

Buildings **Alive**

Insights from the field: tightening and tuning for enhanced energy productivity in buildings

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The Australian Summer Study on Energy Productivity

26 February, 2016

Why is it important to focus on the “people factor”?

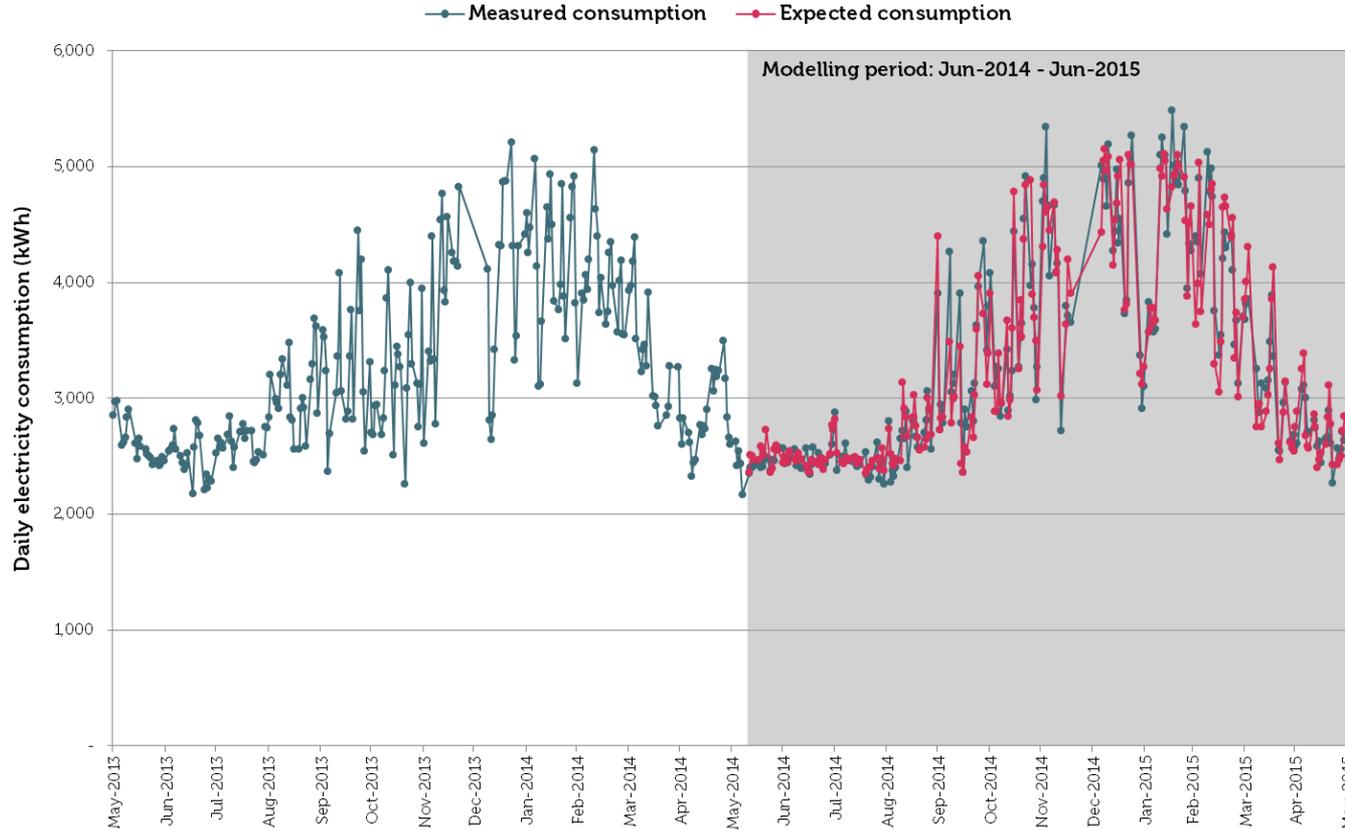
“... the potential reduction through non-technological options is rarely assessed and the potential leverage of policies over these is poorly understood.” (IPCC4, Levine et al. 2007:389)

Measure	NABERS Energy Impact	Measure Summary
Economy Cycle	0.6 stars	Buildings with Economy cycles outperform those without
Building technology	1.4 stars	Buildings with current good practice facade and services technology perform better
Management	1.3 stars	Buildings where management is at least partially in-sourced perform better
	0.9 stars	Buildings where building, asset and portfolio manager all feel able to affect efficiency perform better
Training and skills	0.5 stars	Buildings where there is an efficiency training program perform better
	1.3 stars	Buildings where the manager reports a higher level of energy efficiency knowledge perform better
	Weak	Buildings where the building manager is conservative with respect to new technologies perform poorer

Low Energy High Rise Report, 2009

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The need for a steady-state assessment of performance

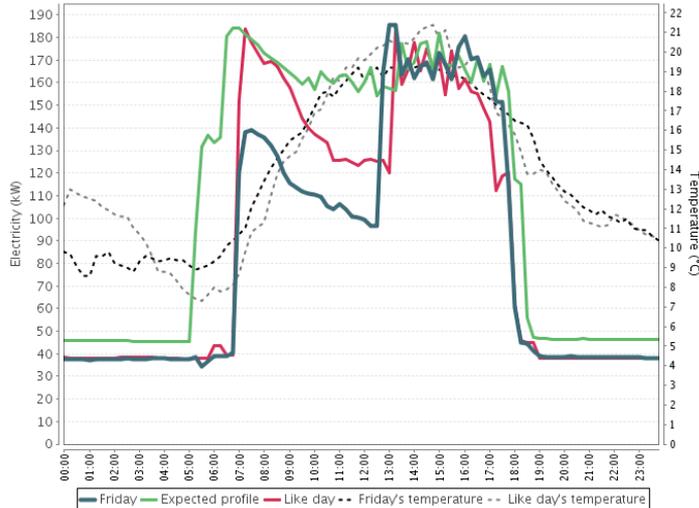


Clear, timely, actionable feedback each morning

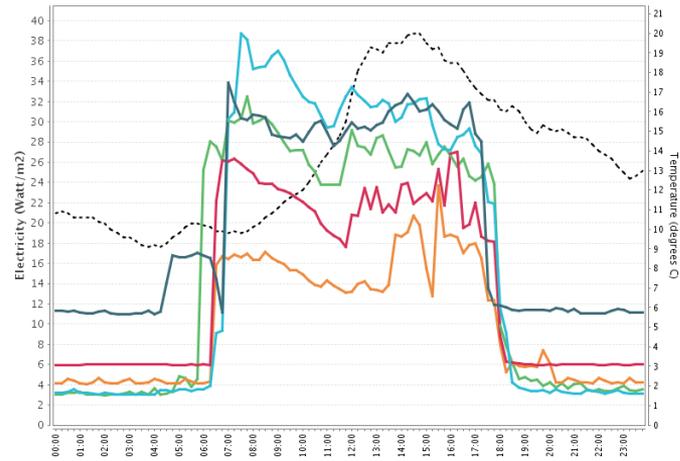
Subject: Building 1's electricity: good day yesterday

Great news, last Friday Building 1 used 23% less electricity than REF's baseline. Nearby buildings used 6% more energy than expected. Over the past 30 days Building 1 has beaten its baseline by 18%.

NMI Data for Friday 23 October 2015, its Closest Like Weather Day (Monday 18 May 2015) and REF's expected profile



Normalised Electricity Consumption

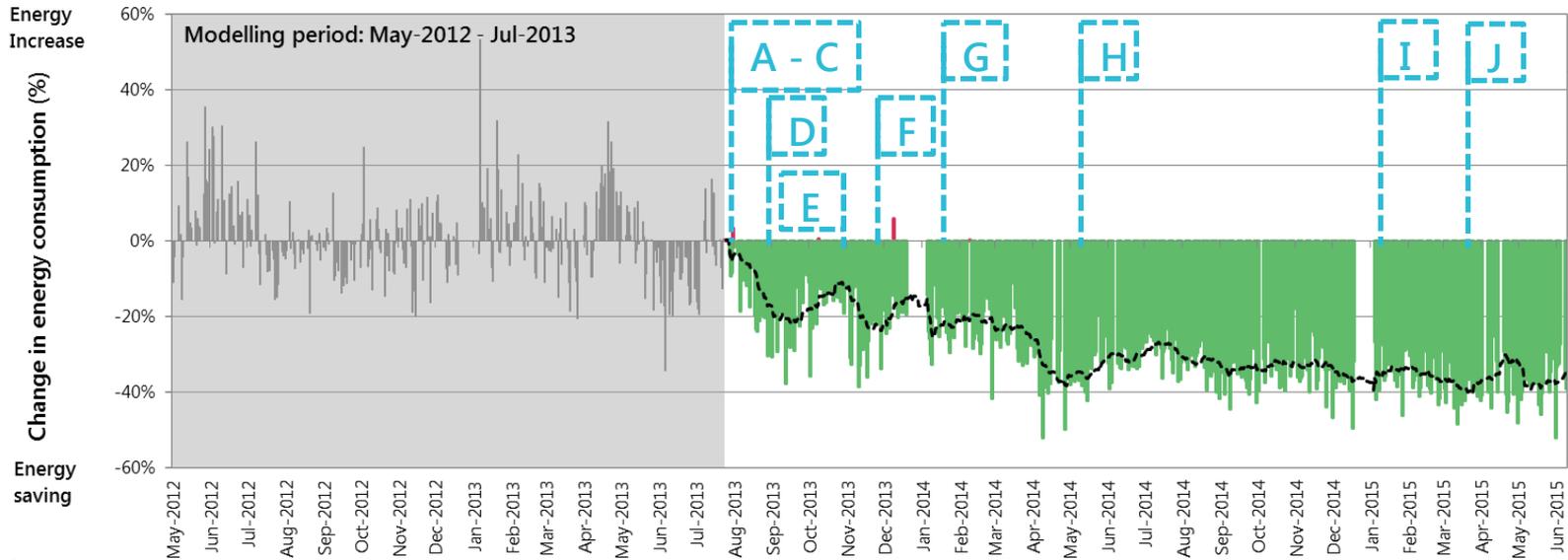


Electricity consumption details from 04:30 to 18:00:

Friday 23 October 2015	1,620 kWh
REF baseline*	2,110 kWh
Like weather day (Monday 18 May 2015)	1,740 kWh

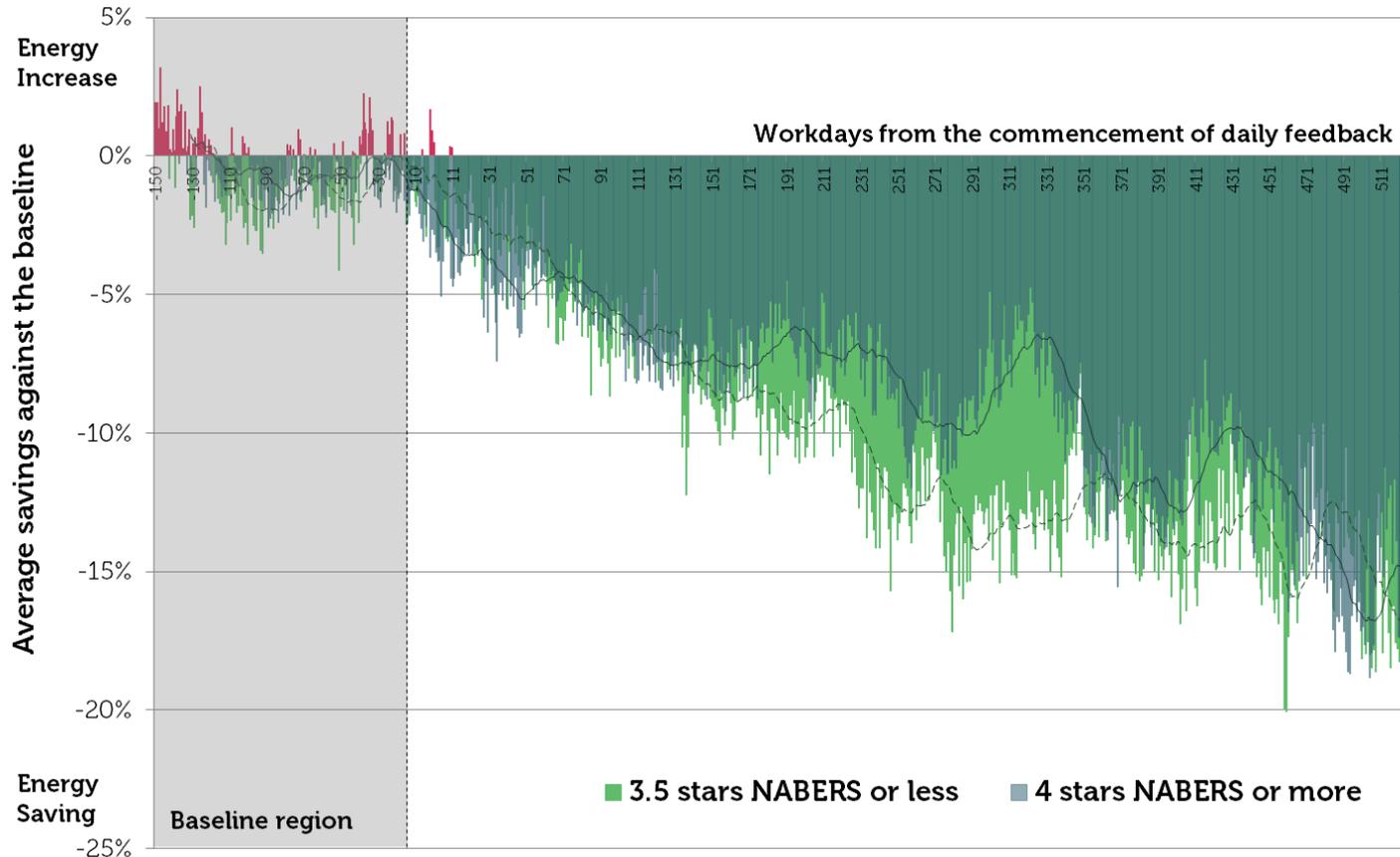
* REF's baseline is based on the weather adjusted performance during the period May 2013 - Jul 2014.

Operational fine tuning and a rapid feedback loop

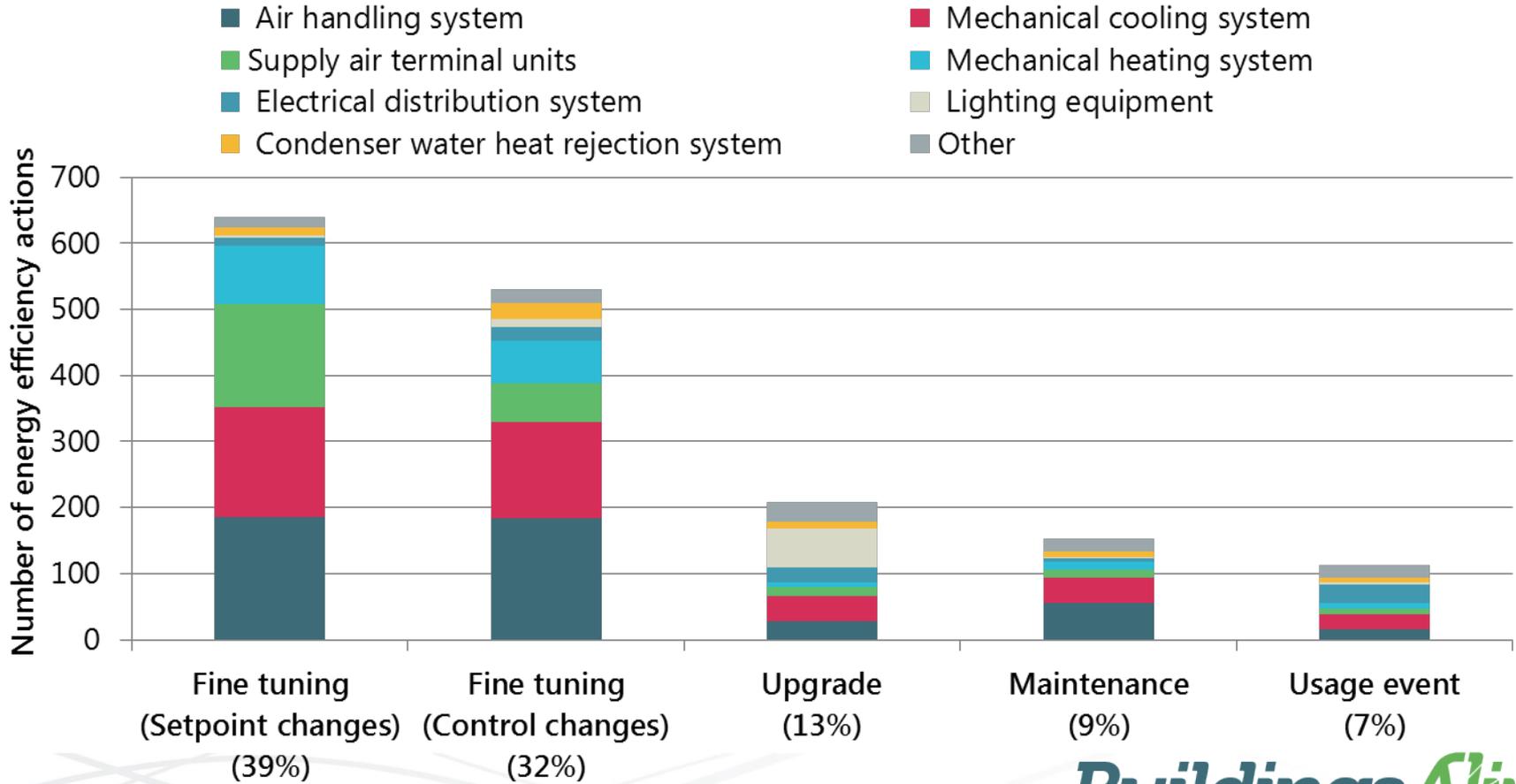


A	1/08/2013	Start boiler plants later.	E	31/10/2013	Increase economy cycle outside air lockout temperature.
A	1/08/2013	Change in cooling call strategy from high select to average select.	F	27/11/2013	Introduce static pressure reset strategy
A	1/08/2013	Adjust chiller outside air lock out temperature.	G	3/01/2014	Fine tune static pressure reset limits.
A	1/08/2013	Reduced supply air pressure to reduce fan power consumption.	H	19/05/2014	New Powerpax chiller installed.
B	14/08/2013	Increase economy cycle outside air lockout temperature.	I	1/01/2015	Chiller control optimization
C	23/08/2013	Implement time control for perimeter lighting.	J	15/03/2015	Increase chiller outside air lock out for the shoulder periods
D	6/09/2013	Reduced supply air pressure to reduce fan power consumption.			

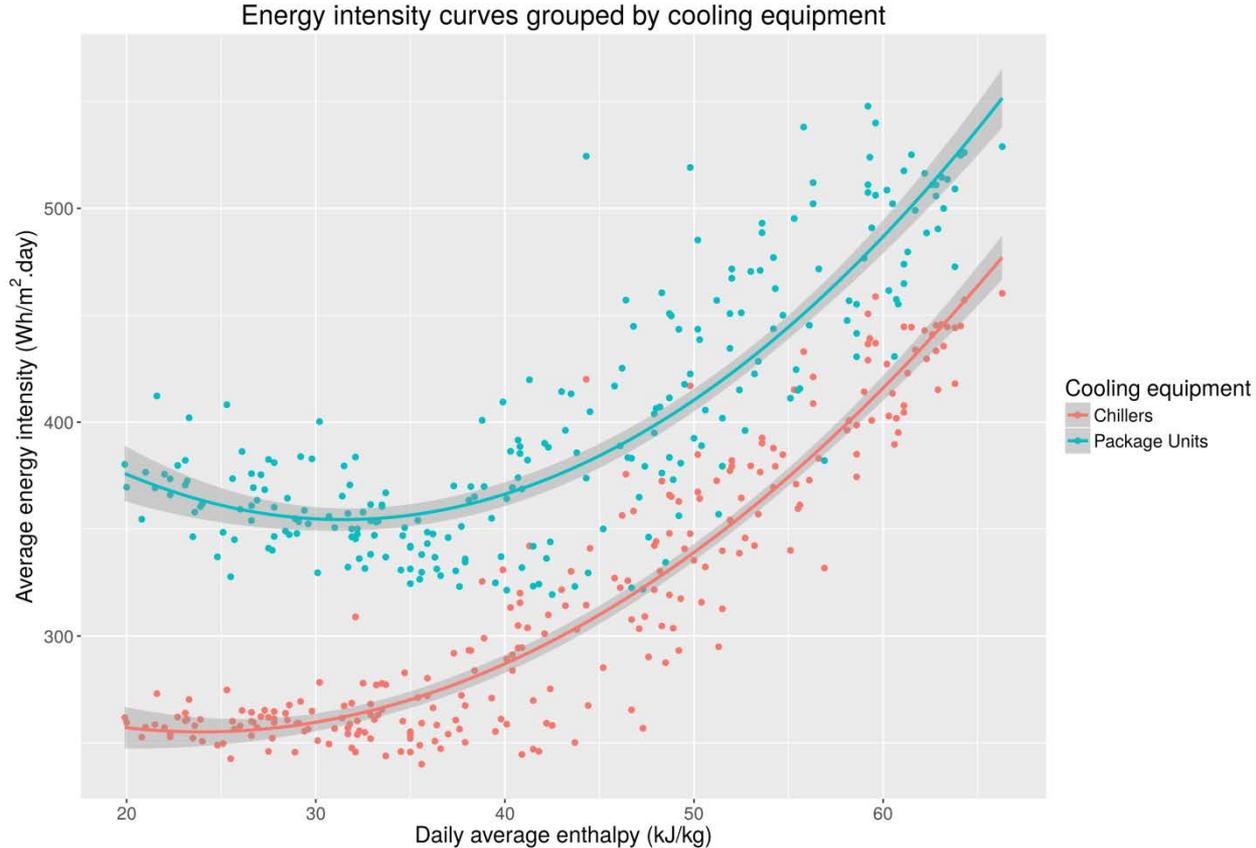
Are people more effective at tuning low performing buildings?



What are Facilities Managers tuning and tweaking?

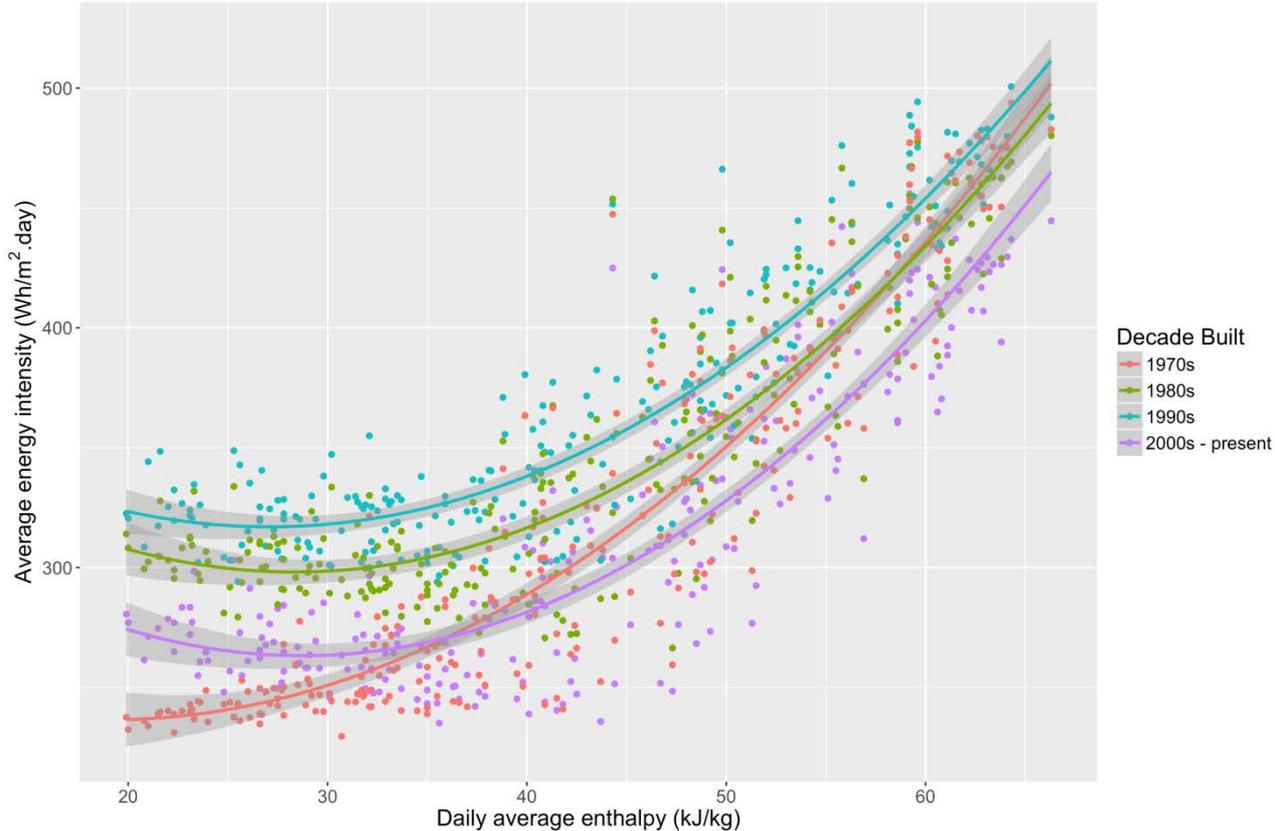


Data insights: energy signatures versus cooling equipment

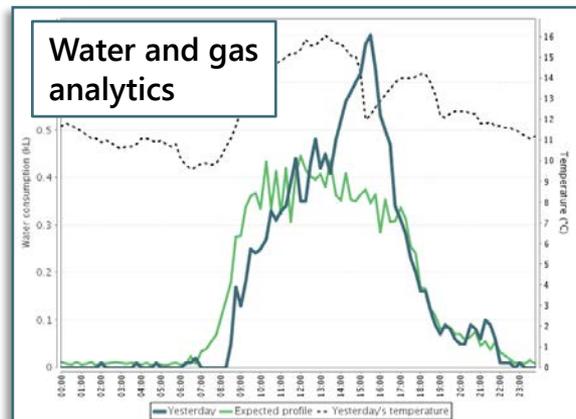
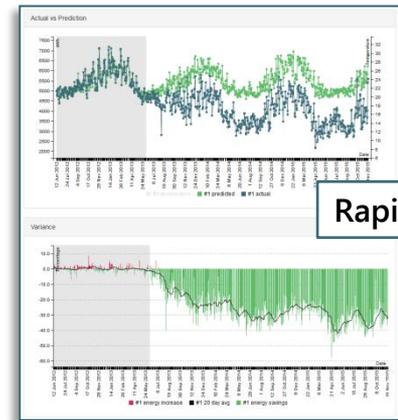
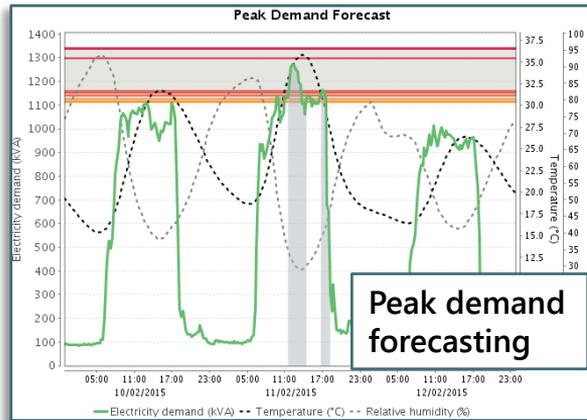
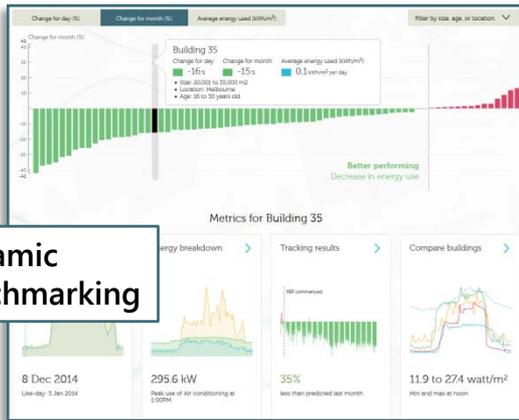


Data insights: energy signatures versus age

Energy intensity curves grouped by decade built



Other ways we're drilling deeper into building performance



Target setting

Building Name
 Cooling System Yes No
 Chiller System Yes No
 Chiller Plant Rooms
 Location Name
 Comments
 External Chilled Water Thermal Feed System Yes No
 DX System Yes No
 Condenser Water Heat Rejection Yes No
 Wet Cooling System Yes No
 Heat Rejection Plant Rooms
 Location Name
 Comments
 Quantity Of Cooling Tower



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