

# Northumbria Research Link

Citation: Capper, Graham, Theobald, Kate and Walker, Sara (2011) Energy demand and associated carbon emissions for Northumbria University estate: one School approach. In: RGS-IBG Annual International Conference, 31 August - 2 September 2011, London, UK.

URL:

This version was downloaded from Northumbria Research Link:  
<https://nrl.northumbria.ac.uk/id/eprint/5733/>

Northumbria University has developed Northumbria Research Link (NRL) to enable users to access the University's research output. Copyright © and moral rights for items on NRL are retained by the individual author(s) and/or other copyright owners. Single copies of full items can be reproduced, displayed or performed, and given to third parties in any format or medium for personal research or study, educational, or not-for-profit purposes without prior permission or charge, provided the authors, title and full bibliographic details are given, as well as a hyperlink and/or URL to the original metadata page. The content must not be changed in any way. Full items must not be sold commercially in any format or medium without formal permission of the copyright holder. The full policy is available online: <http://nrl.northumbria.ac.uk/policies.html>

This document may differ from the final, published version of the research and has been made available online in accordance with publisher policies. To read and/or cite from the published version of the research, please visit the publisher's website (a subscription may be required.)



**Northumbria  
University**  
NEWCASTLE



**UniversityLibrary**



# Energy demand and associated carbon emissions for Northumbria University estate: one School approach

Dr Graham Capper

Dr Kate Theobald

Dr Sara Walker



## Content



- The drivers for carbon reduction in HE
- Carbon footprint methodology
- Carbon footprint results
- Producing “carbon-literate” graduates
- Future plans

## External drivers



- EU emissions trading scheme
- Climate change levy
- Part L Building Regulations
- Display Energy Certificates (DECs)
- Carbon reduction commitment
- HEFCE

## Sustainable development: our vision

Within the next 10 years, the higher education sector in this country will be recognised as a major contributor to society's efforts to achieve sustainability - through the skills and knowledge that its graduates learn and put into practice, and through its own strategies and operations.

*Sustainable development in higher education (HEFCE 2005/28)*



January 2010/01

January 2010/01  
**Policy development**  
**Statement of policy**

A carbon reduction target and strategy for higher education in England.

This report is for information

## Carbon reduction target and strategy for higher education in England



Free

January 2010/02

January 2010/02  
**Good practice**  
**Guidance**

This document offers guidance for institutions on producing individual carbon reduction strategies, targets and associated carbon management plans.

This report is for information

## Carbon management strategies and plans

**A guide to good practice**



Free

## Internal drivers



- Cost
- Corporate Social Responsibility
- Competitiveness
- Environmental concern
- Access to capital
- Corporate image



## The facts



35,000 students from 140 countries make Northumbria the UK's sixth largest HE provider and help the University to perform a leading role in promoting and sustaining the Region's economic, cultural, and social well-being.

(2009 figures)





## The facts



Northumbria offers programmes in 30 of the 32 most popular academic disciplines across eight Schools:

- Arts and Social Sciences
- Built and Natural Environment
- Computing, Engineering and Information Sciences
- Design
- Health, Community and Education Studies
- Law
- Newcastle Business School
- Life Sciences



## Carbon footprint methodology



Gas and electrical consumptions have been obtained for Ellison Building and for Wynne Jones. The consumptions have been calculated initially on an area-weighted basis, using accurate CAD plans for the buildings and an estimate of the percentage of the total occupied by the School.

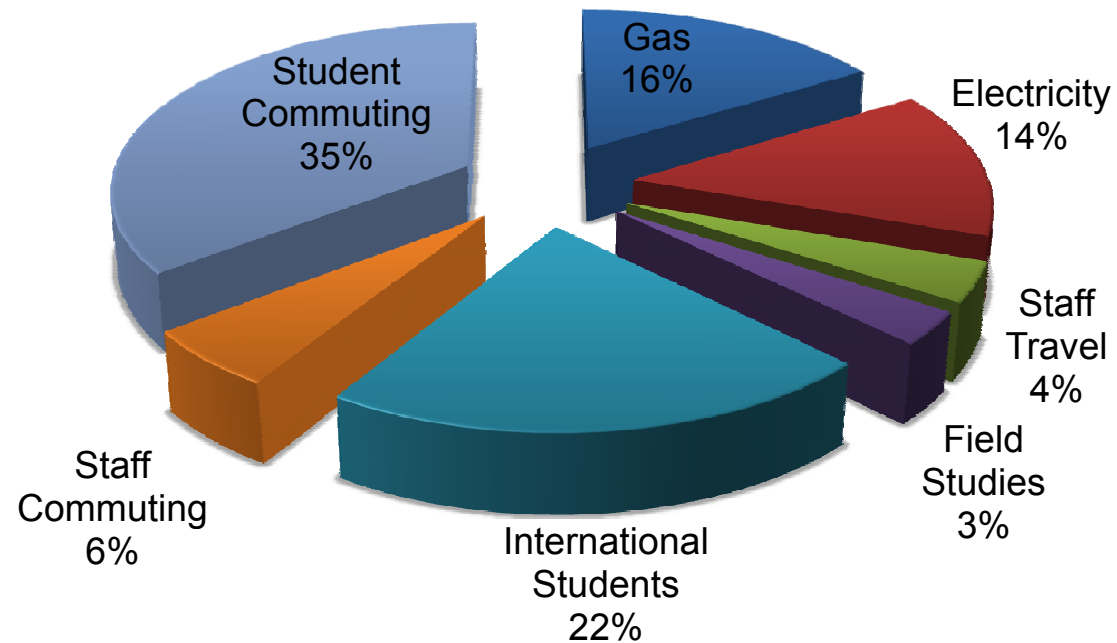
Staff (business) travel has been analysed for a full calendar month and broken down into car use, rail travel and air travel.

Estimates of staff and student commuting are based on actual numbers, modes of transport from commuter studies at both Northumbria and Newcastle Universities and estimates of travel distance. International student numbers have been obtained and CO<sub>2</sub> emission have been estimated based on home location and distance travelled by air.

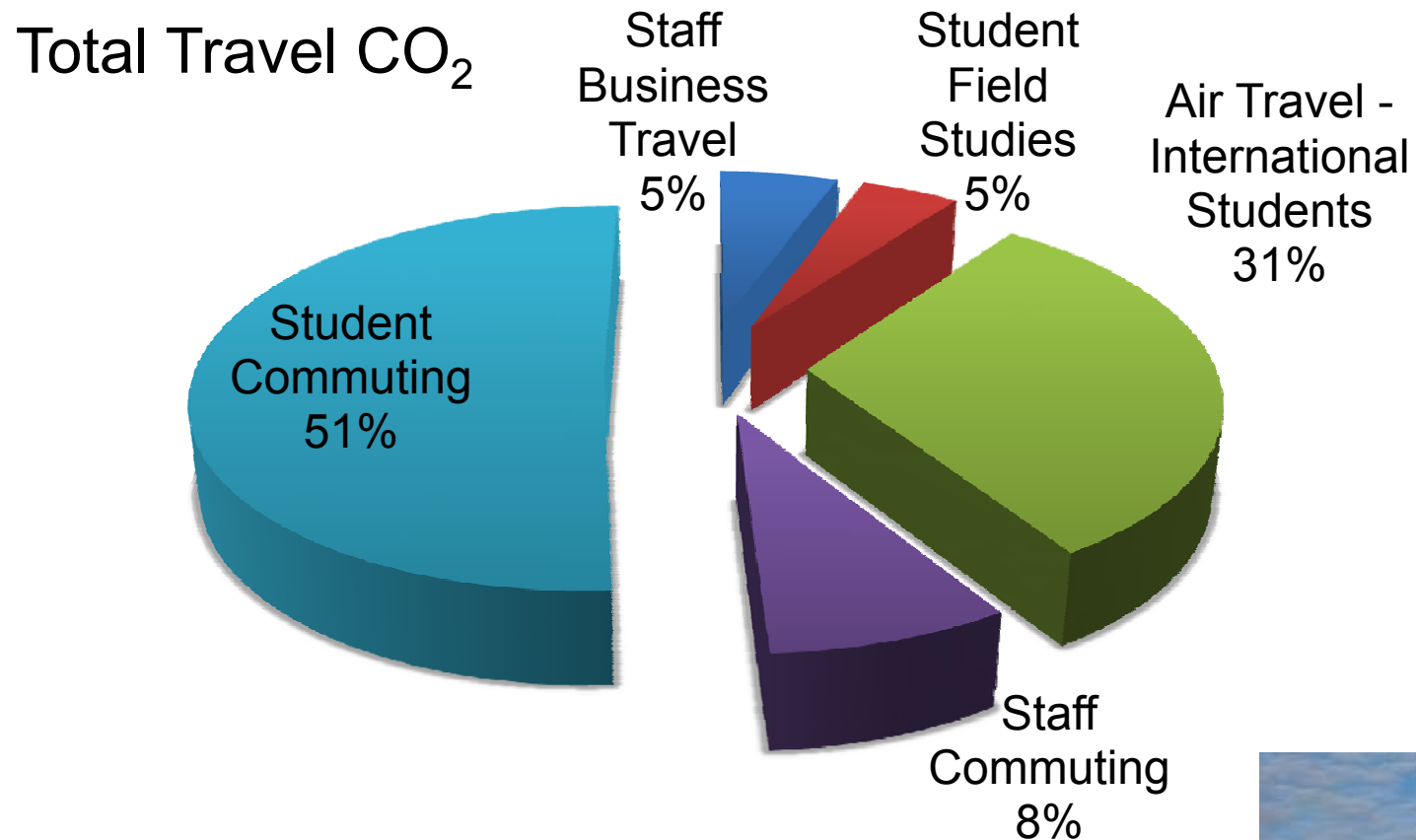
# School carbon footprint



## School CO<sub>2</sub> breakdown



# School carbon footprint



## School carbon footprint



Typical CO<sub>2</sub> figures for universities vary between 400kg and 4000kg / student FTE per annum

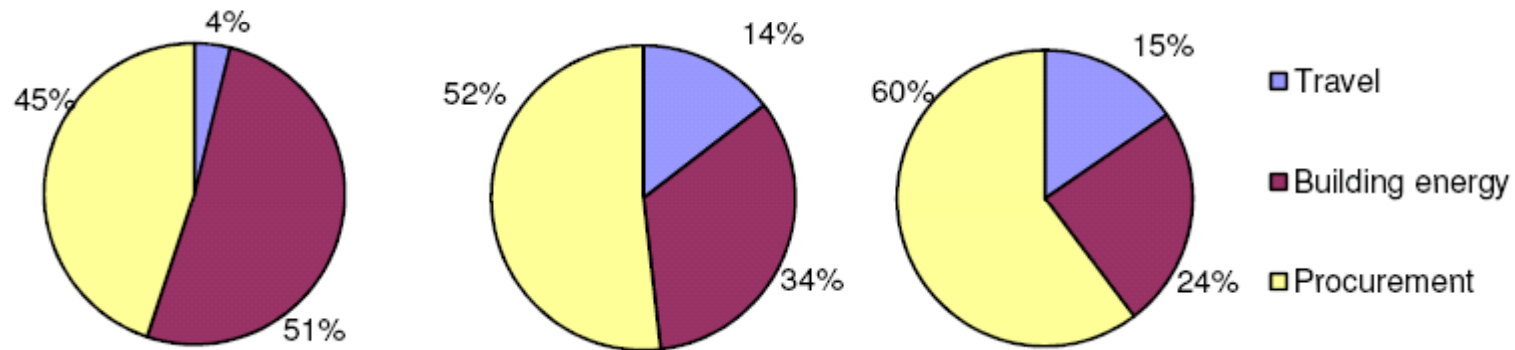


School of the Built and Natural Environment ≈  
1 tonne CO<sub>2</sub> / student FTE per annum





# Procurement



**Figure 1:** 2007 BLT (LHS); London NHS Trusts (Middle) and NHS England (RHS) footprint breakdown  
Arup et al (year unknown). Executive summary: Barts & the Royal London NHS Trust 2007 carbon footprint

Study of carbon footprint for Barts & the Royal London NHS Trust showed that procurement contributed 45% of the carbon footprint

School data on procurement is very limited.

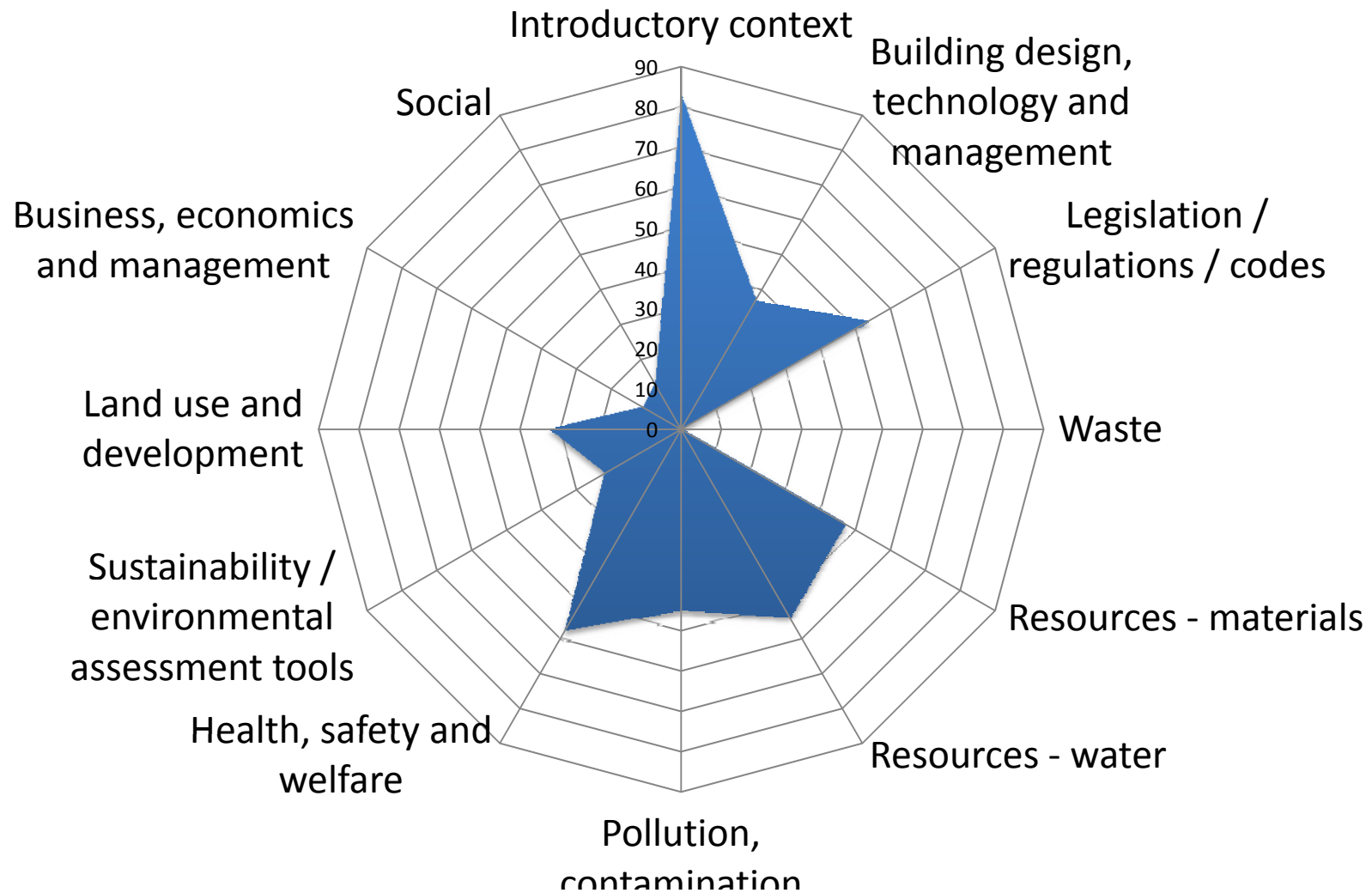




# Curriculum mapping



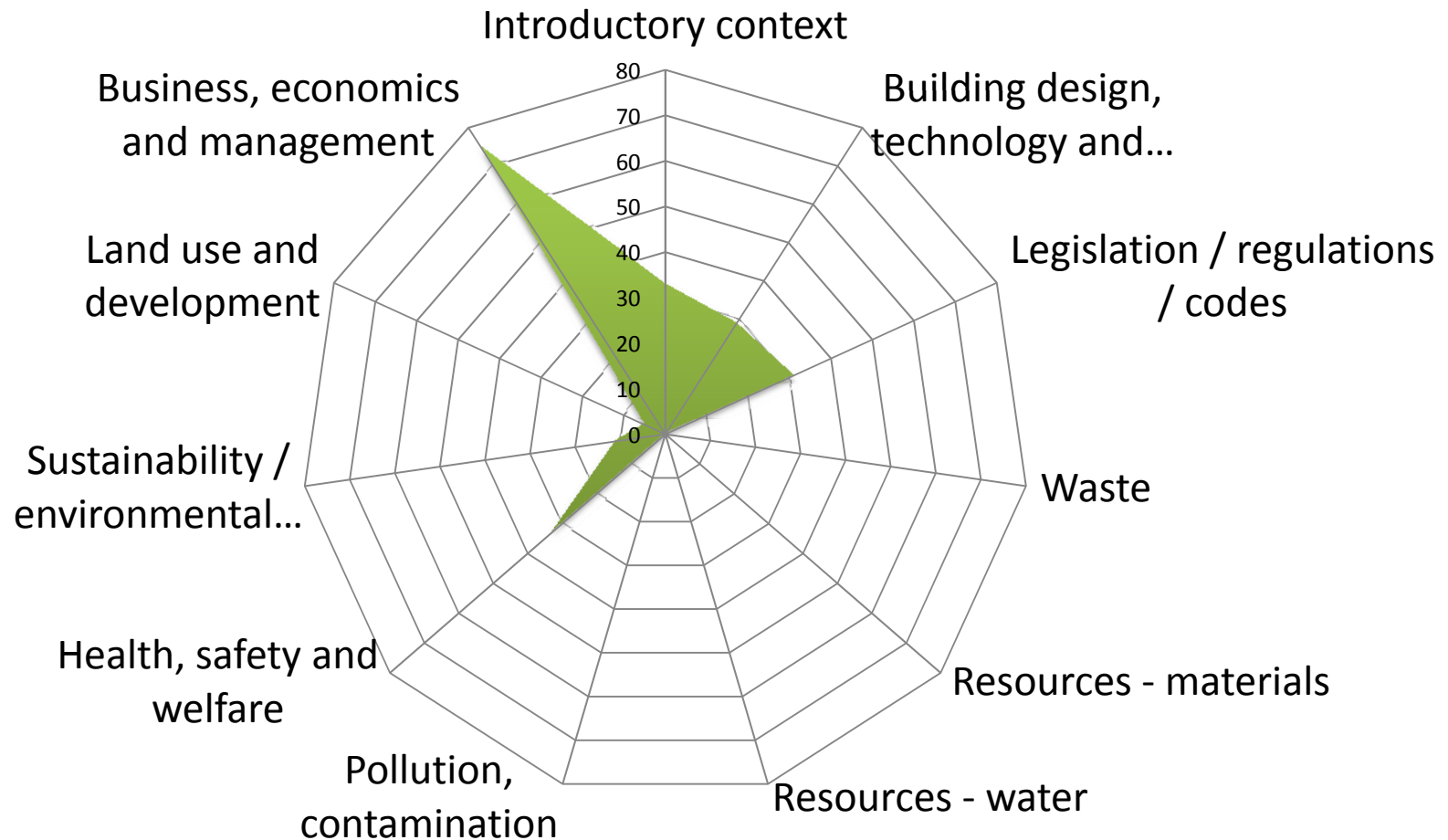
## Building Surveying



# Curriculum mapping



## Quantity Surveying



## The University policy



There has been recent agreement by the Governors to the University's revised Carbon Management Plan. This commits the university to a 32% reduction in carbon emissions by 2020, based on 2005 values.

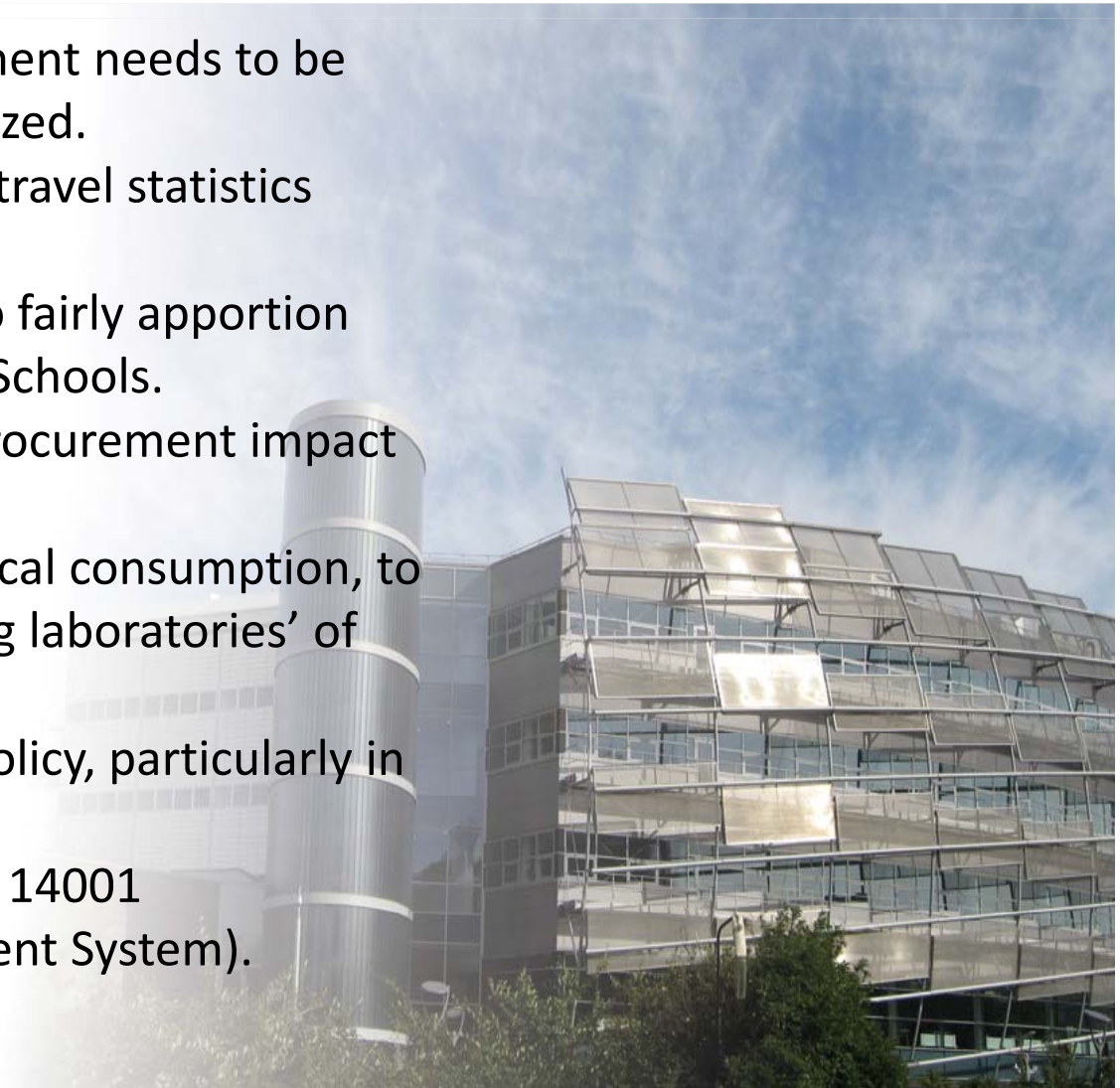
The plan requires a Sustainability Management Group and a *"culture shift for the University and commitment from staff at all levels of the organisation"*.



## The School policy



- Carbon footprint assessment needs to be updated and better publicized.
  - More robust University travel statistics needed in the future.
  - Methodology needed to fairly apportion “overheads” emissions to Schools.
  - More investigation of procurement impact needed.
  - Benchmarking of electrical consumption, to provide live data and ‘living laboratories’ of energy consumption.
  - Aim to develop waste policy, particularly in relation to paper.
  - Aspiration to obtain ISO 14001 (Environmental Management System).



## Summary



- Internal and external drivers
- Carbon footprint methodology complex, estimations at present, some data missing
- School results approx 1 tonne CO<sub>2</sub> /student FTE per year
- Some way to go regarding curriculum
- University target 32% reduction