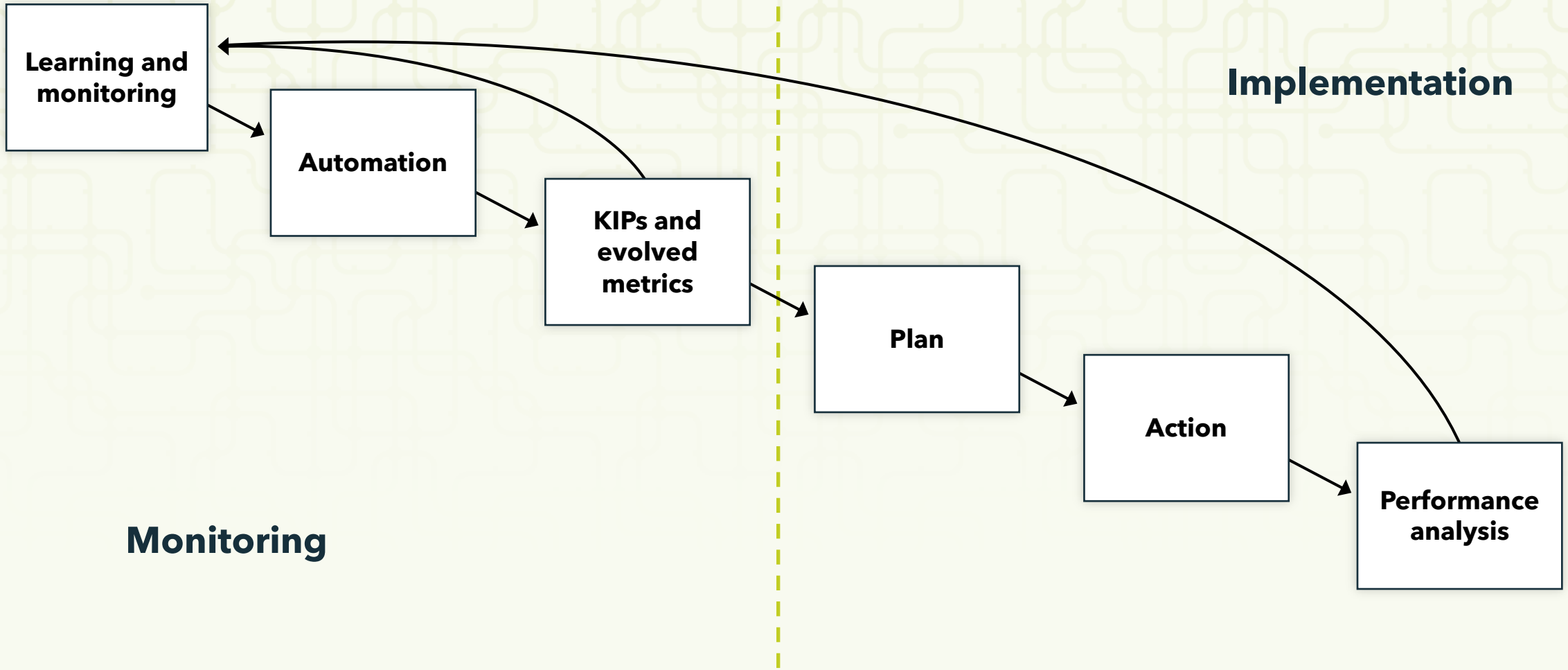
Calculating ROI with Wattics // M&V Options B and C IPMVP ISO50001

CATALYSTA

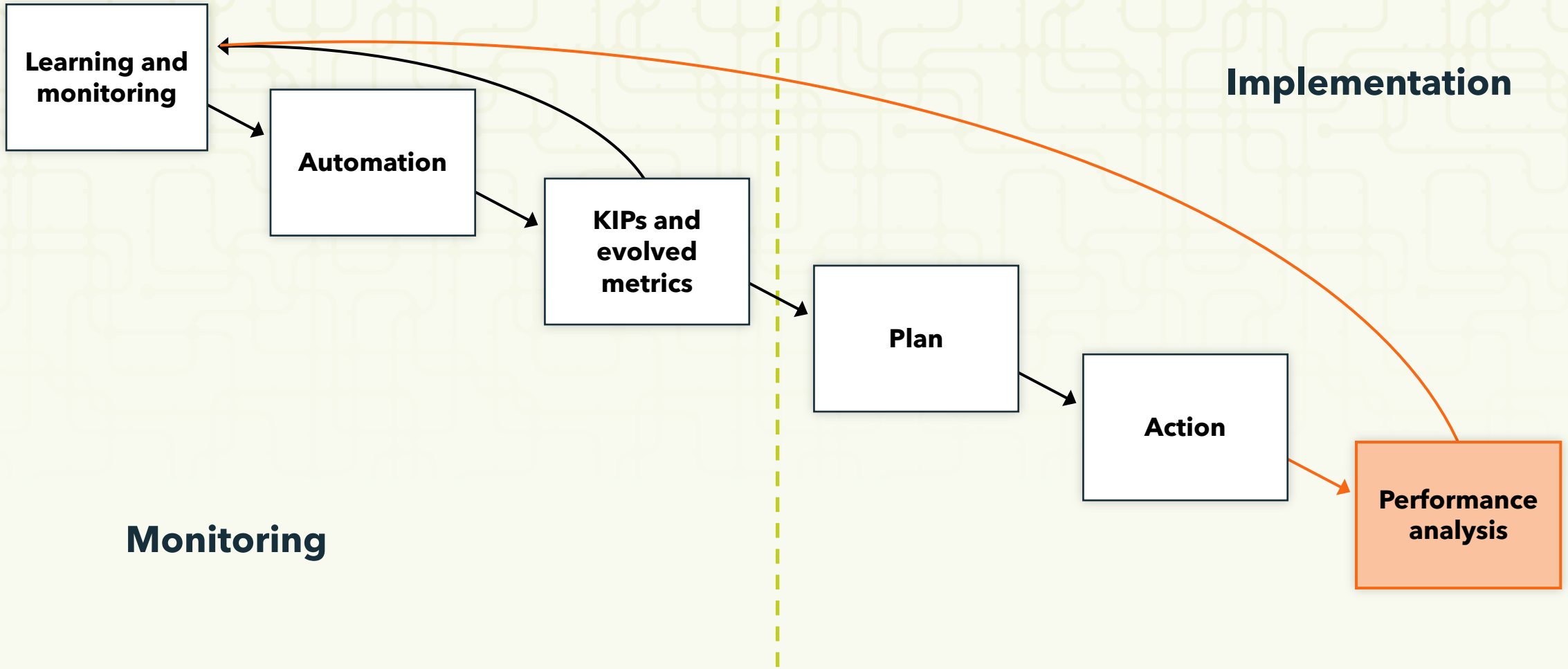
Session Agenda

- What is M&V and why is it important?
- ISO and IPMVP
- IPMVP options
- Success story

The energy efficiency journey with Wattics



The energy efficiency journey with Wattics



What is M&V?

M&V is a standardized procedure, regulated by ISO 50015:2014 (Measurement and Verification of Energy Performance) and included in the framework of ISO 50001:

"The purpose of M&V is to provide confidence to interested parties that reported results are credible... [including] appropriate accuracy and management of uncertainty" (ISO 50015)

Why is M&V important?

“Measurement and verification” (M&V) of energy and cost savings resulting from an energy efficiency initiative is necessary because you can’t simply compare year-to-year out of pocket expenditures.

You have to compare **what you did spend** with how much **you would have spent** in the absence of energy efficiency, in other words how much you avoided spending.

ISO 50001:2011 Energy Management

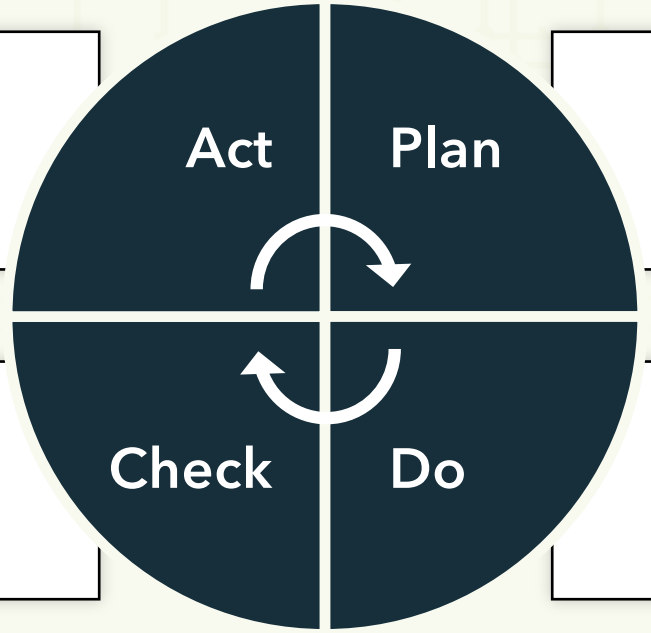
ISO 50001 creates a broad framework for an organization to implement an energy reduction program using the ISO PDCA continuous improvement process.

Plan: Identify aspects and impacts by implementing goals and objectives

Do: Implement; including training and operational control measures.

Check: Assess the measurements and report results to decision makers.

Act: Decide on changes needed to improve process.



ISO 50015 and IPMVP

ISO 50015 “does not specify calculation methods”, it only establishes a common set of principles and guidelines.

The M&V practitioner selects the calculation methods and obtains approval by the parties involved via the M&V Plan.

Historically the most common calculation methods have been those in IPMVP, managed by an international nonprofit agency called The Efficiency Valuation Organization.
www.EVO-World.org

IPMVP Options

Retrofit Isolation

OPTION A
Retrofit Isolation:
Key Parameter(s) Measurement

OPTION B
Retrofit Isolation:
All Parameter Measurement

Whole Facility

OPTION C
Whole Facility

OPTION D
Calibrated Simulation

Option C // Whole facility

This approach is taken where the energy use of the whole facility needs to be measured. A number of independent variables may need to be taken into account such as heating/cooling degree days or production data.

Option C is of great benefit where several energy conservation measures have been introduced and the overall picture for the facility is required.

Option C // Whole facility pros and cons

PROS:

- Evaluates performances of the entire facility
- Factors in interactions amongst ECMs and between ECMs and the rest of the facility

CONS:

- No separation of impacts from different ECMs
- Impact on savings coming from unexplained variations of energy usage can be difficult to capture

Option B // Retrofit isolation

All parameters associated with the energy conservation measure must be measured and cannot be estimated. In other words, you are creating an M&V project which focuses only on some appliances/circuits and not on the entire building's power consumption.

For example, consider the installation of a variable speed drive. The power drawn as well as the hours of operation will have to be measured in order to determine any energy savings.

Option B // Retrofit isolation pros and cons

PROS:

- Savings reports correlate closely with production changes
- Actual savings determined from direct metered usage

CONS:

- Not reconciled to total facility utility costs
- Difficult to establish baselines for varying process and energy consumption levels

✕ Requires extensive metering

Wattics Success Story

Wattics M&V Tool streamlines ECM evaluation and reporting for New Zealand based BMS specialist

Wattics
An EnergyCAP Solution

Wattics Success Story // The project

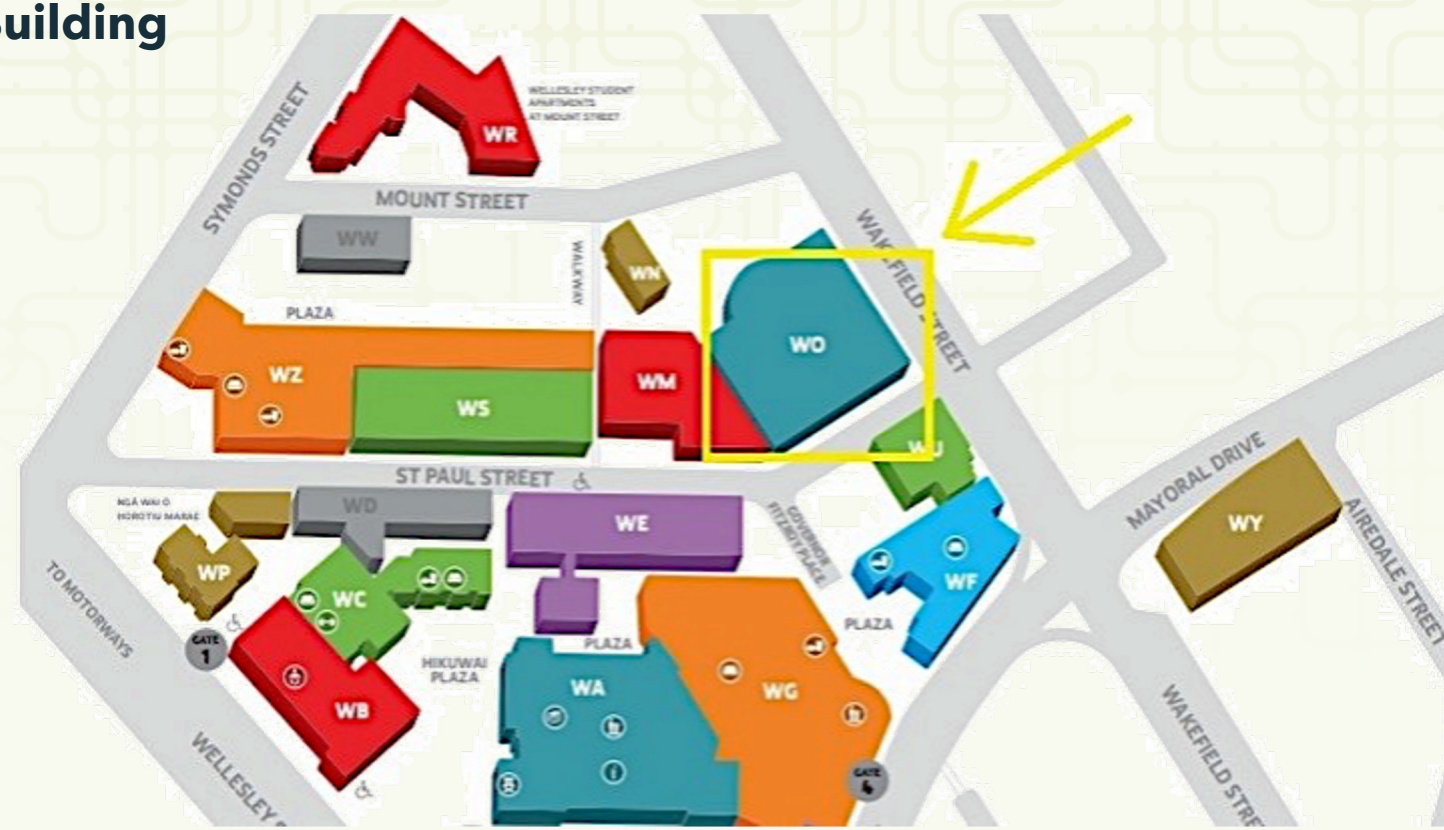
Auckland University of Technology, WO Building

Area: 10,472 m2 - ~113k sq ft

Energy Usage: ~1,302,821 kWh/year

Energy Cost: ~180k NZD/year (~110k$)

Optimization Target: 10% savings



The ECMs

Replacement of chiller and cooling tower

Adjustments to Air Handling Units (AHU)

- Supply air pressure and temperatures setpoints reset
- Disabled after-hours AHU requirement during weekends
- AHU Modulation Controller changed from PI to PID

Results

20.4%
Energy use reduction

NZD 37,272
Annual savings
(~23k$)

6.9 years
Payback period

Next steps

“Limits, like fears, are often just an illusion”

“Limits, like fears, *and estimates on energy savings without M&V*, are often just an illusion”

Resources

Become a member of EVO (**www.EVO-World.org**)

Download IPMVP from EVO

Purchase ISO standards at iso.org

Become a CMVP–Certified Measurement & Verification Professional (**www.AEECenter.org**)

Check out Wattics' and EnergyCAP's resources and have a tour of the two applications

Q&A

Session Survey

conferences.energycap.com/surveys