

>15% Savings on AC Energy Consumption with
COOLNOMIX® AC Energy Saver

at

The Second of December School, Al Qusais

Test-Trial Report



**PACTIVE SUSTAINABLE
SOLUTIONS**

Energy Services Company



Our Story

Pactive Sustainable Solutions offers solutions in building energy efficiency & sustainable building design. The word '**Pactive**' is a combination of **Passive** and **Active** solutions which help reduce energy consumption and therefore make buildings green while reducing carbon emissions. Pactive Sustainable Solutions was established in early 2015, and since then it has been an Accredited ESCO and Energy Auditor in Dubai, Abu Dhabi, Sharjah and Ras Al Khaimah. As a start-up, Pactive's core focus is on making the built environment Sustainable and Energy Efficient.

ESCO Accreditations



Dubai



هيئة كهرباء ومياه الشارقة
Sharjah Electricity & Water Authority

Sharjah



فريق رأس الخيمة لكفاءة الطاقة والطاقة المتجددة
RAK ENERGY EFFICIENCY AND RENEWABLES TEAM

Ras-Al-Khaima



شركة أبوظبي للتوزيع
Abu Dhabi Distribution Co.

Abu Dhabi

Our Service Portfolio

Deliver Service Excellence



Energy Solutions

- Energy Auditing & Management
- Thermographic Study
- ESCO / EPC Services
- Energy Modelling & Simulation
- O&M Efficiency Study
- Measurement and Verification



BMS & Home Automation

- BMS Design Consultancy
- BMS Commissioning Services
- Home Automation Consultancy
- Guest Room Automation Consultancy
- Aurora Lighting Controls



IoT & Data Analytics

- IoT Based Energy Monitoring
- Cloud based EMS
- Smart Energy Data Collection
- Energy Data Analysis & Reporting
- IoT based Retrofit energy solutions



Sustainability

- Green Building Consulting
- Renewable Energy

Coolnomix

Reducing Air-Conditioning Energy Costs upto 40%

COOLNOMIX[®] utilizes innovative energy optimization technology to enable a significant savings on **Split, Package, Inverter and VRV/VRF** air conditioning system **without compromising on user comfort.**

In addition to the traditional feedback control from the thermostat, **COOLNOMIX**[®] also monitors the temperature of indoor unit coil temperature.

This enables the **COOLNOMIX**[®] to apply a complex algorithmic model, signaling to the air conditioner control system that cooling is no longer required long before the air conditioner makes the decision to stop the cooling.



***Refer annexure for more information on Coolnomix

BENEFITS



Energy Cost Optimization



Reduced Operational Costs



Low Capital Investment



Improved Temperature Stability



Reduced Dripping and No Icing Up



Only 1 hour to Install



Immediate Savings



No Maintenance Required

COOLNOMIX® Trials in Classrooms

At The Second of December School

Al Ghurair Facilities and Contracting company invited Pactive to conduct **COOLNOMIX®** trials in **The Second of December School** located in Al Qusais, Dubai to explore the opportunity for energy savings.

Our team conducted various site survey to understand the AC operations at the school and planned the mock-up trials in 2 adjacent identical classrooms. Each Classroom is provided with two decorative split air-conditioners for comfort air-conditioning of 1.73 TR capacity each.

Pactive installed **COOLNOMIX®** on 2 AC units in one of the classrooms (Grade 2, Classroom 5), and the other classroom was without **COOLNOMIX®**. Power and Temperature loggers were connected to both classrooms to establish the savings with like-to-like scenario.

Following instruments were used to monitor and report energy consumption, before and after the installation:

- Fluke power data logger for AC power consumption
- Temperature data logger for space temperature variations
- Temperature data loggers for on and off coil temperature and ambient conditions

Classroom Without **COOLNOMIX®** : Classroom 4

Classroom With **COOLNOMIX®** : Classroom 5

Dates of measurements : **Jan 04 – Jan 17, 2022**



Fluke Power data logger

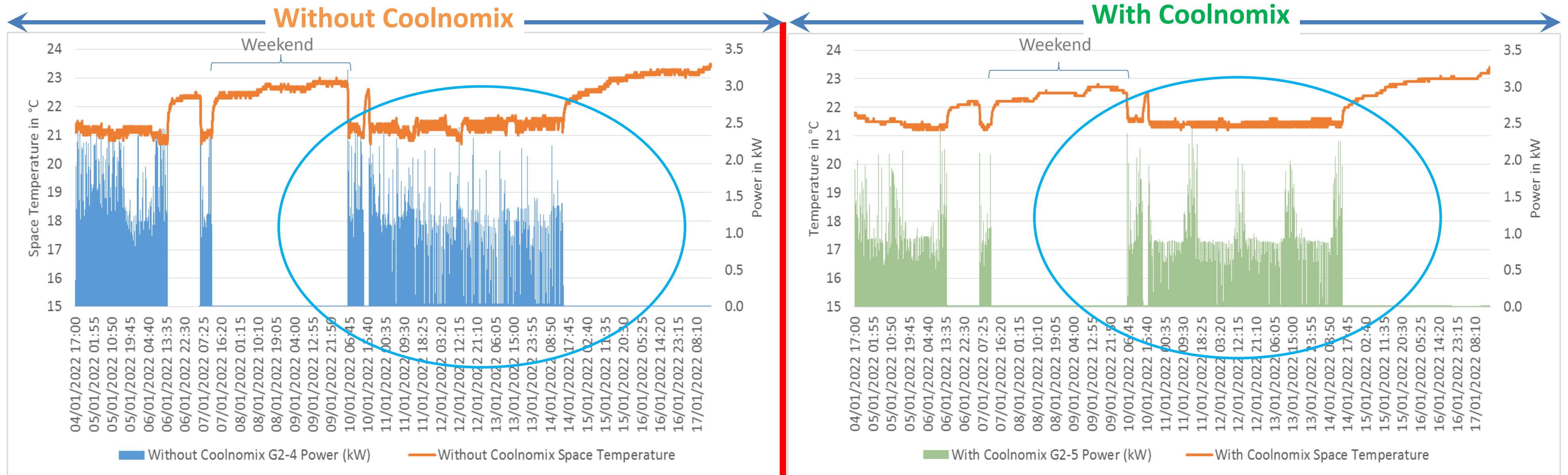


Temperature data loggers

Coolnomix Test Trial Findings – 2nd Grade, Classroom 4&5



Temperature vs Power Consumption with and without **COOLNOMIX**®



Total Consumption: 99.68 kWh

Over 1kW consumption: 602 times

Total Consumption: 84.56 kWh

Over 1kW consumption: 190 times

- AC units with **COOLNOMIX**® operated significantly less hours than the units without **COOLNOMIX**®
- Number of times AC consumed above 1kW with Coolnomix: 190 and without Coolnomix: 602 times.
- Space Temperature was more stable in classroom with **COOLNOMIX**® compared to the one without.
- Energy saved is over 15%; However, we should note that this trial was conducted in cooler months, hence in Summer, the savings will be significantly higher. We expect annual savings of over 25%

Conclusion-Classrooms

Energy Savings with **COOLNOMIX®**

At The Second of December School, **COOLNOMIX®** reduces AC electricity consumption by >15% during the winter season without compromising on user comfort

Electricity savings per year (Winter + Summer Season) is expected to be in the range of 25-30%.

The savings can further be enhanced by fine-tuning the settings in the **COOLNOMIX®**

COOLNOMIX® proved to be an easy deployment without any disruption to the tenant and highly cost-effective with ROI less than 6 months.

Parameter	Unit	Without Coolnomix	With Coolnomix
Measurement Period		Jan 04 , 2022, 5 PM – Jan 17, 2022, 3:20 PM	
Set point temperature	Deg C	21	21
Average Space temperature	Deg C	21.98	21.99
Average power consumption	kW	0.32	0.27
Total electricity consumption during the measurement period	kWh	99.68	84.56
Electricity Savings achieved during Mockup [Winter Season]	kWh	15.12 kWh (>15%)	
Expected Electricity Savings per year [Winter + Summer Season]	kWh	25-30%	

COOLNOMIX® Trials in IT / Electrical Room

At The Second of December School

Al Ghurair Facilities and Contracting company invited Pactive to conduct **COOLNOMIX®** trials in **The Second of December School** located in Al Qusais, Dubai to explore the opportunity for energy savings.

Our team conducted various site survey to understand the AC operations at the school and planned the mock-up trials in the IT & Electrical Room. These rooms are provided with one decorative split air-conditioner unit of 1.73 TR capacity.

Pactive installed **COOLNOMIX®** on the AC unit. Power and Temperature loggers were connected to establish the savings with and without **COOLNOMIX®**

Following instruments were used to monitor and report energy consumption, before and after the installation:

- Fluke power data logger for AC power consumption
- Temperature data logger for space temperature variations
- Temperature data loggers for on and off coil temperature and ambient conditions

Dates of measurements : **Jan 04 – Jan 17, 2022**



Fluke Power data logger

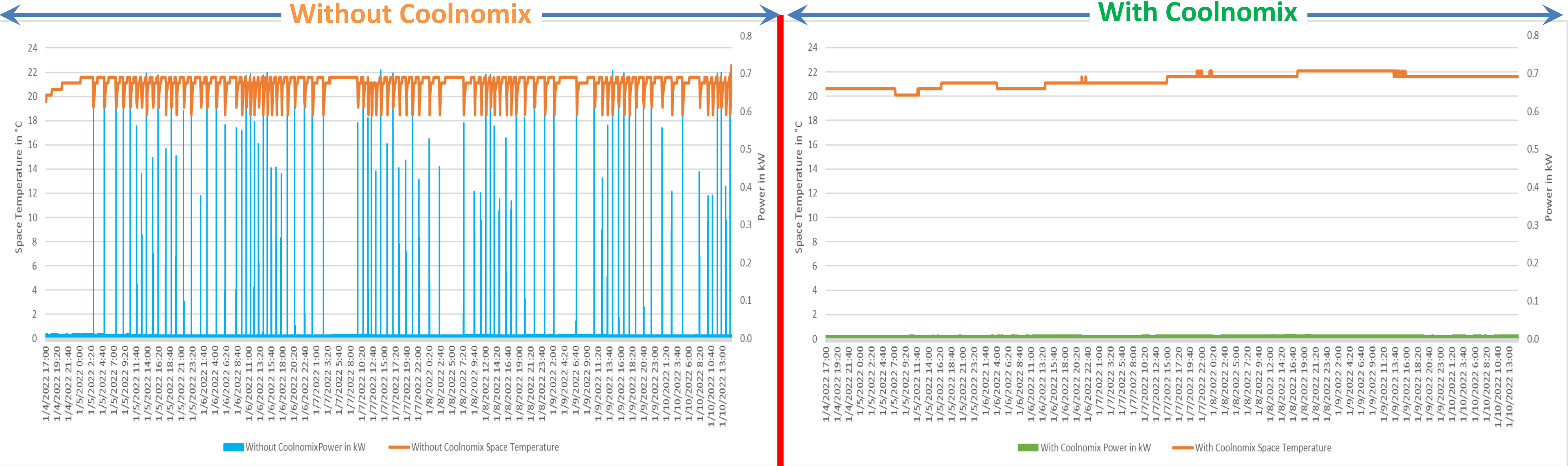


Temperature data loggers

Coolnomix Test Trial Findings – IT / Electrical Room



Temperature vs Power Consumption with and without **COOLNOMIX**®



Total Consumption: 6.11 kWh

Total Consumption: 1.34 kWh

- Without **COOLNOMIX**, the Compressor was turning ON and OFF and over cooling the space due to the inefficient sensors in the AC unit.
- With **COOLNOMIX**, the compressor operation was optimized as the Space Temperature was maintained below 22°C. The compressor is efficiently controlled by very accurate temperature sensors in the **COOLNOMIX**.

Conclusion-IT / Electrical Room



Energy Savings with **COOLNOMIX®**

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Parameter	Unit	Without Coolnomix	With Coolnomix
Measurement Period		Jan 04 , 2022, 5 PM – Jan 17, 2022, 3:00 PM	
Set point temperature	Deg C	21	21
Average Space temperature	Deg C	21.06	21.98
Average power consumption	kW	0.04	0.0
Total electricity consumption during the measurement period	kWh	6.11	1.34
Electricity Savings achieved during Mockup [Winter Season]	kWh	4.77 kWh (78%)	
Expected Electricity Savings per year [Winter + Summer Season]	kWh	25-30%	



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