



Advanced Energy Monitoring with Wireless Submetering

Rochelle Samuel October 18, 2018





Agenda

- Saint-Gobain Introduction
- Submetering Technology
- Soddy-Daisy NorPro Intro
- Case Studies
- Best Practice Sharing & Impact







2017 net sales **\$46.1** вм



Present in 67 countries





1 product out of 4

sold by Saint-Gobain today didn't exist 5 years ago

Created more than

350 years ago





groups in the world with around 950 production sites

Construction Products Sector

PRODUCTS AND ARCHITECTURAL PROJECTS

MAIN BRANDS



Placo



2015 – Italy Glass wool panels to insulate the façades of the Bosco Verticale in Milan

HABITO

Plasterboard that allows objects to be easily attached to the wall without using any specific attachment system



TOPAZ

Saint-Gobain PAM's complete ductile iron pipe system for wastewater collection networks





weber.epox easy Ceramic tile adhesive and grout



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Innovative Materials Sector





AUTOMOTIVE GLAZING

SEKURIT smart vision

ABRASIVES





FLEXIBLE TUBING



BEARINGS







FIRE RESISTANT GLASS



ELECTROCHROMIC GLASS

SageGlass

WINDOW FILM





SHEERFILL.

ADHESIVE FOAMS NORBOND"

CERAMICS FOR ENERGY



NORTON I-HD

New technology from Saint-Gobain

Abrasives that is revolutionizing the

market for diamond tools

PRODUCTS AND ARCHITECTURAL PROJECTS



Novelio Nature Range of fiberglass wall coverings from Saint-Gobain Adfors



The four **cockpit windows** and 32 passenger windows of the Falcon 8X are supplied by Saint-Gobain Sully



Fire-retardant and anti-UV glazing by Vetrotech in the futuristic boarders' residence in Le Rosey, Geneva, designed by Bernard Tschumi



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North American Sustainability Champions Network



With over 130 manufacturing locations in North America, **connecting resources** and **recognizing achievements** internally has become a primary driver for sustainability for Saint-Gobain

- Each Site has identified a site "Sustainability Champion"
- The network has 270+ members





Metering Technology



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What is electrical submetering?





UTILITY METER

Measures how much <u>total</u> electricity your building is using

SUBMETER

Measures **specific electrical loads** after the utility meter





SENSOR Clamped around wire of monitored circuit

BRIDGE

Receives signal from Sensor and sends to Server in Cloud

Dashboard/Mobile

Real Time Alerts and Reports generated from Sensor data

Portfolio of Sensors & Meters





Energy submetering and monitoring allow you to:



- Verify utility bills
- Identify unusual electrical activity
- Validate the impact of energy improvement projects
- Identify equipment issues proactively
- Monitor run hours and trends in energy consumption of individual loads
- Provide maintenance based on actual run hours and usage trends



Panoramic Power differentiated themselves from their competitors

Panoramic Power



Wired Solution



Low cost

- Wireless (clip-on) instead of wired to electrical box
- Easy to install
- Software and hardware in one
- Real-time, continuous monitoring
- Site insights reports by experts





Case Study – Saint-Gobain NorPro site in Soddy-Daisy, TN



Saint-Gobain NorPro Business Overview

Fixed Bed Support & Top Bed Media



Mass Transfer Applications (ex., Sulfuric Acid Production)



WavePak™ Packing



Heat Transfer Applications (ex., Regenerative Thermal Oxidizers)



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Nonreactive, dense ceramic shapes supporting gas and liquid phase reactions End Users: refining and petrochemical processing





Project Intention

Objective: Decrease peak demand, which accounted for almost 30% of the annual electrical energy costs in 2016

CASE STUDIES & IDENTIFIED PROJECTS

- Device Analyzer KPI tool for more predictive equipment maintenance
- 3 Identical equipment with different electrical loads

2 Batch process cycling longer than needed



Dryer fans left on continuously



Installation Photos













#1. Device Analyzer Informs Proactive Equipment Maintenance



The **Device Analyzer** tool shows the actual run time for monitored equipment, allowing the site to:

- Extend the maintenance cycle
- More accurately predict maintenance needs
- Reduce cost of labor, materials, and waste
- Budget more accurately for product lines



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#2. Low Pressure (LP) Blower and Stuck Valve Domino Effect



Switch from compressed air to solely LP blower for batch process

Alarm for LP blower running for longer than 7 minutes

Quality issues identified and fixed



#3. Identical Equipment Behaving Differently



Although all three compressors are identical, the tool shows that **each of the electrical loads vary**.

After identifying this, operators now use the most efficient compressor as the lead and leave the least efficient as a backup. Eventually the issue will be investigated/replaced





#3. Identical Equipment Behaving Differently



Because the fans are manually turned on and off by the kiln operator, they are often left on continuously even though there is product in the dryer, approximately 12 hours per day.

The site has **installed sensors** to determine when product is on the dryer belt to automatically turn fans on and off





Project Summary

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2%

2 Batch process cycling longer than 7% needed



Dryer fans left on continuously 5%

14% savings of 2017 electrical spend



Best Practice Sharing & Impact



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Best Practice Sharing



Submetering as a Service August Webinar



Sustainability Network Webinar

Internal and External White Paper

SAINT-GOBAN

SAINT-GOBA

DOE Better Plants Better Project Award

Electrical Submetering with Panoramic Power

A Case Study Report NorPro Soddy-Daisy, TN

APRIL 2, 2018

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Impact at Saint-Gobain North America

- Soddy-Daisy achieved a 14% reduction in energy use intensity in 2017
- A Master of Service agreement was finalized
- The project is being presented internally as an IoT solution to management
- Over 10 others sites are either in the process or looking into installing the technology

| Monthly Service Fees per Site | | | | |
|-------------------------------|---------|----------|----------|----------|
| Bridges | Sensors | | | |
| Up to 30 | 50 pack | 100 pack | 200 pack | 300 pack |
| | \$1,375 | \$1,700 | \$2,275 | \$2,775 |
| Renewal Service Fee | \$550 | \$700 | \$900 | \$1,100 |





Thank you!

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Appendix



Site Dashboard (Login view)





Energy Flow – Sankey Diagram



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Heat Map – hourly peaks, last 30 days





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Time View – Utility Meter plotted alongside of device level sensors (aggregated)





Time View - Energy



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Time View – Air Compressor usage, 1 week



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Virtual Shedding Tool for Demand Response Planning – uses historical machine profile to predict a future result



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