# Energy Monitoring and Targeting using the PI System and RtEMIS

Presented by **Keith Kirkham, Energy Manager, Irving Tissue Toronto**

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# *Presentation will be in 3 parts*

Our energy issue

Solution using the PI System infrastructure

Results and next steps

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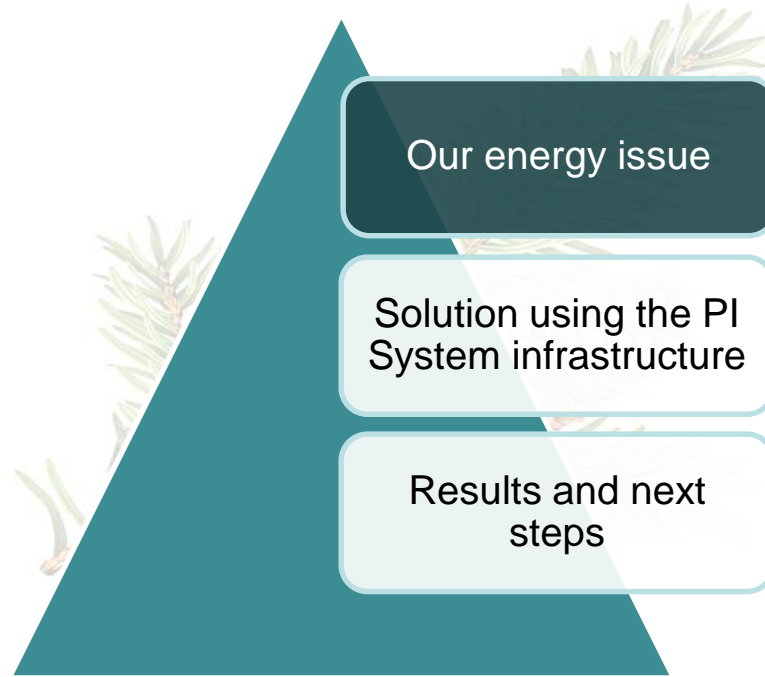# *Irving Tissue Toronto*

- 1551 Weston Road, Toronto

# *Who We Are*

- Manufacturer of household tissue products
- Products include facial and bathroom tissue, and paper towels
- Both branded and private label products

# What was our energy issue?

Our energy issue

Solution using the PI System infrastructure

Results and next steps

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# *Our operation is energy intensive*

- Large integrated tissue manufacturing plant
  - 3 tissue paper machines and 9 converting/packaging lines
- One of the largest industrial single site users of electricity & natural gas in Toronto

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# *Energy Measurement presented an opportunity*

- Mostly local metering

- Process measurements well done

- Electrical metering was uneven

- Data not accessible for analysis

- **We did not know what we were using or how effective we were**

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# *What was our energy opportunity?*

- Our 3<sup>rd</sup> largest cost- but not measured in real time
- Information not accurate for budgeting, forecasting, etc.
- Difficult to tell if there were opportunities to improve our energy performance
- Need to measure in order to manage

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# *What did we want to measure?*

- Electricity- 13 existing meters plus 17 new ones (total 30 meters)

- Natural gas flows- 7 existing plus 2 new (9 meters)

- Steam flow- 6 existing meters

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# *Why monitoring and targeting?*

- Need for monitoring is obvious:
  - Gather and store information in real time to view & understand
- Targeting is less obvious:
  - Best way to measure energy effectiveness
  - More meaningful than KW/unit
  - Indication of 'How **are** we doing?" AND "How **should** we be doing"
  - Answer: *Are we having a good energy day???*

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# *Energy/unit production is not meaningful*
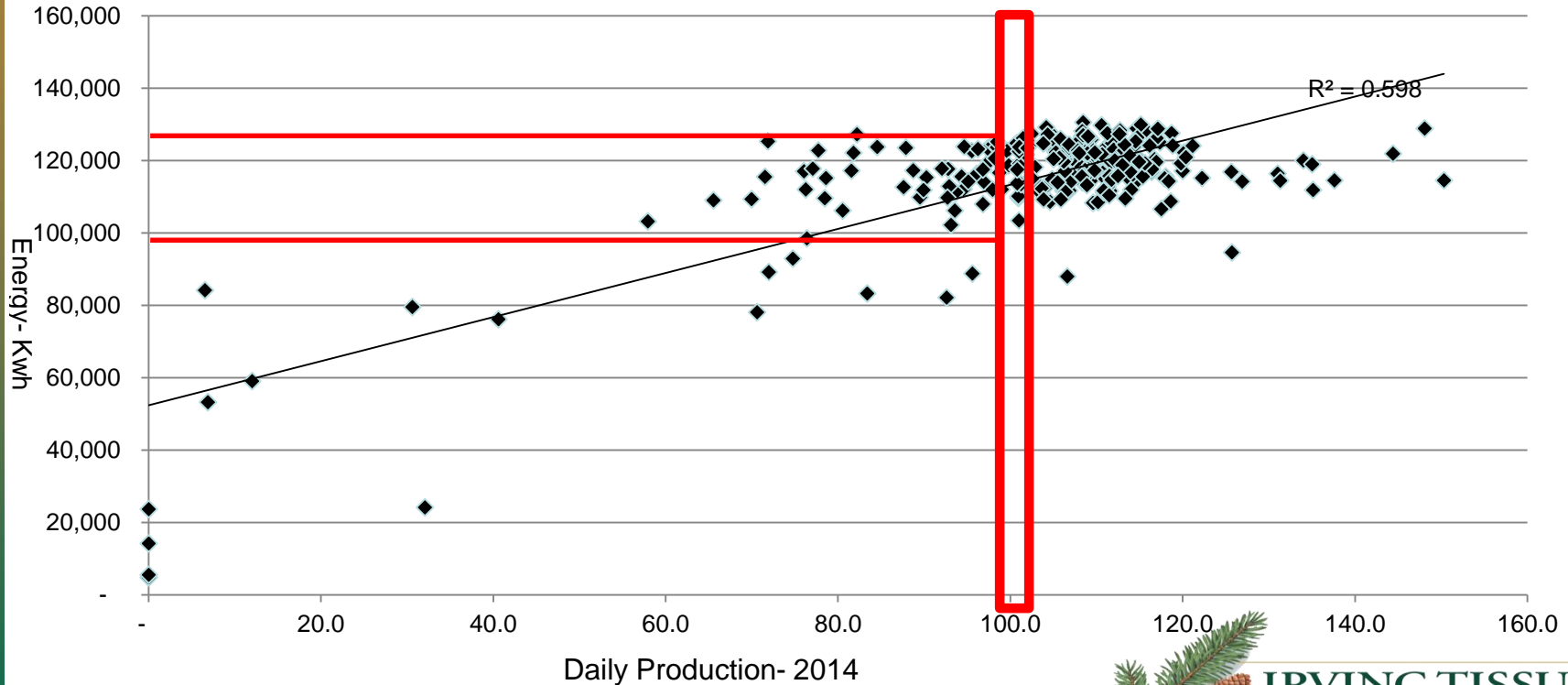
# *How does targeting work?*

- Mathematical prediction of energy use
- Target calculation is done by regression analysis of historical information
- Inputs include all variables that can influence the amount of energy used:
  - Production rate, speed, temperature, humidity, product qualities, etc., etc., and …..etc.

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# *Why is Targeting superior to energy/unit?*

## **Energy/unit**

- Two ways to manipulate-
  - Change energy
  - Change units
- Not intuitive (good?, bad?)
- Depends on a linear relationship
- Only meaningful when you have 0 energy with 0 units- not a real life situation

## **Targeting**

- Provides an immediate measure- above/on/below
- Meaningful in all situations regardless of inputs

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# 3 situations where a target is useful

- Usage is above target- *what is wrong, and how can we fix it.*

- Usage is on target- *how can we improve (continuous improvement)*

- Usage is below target- *why? How do we keep doing this? (Make it permanent!)*

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# *Our solution- PI System Infrastructure*

Our energy issue

Solution using the PI System infrastructure

Results and next steps
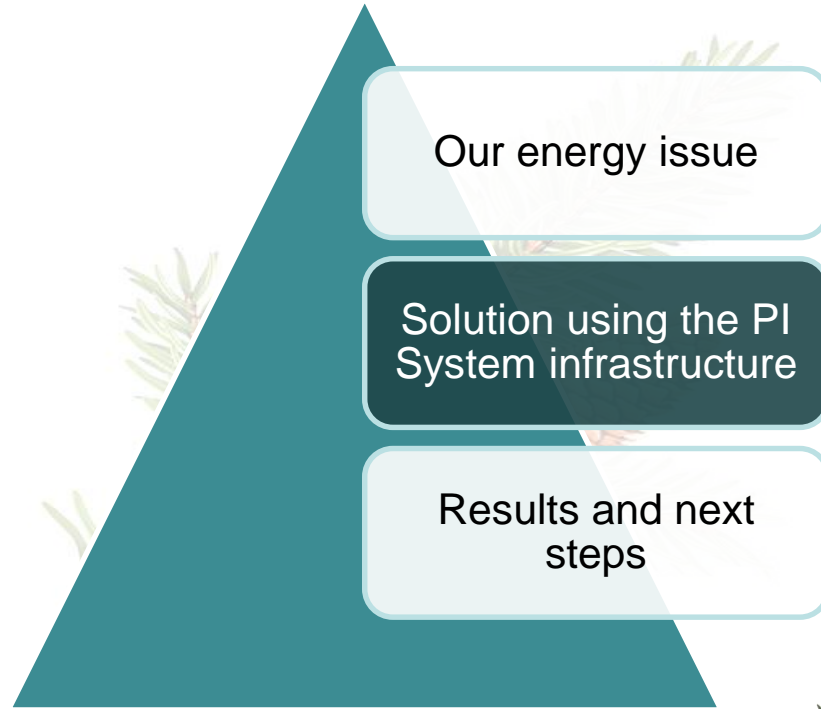
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# We had many selection criteria

- Inputs from several different sources and proprietary platforms
- Archive data for 2 years
- View energy & process data together
- Extract data for analysis and reporting
- Universal access to information via business LAN
- Not another island or sandbox
- Preserve data security-on site
- Calculate and display energy usage & targets accurately
- Customer support

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# *The PI System was a logical choice*

- All of the criteria were resolved with a solution based on the PI System

- Growing use of the PI System within our corporation

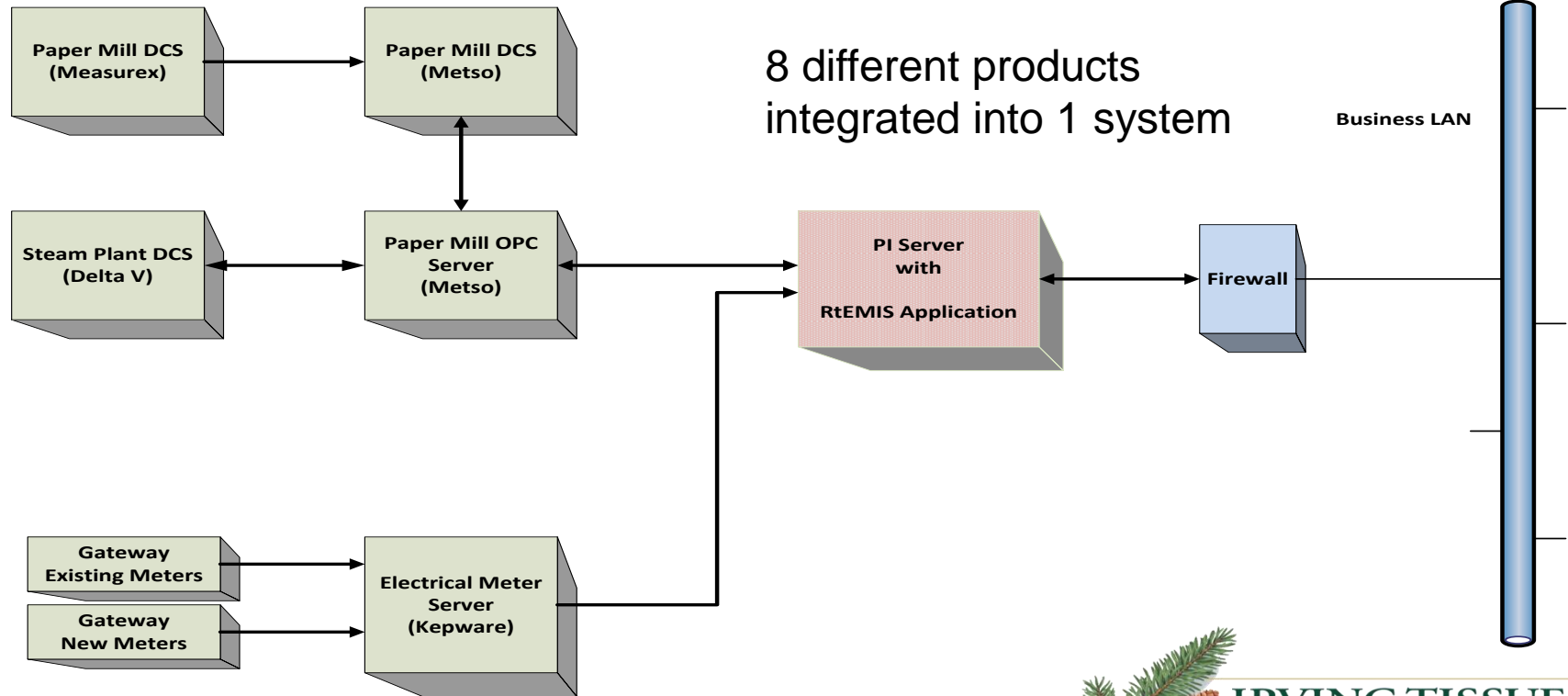- The PI System provided us with a platform for growth

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*met our criteria*

- Based on the PI System

- Web based displays on corporate LAN

- Target calculation expertly done
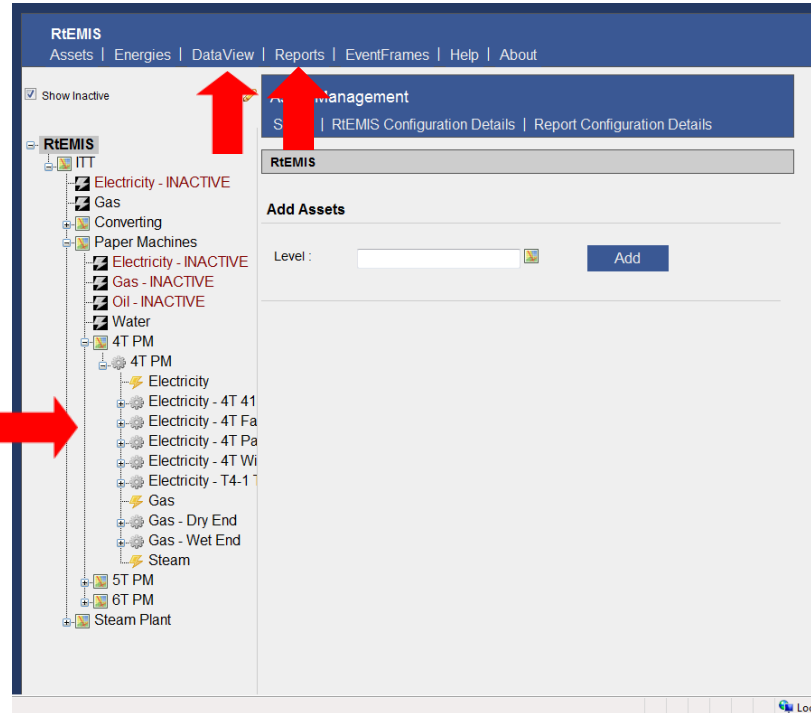
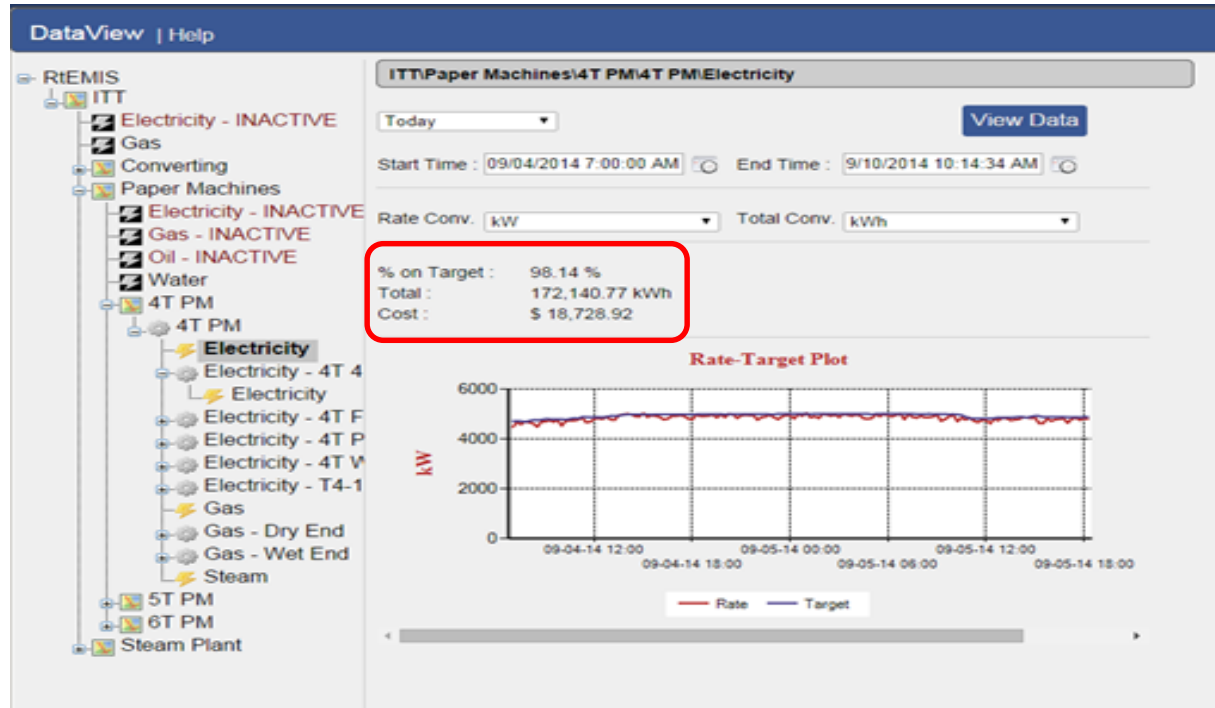- Proven installation on our corporate network

# *Our system*



8 different products integrated into 1 system

# *Start-up Screen for RtEMIS*
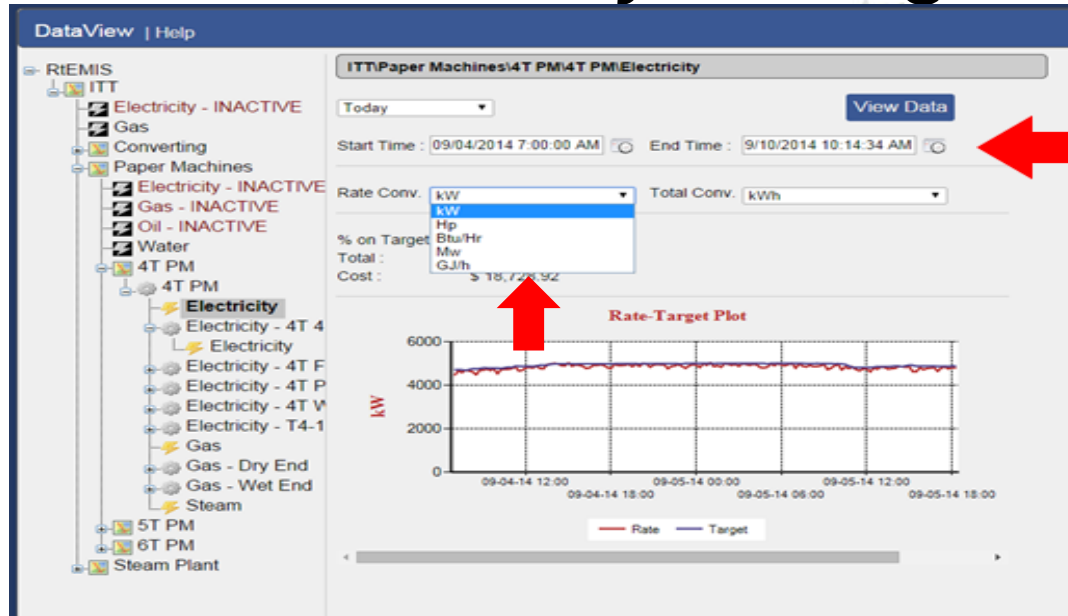
# *Screen print of DataView*

# *DataView Time range & energy units can be easily changed*



Beginning & end times are easy to change

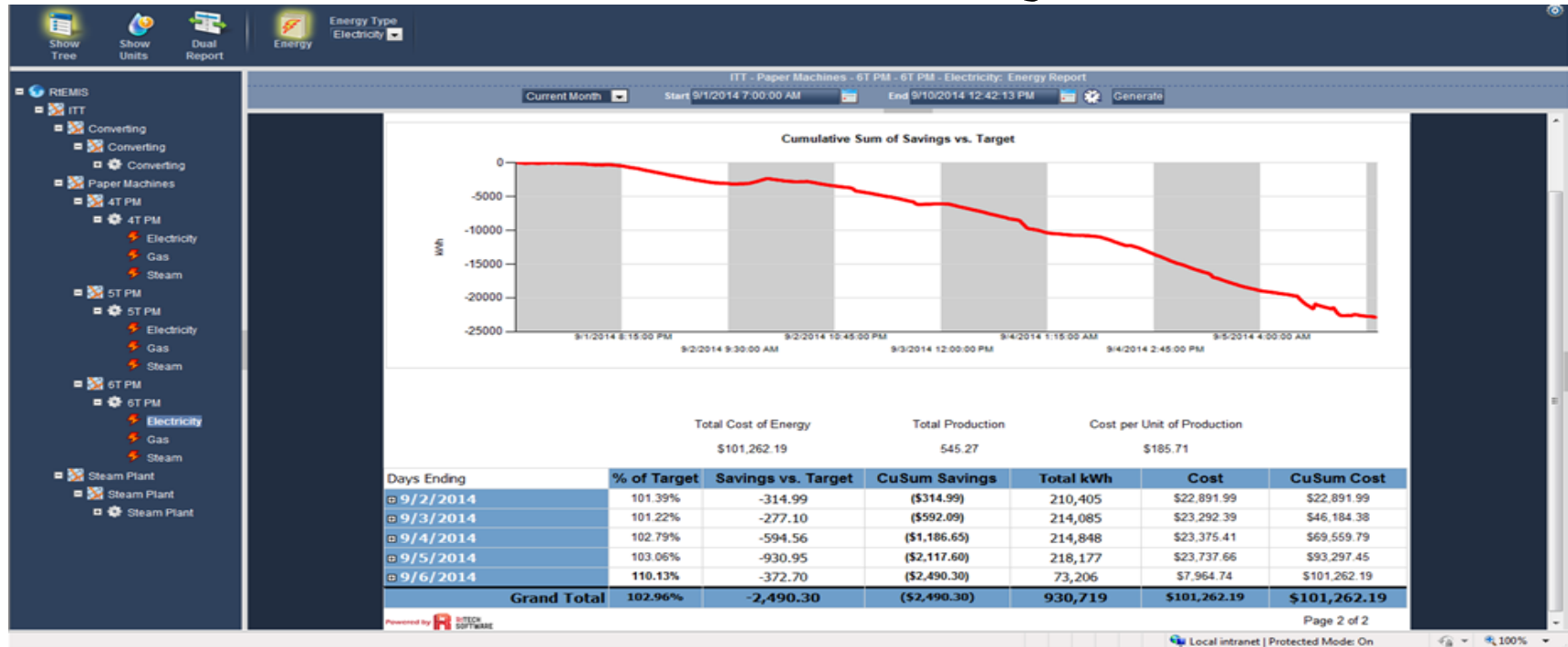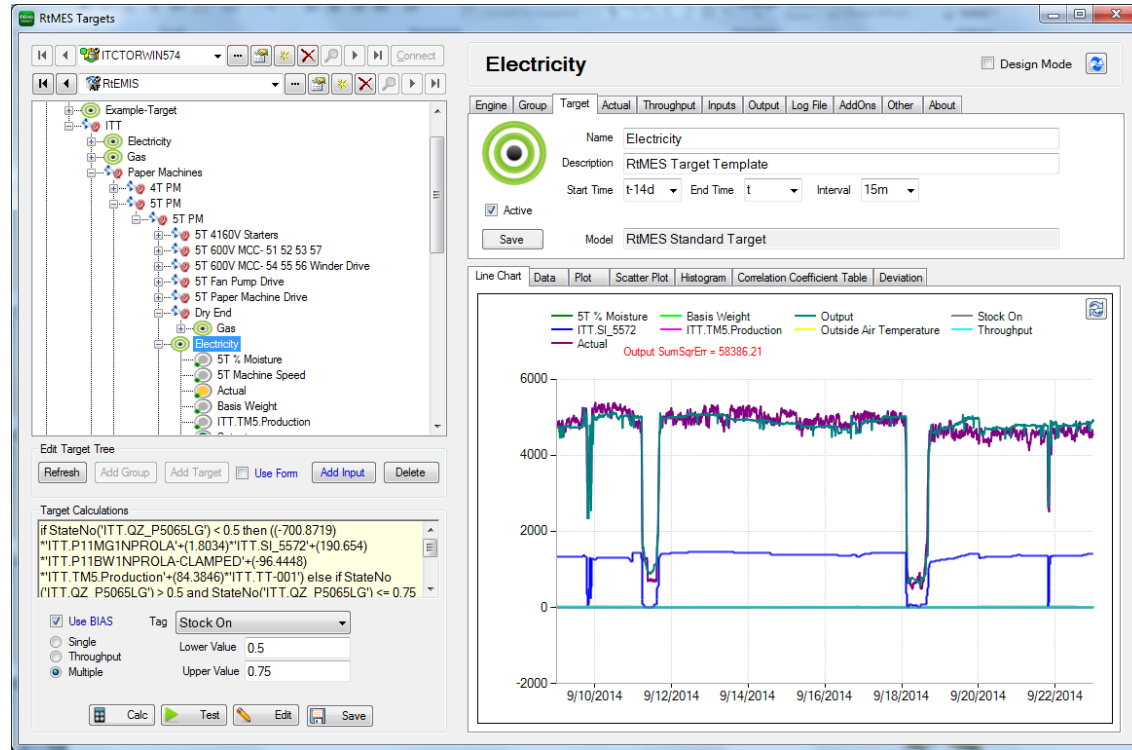# Report view shows more information

# CUSUM chart is major feature

# *Target calculator is easy to use*

# *System features*

- Time range is easily selectable

- Energy units are easily changed

- Real time cost is displayed

- Informative built-in reports

- Target values are written back into the PI System

- Custom reporting easily done with PI DataLink

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# *What we have gained*

- No longer have to guess- *we know real time and historical information-*
  - *Consumption*
  - *cost*
  - *performance*

- Information is available to justify projects and operating decisions

- We know if we had a good energy day

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# Other key learnings

- M&T is a tool- it's not the solution
- Needs to be used as an aid- not as a threat
- Observed belief- energy is beyond our control
- Immediately see results of actions taken
- *If you measure it you can manage it.*

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# *On going opportunities*

- Target calculation is on-going issue:
  - Is the process off, or is it the target
  - Shoot the messenger
- Increase use of the M&T system
- Overcome the belief that energy is not controllable
- Expansion of process information to the PI System

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# A PI System based monitoring system has opened up our 'Energy Eyes'

## Business Challenge

- How to measure energy use and assess performance

## Solution

- RtEMIS installed on PI System

## Results and Benefits

- PI System ideal for gathering data and analysis

- Measure it- Manage it!

- *We know if we are having a good energy day!*

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# *Thanks to those involved*

- OSIsoft- system infrastructure supplier

- RtEMIS- software supplier

- ADM- install and set up

- ITD- business LAN

- Can-Technologies- electrical network

- Metso Automation- paper mill DCS

- Lakeside Controls- steam plant DCS

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# *QUESTIONS?*

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