50 Lonsdale Street
Sustainability Victoria
Air Conditioning
Set-point Offset Trial

Property Owner: Sustainability Victoria
Engineer & Specialist Contractor: Sustainability Victoria

SV’s Fit-out

> Located on the 28th level of the Urban Workshop
> 1950m² NLA
> 5 Star Green Star/ 5 Star NABERs ratings
> ISO 14001 Certified Environmental Management System
> Stretch targets for energy, materials and water consumption as well as transport and est. for sustainable procurement
Sustainability Victoria
Air Conditioning Set-point Offset trial

> In August 2009 Sustainability Victoria’s tenancy was modified to accommodate an Air Conditioning set-point offset trial.
> Trial sought to determine the savings achieved by installing set-point offset control strategies.
> Equipment was installed on a control floor with the same monitoring equipment.
> A control floor was chosen due to a similar amount of tenants and equipment located there.

Sustainability Victoria
Air Conditioning Set-point Offset trial
Drivers

> Pursuit of best practice in tenancy operations.
> Energy cost savings / Carbon emissions management.
> Replication value.
> Low cost no cost savings.
> Strong element of adaptation/behaviour change.
Drivers - best practice in tenancy operations

SV performs at the top amongst Whole of Victorian Government entities that report their EMS results.

Figure 9. Reams of A4 equivalent paper used per full time equivalent employee

Drivers - Carbon emissions management

Sustainability Victoria
Sustainability Victoria
Air Conditioning Set-point Offset trial
Methodology

The scope of works required include:

> Installation of additional energy monitoring equipment of the associated Air Conditioning plant
> Control strategies to raise or lower the floor temperature set-point based on the given month
> Implementation of automatic Energy reporting generated on a weekly basis

Building Configuration

> 3 Centrifugal Chillers, 1 Screw Chiller
> 3 Gun Boilers
> 2 Air Handling Units per floor, one that supplies the North and one that supplies the Southern side of the building
> Each Air Handling Units contains two zones – Perimeter and internal
> 29 Variable Air Volume Units
> Heating hot water reheat in the perimeter areas
Instrumentation

- BACnet Control system for collecting data
- Existing Pulse kWh meters to measure fan energy
- 4-20mA temperature probes connected to the DDC system to measure return water temperatures

Control Setup

- Set-point initially raised or lowered between from -0.5 to 0.5 Degrees Celsius based on the month
- January to March set-point offset increased to 1.5 Degrees Celsius
Data Reporting

Data collected includes
> Fan energy usage (kWh)
> Heating hot water Energy usage (kWr)
> Chilled Water Energy Usage (kWr)

Sustainability Victoria
Air Conditioning Set-point Offset trial

Communications

Extensive communications strategy deployed prior to implementation of the trial which included:
> All Staff presentation which included a Q&A
> Follow up All Staff email on specific details
> Email dropbox set up called ‘Comfort’
> Regular updates as to how the trial was progressing
> Mid-point survey to gauge the impact on staff comfort
Communications

>> inside newS

BEHAVIOUR CHANGE IN FULL SWING

The set-point trial had finally begun by 1 August after a few glitches due to the monitoring systems installation.

The temperature range and conditions will now be monitored more closely than ever by our resident project manager from All Coombs, who is responsible for ensuring we stay within the agreed temperature ranges of 23-25°C in the winter and 23-26°C in the summer.

We’ve already had a huge win with respect to behaviour: oh, oh, oh, oh, oh, chausenars...

After silently advising Kelly Wickham that she doesn’t wear anything but heels and I don’t do layers”, Vanessa Lurry has rigged up for work to be defined against the slight decrease in temperature. Now that’s adapting.

Remember, email Contact if you have any issues regarding the temperature in the office.

---

Preliminary Survey Results

SUSTAINABILITY VICTORIA: Testing best practice measures - Set point trial survey results

Sustainability Victoria, in conjunction with Wright Park and ISPT, started an extended set point temperature range at its new 25 locations of the Urban Workshop, 30 Lonsdale Street, Melbourne. This extended set point was trialed over a two-month period in the summer of 2012 to 11 to attribute savings observed during the trial period.

Staff who were working with Sustainability Victoria prior to the implementation were recently surveyed to assess comfort impacts due to the trial. The results were quite interesting and of the 110 staff surveyed just over 60% responded.

As a baseline:

- 5.2% of staff found the office too warm
- 4.1% of staff found the office too cool

- 51.7% of staff found the office mostly fine
- 34.3% of staff found the office either too cool or 11.4% of staff found the office too cool.

The temperature range during the trial was expanded from the previous ±5°C from a set point of 23-25°C to 23-26°C. The results are as follows:

Comfort levels during the winter months of the set point trial:

- 18% of staff found the office frequency too warm
- 2% of staff found the office almost too warm
- 21.4% of staff found the office either too cool
- 3% of staff found the office too cool
Results

- Total estimated fan energy savings 13%
- Estimated chilled H₂O energy savings 12%
- Total est. GHG savings = 4,642 kg CO₂-e

Energy consumption baseline December 2009

- Fan Energy
  - Level 10: 2496 kWh vs 1865 kWh

- Heating Hot Water Energy
  - Level 10: 80.4 MJ vs 15.8 MJ

- Chilled Water Energy
  - Level 28: 13430 vs 12325 kWh

Ongoing Communications
**Sustainability Victoria**

**Air Conditioning Set-point Offset trial**

**Next steps**

> Suspend for a period over summer to ascertain savings

> Trial alternative scenarios

> Work with ISPT to roll out through Urban Workshop

> Disseminate to sector more broadly

---

**Contact**

> Kelly.wickham@sustainability.vic.gov.au

**Search**

> www.resourcesmart.vic.gov.au

> www.sustainability.vic.gov.au
50 Lonsdale Street
Sustainability Victoria
Air Conditioning
Set-point Offset
Trial

Property Owner:

Engineer & Specialist Contractor:

Sustainability Victoria
Level 28, 50 Lonsdale St
Melbourne VIC 3000
sustainability.vic.gov.au