UTS Environmental Sustainability Initiative: Case Study

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Abstract

Implementing environmental sustainability programs across university campuses presents both opportunities and challenges. The University of Technology Sydney (UTS) launched a coordinated approach to sustainability in 2008.

This paper presents a case study of UTS's Environmental Sustainability Initiative (ESI). It begins by outlining the aims and governance structures for the initiative which consists of a Sustainability Steering Committee; Committee of Working Group Heads and then working groups across six focus areas of energy, transport, procurement, water, waste, planning and design, and also reporting and communications. The paper then describes the development and consultation processes, and final outcomes, for three strategy documents in the areas of climate change (energy), transport and paper use (procurement).

We discuss the role that such working groups, together with other support structures, can play in creating a more sustainable university, and offer practical guidance for other universities and organisations undergoing organisational change for sustainability. We also discuss some of the challenges that emerged such as: how to engage with staff and students to develop shared aspirations and reflect these in tangible objectives, targets and actions; and how to evolve organisational structures to implement strategies and create a sustainable higher education institution.

Sustainability at UTS

Increasingly, tertiary education institutions are taking steps to address their environmental impact and particularly their contribution to climate change. In the US alone, over 600 university and college presidents have signed the *American College & University Presidents Climate Commitment*, a statement committing their institutions to becoming carbon neutral. Australian tertiary institutions have started to take a leadership role in sustainability through organisations such as Australasian Campuses Towards Sustainability (ACTS). Such networks have helped to foster cooperation between institutions.

UTS embarked on its sustainability journey in 1990 when it signed The Talloires Declaration of the University Leaders for a Sustainable Future, a commitment to incorporating sustainability in university curricula. In 2008, UTS became a signatory to the Australian Technology Network (ATN) Declaration of Commitment to Local, National and Global Sustainability, an undertaking to make sustainability a focus of teaching and learning, research, operations, infrastructure services and outreach to local, regional and global communities.

UTS has identified three distinct strands of its sustainability task:
- Embedding sustainability principles and teaching in the curriculum
- Undertaking research in sustainability
- Ensuring that UTS conducts its business sustainably, in other words creating a sustainable campus.

In August 2008, UTS launched its Environmental Sustainability Initiative (ESI) — a framework for the provision of environmentally sustainable and responsible practices, activities, and operations at UTS. Currently, UTS performance in the field of campus environmental sustainability, particularly with regard to greenhouse emissions, places it in the mid-range of ATN universities. However, with a strategic approach, UTS could establish itself as a sustainability leader among Australian tertiary institutions.

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An overview of the UTS context
In 2008, over 32,000 students were enrolled at UTS in onshore and offshore courses and UTS has over 2,500 full time equivalent staff. The primary UTS campus, the City campus, is located on the southern edge of Sydney's central business district and comprises three campus areas that are within walking distance of each other. In addition, UTS has several smaller campuses located in northern Sydney.

UTS is about to embark on a major campus redevelopment program through to 2020, including the provision of new buildings. This presents both challenges and opportunities for improving campus sustainability. Increased capacity increases absolute impacts, for example, total energy use generally goes up as floor area increases. However, new buildings provide the chance to design-in sustainability, thereby decreasing relative impacts, such as energy use per square meter of floor area.

The UTS Environmental Sustainability Initiative
The UTS ESI has a governance structure comprising a high-level Steering Committee to provide overall direction and guidance to the ESI, plus six individual Working Groups to cover the issues of water, energy, waste, transport, procurement and planning. Heads of Working Groups also meet together regularly to discuss common issues. A seventh Communications Working Group was established to cover all ESI promotion and communications.

The ESI is headed up at a senior level by the Deputy Vice Chancellor (Resources) who chairs the Steering Committee. Other Steering Committee members are senior staff from relevant departments, such as Human Resources and Facilities Management, and senior sustainability advisers from across UTS. Working Group membership comprises a mixture of staff with relevant responsibilities, advisers and student representatives. Each ESI Working Group includes, in an advisory capacity, a researcher from the Institute for Sustainable Futures (ISF), UTS's flagship sustainability research institute.
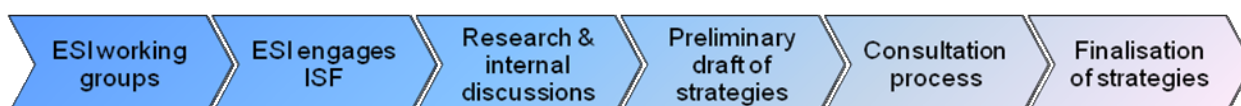
Strategy development
Once the Working Groups were operating, it was quickly identified that the ESI needed to develop a strategic approach that:

- Provides clear direction and a framework for change
- Helps to efficiently allocate resources, to ensure that measures taken are cost-effective
- Provides a means of tracking performance via objectives and targets
- Helps to identify and prioritise organisational needs such as resources
- Provides an opportunity to consult stakeholders and achieve organisational buy-in
- Locks in a commitment to action

UTS engaged ISF to develop strategies in the three areas of climate change (energy), transport and paper use, overseen by the relevant Working Group. For all three strategies, ISF conducted preliminary background research. This included desktop research on other organisations' sustainability plans and other relevant sources of information and guidance on sustainability measures. Original research was also undertaken for each strategy, as discussed later.

Consultation was undertaken with individual staff with relevant responsibilities. Discussions were also held with representatives of the UTS Student Environment Collective. Additionally, once draft strategies were available, all staff and students were invited to attend an open consultation session on the strategies. This was a useful forum for gathering feedback and ideas for the strategies. Figure 1 illustrates the strategy development process for all three strategies.

Figure 1 Strategies development process

ESI working groups → ESI engages ISF → Research & internal discussions → Preliminary draft of strategies → Consultation process → Finalisation of strategies

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To provide a framework and direction for the strategies, ISF developed eight core sustainability principles. The principles state that UTS will: strive to ensure equity; protect and improve human health, well-being and quality of life; not generate emissions that threaten public health or essential ecological processes and make efficient use of land and other natural resources; contribute to the resilience and adaptability of the Sydney and UTS communities to changing circumstances; minimise social, environmental and economic costs; embed sustainability in evidence-based and transparent decision-making; raise public awareness of sustainability issues; and monitor and publicly report on its sustainability performance.

The following sections discuss the three strategies in turn, looking firstly at the research and development process, secondly the research findings and finally the proposed objectives, targets and actions presented in the strategies. The strategies being finalised at the time of writing and measures discussed in this paper are proposed, awaiting final internal approval.

Climate Change Strategy
Strategy development
The process for developing the Climate Change Strategy was unique among the three strategies in that it incorporated work from a separate project to develop a greenhouse emissions reduction target for the ATN universities and because it developed a detailed costing model for emissions reductions.
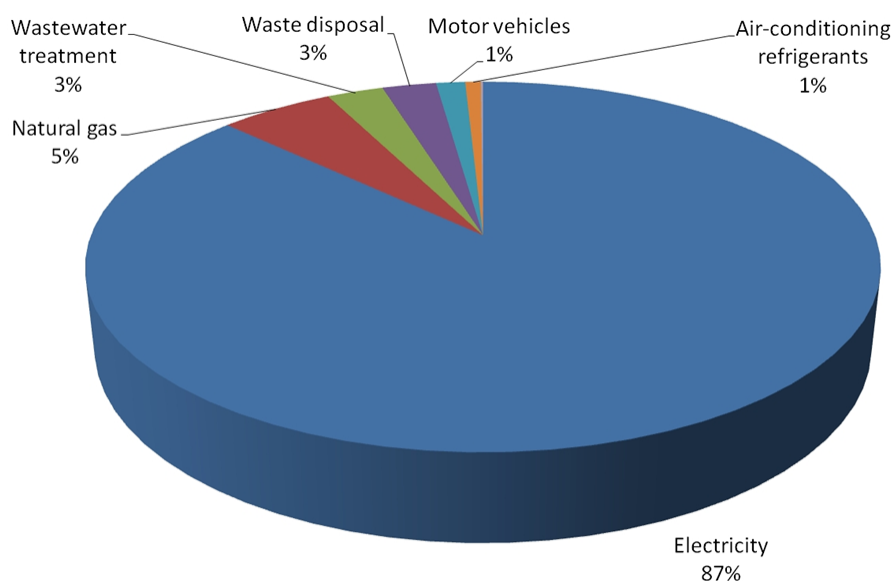
ISF coordinated the process to develop the ATN emissions reduction target. Each university undertook its own research, including development of a greenhouse inventory, review of existing measures and an energy efficiency audit. In February 2008, the ATN announced a joint emissions reduction target of 25% by 2020 compared to the baseline year, 2007. To contribute proportionally to this joint target, UTS has committed to reducing its own greenhouse footprint by 30% by 2020-21.

The UTS Climate Change Strategy development process took place in tandem with the target development process. An important aspect of the process was creation of a 'marginal abatement cost curve', which shows the emissions reductions achieved per dollar spent for any given measure and therefore provides a clear indication of the cost-effectiveness of different measures. The cost curve is not complete at the time of writing.

Research findings
Figure 2 shows the percentage of total UTS Scope 1 and Scope 2 greenhouse emissions generated from different sources.

Figure 2 UTS Scope 1 and Scope 2 greenhouse emissions percentage of total by type

Wastewater treatment 3%
Waste disposal 3%
Motor vehicles 1%
Air-conditioning refrigerants 1%
Natural gas 5%
Electricity 87%

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According to the Greenhouse Gas Protocol reporting framework, Scope 1 and Scope 2 emissions include direct emissions and emissions from electricity. It excludes, for example, emissions from air travel, which are indirect or Scope 3 emissions. The ATN universities, including UTS found that data on Scope 3 emissions was insufficient to include in the target-setting process at this stage, although it is intended that they will be included in future. From the above representation of UTS' greenhouse emissions, it is clear that the biggest emissions reductions must come from reducing electricity use and/or decarbonising electricity supply, which currently contributes 87% of emissions. The UTS Climate Change Strategy therefore focuses on reducing electricity use and changing electricity supply sources. Measures to reduce emissions from transport are included in the Transport Strategy.

Proposed objectives, targets and actions

The results of the research were used to develop objectives, targets and actions. The strategy emphasises that *reducing* the underlying activities that cause emissions, such as electricity use, is the first priority insofar as it is cost effective to do so, followed by reducing the emissions generated per unit of activity, such as emissions per kWh of electricity, by switching to low carbon energy sources. The objectives below set out what UTS aims to achieve through implementation of the strategy:

- Reduce emissions at the rate required to avoid dangerous climate change
- Design new and refurbished buildings to minimise emissions and enable future innovations
- Minimise activities that generate emissions
- Minimise electricity consumption and peak electricity demand
- Minimise embodied energy in construction and/or materials
- Maximise efficiency of all emission-generating activities and technologies
- Minimise greenhouse intensity of energy supply and maximise the percentage that is from renewable sources
- Use offsets to achieve further emission reductions only after cost-effective on-campus reduction options are exhausted
- Promote uptake of greenhouse reduction measures on campus and beyond
- Measure, monitor and report on all greenhouse gas emissions that UTS has the ability to control

As well as the target to reduce emissions by 30% by 2020, the strategy sets an interim target of reducing emissions by 11% by 2012/13. Additional targets were set to achieve a minimum Green Star Education rating of 4 stars for refurbished buildings, 5 stars for new buildings and 6 stars for one new building, and equivalent Green Star-related energy targets. A target was also set to improve data collection.

Based primarily on the cost curve results, the key actions proposed in the strategy to achieve the targets are:
- Implement further energy efficiency measures to achieve around half of the emissions reduction target, particularly energy efficiency in lighting and heating, ventilation and air conditioning
- Meet Green Star commitments in new buildings and focus achievement of Green Star ratings on energy efficiency
- Undertake a feasibility study for a UTS Green IT program
- Install a 1.2MW trigeneration facility for new buildings in the campus development plans
- Investigate sites for installation of small photovoltaic systems
- Increase Green Power to 5% of total electricity purchased
- Continue to monitor, report and analyse energy and greenhouse emissions data and increase the scope of emissions included in the greenhouse inventory

UTS Facilities Management Unit will take ownership of implementation of the Climate Change Strategy with ongoing advice from the ESI Energy Working Group.

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Sustainable Transport Strategy
Strategy development
Unlike other areas of strategy development, transport does not have a specific functional 'owner' within UTS. Transport services and facilities are provided by a number of people in different parts of the organisation, including HR (salary packaging policy), Security Services (car parking allocation), IT (video-conferencing facilities) and Facilities Management (UTS fleet, cycling and pedestrian facilities). The consultation process involved staff from all relevant areas.

A baseline UTS transport 'profile' was developed, incorporating mode split (the proportion of staff and students that use each of the available modes of transportation) and a preliminary greenhouse footprint. Developing the baseline transport profile presented challenges. For the purposes of data collection we considered two broad categories of travel - staff work-related travel and staff and student 'commuting', which in simple terms, is the regular journey to and from UTS campuses. Some data on work-related travel was collected as part of the UTS greenhouse inventory process. However, travel data is not routinely collected in UTS and robust data was available only for UTS fleet vehicles.

To establish staff commuting patterns, we conducted a staff commuting survey in December 2008. A student survey may also be undertaken in future. In the interim, estimates of student travel patterns developed by an external consultant under the auspices of the UTS campus development work, have been used as a proxy indicator.

Research findings
Figure 3 shows UTS staff commuting mode split, based on the results of the UTS staff commuting survey and benchmarked against commuting patterns of neighbouring precincts – the Sydney CBD (Transport Data Centre, 2008) and the Sydney Health and Education precinct (Transport Data Centre, 2008).

Figure 3 benchmarked commuting transport mode split for UTS City Campus staff
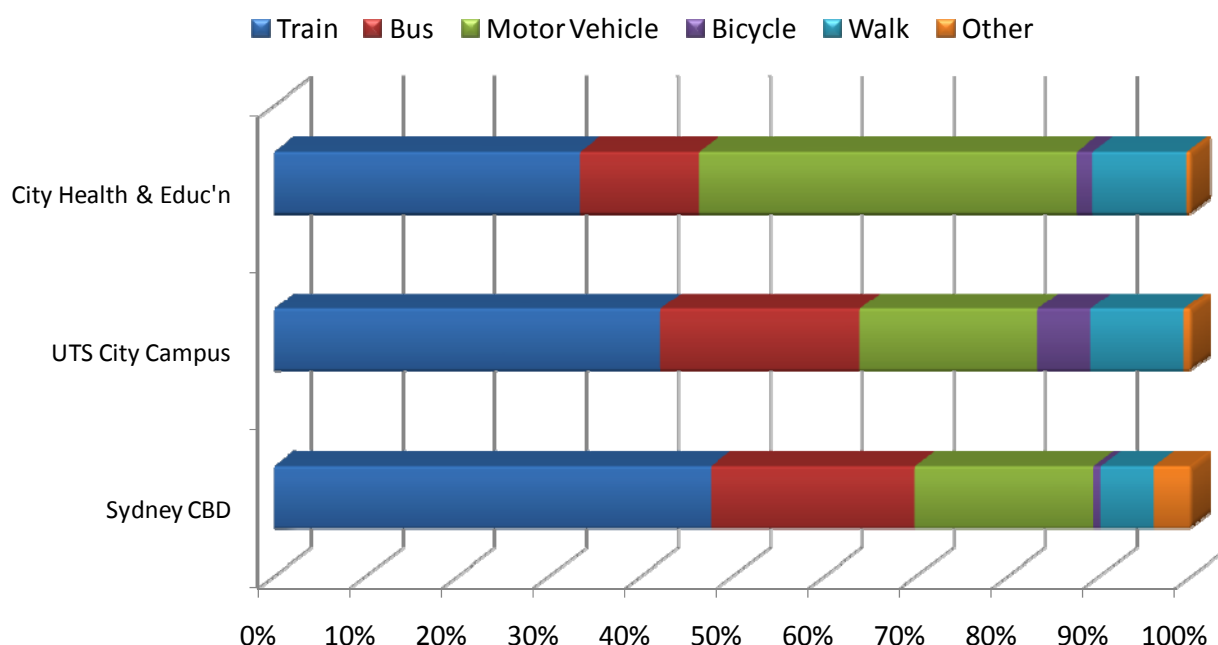
The results show that UTS staff are already relatively sustainable in their commuting patterns, characterised by high levels of public transport use, lower levels of motor vehicle use and relatively large numbers of walkers and cyclists. The estimates for students are broadly similar to the staff profile, with the major differences being around 12% lower levels of car use and 10% higher train use for students than staff (Halcrow 2008). High public transport use amongst staff and students is most likely related to UTS's proximity to major bus and rail hubs such as Sydney's Central Station. The central location of the City campus gives UTS a distinct

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advantage compared to other Sydney universities with respect to transport options. Nonetheless, there is scope to further reduce motor vehicle use and the results indicate the existence of a sizeable community of walkers and cyclists who could be better catered for with campus facilities.

The staff survey also provided information on motivations for mode choice. The most common motivation for mode choice amongst UTS staff members is that a chosen mode is considered to be the quickest option available. Staff members walking or cycling also rated 'enjoyment' and 'health benefits' in larger numbers (78% and 71% respectively). This information is useful for communicating the benefits of particular transport modes.

Proposed objectives, targets and actions

The results of the research were used to inform development of objectives, targets and actions. The strategy emphasises that *reducing* trips is the first priority, followed by increasing the proportion of essential travel undertaken using sustainable modes of transport, particularly walking and cycling. The objectives below set out what UTS aims to achieve through implementation of the strategy:

- Maximise equity in provision of UTS transport facilities and policies
- Avoid travel where possible
- Maximise use of sustainable transport modes
- Minimise private car use
- Minimise pollution, particularly greenhouse gas emissions
- Positively influence external transport services
- Promote sustainable transport modes
- Improve transport data.

Due to the lack of robust data it is not yet possible to set meaningful targets for work-related travel. However, the commuting data is sufficient to set at least one target that can be tracked over time. The target is to double the proportion of staff and student commuting trips by walking and cycling to 35% of staff and students walking or cycling by 2011.

The priority actions that UTS proposes to implement to achieve these objectives are:

- Augment and promote video conferencing and other technology options to reduce the need for travel
- Promote flexible employment policies to reduce the need for travel
- Actively discourage air travel
- Upgrade cycling facilities – bike stands, showers and lockers - and support development of a cycling 'culture'
- Provide loans and discounts for staff to buy periodical public transport tickets
- Investigate the feasibility of a student U-Pass scheme similar to US schemes that incorporate discounted public transport
- Provide pre-paid public transport tickets for work-related travel
- Review fleet management and parking policies with a view to creating fleet arrangements that meet business requirements and do not unduly incentivise private car use
- Investigate the feasibility of introducing car sharing and car pooling schemes
- Actively promote the sustainable transport options available to staff and students. To this end, a UTS Transport Access Guide has been developed
- Work with precinct neighbours to advocate for improved facilities, infrastructure and services for the precinct
- Continue to gather and improve data on the UTS transport profile
- Investigate the need for a dedicated Transport Officer

UTS has recently appointed a Fleet Manager who will oversee implementation of the strategy. The Transport Strategy will require participation of a number of different departments within the UTS operational structure and a new coordinated approach to the overall transport task.

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Paper Reduction Strategy
Strategy development
The Sustainable Procurement Working Group focuses on sustainable procurement procedures. Paper was chosen as a priority for initial strategy development as it is easy to relate to, to make tangible gains and to develop good practice, and because it affects both staff and students.

Research undertaken to understand what paper data was available and collected across campus was challenging because data sources were diverse. For example, while much paper is centrally purchased, some faculties buy their own, UTS printing services makes its own purchases and the paper used in the library is supplied by a contractor. The work involved consultation with staff and students in various departments.

A staff survey in the library was undertaken to better understand staff and student printing practices. A student survey was planned but was not conducted as students were not on campus over the crucial strategy development phase, November to February. Consequently, student feedback was obtained via the open staff and student consultation session held for all three strategies.

Given the nature of paper use within the university (i.e. much is used and discarded on-site), it was important to coordinate with the Waste Working Group of the ESI, particularly to establish protocols for data collection and management of waste paper volumes.

Research findings
Results of the research are presented in
Figure 4, which indicates in broad terms where paper is used across UTS and presents types and quantities of paper used, where data was available.

Figure 4 UTS paper use
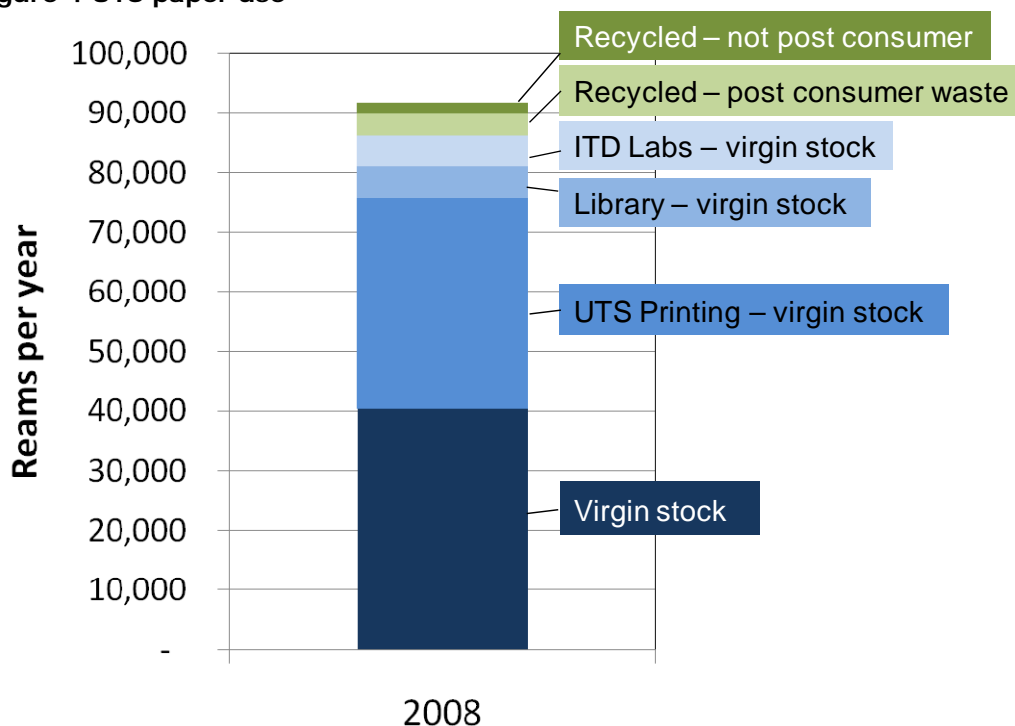
The results show that the majority of paper stock used is virgin, although some recycled paper is used and its use is growing. Whilst campus-wide data was not readily available for all divisions in 2007 to provide a comparison, an earlier publication on paper use at UTS (Hardy et al, 2005) shows that paper in the IT lab alone was >120,000 reams per year in 2001 – more than the total paper use for the entire university in 2008. That was at a time when students were not charged for printing and single sided paper use was common.

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Proposed objectives, targets and actions

The Paper Reduction Strategy identifies objectives and targets for paper use. The strategy emphasises that *reducing* paper use is the first priority, followed by using recycled stocks for essential use. The objectives below set out what UTS aims to achieve through implementation of the strategy:

- Minimise use and purchase of paper used for printing and pre-printed products
- Minimise use of virgin materials and environmentally harmful substances in paper bought externally and in paper used by UTS internally
- Minimise paper waste
- Promote uptake of sustainable paper use
- Improve data on paper use and disposal

Targets include decreasing paper purchased (A3 and A4 copy paper) by 20% by 2011, increasing recycled[1] paper stock to 30% of total paper stocks, and decreasing total paper waste generated by 20%.

The priority actions proposed to achieve the objectives and targets are:

- A campus-wide shift to default double-sided printing
- A preferred paper policy for all A4 and A3 plain papers with a minimum of 80% recycled content
- Mandatory purchase of paper and paper products from preferred suppliers with excellent environmental performance
- A purchasing policy that favours toners with the best environmental credentials
- Continued provision of clearly designated paper waste recycling bins in all office, common and teaching areas of the university
- Promote sustainable paper options
- Improve data on paper purchasing, use and disposal

The Sustainable Procurement working group has taken on the task of allocating responsibility for implementation of actions to appropriate units within the university, however some tasks are likely to require dedicated resourcing, particularly with respect to maintaining an accurate data set of paper usage over time in order to track progress. Strategies for other procurement practices will be developed subsequently.

Common issues for the three strategies

Although each the three strategy development processes identified challenges and opportunities specific to each of the three areas of climate change, transport and paper use, the process also drew out some common issues affecting all three and potentially other areas of the ESI. Four of the main issues are discussed below.

The first issue is **resourcing**. The three strategies identified a suite of actions needed to move UTS towards sustainability. Implementation of these actions will require a significant commitment of human and financial resources. To date, the ESI has been successful in using voluntary commitments of time from Working Group members to assess sustainability performance and plan for improvements. An important theme to emerge from the strategies is that voluntary commitments of time will no longer be sufficient as UTS moves into the implementation phase. Additional dedicated resources will be needed to implement the strategies. Projects must be assigned to new or existing staff and deliverables incorporated into work planning. It is important to identify whether there is an existing natural hub for implementation in different areas or whether new functional roles may be needed. The strategies identified specific resourcing needs for each area and these can be summarised as resourcing for strategy implementation, particularly coordination and ownership, and resources for ongoing data collection and reporting.

The second issue is **embedding sustainability** in UTS's regular decision-making processes. The ESI was initially set up outside UTS's regular operational decision-making processes, and this has been helpful in the development and planning stage when flexibility is important. If sustainability is to be truly integrated into operations, UTS will need to make it business-as-

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[1] For the purpose of the strategy, recycled content is defined as a minimum of 80% recycled content, preferably post-consumer waste

usual. For example, in procurement, where cost, quality and appropriateness have previously been core considerations, in future, environmental performance must also be included. A challenge that has emerged is that business structures are not set up with a sustainability focus in mind. The traditional functional areas of human resources, finance and facilities management, may operate well for regular business decision-making. Sustainability however is often a cross-cutting issue, requiring cooperation from people across different sections of the organisation. To date, the ESI has brought people together outside of normal business structures to work on sustainability. UTS may now need to find new ways of ongoing cross-divisional working to fully embrace sustainability.

A third issue for all three strategy areas is availability of appropriate, complete and accurate **data,** and ongoing **monitoring and reporting** of performance. UTS has been monitoring energy use in buildings for some years. It has only recently begun to measure its greenhouse footprint and only through the strategy development process have efforts been made to develop a transport profile and to collate comprehensive data on paper use and disposal. This means that the data needed for sustainability indicators is not yet routinely collected in most cases. Systems to collect such data are embryonic and not well integrated into regular UTS data systems. There is a considerable task ahead to decide what level of data accuracy and completeness is appropriate and how data collection can be integrated into systems without significantly increasing administrative burdens.

A final issue for all three strategies is how to effectively **engage the UTS community** of staff, students and other stakeholders to encourage uptake of strategy measures. Support and buy-in from staff and students in particular will be crucial to the success of the strategies. UTS is considering a comprehensive engagement program based on other successful Green Office programs that would provide staff and students with basic training and ongoing support mechanisms.

What UTS has learned
Establishing the ESI and developing strategies for three key areas of impact are early stages of UTS's sustainability journey. Already we have learned much from our own experience and the experiences of other universities and organisations who are on their own sustainability journeys.

The issues described above highlight a core long-term requirement for a sustainable organisation – culture change. The ESI has kick-started the process of culture change in UTS, but it is not something that will be achieved overnight and it remains to be seen how deeply change will take root. For an organisation to become sustainable, strong commitment and leadership from the top is important. The UTS Senior Executive has recognised opportunities in sustainability and has made public commitments to achieving a sustainable campus. The establishment of the ESI is an early indication of that commitment, which will need to be enduring to create deep and long-term culture change.

Taking a strategic approach, that is not embarking immediately on a suite of well-intended but ill-planned measures, but instead researching, planning and consulting to arrive at an ambitious and achievable plan of action, may seem self-evident but is often lacking in organisational change for sustainability. This strategic approach should mean that UTS is well-prepared for the hard yards to come, knowing that the measures implemented are contributing to achievement of specific goals and targets. Importantly, the approach for each of the three strategy areas in UTS's case was necessarily different, depending on factors such as the scale and nature of the task, past work in the area and availability of data. The success of UTS's ESI is dependent on winning the support of the broader UTS community. Engaging key stakeholders, and particularly the many and varied people directly responsible for implementing change measures, is therefore a crucial aspect of strategy development and implementation.

Finally, recognising that sustainability is a journey that requires continual review and reflection will be important to ensure that UTS continues to make the most of opportunities and respond to challenges and constraints as they arise. While change is occurring, UTS must monitor and

review performance and reprioritise implementation of measures, to ensure that they continue to make sense as internal and external circumstances and drivers evolve. Sustainability presents an opportunity for UTS to modernise along a particular pathway that will build in resilience to future constraints such as resource depletion and carbon pricing. To do so effectively, its strategies must be dynamic. For this reason, the sustainability strategies have a two-year lifetime before they must be reviewed and reassessed, at least in the initial phase of implementation. UTS is already rising to this challenge with a review of the effectiveness of ESI governance structures currently underway.

Acknowledgements

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