

Meniscus – Advanced Energy Management Services – focus on process management

Presentation to ESTA

23rd April 2009



Overview of presentation

- **Business description**
- **Process monitoring**
- **Process and Energy Management Services**
- **How does it all work?**
 - ❖ *Calculation Engine*
 - ❖ *Web Site*
 - ❖ *Dynamic Dashboards*
- **Adding value to your business**

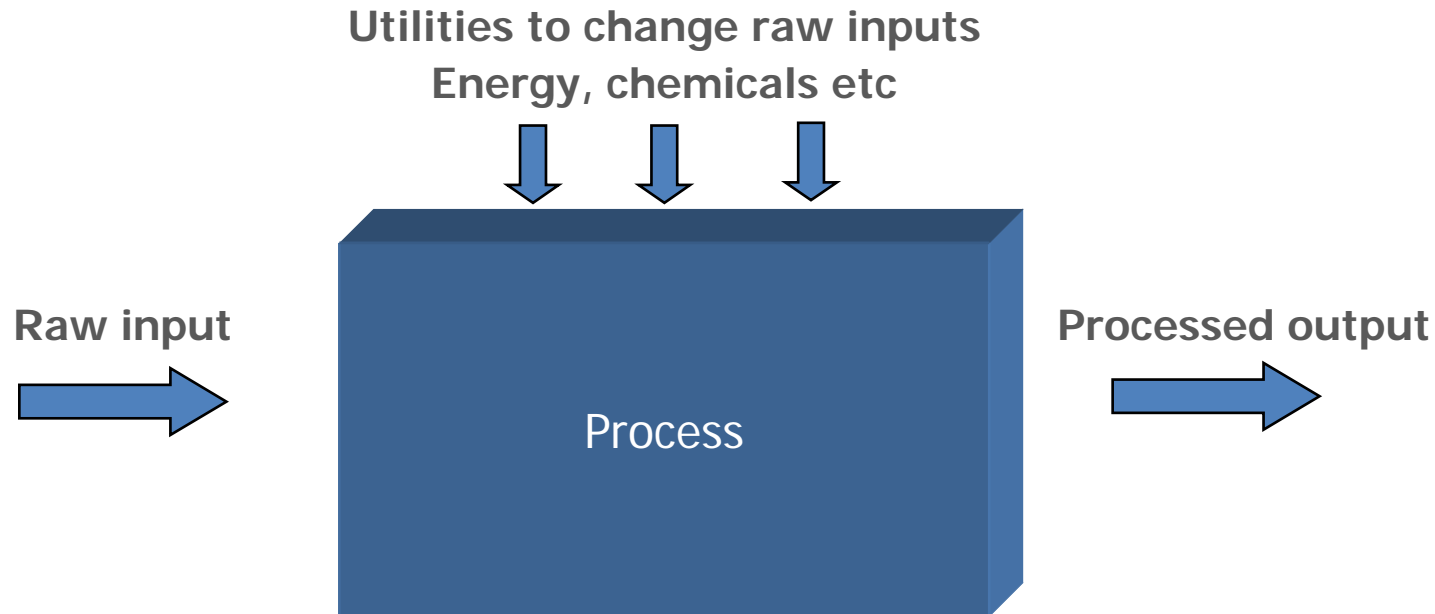


Business Description

- Set up in 1997 as a service company adding value to operational data
- Software developed in house and delivered as a hosted service
 - ❖ *'Pay as you Go' business model*
 - ❖ *Can be delivered 'in house' if required*
 - ❖ *Use it as little or as much as you want*
- Primarily focused on industrial market
 - ❖ *Water and Electricity Industries*
 - ❖ *Process monitoring and benchmarking*
- Key USP's
 - ❖ *Totally web based*
 - ❖ *Ability to calculate any KPI, benchmark, unit cost or performance metric*
 - ❖ *System is very flexible*
 - Methods of information delivery
 - Ability to use any numeric data
 - Not tied to a specific database



Process Monitoring– what do we mean?

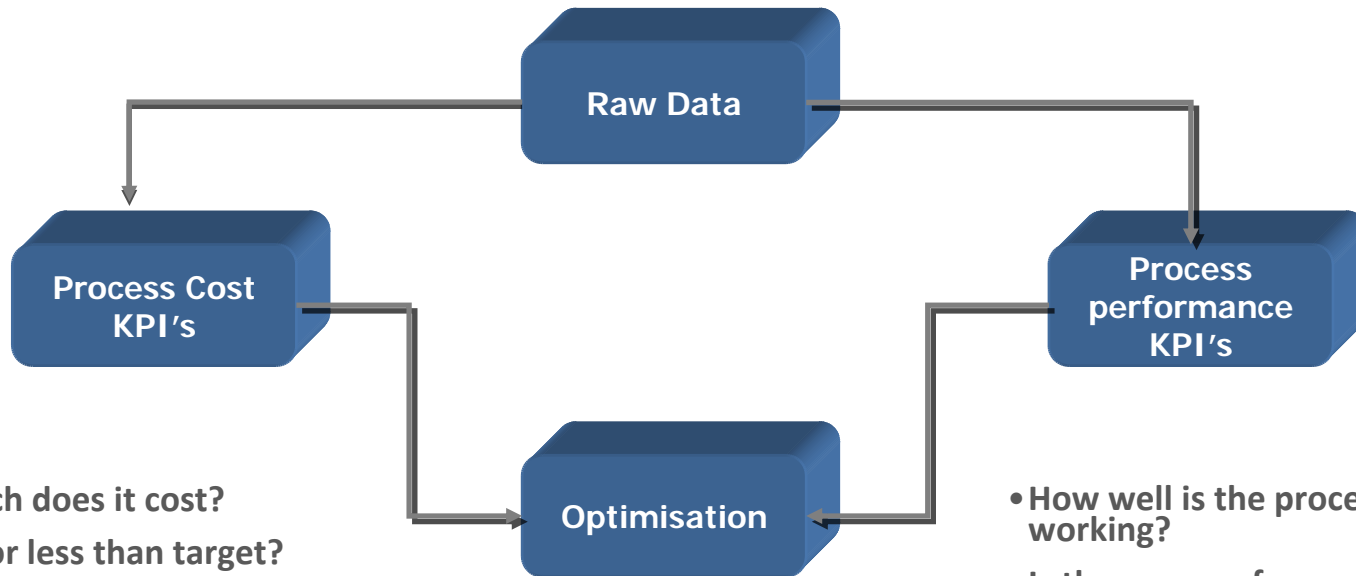


$$\text{KPI} = \frac{\text{Utility input}}{\text{Processed Output}}$$

$$\text{Or} = \frac{\text{Raw input}}{\text{Processed Output}}$$

Provides a way to monitor & compare process performance

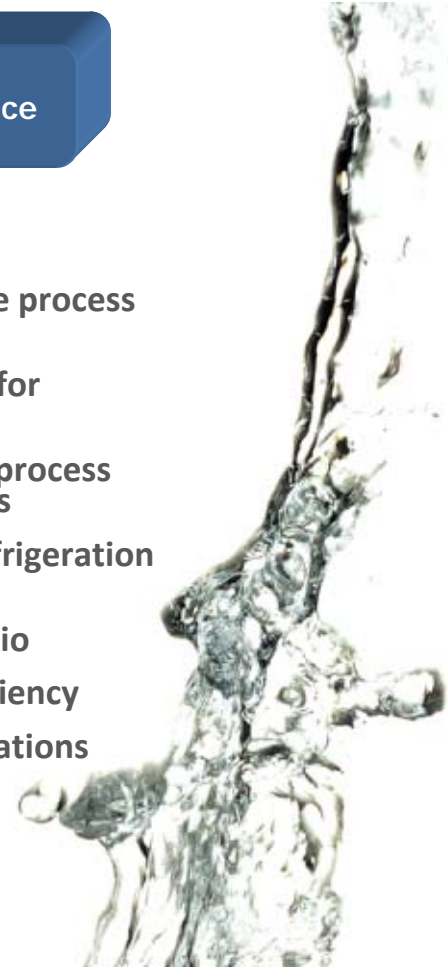
Process Monitoring – two prong approach



- How much does it cost?
- Greater or less than target?
- Cost driven KPI's
 - kWh/m²
 - kW/000 PE for w/water plant
 - kWh/m³ air delivered for compressors
- Benchmarking of similar processes
- Primarily management focused

- Both sets of data required for optimisation
- Process KPI's > What needs to be changed
- Cost KPI's > How much will this save?

- How well is the process working?
- Is there scope for improvement?
- Calculation of process specific metrics
 - COP for refrigeration plant
 - Recycle ratio
 - Boiler efficiency
- Primarily operations focused



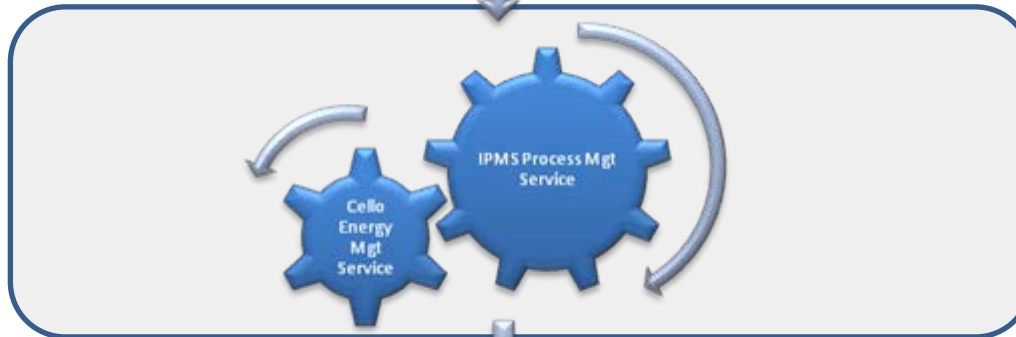
Process and Energy Management Services

- Processes any numeric data
- Can accept any timebase



Data Collection

- Process Benchmarking
- Real Time Process Monitoring
- Advanced Energy metrics
- Energy Bill reconciliation



Data Processing

- Comprehensive web site
- Customised Management reports
- Web Services enable much more sophisticated delivery



Information Delivery



IPMS - Key features and capability

Calculation Engine

- Real Time Calculations
- Customised calculation templates
- Based around Web Services
- Exception e-mailing



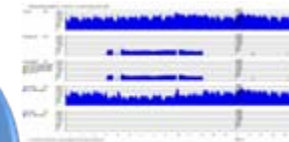
Comprehensive web site

- Graphics
- Dashboards
- Benchmarking
- Administration



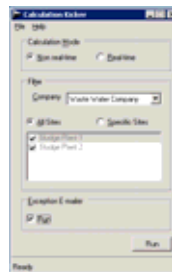
Web Services

- Dynamic Dashboards
- Process Energy Certificates
- Web based SCADA



Client Tools

- PC Client
- Exception Emailer
- Auto Import
- Auto 'dirtying' of data

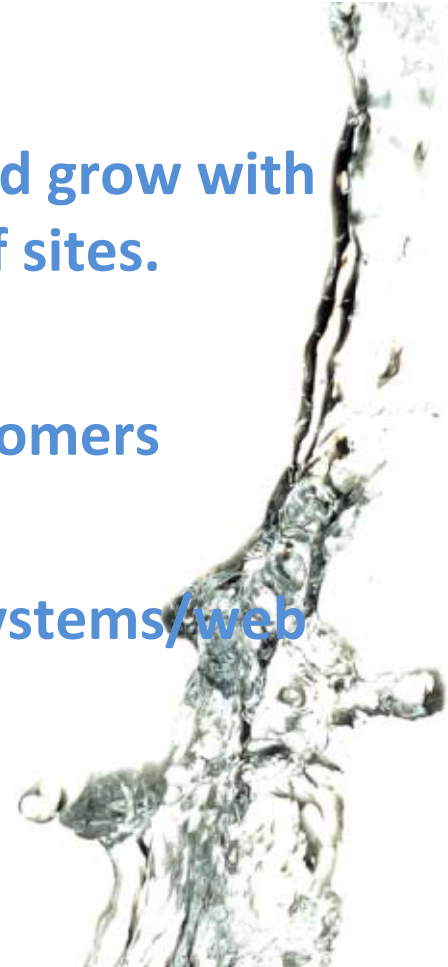


Energy Management

- Bill management with Cello
- Monitoring & Targeting
- Energy Benchmarking

Summary

- **Providing a sophisticated, yet easy to use, value added performance management service.**
- **Very flexible business model. Can start small and grow with the customer – or set up monitoring for 100's of sites.**
- **Can deliver unique services through to end customers**
- **Can build web data and graphics into existing systems/web site**



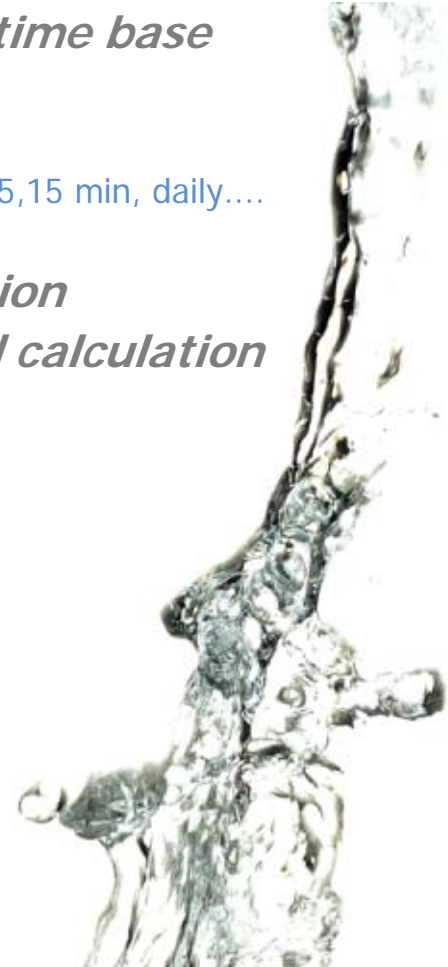
Calculation Engine and Database

➤ Calculation engine

- ❖ *Real Time calculation ability*
- ❖ *Set up any calculation based on any numeric data /time base*
- ❖ *Incorporates business rules to handle:*
 - Different 'meter' types – incrementing, consumption ...
 - Different aggregation periods and types – sum, average over 10 sec, 1,5,15 min, daily....
 - Data spikes, meter resets etc
- ❖ *Automatic 'dirtying' of data - automated re-calculation*
- ❖ *Calculation templates – ability to create customised calculation functions*
- ❖ *Can be connected direct to third party databases*

➤ Web Services

- ❖ *All connections to and from clients via Web Services*
- ❖ *Much easier to integrate into own applications*



Comprehensive web site

➤ Range of Graphics

- ❖ *Traffic Light system to highlight Quality, Cost and Process issues*
- ❖ *Use the Dundas graphing application for graph and dial controls*
 - Up to 5 trends per graph
 - Ability to drill down into data
 - Ability to view trends for associated calculated variables
- ❖ *Uses Crystal Reports™ for delivery of management reports*

➤ Dashboards – static dashboards

- ❖ *Performance dashboard – Cost, Quality, KPI and Process*
- ❖ *HACCP (risk) dashboard – Monitors key metrics using SPC*

➤ Web enabled Set up and Administration

- ❖ *Most set up features of the PC Client are available in the web site*
- ❖ *Ability to set up Users, Groups and to assign permissions*

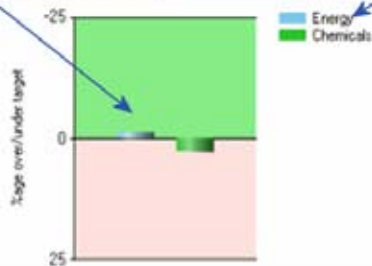


Bars in the green section show where actual cost is less than target. In the red section where actual cost is greater than target.

Can add multiple "Groups" of cost

Click on the link to view trends and to drill down into underlying data.

Cost (year to date)



Meter	Units	Cost	Target Cost	% Diff
ENERGY	kWh	£79,007	£79,953	-1.2
Sludge.accessible.power	MWh	4947	4919	3.4
BAF.power	MWh	437,311	438,371	-2.0
VITOX.power	MWh	427,029	426,216	10.4
Trainers.treatment.power	MWh	49,203	611,103	-17.1
Other.power	MWh	43,810	64,444	-14.1
CHEMICALS	kg & m³	£86,296	£84,152	2.7
Urea	kg	£20,776	£24,046	-13.6
Polysaccharide	kg	£10,906	£9,076	20.2
Quatern.am.for.hours.net	kg	£54,717	£51,033	7.2

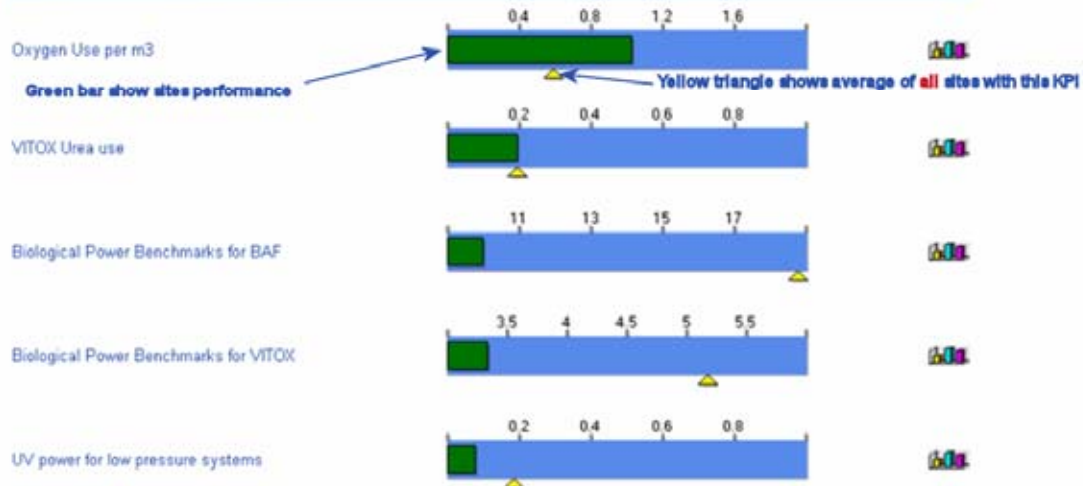
Click here to see exceptions

Click icon to see trend with high/low limits

Quality

Meter	Limit		This week	Breaches		Compliance (%)	
	High	Low		This month	This year		
Train 1 ammonia (mg/l)	7.34	N/A	3	4	27	41.3	
Train 2 ammonia (mg/l)	7.33	N/A	3	4	26	42.2	

KPI's (25/03/2006 - 21/10/2006)



Process

Meter	Average	Number of Exceptions		
		Low	High	
BAF.backwash.to.flow.ratio	0.58	N/A	10	
BAF.DO	70.36	N/A	10	
Primary.to.SAS.ratio	0.68	3	N/A	
Recycle.ratio	1.37	N/A	8	

Average value over the last month

Number of high/low exceptions for each Process parameter

Menu

Home
 Site Setup
 Performance
 KPI's
 Opportunities
 Analysis
 Data Entry
 Calculate
 Reports

Logout

Account

Change details
 Change password

Sites

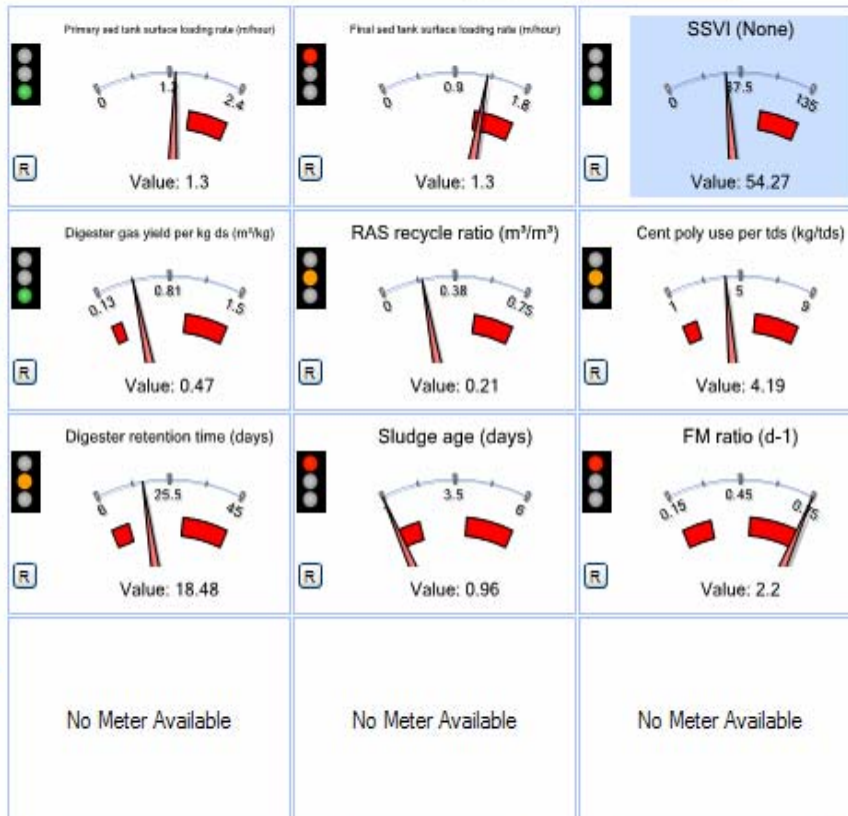
All Sites

HACCP Dashboard

Dashboard Date

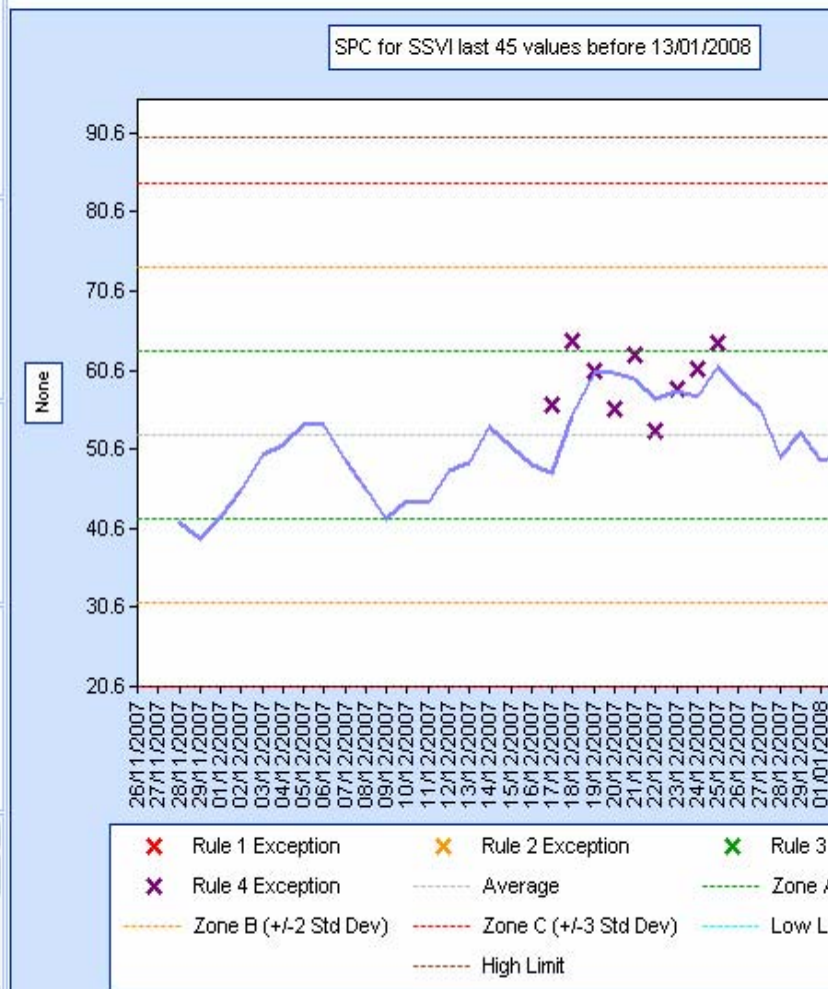
13/01/2008

Refresh



Date	Value	Exception
10/01/2008 00:00:00	77	2
09/01/2008 00:00:00	64	3
08/01/2008 00:00:00	83.79	2
07/01/2008 00:00:00	67	3
06/01/2008 00:00:00	67.45	2

SPC for SSVI last 45 values before 13/01/2008



Energy Management

➤ Cello – Open Source Bill Validation software

❖ *Automated snag identification on data import*

- Importer – missing/invalid/not recognised MPANs, file format, potential for specific conversion checks
- Channel – missing or estimated reads kWh or kVArh, negatives
- Site – Export to Net > import from generators, parasitic load > import from NET
 - Timing issues

❖ *Ability to create virtual bills for comparison against actual*

❖ *Limited graphing but can expand*

➤ IPMS – Advanced Energy Management

❖ *Ability to set targets for any meter for conventional M&T*

- Degree Days, regression based formula or much more complicated calculations

❖ *Creation of any benchmark*

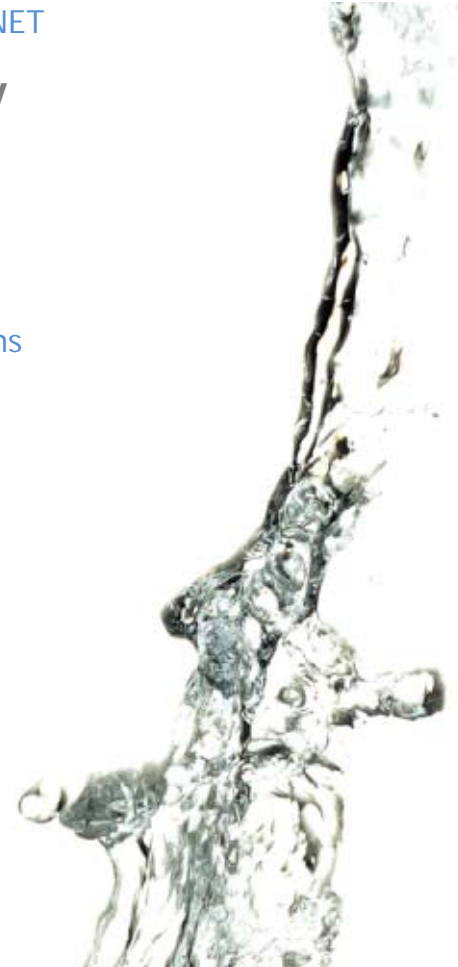
- Normalise by m², flow, degree day, footfall etc
- Ability to set up comparative benchmarks on the web site

❖ *Cost & Performance monitoring at Process level*

- Performance monitoring identifies performance gap
- Applying performance gap to costs gives potential savings
- Process Energy Performance Certificates

❖ *Suitable for any utility*

- Natural Gas, chemicals, water, sludge, industrial gases etc.



Improved automation and Client tools

- **PC based Client that customers use to set up the database**
- **IPMS – Tools running on Meniscus server**
 - ❖ *Import – automated import of data with ability to customise import formats*
 - ❖ *Exception e-mailer – automates sending of exception e-mails*
 - ❖ *Data is automatically 'dirtied' on:*
 - Receipt of new data
 - Change of calculation
 - ❖ *Dirty data automatically recalculated*
 - ❖ *Event Watcher – monitors Event Log for IPMS generated errors and sends out e-mails*



Web Services

➤ Dynamic Dashboards

- ❖ *Use latest web technology to deliver 24/7 'corporate' dashboards. Create a customised dashboard and then stream processed data to it – no need to login.*
- ❖ *Can display any numeric data including calculations*
- ❖ *Can be used to develop web based SCADA schematics*

➤ Process Energy Certificates

- ❖ *Compare site energy performance against benchmark and theoretical best practice.*

