



Behaviour Change for Energy Efficiency: Insight Summary



Aim of the project

- To identify components of a behaviour change program targeting building occupants and managers to foster better environmental conditions to achieve more energy efficient outcomes;
- To serve as a first step for Townsville City Council (TCC) to investigate the possibility of design, implement, and evaluate behaviour change programs for energy efficiency;
- To understand the history, the issue, the people, and the facilities of TCC.

Council efforts to date

Phase	Objective	Tasks completed
Phase 1	Finding 'low hanging fruit'	Initiatives that would provide the greatest benefit for the least cost
Phase 2	Focusing operational savings	Critical analyses of billing costs and tariff pricing to minimise cost while maximising efficiency
Phase 3	Demonstrations and Prototypes	Council engaged in projects to improve energy performance and efficiency beyond reactive measures, introducing new smart systems
Phase 4	Continuation of the demonstrations	The Environment Department worked with other Council divisions to lead energy efficiency improvements
Phase 5	Transition Phase	Focuses on behavioural change

Methods of the project

A mixed-method project to triangulate data in order to ensure the most reliability and validity of the findings.



Literature review: Method

- **A literature review** - to identify behaviours and determine beliefs around 'barriers and benefits' of target behaviour for target audience, from reliable and credible sources such governmental reports and scientific publications;
- **Multiple databases and sources** were searched
- **A total of 50 studies or reports** were identified, examined, analysed, and synthesized

Literature review: Results

4 common enablers to energy efficiency in the workplace

1. Pro-energy efficiency leadership culture
2. Management knowledge and capabilities about sustainable innovations and energy efficient technology
3. Management investment in energy efficient technology, training and workforce programs
4. Awareness of financial and non-financial benefits from energy efficiency

Literature review: Results (cont.)

Solutions or energy efficient interventions identified:

Facilitation of environmental restructuring / optimisation

Changing physical or social context to increase convenience

- Interactive dashboards, proficient energy

Enablement

Increasing means/reducing barriers

- Knowledge management (promotional and educational strategies)
- Greater control over workspaces

Persuasion

Communication to induce positive or negative feelings or stimulate action

- Co-designed initiatives and interventions
- Highlight non-energy benefits of savings

Incentivisation

Creating expectation of reward

- Commitments, goal setting
- Prizes, challenges, games

Monitoring and reporting energy use

Increase salience of energy behaviour

- Dedicated organisational structure
- Employee feedback tools

Social influence

- Modelling of target behaviour by peers or significant others
- Social comparison feedback

Co-design: Method

Co-design workshops aimed to gain insights from council staff and contractors to understand:

1. Perceived barriers to energy efficiency
2. Strategies or solutions that can be utilised
3. Provide actionable steps to implement strategies



Two co-design workshops on 29th July 2021

- Townsville City Council staff (n=15)
- Contractors (n=9)

A total of **24 participants**

Co-design: Method (cont.)

Co-design sessions had 3 main activities



Activity 1: General group discussion

Participants discussed experience with previous initiatives and their current role in Council's energy efficiency



Activity 2: Barrier ranking and solutions ranking

Participants were asked to review 12 barriers and 11 solutions and select their top 3.



Activity 3: Group ideation

In groups, participants outlined actionable steps that are required to make a key strategy/solution happen.

Co-design: Findings

TOP 3 BARRIERS TO ENERGY EFFICIENCY

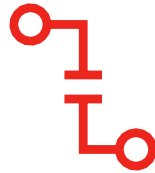
Funding and finance constraints

Exclusion or failure to include all occupant groups in retrofits

Limitations of the premises and personnel resources



Belief among management and staff that energy projects require large upfront costs, with little to no return on investment



Perceived disconnect of information, inputs and feedback loops across teams and departments



Existing non-efficient assets (with ongoing lifespan) limit opportunity to achieve energy efficient outcomes. Difficulties lay with integrating new technologies.

Co-design: Findings (cont.)

TOP 3 SOLUTIONS TO ENERGY EFFICIENCY

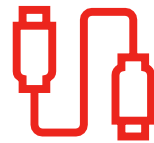
Proficient energy data collection systems and sensors for obtaining granular data collection

Automated and retrofitted technologies

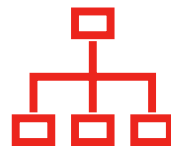
Dedicated organisational function for energy related technical, financial, and behaviour support



Agreement that for all technical and behavioural decisions effective and real time data collection and management systems are needed



Inclusion of multivariate data streams would be a valuable to make more informed and data-based decisions for energy efficiency upgrades and retrofits



Wider support, integration and function of existing organisation structure for energy efficiency in Townsville City Council.

Building and site audit: Method

Building and site audits were used to understand:

1. Current engineering and technical skills in Townsville
2. Current status of building and services
3. Understand level of control, monitoring, analysis and management

Building and Plant Site Tours of two Council and two Commercial facilities at:

- **103 and 143 Walker Street**
- **Mt St John Wastewater Treatment Facility**
- **420 Flinders Street**
- **445 Finders Street**

Interviews were conducted with facility managers and site representatives to gauge **attitudes towards energy management**

Building audit and site tour: Findings

1. No demand from building owners or property managers to upgrade
2. Operational staff had minimal responsibility or oversight of facility energy consumption.
3. Minimal interest from occupants regarding energy usage and consumption and no coordination between building owners and users

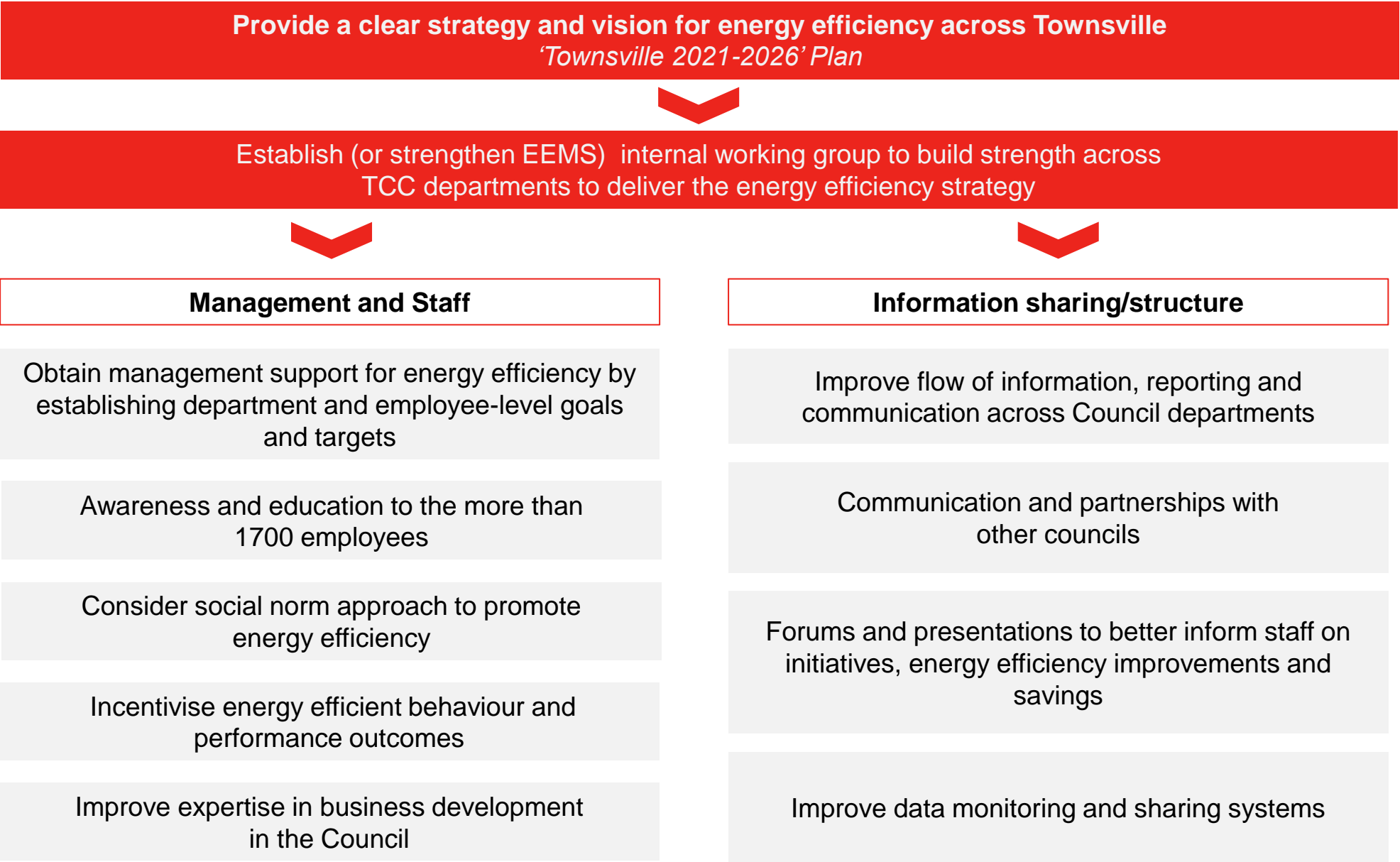
Recommendation

A more proactive, performance-based maintenance scheme may improve energy efficiency in Council buildings

Key insights

- Council have reached practical saturation in the implementation of technological solutions for energy reductions - further upgrades would have high costs and are **unlikely to be supported in a cost-benefit analysis, unless cost efficiency can be demonstrated**
- Council leaders are **driven by operational problems and 'business as usual'** and are not motivated or rewarded to trial new technology
- Attitudes of Council **staff is an obstacle**. It is difficult to persuade staff to work energy management as key roles do not include financial reward or prestige for reducing energy use.
- Further technological development has become difficult due to structural changes and attitudinal factors within Council and hence the **current Council goal is behavioural change**.

Recommendations



Future research should be conducted with leadership and management as they have **direct impact on policy and strategy implementation**

Thank you

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