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# MEASURING AND MANAGING ENERGY

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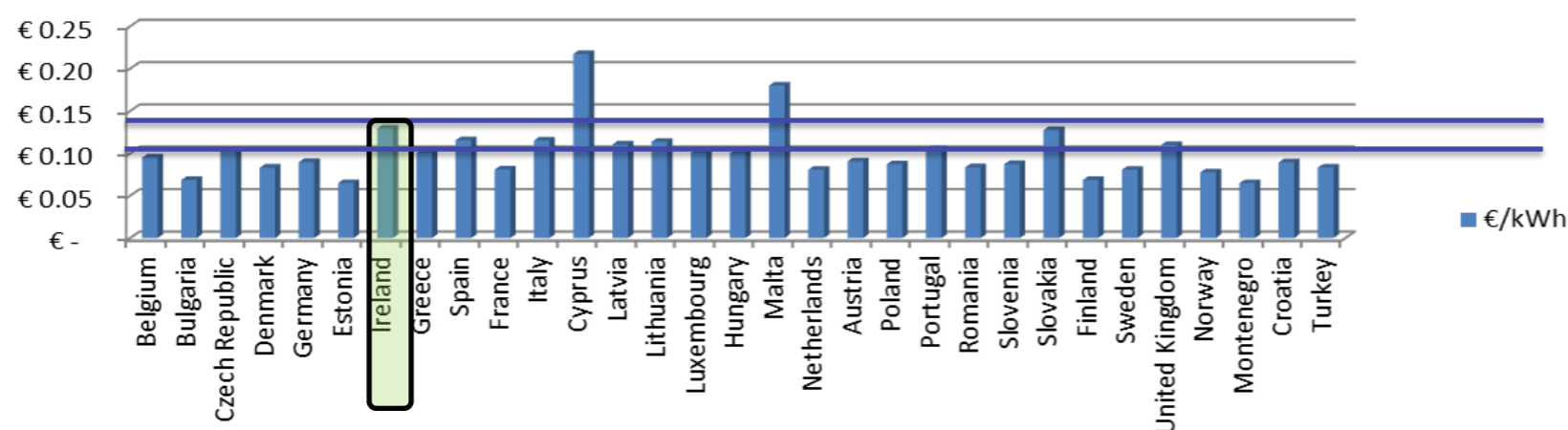
# AGENDA



- Why monitoring and measuring energy is a good idea
- How can this be done at a reasonable cost and minimal effort
- Case studies on how energy management delivers

# Energy Costs – 20% higher than UK

2012  
Commercial Electricity Costs Europe

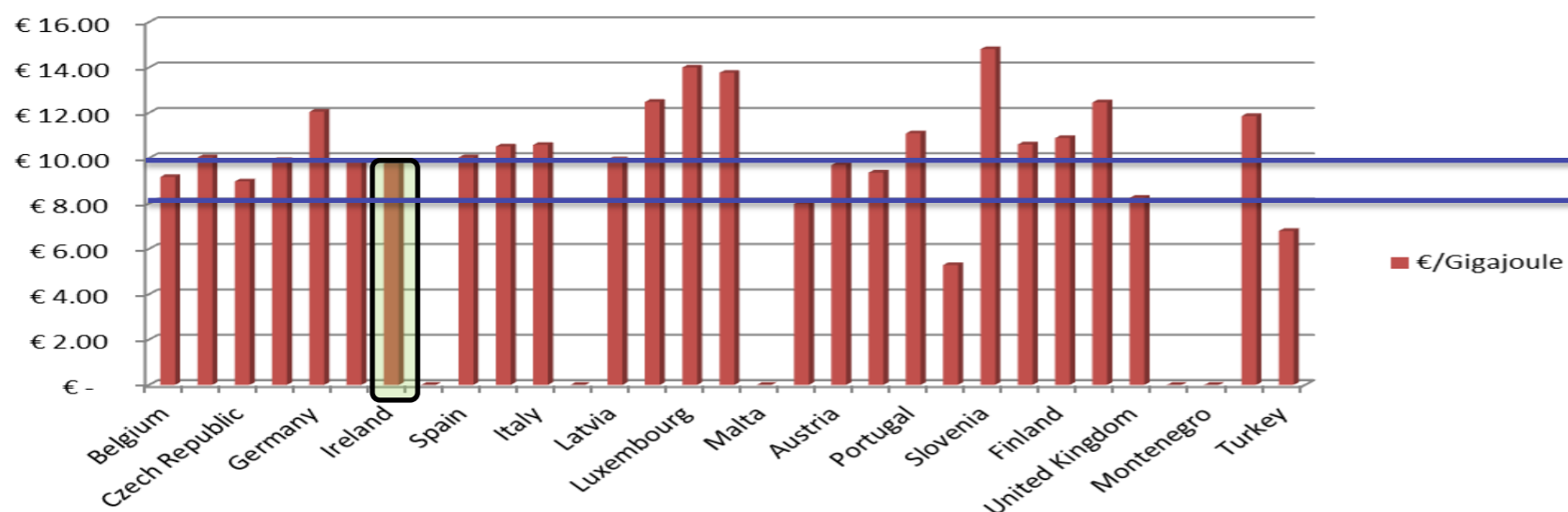


2<sup>nd</sup> Largest Single Cost After Labour

Largest Uncontrolled Cost

A Competitive Disadvantage

€/Gigajoule





# Why Manage Energy

- Rising Energy & Water Costs & Need For Efficiency
- Incurring Excess Charges
- Managing Multiple Utility Suppliers
- Managing Energy Across Multiple Sites
- Bill Verification & Manual Reading of Meters
- Allocating Costs within Organisation
- Metric Reports (need for timely & accurate data)
- Process Management - ISO 50001, LEAN, SixSigma
- M&V Requirement Energy Performance Contracts
- National Energy Efficiency Action Plan – 2020



# Why Measure Energy



Knowledge → Good Decisions

# HOW TO MONITOR & MEASURE

- If over 300MWh PA or 100KVA Do you have a Electricity 'profile meter'?
- If so:
  - Suppliers provide 5 day old 30 minute consumption data
    - Gaps when switching supplier
  - Data can be requested from the MRSO as a CSV file
- Manual reading of meters:
  - Electricity
  - Gas
  - Water



# ALTERNATIVELY AUTOMATE

Data gathering with automatic Meter reading technology for real-time reading of meters:

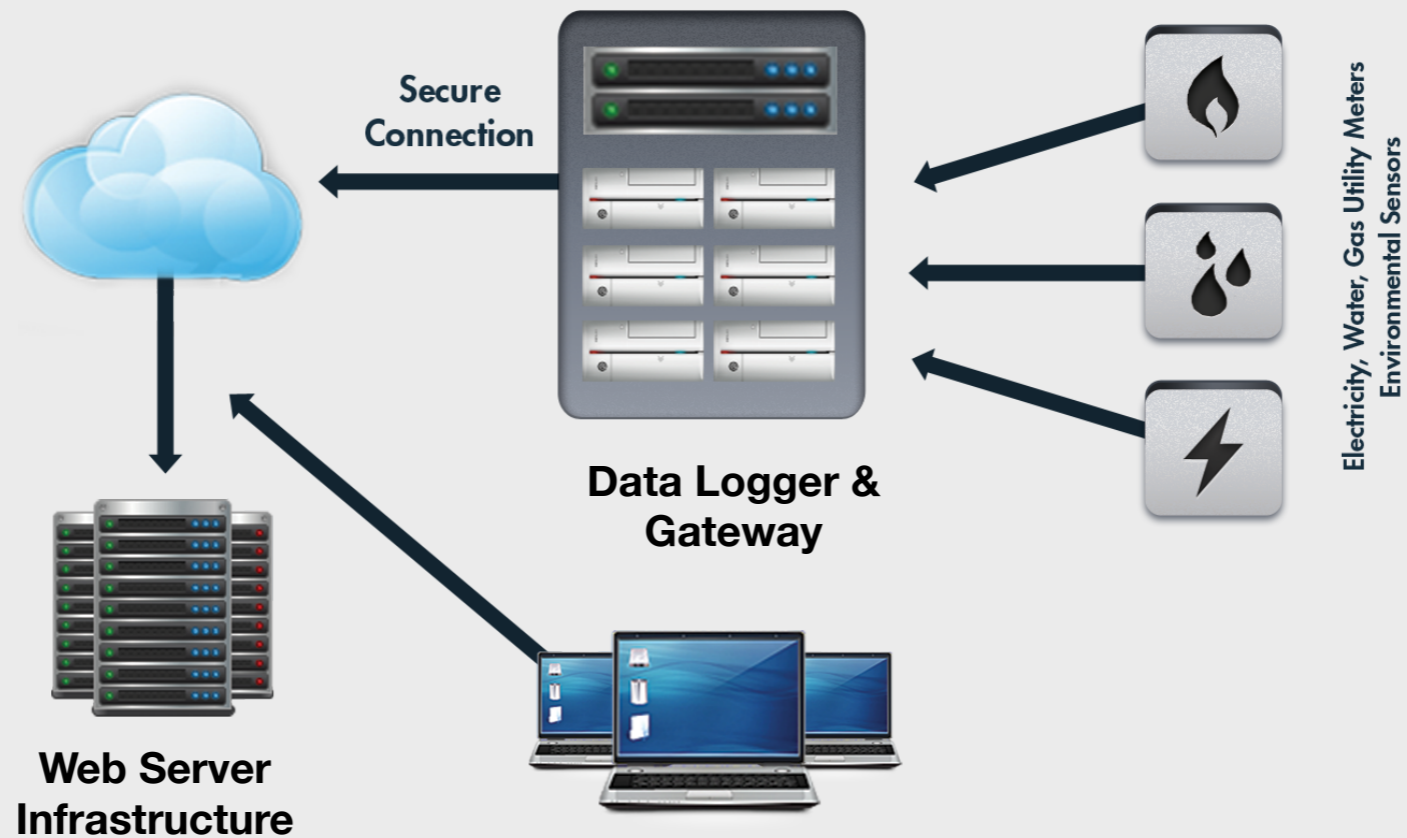
- Electricity
  - Gas
  - Water
  - Oil
- 
- Subscribe to web based energy analytics software for automated reporting

HOW?

1. Achieve Senior management buy-in
2. Do the groundwork
3. Monitor your Base-load
4. Benchmark your success
5. Set your limits
6. Promote your progress

# HOW IT WORKS

## System Architecture



# Metering Solutions for All Requirements



# REAL-TIME MONITORING & MEASUREMENT

- Obtain the real cost of energy – electricity time of use tariffs
- Identify and explain increase or decrease in energy and water consumption
- Identify specific areas of waste (chillers or HVAC plant left on?)
- Question, target and reduce base loads (out of hours consumption)
- Obtain feedback on operating practices & results of efficiency management projects
- Establish metrics on the relationship of use with key performance indicators
- Manage and report on energy & water
- Involve and action the whole organisation – unlimited user access

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## A Competitive Advantage

# INTUITIVE BUSINESS SYSTEM

The screenshot displays the 'Switch Data Viewer' interface. At the top, there is a navigation bar with options: Data, Analyze, Reports, Targets, KPIs, Events, Kiosks, C.R.C., Setup, and Help. The user is logged in as 'radmin'. The main content area is divided into several sections:

- Summary:** A dashboard with six KPI cards: Cost (€66), Carbon (432 kg), Energy (930 kWh), Area (0 m²), Water (0 L), and Oil (0 L).
- Site League:** A table comparing three sites based on Cost (€) and Carbon (kg).
- KPIs:** A section for Key Performance Indicators with a search bar and a list of metrics: Usage/Occupant, Cost/Site Area, Running Cost, Clare, and Cost per Kwh.

Site	Cost (€)	Carbon (kg)
Funniff Manufacturing	367.84	1031.32
Funniff Retail	66.06	432.45
DemoBurger	61.76	393.17

Usage/Occupant	Cost/Site Area	Running Cost	Clare	Cost per Kwh
test				

Top Level Summary of Organisation

Site League Table

Key Performance Summary

# DATA VIEWER SELECTING DATA SOURCES

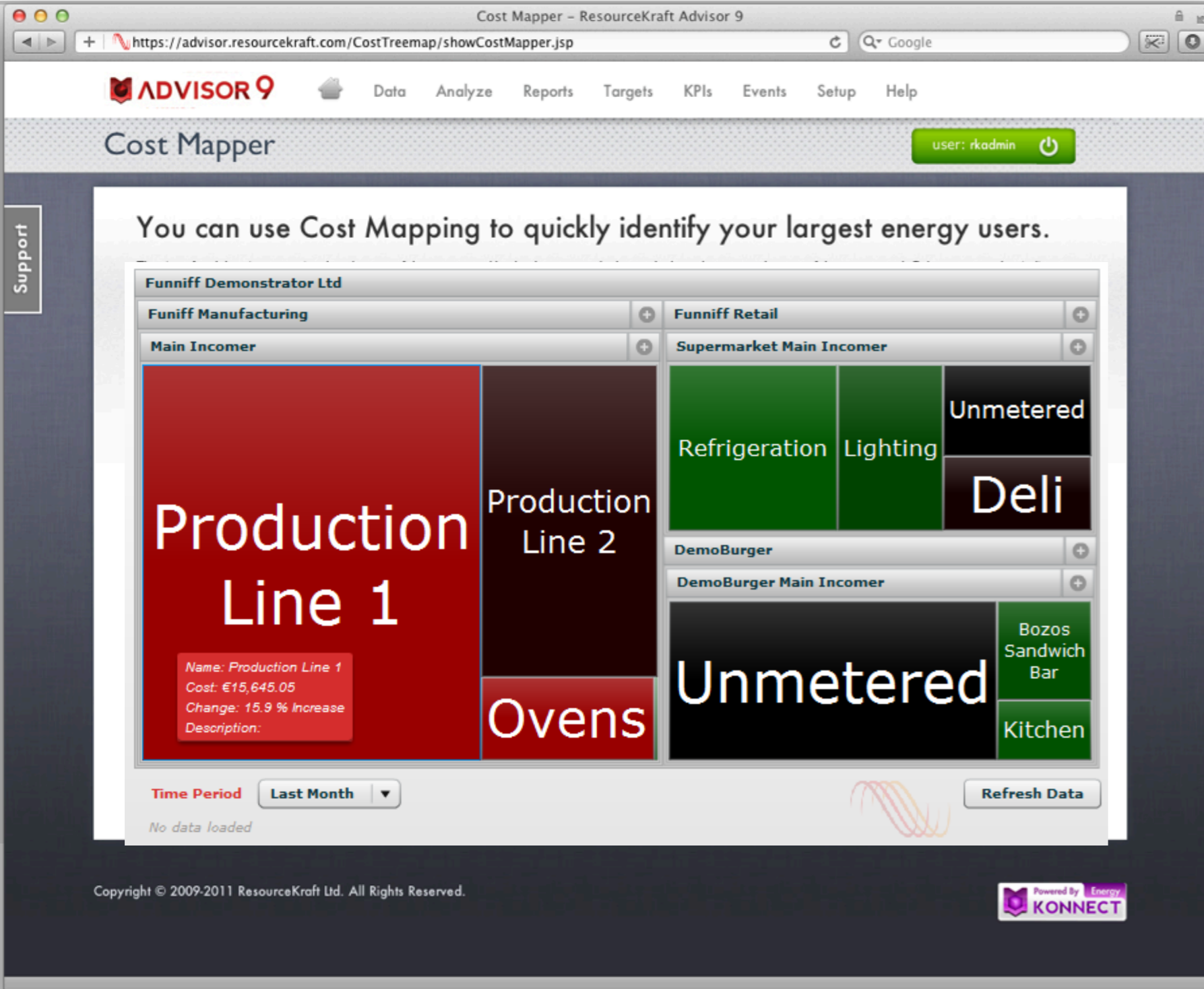
The screenshot displays the ResourceKraft Advisor 9 Data Viewer interface. The main view shows a line graph of electricity usage (kWh/15 min) for February 16, 2012. The graph compares two data sources: Bozos Sandwich Bar (DemoBurger) and DemoBurger Main Incomer (DemoBurger). A tooltip indicates a peak usage of 27.59 kWh at 11:22 on February 16, 2012. Below the graph, a table provides a summary of usage and cost for the selected source.

	Total	Work Hours	Non-Working Hours
<b>Usage</b>	339 kWh	288 kWh	51 kWh
<b>Cost</b> Energia Low Voltage Max Demand	€48	€43	€5



  

	Total	Work Hours	Non-Working Hours
<b>Usage</b>	2,266 kWh	1,944 kWh	322 kWh
<b>Cost</b> Energia Low Voltage Max Demand	€208	€185	€22
<b>Carbon Emissions</b>	1,054 kg	904 kg	150 kg
<b>Max Demand</b>	130.56 kW (13:30 GMT 09/03/12)		
<b>Base Load</b>	20 kW		
<b>Load Factor</b>	72 %	83 %	51 %
<b>Advanced</b>	Peak kVA: 134 kVA (13:30 GMT 09/03/12) (59% of MIC)		
	Avg Power Factor: 0.95		

# COST MAPPER ANALYTICAL TOOLS












Quickly Target  
Largest Energy Users

-  Decrease in costs
-  Increase in costs

Select the time period for  
your analysis



# TARIFF ANALYSIS BILL VERIFICATION

	Low Voltage Max Demand	Universal	11900.43	19894.55		16.1 % ( €2,277.24 )	
	Low Voltage Max Demand	Universal	20648.67	71732.48		-45.6 % ( -€6,470.99 )	
	5 Band Seasonal Time of Day	Universal	19567.37	65848.17		-38.0 % ( -€5,389.70 )	

Current Tariff ■  
 Cost Saving ■  
 Cost Increase ■

## Energia: Low Voltage Max Demand

Description	Quantity	Rate	Total
Night Units	24,546 kWh	0.0554 €/kWh	1,359.83
Day Units Summer	115,557 kWh	0.1064 €/kWh	12,295.24
Standing Charge	30 day	3.02 €/day	90.60
MD Charge Summer	15,723 kW ·day	0 €/(kW ·day)	0.00
Service Capacity Charge	6,000 kVA ·day	0.072 €/(kVA ·day)	432.00
			<b>€14,177.68</b>

Excess Capacity charges are based on QH meters  
 Any customer specific discounts are not supported  
 Standing Charge for Autoproducers with MEC > MIC is not supported  
 Reductions for Public Holidays are not supported

# CUSTOMISATION DASHBOARDS & KIOSKS



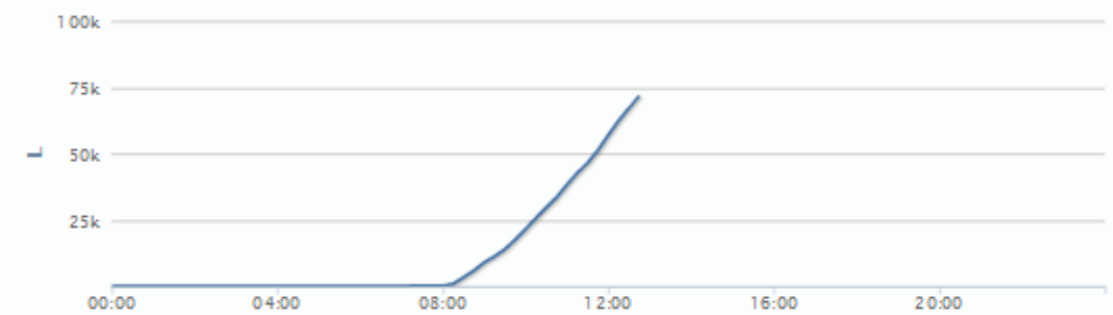
Funnif Manufacturing

Overview Main Incomer Water Mains Production Line 1 Production Line 2

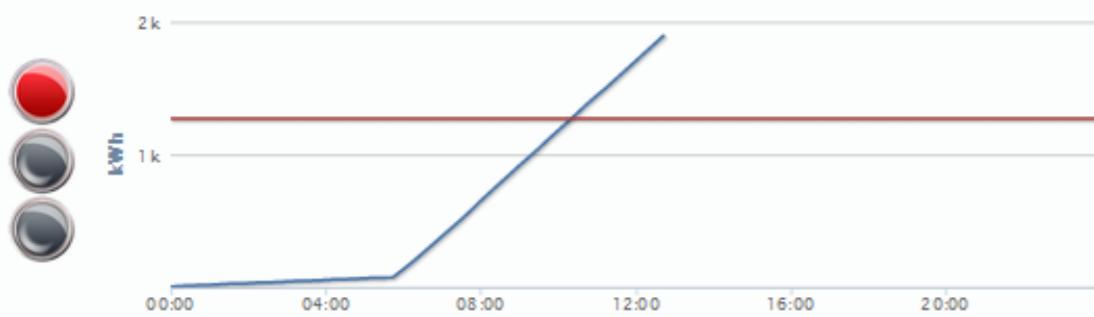
Main Incomer



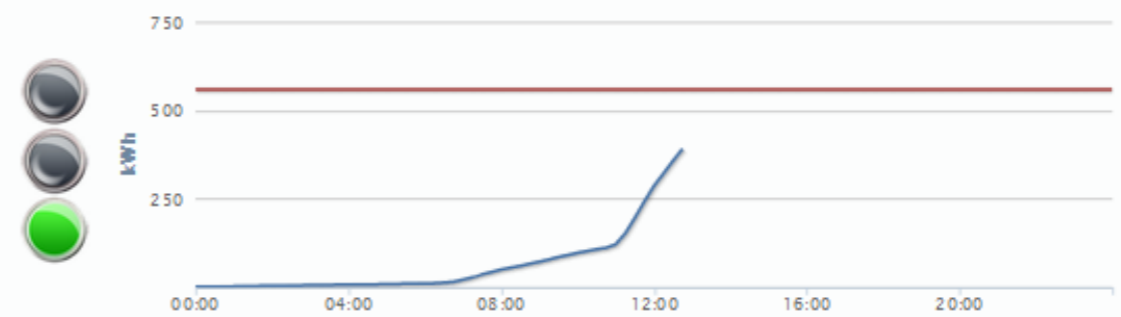
Water Mains



Production Line 1



Production Line 2



# AUTOMATED REPORTS

## Energy Cost Report

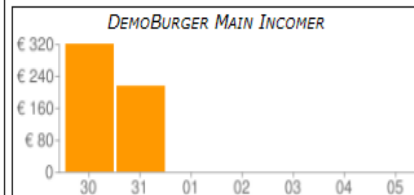
Funniff Demonstrator Ltd, Week 5, 2012 up to 0

### Site Costs Table

Site	Cost	Trend
DemoBurger	€538.42	75.63% saving on previous Week (€2,209.13)
Funniff Manufacturing	€2,094.75	51.07% saving on previous Week (€4,280.82)
Funniff Retail	€622.88	73.87% saving on previous Week (€2,383.79)



### Resource Costs



Item	Type	Usage	Cost
DemoBurger			
Oil	Oil	no tariff associated with this datasource	
DemoBurger Main Incomer	Electricity	3,746.88 kWh	€538.42
→ Kitchen	Electricity	334.10 kWh	€48.43
→ Bozos Sandwich Bar	Electricity	518.00 kWh	€75.07
Training	Electricity	726.10 kWh	€113.58
Funniff Manufacturing			

Item	Work	Out of Hours
<b>Boning Hall</b>		
Electricity	225 kWh	211 kWh
Tray Wash	1,099 L	300 L
45 Water	-16,868 L	4,993 L
<b>Chill</b>		
Electricity	4,247 kWh	5,912 kWh
<b>Cleaning Water</b>		
Cleaning Water	1,203 L	23,466 L
<b>Coldstore</b>		
Electricity	457 kWh	283 kWh
<b>Effluent</b>		
Electricity	457 kWh	283 kWh
<b>Kill Floor</b>		
Tripe	18,880 L	0 L
Feet	29,699 L	0 L
Electricity	589 kWh	199 kWh
82 Water	31,608 L	36,539 L
45 Water	23,097 L	1,100 L
<b>Lairage</b>		
Cold Water	15,725 L	10,901 L
Electricity	168 kWh	68 kWh

# SAVINGS How & Where They Are Achieved

- Targeting & reducing base loads
- Eliminating over-billing - Remove estimate readings
- Avoiding excess charges such as;
  - ✓ Breach of MIC
  - ✓ Excessively set MIC
  - ✓ Wattless power – Power Factor
- Tariff analysis
  - Understand impact
  - Procurement
- Involving the whole Organization (unlimited user access)
  - ✓ Energy Awareness Campaigns
  - ✓ Use of Public Displays/Dashboards
  - ✓ Changing Behavior
  - ✓ Apportioning Responsibility

100% Capital Allowance in year 1





# Case Study



## Hotel

### Fitzgerald Woodlands House Hotel & Spa

- Started metering
  - Mains, Kitchen, SPA, Leisure and Restaurant
- Expanded metering to all major Electric, Gas and Water

## Benefits

- Prior, usage was a once a month calculation Now energy use is reported immediately
- Full financial management
- 4 staff allocated energy responsibility
- Over 15% reduction in energy use
- €35,000 in dishwasher savings



*“ResourceKraft highlighted the many areas where we could make savings. While we cannot control utility prices, we can now control our use and the costs associated with that. It has raised energy awareness among staff throughout the whole hotel. I would recommend this system to any company that needs to address their energy consumption and hence reduce their energy costs’.*

**David Fitzgerald, General Manager, Woodlands Hotel, Adare, Co Limerick**

# Case Study

## Meat Processing Plants

Significant costs to business. Required to manage 6 sites in a large multi-national. Management agreed metrics and targets, required comprehensive suite of standard and customised reports:

- Production
- Site Comparison
- Temperature
- Cost analysis and reporting.
- Corporate Key Process Indicators (KPIs)

Deployed comprehensive metering and imported production data.

## Benefits

Ability to set targets and alarms, “deep dive” to line issues. Immediately identified water issues at all temperatures

- Up to 50% reduction in hot water use
- A complete return on investment within year 1 of installation
- On-going savings >10%



**Accelerated Capital Allowance (ACA)**



Received 100% capital allowances from ACA & ECA schemes



# Case Study



Management required information to action on energy costs  
Significant areas for savings were quickly identified and acted upon.  
Within six months Twohigs reduced its energy costs by 19% and its energy-related carbon emissions by 15%.

## Benefits

- Basic Refrigeration maintenance – Saving €4,090 p.a.
  - Reduced lighting for early morning shelf stacking. Light bulb & fitting changes – Saving €6,842 p.a.
  - Better management of air curtains – Saving of over €2,000 p.a.
  - Identifying and turning off appliances after hours – savings of €11,131 p.a.
-

# Case Study



## Bank of Ireland

- 320 sites
- €25M in Electricity, fuel and water
- Environmentally conscious
- Fully sub-contracted Facilities Management
- Out of Hours use the priority problem
- Erratic water charges
- Need “Delegation” to get things done
- No time - Non technical

## Deployment

- Installed over 4 months
- Security and IT approved Web hosting
- Retail branches, data centres, call centres & corporate

## Financial Benefits

- Over €1M reduction in Out-of Hours use
- €100,000's savings in waste water leaks
- Waste heating savings
- Reduced closure times
- Year 1 ROI of 92%



## Corporate Benefits

- Leading Group cost reduction step-change project
- Carbon Conformance
- Environmental Leadership
- ISO50001 conformance



*"It makes absolute business sense. ResourceKraft is delivering full control of energy and water costs, like ERP [Enterprise Resource Planning] does for our other business costs."* **Bernard Higgins Group Facilities Manager Bank of Ireland**



# SUMMARY

Energy Costs are 20% higher than UK

Measuring and managing will deliver savings at Net Zero cost

Less than 1 year Return on Investment

~15% saving

Management commitment and metrics

Works for others!





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## Real-Time Electricity Cost & User Reporting **SPECIAL OFFER:**

### Package Includes:

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- Self-install Main Meter connection
- Options for:
  - 2 control ports
  - Expansion port for additional metering and controls
- Software license and mobile charges for year 1
- Scheduled cost & consumption reporting
- On-line energy analytics
- Reports and dashboards
- Alerts and alarms
- On-line commissioning and tariff setup
- On-line training provided
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