DIVISION OF TECHNOLOGY, INFORMATION AND LEARNING SUPPORT

INFORMATION TECHNOLOGY SERVICES

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A Year of Green IT

Michael Flynn

a university for the real world®

Climate Change...

Who am I?

- I am not a 'Greeny' but I am trying
- I am a Gen Y
- BA of IT from QUT and Cert IV in Project Management
- QUT Green IT Project Manager since May 2009
- Previously involved in QUT/GU Mobile Staff Productivity Project
- Second time presenting at QUESTnet

Presentation Overview

- Corporate Commitment to Sustainability
- Green IT Program
- Metrics and KPIs
- Working across organisational boundaries
- Projects
- Lessons Learned

Corporate Commitment to Sustainability

- **2008** – Signed ATN Declaration of Commitment to Sustainability
- Includes reducing CO_2 emissions from 2007 levels
  - 10% by 2012
  - 25% by 2021
- **2008** – Formed a high level Sustainability Working Party (SWP)
- **2009** – Established a $4,500,000 Sustainability Fund from which sustainability initiatives are funded over the next three years

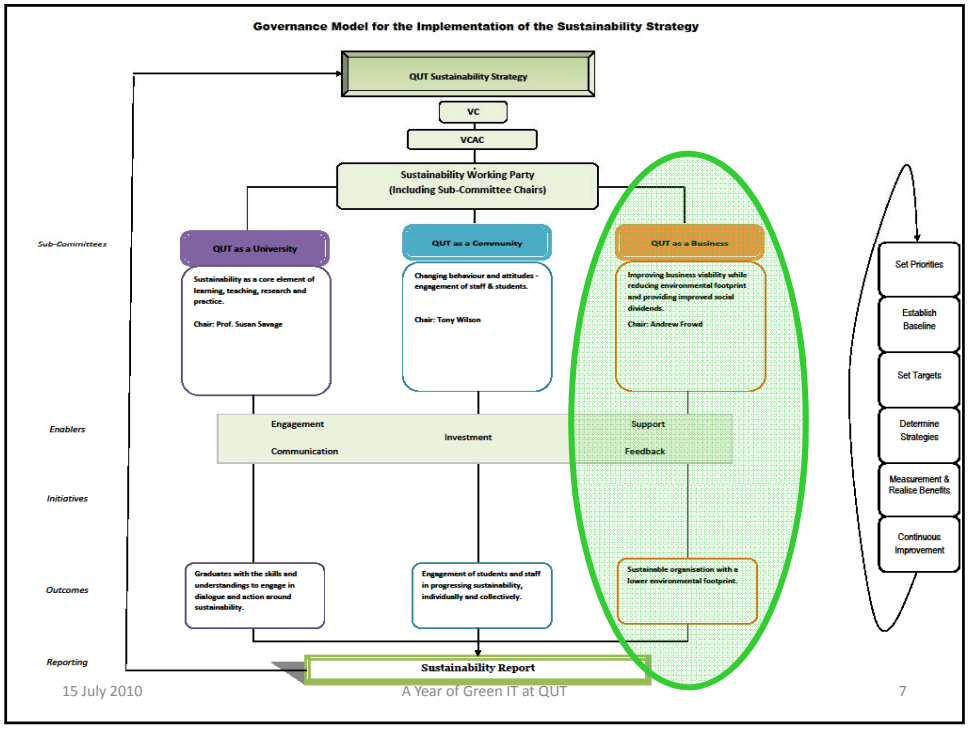
AUSTRALIAN TECHNOLOGY NETWORK OF UNIVERSITIES

Curtin University of Technology
University of South Australia
RMIT University
University of Technology Sydney
Queensland University of Technology

Corporate Sustainability Teams

- **2009** – Formed three SWP subgroups to oversee sustainability in our
  - **University** – curriculum & research
  - **Community** – everyday activities
  - **Business** – operations & infrastructure

- **2009-2010** – QUT formed the corporate sustainability team
  - Sustainability Operations Manager – Facilities Management (FM)
  - Sustainability Coordinator – Facilities Management (FM)
  - Green IT Project Manager – IT Services (ITS)
  - Energy Manager – Facilities Management (FM)
  - Communication Officer – Marketing and Communications (M&C)
  - Procurement Officer – Finance and Resource Planning (FRP)



Green IT Program

- Green IT Program was established in May 2009
  - 12 Month Project Manager position
  - Based in ITS but governed by ITS and FM steering committee
- Program Objective
  - To evaluate and progress a portfolio of Green IT projects. These will be implemented university wide to achieve measured reductions in QUT's energy consumption and carbon footprint
- Initial Priorities
  - Establish ICT energy consumption baseline
  - Student Labs Workstation Energy Management Project
  - Sustainable Printing Project

Green IT Program Governance

- Green IT Steering Committee membership
  - Director of Facilities Management (FM)
  - Director of Information Technology Services (ITS)
  - Associate Director, Operations (FM)
  - Associate Director, Infrastructure Services (ITS)
  - Manager, Engineering Services (FM)
  - Manager, Client Infrastructure Services (ITS)
- The alliance between ITS and FM presented both opportunities and challenges

Metrics and KPIs

- 2009 QUT ICT Energy Consumption Baseline
- 2009 CAUDIT Green IT KPIs

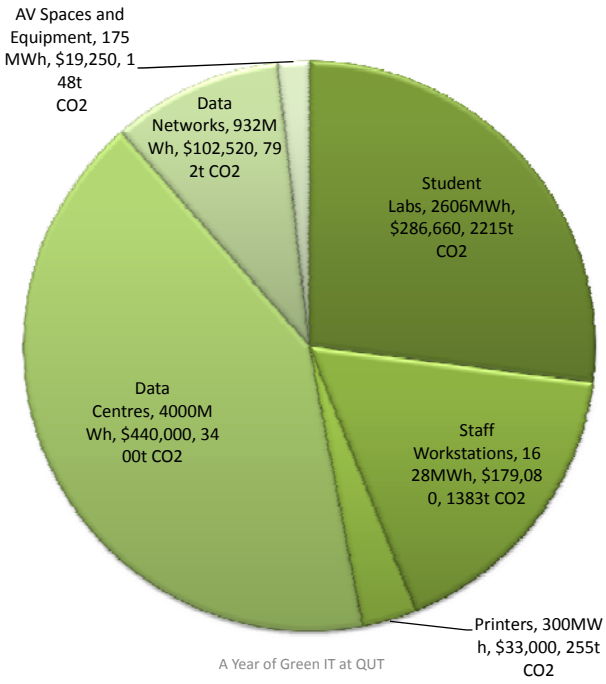
2009 QUT ICT Energy Consumption Baseline

- Crucial for prioritising projects and measuring energy savings
- No easy way to measure ICT infrastructure energy consumption
- Various techniques were used
  - Metering individual devices and facilities
  - Using vendor supplied data and verifying where possible
  - Making assumptions based on expert advice
  - Extrapolating data with varying accuracy

2009 QUT ICT Energy Consumption Baseline

ICT Infrastructure Area	2009 Energy Consumption (kWh)	Accuracy	Cost	CO2 (tonnes)
Data Centres	4,000,000	+/- 10%	$440,000	3400
Student Labs	2,606,000	+/- 10%	$286,660	2215
Staff Workstations	1,628,000	+/- 10%	$179,080	1383
Data Networks and Phones	932,000	+/- 10%	$102,520	792
Printers	300,000	+/- 30%	$33,000	255
AV Spaces and Equipment	175,000	+/- 20%	$19,250	148
Totals	**9,641,000**	+/- 11%	**$1,060,510**	**8194**

- In 2009, ICT represented 20% of QUT's total energy consumption
  - 54,118,879 kWh
  - $5,050,307
  - 48,165 tonnes CO2



2009 CAUDIT Green IT KPIs

- Based on a KPMG report commissioned by Monash University
- Endorsed by the CAUDIT Standing Committee on Green IT
- Included in the CAUDIT Profile and Benchmarking System
  - EPEAT Gold Rating
  - Server Virtualisation
  - Power Usage Efficiency
  - Environmental Disposal
  - Total Paper Consumed
  - Total Paper Recycled

CAUDIT
Council of Australian University Directors of Information Technology

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2009 CAUDIT Green IT KPIs

- **EPEAT Gold Rating: 33%** of desktop boxes and laptops hold an EPEAT gold rating
- **Server Virtualisation: 66.7%** (417 virtual/625 physical) of servers are virtualised
- **Power Usage Efficiency (PUE) : 2.5** is the combined PUE of QUT data centres

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2009 CAUDIT Green IT KPIs

- **Environmental Disposal: 92%** (4715 out of 5100) of desktop and laptop workstations were recycled, reused or disposed in an environmentally sound manner
- **Total Paper Consumed: 95,600 reams** were consumed
- **Total Paper Recycled: 14,896 reams** were recycled through office recycling programs

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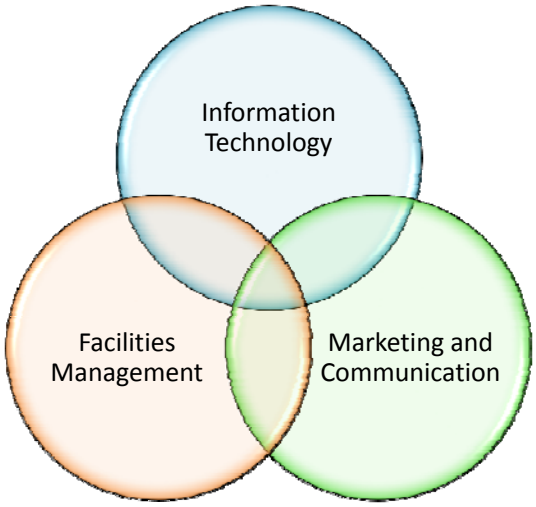
Working Across Organisational Boundaries



Working Across Organisational Boundaries

- Green IT projects are competing for the same funding as energy management and other sustainability projects
- ROI is not always clear for Green IT projects
- The role of FM in the Green IT Program
  - Approve funding for Green IT projects
  - Assist in developing robust metrics
  - Gave validity to project business cases
  - Champion the Green IT Program
  - Align Green IT with corporate sustainability strategy

Working Across Organisational Boundaries

- Challenging to manage FM expectations of Green IT
- FM struggles to understand the complexity of IT environments
- ITS struggles to keep things simple
- Different attitudes and approaches
  - ITS – investigate, analyse, consult, plan, pilot...etc
  - FM – 'just do it! – plan it, change it, measure it'

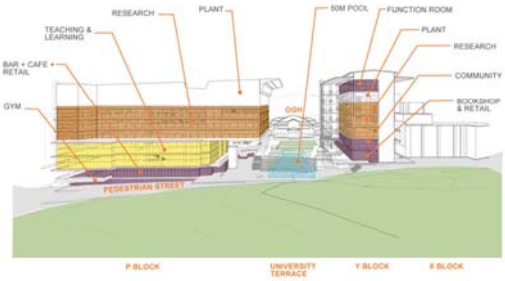
Working Across Organisational Boundaries

- FM's comments on ITS
  - 'Why is this taking so long?'
  - 'Why are there so many people involved?'
  - '@#!% IT people'

- ITS' comments on FM
  - 'Why is this taking so long?'
  - 'What more do they want?'
  - '!@#$ Engineers'

Working Across Organisational Boundaries

- Project Management
  - ITS – flexible, lightweight, in-house, qualified, intangible
  - FM – rigid, robust, contracted, quantified, tangible



Green IT Projects

- Student Lab Energy Management
- Sustainable Printing
- Staff Workstation Energy Management
- Energy Efficient Data Centres
- Sustainable Data Networks
- Video Conferencing Travel Reductions
- eWaste
- Other Initiatives

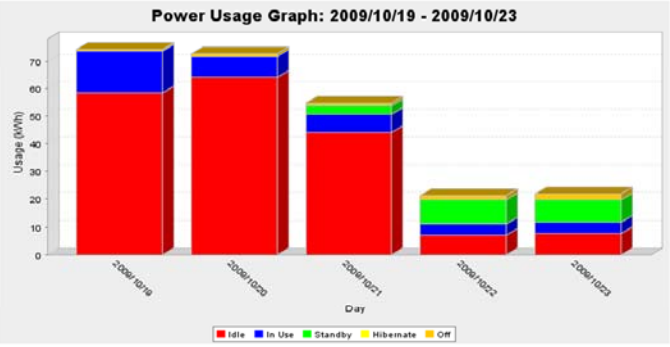
Student Lab Energy Management

- **Timeframe:** June 2009 – present (ongoing)
- **Cost:** $25,000 (resourcing provided by operation teams)
- **Objective:** Reduce the energy consumption of 3,500 student workstations by 40%
- **Implementation:** Select and deploy a solution which will
  - send lab workstations into standby after 5 minutes of inactivity
  - wake them for maintenance windows
  - report energy consumption

Student Lab Energy Management

- **Outcomes:**
  - Successful pilot in October 2009 with a verified 60% reduction in workstation energy consumption
  - Communicated to students via digital signage, Facebook, email, splash screens and minimal physical lab signage
  - Deployed throughout student labs in Q1 2010 but currently disabled due to issues with Wake on Lan
  - ITS is currently investigating the implementation of vPro to provide a more reliable 'wake-up' mechanism

Student Lab Energy Management



	USAGE (KWH)					
DAY	IDLE	IN USE	STANDBY	HIBERNATE	OFF	TOTAL
2009/10/19	58	16	0	0	1	75
2009/10/20	64	8	0	0	1	73
2009/10/21	44	6	3	0	1	55
2009/10/22	7	4	9	0	2	21
2009/10/23	8	4	8	0	2	22

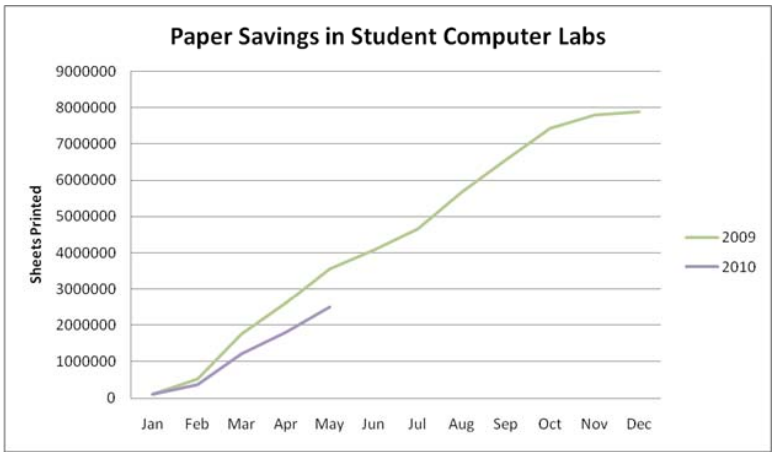
Sustainable Printing

- **Timeframe:** May 2009 – present (ongoing)
- **Cost:** $0 (resourcing provided by operation teams)
- **Objective:** Reduce the environmental impact of printing operations
- **Implementation:** Put in place various measures to reduce paper consumption and improve printing practices
  - Default double-sided printing in staff and student environments
  - Trial of prox card system on multifunction devices (MFDs)
  - Joint project with PHD student to change staff behaviours
  - Review and recommend preferred paper products
  - Consolidate and replace standalone printers with MFDs

Sustainable Printing

- **Outcomes:**
  - Developed printing baseline using data from paper suppliers
  - Double-sided printing was made default across networked staff printers in May 2009
  - Default double-sided printing was implemented across all student labs in February 2010
  - Engaged with PHD student from Creative Industries Faculty

Sustainable Printing



Staff Workstation Energy Management

- **Timeframe:** July 2009 – present (ongoing)
- **Cost:** up to $150,000 ($0 spent)
- **Objective:** Reduce the energy consumption of 9,000 staff workstations by 30%
- **Implementation:**
  - Identify internal and external energy management solutions
  - Pilot chosen solution and full deployment
- **Outcomes:**
  - Successful pilot in April 2010 of deploying a new Windows XP Power Scheme to ITS and FM workstations

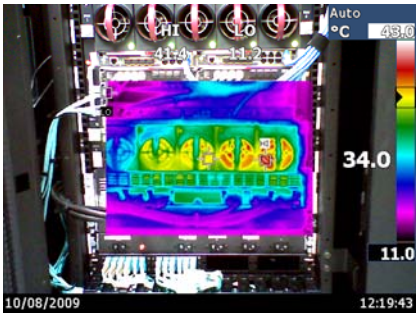
Energy Efficient Data Centres

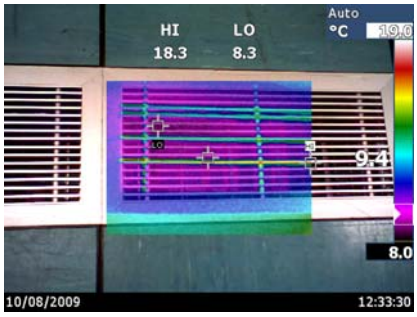
- **Timeframe:** June 2009 – present (ongoing)
- **Cost:** up to $260,000 ($30,000 spent)
- **Objective:** Reduce the energy consumption of data centres
- **Implementation:** Deliver efficiencies in both the
  - configuration and management of the facility
  - The utilisation of ICT equipment

Energy Efficient Data Centres

- **Outcomes:**
  - Ongoing server virtualisation and consolidation
  - Data Centre Power Upgrade Project delivered significant cooling efficiencies and improved monitoring and management
  - Procurement of a thermal imaging camera to assist in managing hotspots and cooling configuration
  - Sealed floor tiles to prevent chilled air loss
  - Commissioned Hitachi Data Systems to provide recommendation on Energy Efficient Data Centre Strategy

Energy Efficient Data Centres





Sustainable Data Networks

- **Timeframe:** November 2009 – present (ongoing)
- **Cost:** $0 (resourcing provided by operation teams)
- **Objective:** Reduce the energy consumption of data networks
- **Implementation:** Identify opportunities to reduce devices and improve network management, practices and standards
- **Outcomes:**
  - Powered down unused network devices on the now defunct Carseldine campus
  - All new edge network devices will now be Power Over Ethernet (POE) enabled
  - Patching on demand is now standard

eWaste

- **Timeframe:** May 2009 – May 2010 (12 months)
- **Cost:** $0
- **Objective:** Dispose of eWaste in an environmentally sound manner
- **Implementation:** Developed an eWaste process and facilities
- **Outcomes:**
  - eWaste process was developed in collaboration with FM and IT support teams
  - eWaste cage has been commissioned on both campuses
  - More tan 400 devices were disposed through eWaste facilities in 2009

Video Conferencing Travel Reductions

- **Timeframe:** May 2010 – present (ongoing)
- **Cost:** $0
- **Objective:** Reduce staff air travel through increased use of video conferencing
- **Implementation:**
  - Baseline air travel and video conferencing utilisation
  - Video conferencing service improvement
  - Targeted marketing of videoconferencing services

Video Conferencing Travel Reductions

- **Outcomes:**
  - Obtained 2009 Air Travel Baseline
    - 15,510 flights
    - 6,357 tonnes of CO_2
    - 49,192,842 kms travelled
  - Obtained 2009 Video Conferencing Baseline

2009 Utilisation Data	Access Grid (HPC)	Room based (H323)	EVO	Office Communicator
Unique calls	120	533	158	No stats
Unique users	No stats	No Stats	22	No stats
Average session time	2-3 hours	61 minutes	20 minutes	No stats

Other Green IT Initiatives

- Embedding sustainability principles in the QUT Project Management Framework
- Green IT at Senior Leadership Group Conference

Lessons Learned

- Patience is a virtue
- Relying heavily on operational resources is risky – try to avoid
- Be prepared to change the way you work
- Managing Expectations
  - Know when hide complexity and know when to reveal it
  - Get to know people
  - Don't overpromise
- Know the right time to seize opportunities
- Be gracious

Questions?