

Automation as the Profit Engine of your Business

EcoStruxure Profit Advisor - Turn industrial automation into the Profit Engine of your business

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Trends and Needs

- ❑ Industrial Operations and Power Generation/Distribution are changing at breakneck speeds
- ❑ Disruptive forces of change are everywhere
 - Speed of Business (any business!!) continues to increase
 - Technology Changes are driving innovations
- ❑ Automation that unlocks new business models and SIGNIFICANT POTENTIAL for our End User and System Integrator customers in four key are
 - Operations
 - Safety
 - Asset/equipment Reliability
 - **Profitability!**

Turn Industrial Automation into the Profit Engine of Your Business

To Drive Measurable Operational Profitability Improvements – Safely

Uniquely
Powered by
Schneider
Electric

Built on the
EcoStruxure
Platform

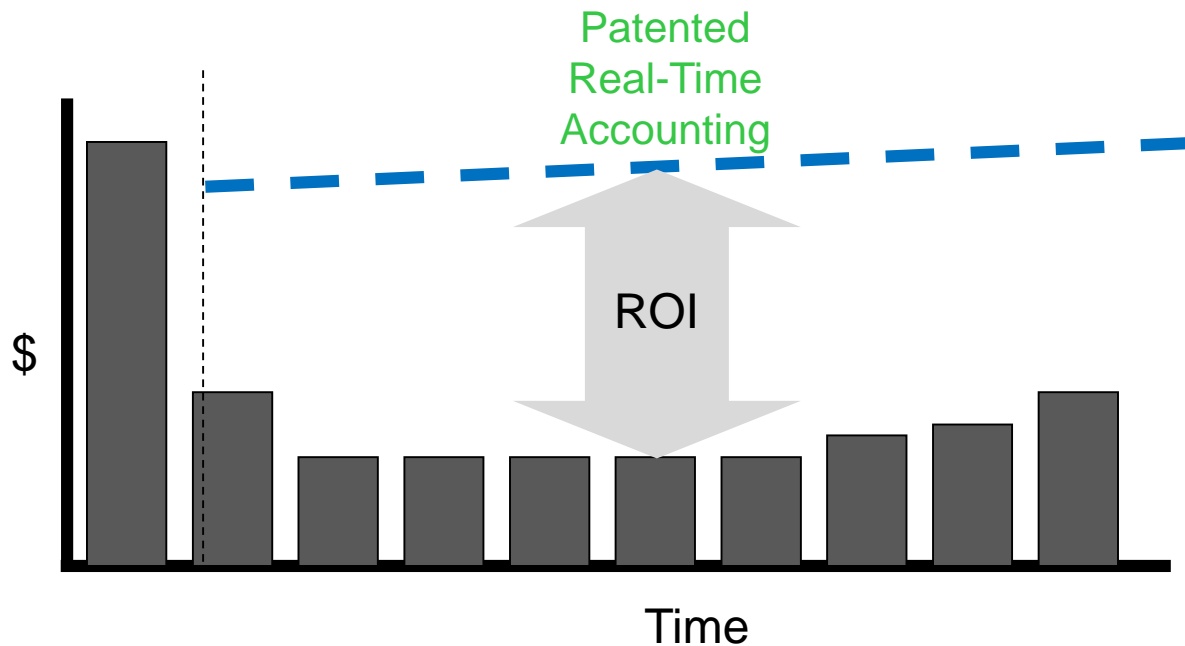
IIoT, Connected Assets, Big
Data Analytics Engine,
Edge and Cloud Computing

Predicated on
Effective Real-Time
Process, Reliability
and Safety Control

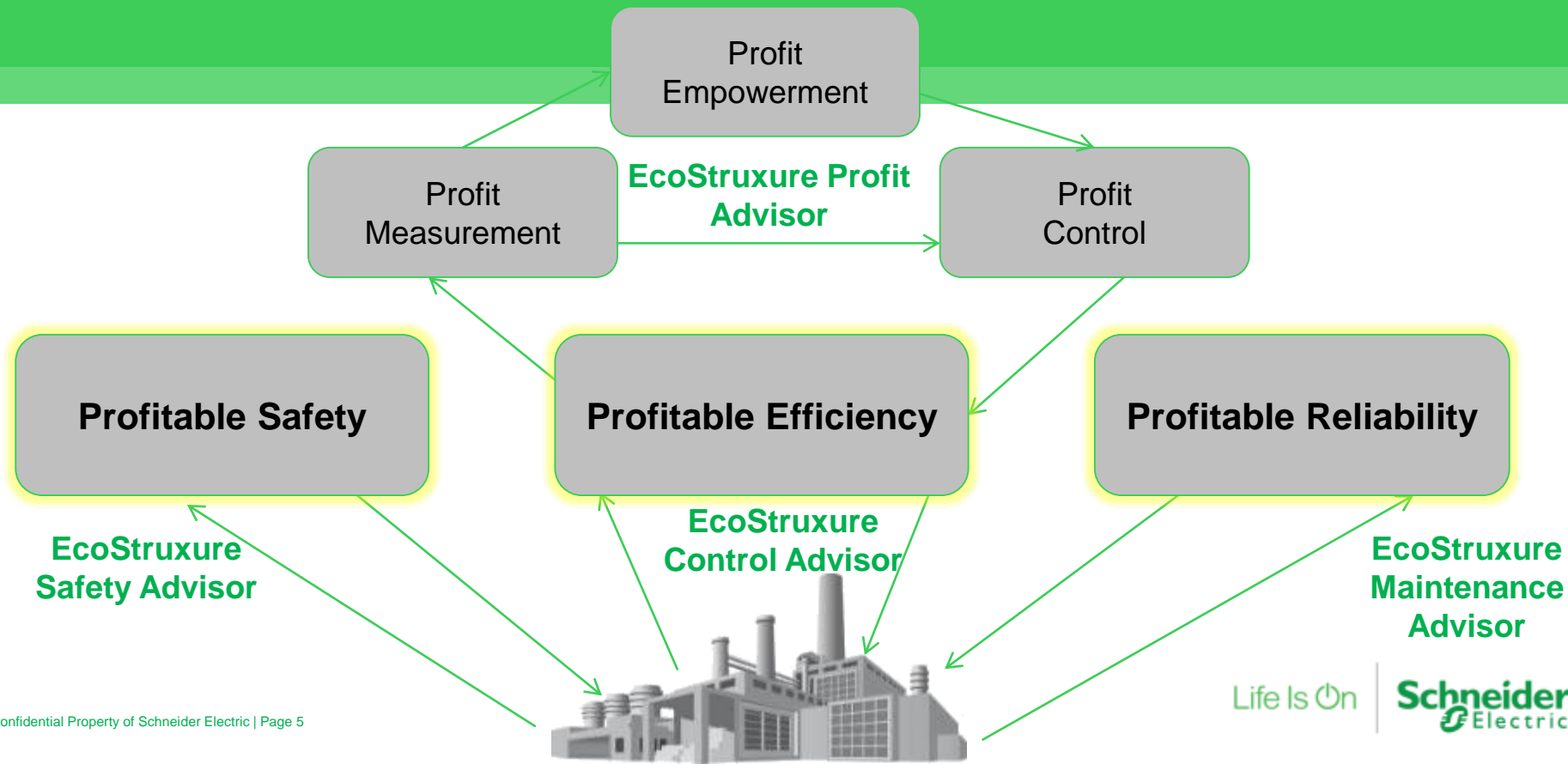
Extends Process
Control to
Real-Time
Profitability
Control

Measuring the Benefit from Automation

Turn Industrial Automation into the Profit Engine of Your Business



Profit Engine Functional Architecture



EcoStruxure Profit Advisor

Drive Measurable Operational Profitability Improvements – Safely

Calculates
real-time accounting
factors from
standard process
historian data

Measures
Operational
Profitability
Contribution:
Equipment - Unit – Area –
Plant assets

Enterprise & Value Chain

Roll-Up
Accounting
Models

Industry
Specific
Versions

EcoStruxure™ Plant

Apps, Analytics & Services



The most comprehensive asset performance management system

Edge Control



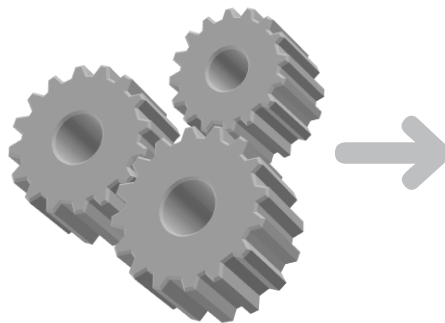
The first PAC with built-in Ethernet capability

Connected Products



The first services-oriented variable speed drives

Profit Engine



Oil & Gas

Mining, Metals & Minerals

Water & Wastewater

Food & Beverage

Customers

Profit Advisor Differentiators

☐ Only generally available Real-Time Accounting tool

- Patent protected
- Built on Big Data analytics engine (SEEQ)
- Cloud or on premise

☐ Works with all major process historians

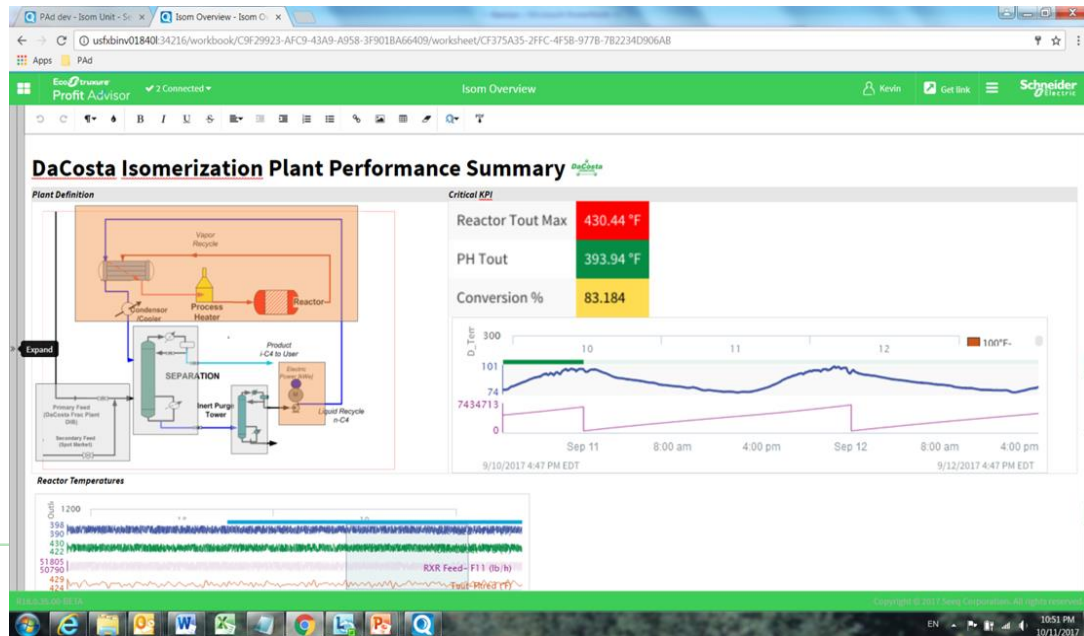
☐ Provides Multiple Analytical and Visual Options

☐ Provides the basis for Measureable Business Value Improvement

☐ Key Component of Value-based IIoT

An empowered workforce makes better business decisions

Profit Advisor determines how each action and asset affects real-time operational profitability and potential savings, enabling a 3% improvement in production value and 5% reduction in cost per year.



Examples of Prior Real-time Accounting Diagnostic Successes

Use of Real-time Accounting with Dynamic Performance Measures in a Diagnostic Approach...

❑ Eli Lilly- Kinsale Solvent Recovery Plant 

❑ African Rainbow Minerals 

❑ Cleveland Cliffs 

❑ Reliance- Jamnagar Refinery- CDU and Power Plant



❑ BASF- Freeport Complex: Anone 1 and 2 Oxidation and Distillation Areas 

❑ Sasol- Sasolburg, SA: Chemicals Steam Plant

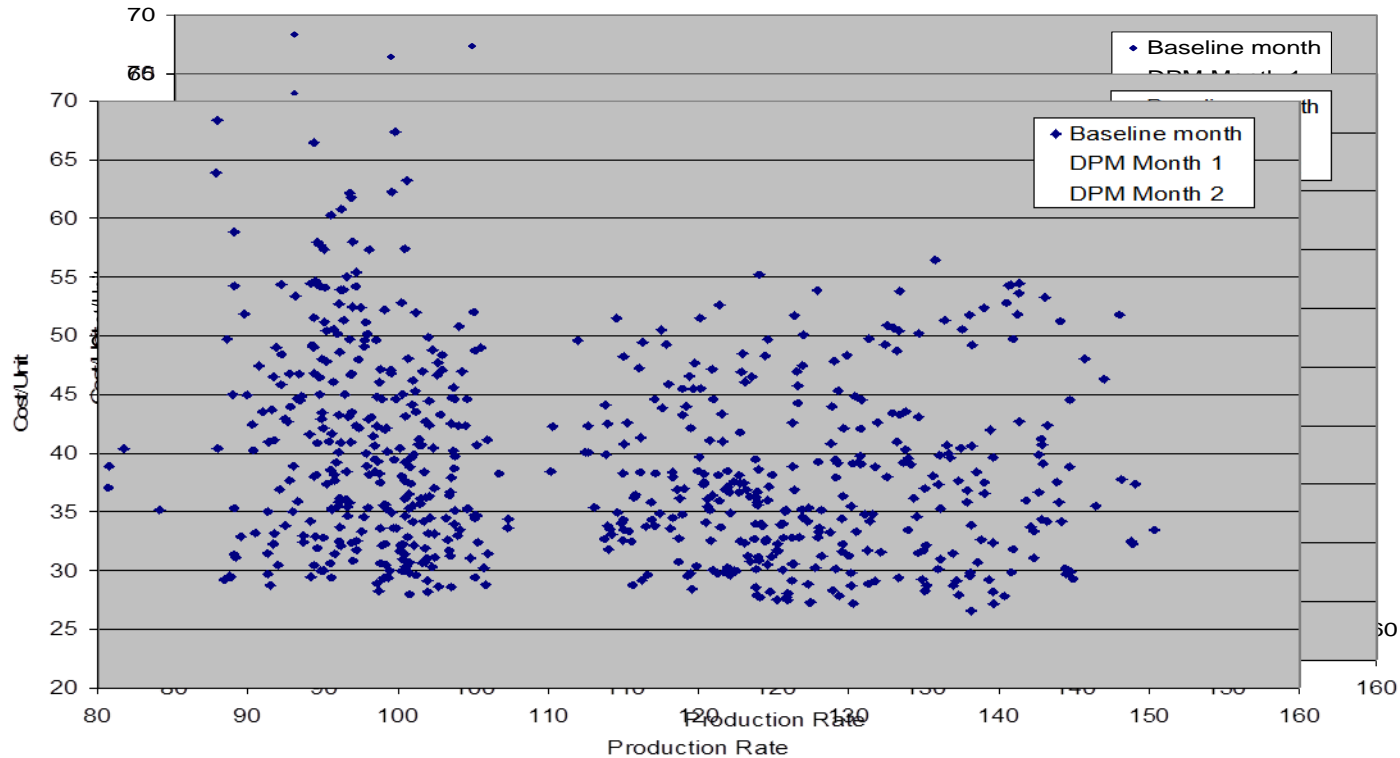


❑ Lubes Additive Plant- Beaumont Refinery 

Life Is On

The Schneider Electric logo, featuring the company name in a bold, sans-serif font with a stylized 'E'.

Measure, Empower, Improve



EcoStruxure Profit Advisor Capabilities



- **Historical Data Review & Analysis**
 - Past Operational Profitability Profile
 - Golden Operation
- **Real-Time Performance Indication**
 - Continually Displays Operational Profitability
 - Engine for Workforce Empowerment
 - Operations, Maintenance, Engineering, Supervision & Management
- **Profit Planning**
 - Projects Profit Potential into Future
 - Combined Simulation & Modelling Tools

EcoStruxure Profit Advisor Technology

Profit Advisor



**INDUSTRY
SPECIFIC PLUG-IN**



**SeeQ
ANALYTICS ENGINE**



Profit Advisor - Isom Unit

usfbxbinv01840134216/workbook/3B25B77B-8F84-41A4-BD1E-BE449B88A861/worksheet/FF588C83-A91B-4991-B816-A5E19EB8AB00

Apps PAd

EcoStruxure Profit Advisor 2 Connected Isom Unit Advisor Kevin Get link Schneider Electric

Refresh

Assets

- Isom Unit
 - Feed Section
 - Feed Lines
 - New Asset
 - Slug Catcher
 - Main Separation Tower
 - Ancil. SwchGear
 - Main Tower**
 - New Reactor Pad
 - Reactor Section
 - PH/Cat Rxr- R105
 - Product Condenser
 - RXR Feed Pump
 - Stripper/Vent
 - Column

Custom Add Delete

Main Tower Update

Summary

	Energy	Material	Production
Main Separation Tower			
Amount	\$35,791.15	\$0.00	\$1,257,405.76
Improvement	0.0%	0.0%	0.0%
Potential Benefit	\$0.00	\$0.00	\$0.00

Energy

Name	Quantity	Unit Cost	Total Cost
Overhead Fin-Fan CHX	5,817.097	\$0.07	\$378.11
Reboller Steam-MT	0	\$0.01	\$0.00
Steam Heat	7,016,441.256	\$0.01	\$35,082.21

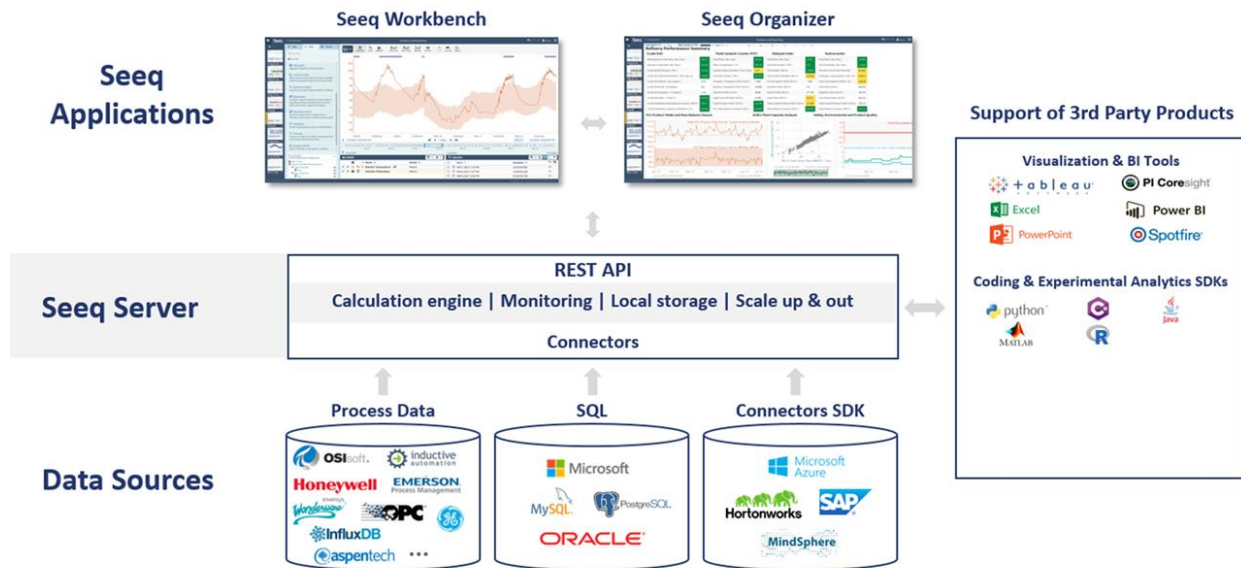
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SEEQ— Partner Technology Capabilities

Key to empowering the Profit Advisor....



**Empowering Performance
Enhancing Insights from YOUR data
assets...**

Connect to data- time series and other sources for context

- Concept of capsules

Large data sets- characteristic of process time series data the norm

- Big data at its heart....

Rich calculation and formula development

Asset and process segment modelling

Compelling success cases across many industry segments

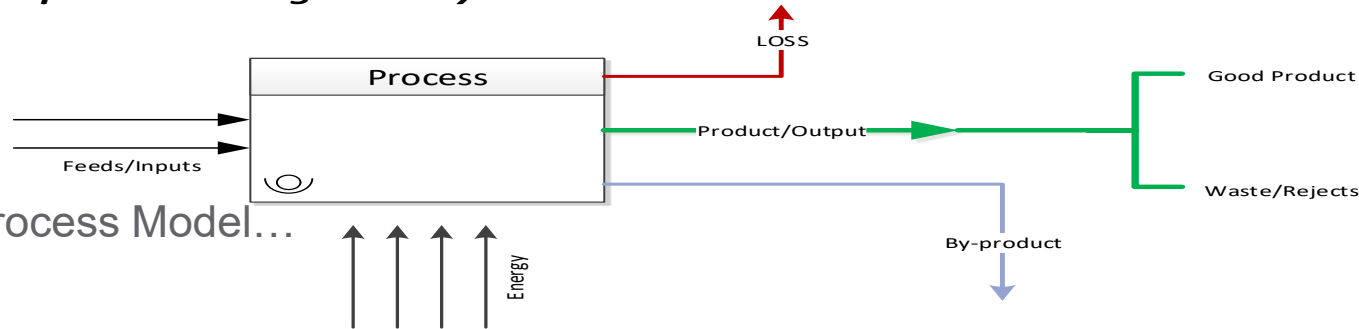
- Pharma
- Chemicals
- HVAC

Real-time Accounting Decomposition

- Identify process logical and process steps

Process-

converts inputs to an output via the use of energy and chemical transformation with other materials possible along the way...



- The Process Model...

Materials		Production		Energy	
Feed 1	F1_Cost	Product	P_Value	Steam	St_Cost
Feed 2	F2_Cost	By-Product	ByP_Value	Gas	G_Cost
		Waste	Waste_cost	CW	CW_Cost
				Refrig	R_Cost

Possible CHP Model

Assets

- CHP Complex
 - Converter
 - GenSet-1: Gas Eng
 - GenSet-2: GT/HRSG
 - Boiler 1
 - Boiler 2
 - PV Array
 - Load- BOP
 - Chiller- CF1
 - Chiller- Absorp**
 - Chiller- CF2
 - Cooling Towers
 - Consumer
 - Building 1
 - Chem/Bio Labs

Summary

Load- BOP	Energy	Material	Production
Amount	\$200.00	\$0.00	\$200.00
Improvement	0.0%	0.0%	0.0%
Potential Benefit	\$0.00	\$0.00	\$0.00

Production

Name	Quantity	Unit Cost	Total Cost
✖ Cooling Water	1,000	\$0.10	\$100.00

Custom Add Delete
Chiller-Absorp Update

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HVAC Performance Management

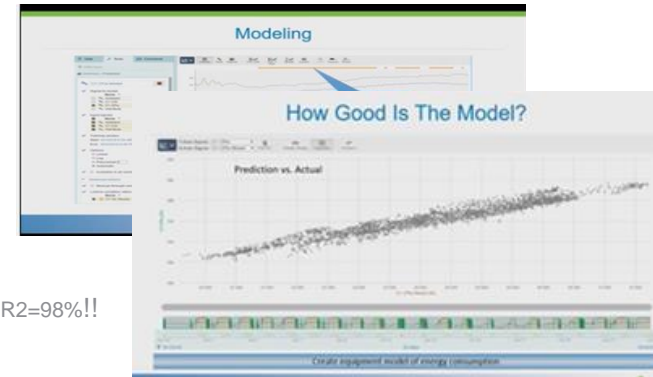
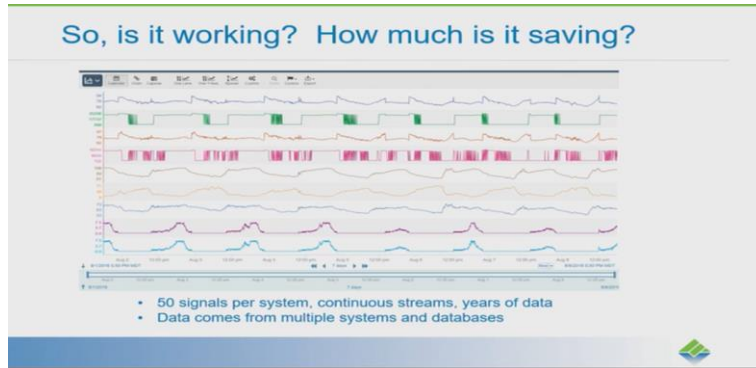
Equipment acts to remove evaporative load/ambient humidity prior to main Building complex Chillers

- Pay for performance contract to insure unloading of chillers in summer months and \$\$ savings

Demonstrated 72.5 MW reduction in power use via SoCal Edison results

Use of underlying Profit Advisor SEEQ tool to identify and aid in rectifying issues associated with underlying equipment performance

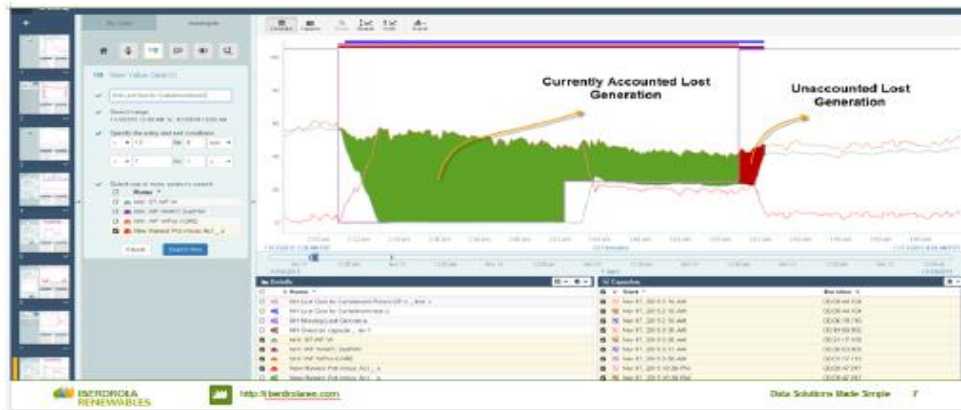
Engineering analysts use repeatable and re-usable assessment capabilities to track and RCA potential bad actors, ensuring sustained, “optimal” performance



Utility Wind Power Curtailment Impact Analysis

- ❑ Large IOU with considerable renewables footprint- mostly wind turbines
- ❑ Wind Power curtailment due to supply constraints is common issue
 - ❑ Cost Recovery possible with supporting analysis
- ❑ Underlying Profit Advisor SEEQ engine used to identify curtailment impacts and allow monetization
- ❑ Complex analysis from multiple data sources insured cost recovery across fleet

Src: ARC Insights White Paper. May, 2016



Avangrid Renewables' Klondike Wind Farm

EcoStruxure Profit Advisor Value

1% to 3% production value Improvements

3% to 5% energy and material cost reductions

Value-focused
IIoT

Patented
Real-Time
Accounting

World Leading
Safety, Process
and Reliability
Control

Profit Control
Cascaded to
Process
Control

We turn our customers' industrial automation investment into the Profit Engine of their business

- Value-focused IIoT solutions, expertise enabled by EcoStruxure Plant



Ignite the profit engine
of your business