themes through an iterative coding process. NVivo is a widely recognised tool for qualitative research and supports data management, coding and theory testing (Albertini 2018). We refined and developed parent nodes, sub-nodes and added emergent themes throughout the qualitative analysis process. we then used coded data to draw relationships and insights that emerged from the analysed data to gather our key findings and extend on the current literature.

# 4. Findings & Discussion

The objective of this research is to explore *How can greenhouse gas emission targets be set and achieved in higher education institutions?* UniX achieved a medium term target of reducing GHG emissions by 30% percent. First we describe and explain how they did this. Having attained their current target, they are in the process of formulating new targets. We identify that these represent two distinct phases, with the second having a more transformational aspiration. We class

the initial, very first target selection process; *target birth*, unusually characterised by ambitious target setting. Once attained, this is followed by a bolder, even more ambitious *target renewal* prcess. The initial target setting during *target birth* is operationally more uncertain, with a strong commitment for target attainment owing to the first time pursuit of the target. However, the second target renewal phase is supported by prior learning, borne from the target birth stage. This leads to great operational clarity around what is possible, an ambition to pursue further change and appears to drive greater underlying operational transformation. In this way, accounting controls in the form of targets fluidly progress over time and effect operational transformation. What is unique here is not the learning effect, this has been discussed in prior literature. We contend that the robustness of the initial targets set represent a unique approach to driving target change, a form of "jumping in the deep end" from a management control and performance management perspective. This has subsequent effects that can offer substantial operational transformation for organisations.

The findings highlight the critical role HEI play in innovation ecosystems as enablers and catalysts for broader societal change. Additionally there are three emergent findings that can be drawn from the study; disconnected local areas, the lack of integrated performance measures and the role of representational control. These emergent findings are discussed further below.

## 4.1 Setting and achieving climate change targets at UniX

### 4.1.1 Target setting – from "external aspirational" to "internal actual"

The current system of setting and achieving sustainability targets at UniX was observed as a complex and iterative system. Per Figure 3, this model highlights in detail a MCS employed by the institution to achieve targets. It was constructed through observation and data collected from interview responses.

The UniX Sustainability Policy is *the highest level document [UniX] have and that's the one approved by Council* (Participant 1). The policy outlines the *purpose, scope, definitions* and *six principles* which inform the strategy process and organisational decision making linked to sustainability practices (UniX Sustainability Policy) *All activities need to be according to those principles'* (Participant 1). The UniX Sustainability Policy is currently under review by the Sustainability Team and a revised policy will be submitted to UniX Council for approval in 2021.

Informed by the Sustainability Policy and UniX's organisational commitment, the climate emergency declaration was signed in 2019 by the Vice-Chancellor. This signalled a public commitment of working towards carbon neutrality *by 'mobilising more resources for action oriented climate change research and skills creation* and *'pledging to increase the delivery of sustainability education* (press release). However, the aspirational target set after signing the

declaration remains unofficial due to the lack of a clear strategic plan for achieving the aspirational target of 'carbon neutral by 2030' and 'net zero by 2050'. Those targets are still subject to change and have not yet been ratified by the university. In order to move from aspirational target to a substantive climate change target, the institution proceeds to develop a strategic plan.

The strategy formulation component of the MCS at UniX is complex and far-reaching. The strategy document is developed every three years by the Sustainability Team at UniX. The strategy document is developed through three phases that engage a bottom-up approach. A review of the previous sustainability strategy and consultations with staff and students are used to guide the development of the strategy document. It is an interactive process that addresses the needs and wants of the UniX community. UniX believed that target setting is more successful when middle-managers are engaged in a bottom-up approach rather than a top-down formulated strategy which dictates. The bottom-up strategy generates commitment and motivation of middle management - typically the individuals responsible for implementing initiatives outlined in the strategy document.

*" …there'll be two separate consultation processes because we've got to concentrate on the two different issues. But what we normally do is review what's being done in the past so we do the consultation and then we come up with a draft plan and then we publicly release to the UniX community. We put that out on the Internet and ask for feedback, and then we include any feedback into the plan and update it. And that becomes our final plan"* (Participant 1)

The consultations are framed around four areas of the university; operations, teaching, research and governance. Whilst everyone is welcome to attend, the sustainability team *specifically target people involved in [each area] in the university* (Participant 2). Additionally, UniX hosts a separate consultation for students to share their concerns. The consultations are designed so that '*everyone across the university is involved in helping to deliver, including students and staff. And, you know, we've all got a role in helping to meet the goals and objectives and targets within the strategy'* (Participant 2).

*"There are many ways that you can develop a strategy for an institution, [your] strategy can be written in a locked room with key power holders and decision makers. They write it, they hand it down, it gets shared, and then we will have to implement it… If you bring people along on the journey with you, not only will you end up with a much stronger outcome because it's built off the back of the knowledge of your community, because people bring knowledge and experience and expertise - but the act of actually engaging people in a conversation about what the right solution is a change management process in and of itself"* (Participant 7)

Once the consultations have taken place, the sustainability team synthesises all the information into the strategy. In addition to using a bottom-up approach in strategy formulation, backcasting is used as a method to develop a clear and actionable plan to achieve the climate change target. Within the broader sustainability strategy there is a 'carbon neutrality plan' constructed with the purpose of meeting the aspirational GHG emission reduction target. Backcasting is used to identify three elements. First, the current resources and capabilities of UniX that will aid the institution to move toward the carbon neutrality target; second the resources and capabilities that will need to be invested in, and third the shortfall needed to be offset by purchasing carbon credits.

Evidently technologies and contexts are dynamic, and it is necessary to acknowledge the place of emergent strategies throughout the implementation of the sustainability strategy document. This is also an example of where negotiation can be observed in achieving the target. If the shortfall is too large, it is predictive that there could be a series of negotiations on the time frame or ambitiousness of the GHG emission target. As the university signed the climate emergency declaration, which included target parameters, a set of boundaries naturally existed to shape the degree of negotiation around target setting.

The final strategy document is sent through the university's bureaucratic system to receive the necessary approvals from the Deputy Vice-Chancellors (DVC) and Vice Chancellor of UniX. The Council is made aware of the strategy. The strategy document currently being developed by the university will be the first aligned with the aspirational target of carbon neutrality. It is important for the institution to have this plan articulated prior to setting the target. Participant 3 affirmed:

'*We do have a carbon neutrality target and goal and desire. But the important part for us and indeed… for other universities, is if there is no plan there is no point in having a target*'

If the strategy implementation document evidences a clear roadmap to carbon neutrality, the aspirational target will be defined and announced to the public, setting the process for achieving the climate change target in motion. After the initial strategy, it is be reviewed and adjusted on a tri annual basis by the sustainability team.

### 4.1.2 Achieving the Target

Once the target has been ratified and released to the public, the implementation of the strategy is lead by the DDV, a UniX sustainability committee. The strategy is *broken up into those four key areas [teaching and learning, research, operations and community engagement]* (Participant 1) and it is the responsibility of each DVC to actively enforce and engage with the strategy within their area. There are examples of disconnect between the UniX local areas and sustainability. In the previous strategy, there was *a change of deputy vice chancellor [in research] so the previous one had signed off on the initiatives… so all of those initiatives are on hold* (Participant 1). Whilst there are implementation initiatives outlined for each of the areas in the strategy, it is not within the
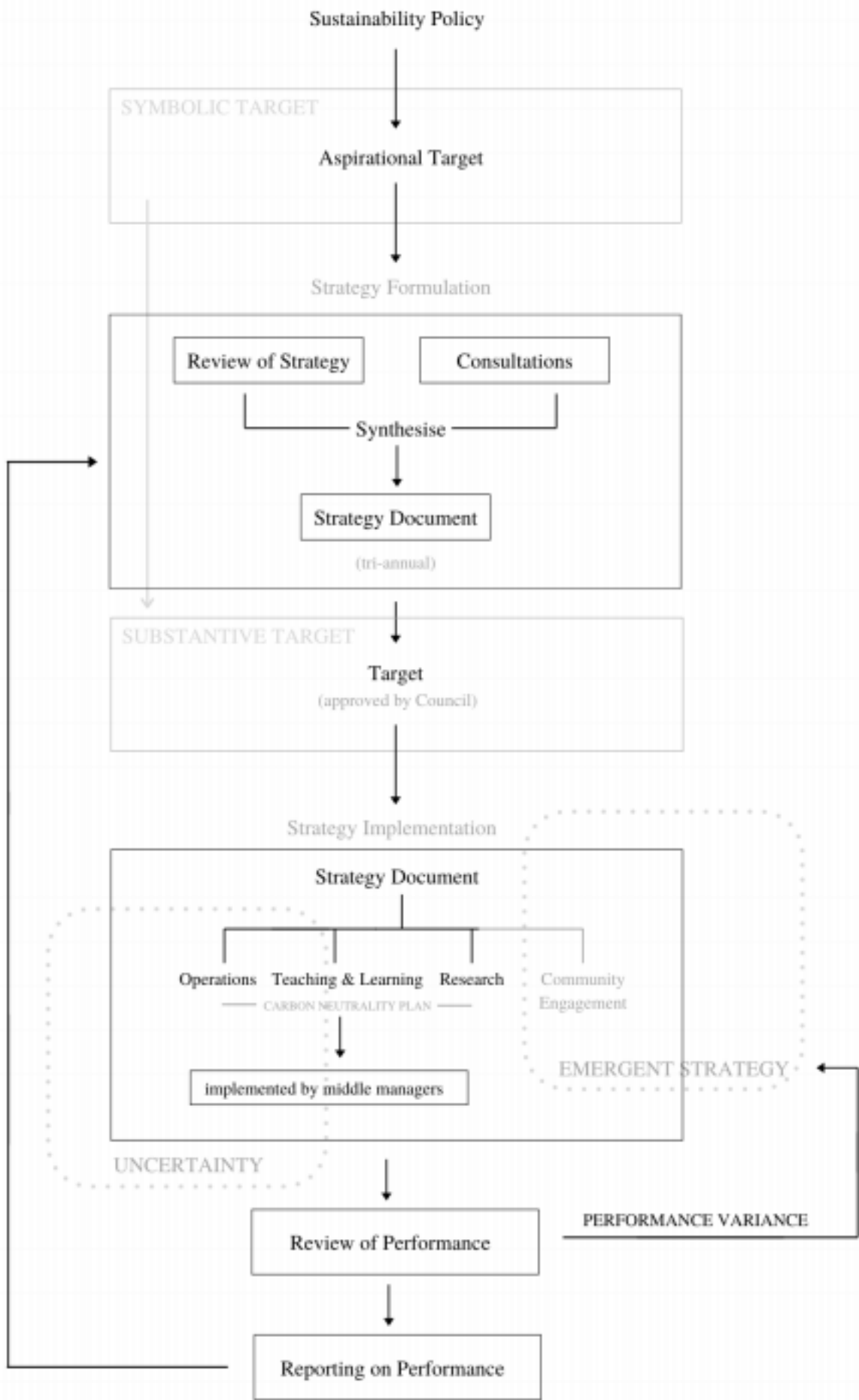
Fig. 4: Target Design Framework

(Resources) is *adamant on making sure we reach those targets. [It's] kind of embedded in most things we do where we can'* (Participant 5) and they are *' really on board with [sustainability]. But others… in the group have… not been supportive and have not tried to pursue goals on sustainability'* (Participant 4). Without unanimous support *' it's really hard to get momentum behind a strategy to achieve carbon neutrality'* (Participant 4). Accountability and commitment transcends through various levels of the hierarchy within Operations at UniX. This same form of accountability appeared less evident in Teaching & Learning, and Research. The lower level of accountability permeated the performance of those areas in the review of the 2017-2020 strategy. Due to the lack of accountability and commitment through Teaching & Learning and Research, there appeared a significant gap which impacted the institutions' ability to attain their climate change targets.

Beyond the sustainability strategy, a specific carbon neutrality plan was developed with the sole purpose of achieving the GHG emission reduction target. The carbon neutrality plan will extend over Operations, Teaching and Learning and Research. A predominant percentage of the plan will be focused on Operations *' because most of the initiatives within the carbon neutrality plan are in the operations area, because of things like solar panels, electricity consumption and all of that'* (Participant 1). Within the three areas, the responsibility of implementing the sustainability strategy more broadly and the carbon neutrality plan specifically will fall in the hands of middle managers. The DVCs have the initial task of implementing and endorsing initiatives set out in the strategy, however as evident from previous strategy implementation processes, middle managers implement the operating system and local area initiatives.

### 4.1.3 Proposing a Target Design Framework

The Target Design Framework (Figure 4 above) builds on the conceptual model developed by Dahlmann et al. (2019) which examines performance through substantive and symbolic climate change targets. Extending their work, this study explains how institutions set and actually achieve those substantive targets. Empirical studies have identified that substantive climate change targets result in higher organisational performance than symbolic targets (Dahlmann et al. 2019). What emerged from this study was the Target Design Framework which outlines how UniX design the process to set and achieve GHG emission targets. The Target Design Framework identifies that in UniX, symbolic climate change targets are foundational in developing and motivating the organisation towards setting a substantive target.

As articulated in the Target Design Framework, the institution sets an aspirational target, and then develops a strategic plan to reach that target before ratifying a substantive target into the organisation's objectives. What this study identifies is that rather than necessarily being separate entities, symbolic targets can be used as a catalyst for the institution in setting a substantive target such as carbon neutrality. In this capacity, symbolic targets can actually be more ambitious than

substantive targets, in comparison with Dahlmann et al. (2019) conceptual model, as they are aspirational in nature and therefore a roadmap to achieve the goal has not yet been defined by the organisation.

### 4.1.4 Emergent Strategy

Underneath the hierarchical strategy implementation process sit two ever present and implicating constructs; emergent strategy and uncertainty. Emergent strategy is regularly utilised by UniX, particularly in instances where an original initiative is found to be inefficient, ineffectual or more costly than a sustainable alternative. Examples were provided by participants of strategies which after creation of the strategy were found not to be as sustainable or cost effective, in which case it was replaced with an alternative. Furthermore, there have been instances over the period of the previous target in which technology had evolved or become more mainstream, making it more cost efficient. An example of this was the original plan for generation using gas, which was replaced by Photovoltaics (PV) solar ,which had over time become more cost effective and had a greater environmental impact.

### 4.1.5 Uncertainty

Alongside emergent strategy sits uncertainty. Over the duration of this study, the global pandemic caused by the virus Covid-19 has been evolving. In 100% of interviews, 'Covid' was mentioned by participants as having some impact on sustainability at UniX, either positive, negative or both. A majority of participants considered Covid-19 as an uncertainty that will have adverse affects on the institution whether that be financial, environmental or social. Over the duration of the previous climate change target at UniX, the institution had to chart through the Global Financial Crisis of 2009, alongside other uncertainties such as the delay of Solar Farm X which 18% of participants stated was a major barrier in achieving both the previous and aspirational target. In the case of the previous target, UniX was required to purchase carbon offsets in order to achieve the target without Solar Farm X functioning. Uncertainty tends to ebb and flow around strategy implementation however through this study alone, it is evident that uncertainty always exists and must be considered by institutions as an independent variable when setting and achieving their climate change targets.

 *"We were unprepared for covid, we adapted fairly quickly to our credit, but what's the next one and to assume that there won't be a next one, we think is perhaps a bit naive. So there could be a next one. You know, we don't know what that is… And maybe we need to start thinking about that more and preparing for that more."*(Participant 10)

### 4.1.6 Organisational Performance and Reporting

Throughout the strategy implementation process, UniX measures performance of the targets

annually through a review of the initiatives using a traffic light system. Those performance measurements identify any performance variance which enables UniX to reassess initiatives and consider ways of improving performance. This promotes emergent strategy and reiterations of the tri-annual implementation document. In addition to measuring performance, the university will then take those results and report annually on their progress both internally and externally. At the end of the three years of the strategy document, the DDV will return to the strategy formulation process and begin a review. This pathway continues throughout the duration of the climate change target.

Through the observation of these findings, the target design framework (see figure 4) was developed to visually describe the process of setting and achieving GHG emission targets at UniX. Through the conceptual model, we was able to identify further findings and theorise on the process.

## 4.2 EmergentThemes

In addition to the process of setting and achieving GHG emission targets UnIX, emergent findings were identified including the correlation between targets and the phases of sustainability and the role of control systems.

### 4.2.1 Phases of Institutional Sustainability

The phases of institutional sustainability represent a growth in mindset, change in culture and a transformation in organisations with sustainability at the core of the business model. Evident through analysis of UniX and the process of moving between targets, there is not a distinct beginning or end to each phase but a more fluid form of development. It is important to acknowledge the progression of HEI in the transformation from a business as usual mindset to integrating sustainability into the core business model. As defined in the literature, there are varying levels of organisational commitment to sustainability. We focus on the implications of the second wave, third wave and the transition from the second wave to the third wave.

#### The Second Wave

The previous target was set by UniX as part of the Australian Technology Network (ATN) in 2007. The target of 'reducing 2007 emissions by 30% by 2021' set by the ATN was reasonably ambitious for the time considering the availability and cost of renewable technology. At the time the target was set, it was *the peak of concern about climate change when the Rudd government got elected… [and ratified] the Kyoto Protocol* (Participant 4). The conversation was ultimately directed at climate change and universities felt obliged to get on board. When the *global financial crisis (GFC) hit in 2008/2009, suddenly resources to do things like energy audits and reductions in GHG emissions were a lot more scarce* (Participant 4). With the change of government, there was change in the conversation about climate change and it became a considerably conflictual issue. After the GFC,

universities in the ATN tapered their commitment. UniX remained committed to the target and was able to achieve their 2021 emissions reduction target by purchasing carbon offsets. Though a considerable challenge that resulted in the purchasing of carbon offsets was a delay in Solar Farm X in which UniX has a purchasing agreement.

The '30% Reduction' target was steamrolled by the ATN, rather than by UniX 'leading the charge'. Now moving into the carbon neutrality target, UniX is leading the industry in Australia as the first university to sign the climate declaration. The decision to purchase stakes in Solar Farm X was a considerable transition in the business model that goes beyond switching from coal-powered to renewable energy. That decision marked the beginning of a transition between two phases in the pursuit of sustainability.

### Transitioning into the Third Wave

Moving beyond the '30% reduction' target, UniX is working towards setting a carbon neutrality goal. This represents the next step in moving towards a holistically integrated sustainable business model. In order to achieve a carbon neutrality target, the institution will have to take steps beyond technology and operational changes. Achieving the ambitious GHG emission target requires adjustments to the organisation's business model. UniX has already taken a step in that direction by engaging in a purchasing power agreement with Solar Farm X. Rather than switching from coal powered energy to renewable energy, UniX has extended their impact by acquiring stakes in a solar farm, essentially 'sandwiching' the energy company as a consumer and the source of energy.

Reaching carbon neutrality in scope 1 and scope 2 emissions will require further changes to the business model, including strict management of the electricity generated by the institution. Moreover, UniX intends on setting a second target of achieving net zero carbon which extends to include scope 3 emissions. Addressing and reporting scope 3 emissions will represent a considerable shift in the UniX business model, as scope 3 encompass emissions generated by UniX suppliers and any staff and student travel.

As stated by two participants, sustainability is a *journey* that UniX and individuals within the institution are on. By identifying the emerging phases that UniX is going through on the journey to carbon neutrality we am also able to observe the correlation between these waves of sustainability and the subsequent targets being set by the case organisation.

### 4.2.2 Target attainment inhibitors - Local Area Disconnect

Local area disconnect was identified as a com theme throughout interviews and PAR. Local area disconnect is the gap in connection and alignment to a GHG emission target between faculties and departments of an institution. A core example identified was the lack of alignment from Teaching and Learning to the GHG emission target. A high level employee in the Teaching and

Learning area of UniX stated *"Where's the direct connection for me between the Teaching and learning that we do and the issues around the neutrality? … don't connect very often"* (Participant 11). The lack of connection to the GHG emission target from a core area of UniX presents challenges to achieving the GHG emission target set by the case organisation, as it is evident through the Target Design Framework that gaps will have an adverse effect on organisational performance. This issue was reconfirmed by a participant in the PAR workshop who stated that *"Teaching and Learning are great in some areas and doing nothing in others"*

Beyond a lack of alignment, the vast complexity of the institution and its governance structure means it's difficult for individuals or departments in UniX to communicate with each other. Often this lack of communication means that important information is lost or not communicated to the right people.

*"the passing of information has to be a little more transparent… I'm sure there's all this information… email or something like that that's being sent, but it's not reaching the right people yet in terms of record keeping"* (Participant 9)

A lack of transparency and communication curtails innovation and collaboration at UniX. This requires addressing in the transition to the third wave of sustainability.

### 4.2.3 The foundational role of control systems

#### Lack of individual level accountability

A common theme that emerged throughout the interviews and PAR workshop was a lack of individual accountability or performance measures as employee KPIs. An interesting conversation ensued in which employees discussed the negative connotations of KPIs for academics and other employees as 'extra work', and something else they will be 'measured on'. One participant declared that the culture around KPIs is not overtly positive, though perception can greatly depend on the type of metric which an employee is measured against. There are a considerable lack of performance measurements to incentivise middle and lower management at UniX. Facilities and operations managers are responsible for the running of all buildings on campus. This pertains to energy efficiency, waste management and water and involves tasks ranging from HVAC systems to the automation of lighting. When asked about sustainability KPIs related to the day to day operation of the buildings, a facilities manager identified that there is not much of a consideration in their role (Participant 22), representing a considerable gap in the MCS.

One participant articulated that even if an employee is committed to the target of carbon neutrality, often there is a problem that *actually doing things for the right reason is undervalued, is not valued properly"* (Participant 8). By having a *"sustainability framework [you] start to actually promote those ethical decisions"* (Participant 8). Though beyond promoting action through having a

sustainability framework, accountability is still a necessary component of the MCS that UniX is lacking.

"A*nd that accountability often has to be linked to their employment agreements as well. Basically, this is part of your job, to achieve these targets, so there needs to be a carrot and stick… we all believe in this target… there is actual accountability in front of you and peers showing us how you change your plan to get to those targets.*" (Participant 8)


A lack of individual accountability or performance measures in the form of employee KPIs also emerged as a challenge in the PAR workshop. In a follow up conversation with one of the PAR participants, they stated that rather than KPIs, staff work plans provide an opportunity to enable agency in individuals by outlining sustainability objectives that are pertinent to staff context. The lack of results control was observed as a barrier to environmental performance at UniX.


### Action (Representational) Control

Within UniX, representational control was observed in the Operations area of the institution. A senior manager in sustainability, beyond being responsible for the sustainability strategy and its implementation, plays an active role in being present for business meetings and decision-making processes. Their representation extends over contracting building projects to budget meetings, where they were identified as being outspoken in the pursuit of sustainability by other interview participants.


"*Participant 1 quite often sits on quite a lot of these tender interviews as well, just to make sure, [they are] pretty outspoken and making sure that everyone's got that as a bit of criteria because it's quite easy to not have it included, in the plan"* (Participant 5)


Their constant questioning of decisions in relation to sustainability and the targets is evident in ensuring that the climate change objectives are prioritised and considered with the same weight as economic and social factors.


When asked about the targets, 27% of participants referred me to the senior manager referred to above. This delineates a level of association throughout the institution between Participant 1 and sustainability. Whilst there are other active members such as Participant 2, Participant 1 was the most commonly associated individual with 'the GHG emission target'. A representational control in each area of the institution including Teaching and Learning and Research could ensure that alignment with the sustainability policy and targets was always a talking point and priority in meetings, committees and decision making. The observation of the data did not highlight any similar form of control in Teaching and Learning or Research.

### 4.2.4 Targets and their impacts on the tansition to the third wave of sustainability

Benn et al. (2014) sits within the organisational theory and sustainability literature, and has not be addressed in management control literature thus far. This study captured an institution transitioning from the second to third wave of sustainability, which existing literature has largely not engaged with. Gaining an understanding of historical targets through our data collection, in addition to gathering data on the current state of the institution, we draw a link between the types of targets set and institutional progression through the phases of sustainability. The link between the extent of change towards sustainability in an organisation has thus far been drawn between strong sustainability and MCS. Existing literature does not extend this to acknowledge the influence that target setting has on this transition (Narayanan & Boyce 2019).

Evident through the two phases identified in the findings, the type of target set by the institution largely reflects the stage of the sustainability phase model the institution sits in (Benn et al. 2014). The observation of the UniX transition identified mechanisms important to enabling a transition towards the third wave, in addition to some mechanisms that are not functioning as well, or need to be addressed by institutions in their transition to becoming a sustaining business. Such mechanisms include the control systems an organisation uses and their manner of working together

### Control systems

As identified in the literature, MCS are an integral tool in achieving strategic objectives in organisations (Chenhall & Euske 2007; Narayanan & Boyce 2019). The current literature on control systems is extensive and includes various forms of enabling and coercive controls that institutions implement in order to motivate and work towards reaching organisational objectives. Building off Merchant & van der Stede (2012) objects of control framework; *personnel control, cultural control, actions control* and *results control.* This study identified two core control mechanisms at UniX which are not currently being maximised as organisational capabilities.

### 4.2.5 Results control

Results controls as defined by Merchant & van Stede (2012) are those that examine desired and achieved results. Results controls are dominantly used for controlling employees *with decision authority,* commonly managers, or those that are responsible for achievement, not those actually performing the task (Merchant & van der Stede 2012, p. 30). This aligns with what was found at UniX, the sustainability results control methods implemented in the institution were predominantly linked to top level management such as DVCs and heads of departments. It is then the responsibility of those managers to ensure that the results are achieved by 'managing' the employees who perform the task. What was also identified at UniX was that those KPIs were not being translated to middle management or those responsible for performing tasks. However Merchant & van der Stede (2012) also consider that results control can be driven through the lower

levels of the organisation. Particularly within building and facilities management, not integrating results controls beyond those with decision authority eventuated in a gap in the control system that affected performance. KPIs are a way to direct attention and encourage accountability in the institution by setting individual goals and monitoring the performance towards reaching those goals (Merchant & van der Stede 2012). While the metrics may differ dependant on employee decision authority, what was highlighted through this study was the need for performance measures to be integrated further down the employee hierarchy.

The study highlights that results controls should be used not just to control the behaviours of management, but also to direct attention of middle managers and those whom implement the tasks that subsequently achieve the results, alleviating a lack of direction (Merchant & van der Stede 2012). KPIs can enable agency if structured in a way that provide employees with the capabilities to act. Employees at UniX have work plans that are constructed annually. In Teaching and Learning and Research, those work plans outline a certain level of satisfaction from students, or a certain number of research outputs. Sustainability KPIs related to the GHG emission target could be integrated into work plans, in order to address the gap identified. Integrating performance measures into staff work plans allows for negotiation and employee input, encouraging action on an individual scale and contributing to the broader organisational goal of carbon neutrality.

### 4.2.6 Representational control – boosting action control

Representational control emerged as a variance from the current control elements defined in the MCS literature that emerged through analysis of the data. Representation control is when an institution uses advocacy to align employees and decision making with organisational values. Merchant & van der Stede (2012) framework identifies four controls. Within action control, action accountability is an element in which supervision or monitoring is used to control employee actions (Merchant & van der Stede 2012). However, in this control element, action accountability is often negative and results in punishment if an employee deviates from what is deemed acceptable by the organisation (Merchant & van der Stede 2012). Representation highlights a variance from the action control element, which strengthens the efficacy of action control. Action controls are characterised as usually being pre-specified, while representational control is not necessarily pre-specified (Merchant & van der Stede 2012). Similar controls have also been identified in Simons (1995) levers of control framework through boundary systems and Malmi & Brown (2008) MCS package conceptual framework through administrative control. Representational control, rather than controlling through punishment or supervision, leads employees by enthusiastically advocating for institutional objectives.

In a sustainability context, representational control serves as a measure to advocate and prioritise sustainable practices that align with the institutional targets. As often seen in the target setting and achieving process, it is common for sustainability to be pushed out of sight and out of mind in the

management of day-to-day operations and decision-making. Representational control addresses this barrier in achieving the target.

Representational control links in the theory of organisational champions to the MCS literature. Organisational champion literature defines a *champion* as 'an individual who makes a decisive contribution to [innovation] by actively and enthusiastically promoting its progress through the critical organisational stages' (Achilladelis et al. 1971 in Heng et al. 1999, p.22). Similarly representational control involves an individual or *champion* who actively and enthusiastically promotes sustainability in organisational decision-making. This is consistent with existing literature on transformational leadership which is suggested to motivate and inspire subordinates (Nguyen et al. 2017). Transformational leadership helps promote long-term vision and can motivate subordinates to exert extra effort to improve performance (Nguyen et al. 2017). However, in the control system, representational control would be the element of control under which transformational leaders act. Moreover, representational control is comparative to action accountability, and draws on more than leadership to motivate. Representation control can be used inline with GHG emission targets, and informs decision-making through advocacy. This is a powerful element of control which does not rely on administrative controls to either punish or reward employees. It sits between enabling and coercive controls and directs attention toward GHG emission targets set by the institution.

## 5.1 Theoretical Contributions

From our emergent themes, we offer three claimed contributions.

From a target setting perspective, and advancing Dahlmann, et al (2019), we offer a target design framework that outlines the process of setting and achieving greenhouse gas emission targets in UniX. The model captures the role of intersection between symbolic and substantive targets and offers an enunciation of how targets can progress from aspirational, early stage statements of intent to internal, actionable targets, and their impact on organisational activities. This adds to the literature as it offers an extension on climate change targets and their relationship to performance (Dahlmann et al. 2019). We progress the Dahmann et al. (2019) conceptual model of climate change targets by identifying the role of symbolic and substantive targets in target design as having a symbiotic relationship. More broadly, in doing so, we offer case evidence highlighting the iterative process of setting a target, and the integrative approach which identifies strategy formulation as the catalyst that turns an aspirational target into a formal target whilst acknowledging the presence of inhibitors (the absence of target accountability in certain areas of UniX). In the context of HEI, as complex organisations, the findings highlight the importance of a transparent system that combines top-down and bottom-up approaches to connect and motivate employees to achieve organisational objectives, else rewards from doing so in areas that achieve

this and the consequences resulting from the absence of individual ownership to targets set

Second, we depict how GHG emission targets intersect with the phases of sustainability that organisations navigate through in achieving sustainable business models (Benn et al. 2014). We argue that we are the first, or one of very few studies that draw a link between the types of targets and the waves of the sustainability phase model. We advance the literature by drawing on organisational theory put forward in Benn et al. (2014) and linking it to target setting and the respective sustainability waves.

Finally, and third, we advance the control system literature by identifying an element of control (representational control), that strengthens the efficacy of action controls, offering a learning that advances and broadens the efficacy of Merchant & van der Stede's (2012) objects of control framework. Generally, the four controls *personnel, cultural, results* and *action* are a strong framework that clearly identify the categories of control elements MCS (van der Kolk et al. 2019). Our findings show a variance in the existing MCS literature where representational control can be used to actively lead an institution toward sustainable practices, by impacting the other control objects, especially action controls. We advance current literature by identifying and exploring the role of representational control, drawing on the organisational champions literature (Heng et al. 1999).

# 7. Conclusions & limitations

This study aims to examine how HEI set and achieve GHG emission targets. From our findings, we propose the target design framework on how UniX set and achieve GHG emission targets, to better understand how institutions can navigate through the barriers to achieving carbon neutrality, thus addressing calls from the literature (Dahlmann et al. 2019; Ioannou et al. 2016). The framework highlights gaps in the target setting and achieving process that cause barriers to organisational performance and has implications on the achievability of the target. Additionally, the target design framework will have practical implications in higher education, as it guides institutions to set and more importantly achieve GHG emission targets. Moreover, this study identifies targets as enabling in the transition between the phases of sustainable development. Finally, this study captures UniX in the transition process the second and third wave (Benn et al. 2014). This will have practical implications by capturing the transition between the second and third wave, this study can serve as a guide for HEI navigating through the phases to become a sustaining business.

Second, this study identifies the importance of MCS in organisational performance for GHG emission targets through two mechanisms. The study identifies the role of control systems, particularly results control, as necessary to organisational performance. This will have practical implications for top-level management in determining results control, and moreover, extending the control down through the organisation to lower level employees through KPIs and work plans. Moreover, we identify a variance in the control system, highlighting an element of *representational control*. This contributes to the MCS literature and enhances our understanding of how institutions can enable sustainability practices that align with GHG emission targets through MCS. Furthermore the contribution of *representational control* may help top-level management implement effective controls throughout complex institutions through organisational champions who represent and guide decision-makers towards sustainability objectives, even in tumultuous and uncertain contexts.

Nevertheless, there are limitations to this research that must be acknowledged. The single-case study method is designed to describe complex phenomena, not to measure frequency (Albertini 2018). Therefore a single-case study is limited as such, and cannot always be generalised and the findings applied to other institutions. Despite possibility that these findings could be relevant to other HEI, these results are specific to the case organisation. Other limitations include only having access to primary interview data and a limited number of archival documents. A delimitation of this study was that we was unable to look at how the third wave of sustainability will play out in UniX. This study calls for future research to be conducted on representation controls for other organisational objectives and in other industries. Furthermore, future research should explore the role of organisation in target design and how local area disconnect plays a role in organisations reaching the third wave of sustainability.

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# Appendices

## Appendix A

### Dahlmann et al. (2019) Conceptual Model

*Target Type*

Absolute targets and intensity targets have been identified as having striking discrepancies in their legitimacy of organisational intentions and implications on environmental performance (Bui & de Villiers 2017). An absolute target is one that aims to reduce an institution's total levels of carbon emissions over time (Pinkse & Kolk 2009) and is a key criterion in international climate change policies and initiatives. Whereas, intensity targets are considered symbolic and more concerned with the current image of an organisation (Dahlmann et al. 2019). Absolute target types link to the science-based target setting scheme and represent a strong and inward-looking goal for organisations to work towards.

*Target Scope*

Target scope encompasses scope 1, 2 and 3 emissions and how an organisation reports on them. Scope 1, or direct emissions, are those that come directly from the sources either owned or controlled by the organisation. Scope 2 emissions, or indirect emissions, are those that are generated as a result of electricity bought and consumed by the organisation. Finally, scope 3 emissions are those generated by activities of the organisation but are not owned or controlled by the company itself (Australian Government Clean Energy Regulator 2018; Reitbergen et al. 2015). In Australia, under the National Greenhouse and Energy Reporting Legislation, scope 1 and 2 emissions must be reported as a minimum standard by organisations' (Australian Government Clean Energy Regulator 2018). Furthermore, reporting scope 1 and 2 emissions is a minimum standard to reflect a substantive GHG emission reduction targets in organisations (Dahlmann et al. 2019).

*Target Ambitiousness*

Ambitious targets are more difficult for an organisation to achieve. Whilst this evidentially improves the environmental performance of an organisation (Ioannou et al. 2016; Dahlmann et al. 2019), it does not represent targets achieved. It is also integral to acknowledge the complex construction of organisational ambition and how a difficult target, combined with an extensive time frame, can often result in a loss of motivation and goal erosion (Gary et al. 2017), therefore implicating performance and ensuring the organisation fails to meet their objective.

*Target Time Frame*

The time frame of targets refers to the length of time an organisation assigns to the target. When compiled with a difficult and absolute target, it often results in a long time frame in order to provide the opportunity for an organisation to achieve it (Dahlmann et al. 2019). Additionally, it draws a linkage to the literature on long-termism and stretch targets, where an interesting debate continues and has not proven achievability in financial or non-financial goals (Gary et al. 2017).

# Appendix B

## Performance Measurement and Reporting

Performance measurements and target setting host an integral and recursive relationship (Reitbergen et al. 2015). Performance measurements, a set of metrics which quantify the effectiveness of an action (Mishra et al. 2017) hold significant repercussions for the aspirations of top and middle management and implicate challenges such as goal erosion (Gary et al. 2017). The balanced scorecard is an important performance measurement tool fashioned to minimise information overload and to develop a vision and strategy, that can be turned into actions (Mishra et al. 2017). The GHG Protocol, a framework to account for all GHG emissions, was developed in 2004 and is the widely used standard for accounting scope 1 and 2 emissions of organisations, government agencies and HEIs (Udas et al. 2018). Sustainability reporting is the extension of performance measurement and is used to articulate the performance evaluation of an organisation to its stakeholders (Mishra et al. 2017). Sustainability reporting is considered a catalyst in sustainability, contributing to the alignment of institutional missions with environmental objectives (Lozano et al. 2016; Yanez et al. 2019). Furthermore, it helps to develop a focused strategic vision for the institution to drive change (Yanez et al. 2019). How organisations measure their performance and subsequently choose to report on it, has enormous implications on the aspiration, strategic implementation and achievability of targets in organisations.

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# Appendix C

**Interview Participants and Role**

| Participant Number | Role |
| --- | --- |
| Participant 1 | Senior Manager |
| Participant 2 | Manager |
| Participant 3 | Senior Manager |
| Participant 4 | Senior Manager/ Lecturer |
| Participant 5 | Management Accountant |
| Participant 6 | Consultant |
| Participant 7 | Senior Manager |
| Participant 8 | Senior Manager |
| Participant 9 | Engineer |
| Participant 10 | Senior Lecturer |
| Participant 11 | Senior Manager |
| Participant 12 | Marketing Manager |
| Participant 13 | Facilities Manager |
| Participant 14 | Senior Manager |
| Participant 15 | Marketing Manager |
| Participant 16 | Senior Manager |
| Participant 17 | Accountant |
| Participant 18 | Accountant |
| Participant 19 | Manager |
| Participant 20 | Senior Manager |
| Participant 21 | Project Manager |
| Participant 22 | Facilities Manager |

# Appendix D

**Semi-Structured Interview Questions**

1. Can you talk to me a little about your role?

    1.1 Formal title sure, but what kind of work do you do? Who do you work with? What type of involvement do you have with strategy?

Role of strategy

2. Can you talk a little about the strategy process within [the institution]?

Role of sustainability
    2.2 How strategy is made and enacted

3. Can you talk a little about the target setting process within [the institution]?

The role of targets in the organisation
4. Tell me about your understanding of how greenhouse gas emission targets are set, measured and reported, within [the institution].

5. What challenges do you see with achieving the current target(s)?

6. What opportunities do you see with achieving the target(s) or more stretch?

7. What do you think is most important to the institution's ability to reach carbon neutrality?