



# RETRO-COMMISSIONING PIVOTS BUILDING TOWARD ENERGY-EFFICIENCY

SYNERGY CONSULTING ENGINEERS

# AN AGGRESSIVE 5-STEP COMMISSIONING PLAN DRASTICALLY REDUCES ENERGY WASTE

## Project at a Glance

Location: Michigan

Facility: Government Building Portfolio

5 Minute Read

## Highlights

- Utility-sponsored conservation program valued at more than \$40,000
- Energy Conservation Measures (ECMs) drive easy Return on Investment (ROI) decisions for clients
- Utilizing data as an asset, an energy-draining facility becomes an energy efficient model for the rest of the portfolio



## THE PROBLEM

A government building portfolio, based in Michigan, encompassed a variety of aging facilities with varying levels of energy efficiency. The portfolio desperately needed benchmarking and data-driven solutions to implement proactive Energy Conservation Measures (ECMs). Consumers Energy, a Michigan-based utility provider, has been on the cutting-edge for years with its rebate incentives for reducing energy waste in qualifying buildings. Their Retro-Commissioning (RCx) stimulus for this program, valued at more than \$40,000, advertises the belief that similar buildings can save an average of 15% or more on energy through this incentive program. Synergy was entrusted to perform Retro-Commissioning on the least efficient facility within the client's building portfolio in order to provide the "proof of concept" for other facilities to follow.

## THE PLAN

As with most things during the pandemic, conducting energy audits at government facilities proved to be a challenge as energy efficiency took a back seat to occupant health and safety. At the time the audit was to be performed this meant the typical energy footprint of the facility would be drastically impacted by the reduction in occupants and activity within the facility. In response, Synergy's engineering team had to retroactively decipher the building energy usage

prior to the pandemic. This was accomplished by working directly with the Client to retrieve the historical trending data of the facility, which aided Synergy in understanding the pre-COVID building usage. The trending analysis required diligent data scrubbing to determine the pre-COVID state to determine possible energy savings for the post-COVID state while maintaining the proper IAQ and ventilation standards for occupant health and safety. All of these challenges were met and efficiently accomplished using Synergy's 5-Step Retro-Commissioning Plan:

- ✓ Perform an FCA
- ✓ Review the BAS
- ✓ Cx Recommendations
- ✓ Quantify Savings
- ✓ Implementation



## # 1: Perform a Facility Condition Assessment (FCA)

The first step in the process was to perform a detailed FCA of the facility. The assessment allowed Synergy to gain a deeper understanding of all the assets in the facility, what their existing operating conditions were, and what their potential operating conditions could be.

For more information on the Michigan Utility-Sponsored Energy Incentives scan this QR Code.





## #2: Review the Building Automation System (BAS) Data Trend + History

Once the FCA was completed and all necessary asset data was documented, a deeper dive into the Building Automation System (BAS) historical trend data was performed. The trend analysis revealed many ECM opportunities, but this particular RCx Incentive Project was only focused on the low-cost/no-cost opportunities, which primarily focused on control modifications like equipment setbacks, revised scheduling, and aggressive reset strategies. Synergy was also able to provide the Client with a list of potential ECM opportunities that would require a larger capital investment, so they could determine which additional energy projects could be performed at a later date outside the boundaries of this RCx project.

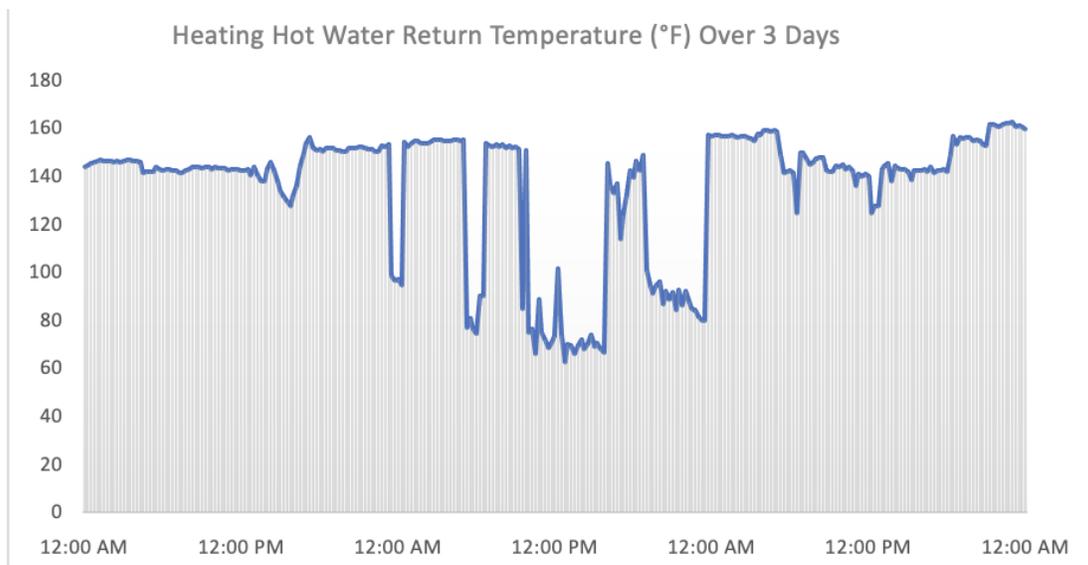


Figure 1: The heating hot water sensors throwing off erratic numbers



## #3: Provide Actionable Recommendations

Synergy's engineers utilized data analytics to target viable energy improvements within the buildings. For example, after analyzing the Client's BAS trend data, it was discovered that a failing heating hot water temperature sensor was providing erratic and inaccurate feedback values to the control system, which was preventing the Heating Hot Water System from functioning correctly according to its Sequence of Operation (SOO). Replacing this failed sensor would allow the system to operate correctly and efficiently moving forward.



## #4: Quantify Potential Savings

In order to validate the potential ECM savings, Synergy's team gathered historical weather data, along with the BAS trend data, to extrapolate projected savings for a year. These numbers were based on determined space temperature setpoints and schedules that would optimize building performance while maintaining occupant comfort and safety. In analyzing the trend data, Synergy developed a variety of strategies for implementing change that would result in persistent energy savings, including more efficient fan operation, reduced pumping requirements, aggressive system resets, etc.



## #5: Deliver an Implementation Plan

After compiling and reviewing the ECM options, the top measures were summarized and presented to the Client in the Implementation Plan. This plan includes a Return on Investment (ROI) summary so the Client is able to focus on the most cost-effective solutions first. Synergy also provided some general system recommendations and best practices for proactive operational maintenance. As an example, the Client had flow sensors that had not been cleaned or calibrated in over ten years which was resulting in inaccurate system feedback data. Consistent and proactive calibration and maintenance can be a quick and cost-effective way to reduce energy waste.

Creating an implementation plan allows the client to visualize their best options and quickest Return on Investment (ROI) for their facilities.

### OWNER SUCCESS

In order for the Client to qualify and benefit from the incentives offered through RCx program, Consumers required the client to verify the completion of the suggested ECMs. This verification incentivizes the client to get to the finish line of their energy reduction efforts and prove their results to the energy provider. In compiling the large amounts of data, Synergy provided the client with actionable information that helped them turn an energy-inefficient facility into an energy-conserving and operational success while providing the RCx blueprint that can be applied to all their other facilities.



Scan the QR code to talk to us about your building portfolio energy reduction goals.