

Case Study

Utility Reporting Tool

Situation:

In order to improve management of energy costs, Canada's largest airport needed to collect and archive energy usage data on a daily basis and automatically generate a daily report of energy consumption and cost.

Solution:

The existing Johnson Controls building management system already had available the raw electricity, gas, steam and water consumption data as monitored points. What was required was a reporting tool that would collect that data, calculate the energy consumption and cost and automatically deliver a daily report to designated recipients.

AFDtek applied its experience in building management systems, Microsoft .NET programming, Web Services, Crystal Reports and Data Base technologies to develop a reporting solution to meet the customer's requirements.

Key Features of the project:

- Raw data was read from the Johnson Controls system using the Johnson Controls Secure Web Services feature
- Consumption data was collected from all systems that consumed electricity, gas, steam or water – including the lawn sprinklers
- Total energy usage was calculated from the individual consumption data
- Energy costs were calculated based on customer input cost information – provision was made for future real-time downloading of cost data
- Daily consumption and cost data were stored in a Microsoft SQL database
- Daily Heating and Cooling Reports (in .PDF format) were automatically generated and e-mailed to designated individuals
- A secure web interface was provided for the user to configure report functions – user definitions, utility rate definitions, e-mail recipient definition, etc.
- A secure web interface was provided for the user to make manual requests for Daily, Weekly, Monthly or Yearly Heating/Cooling Reports (in .PDF format)
- Crystal Reports was used to define the report – this will facilitate future changes to the report or reuse of the reporting utility for other projects
- The reporting utility's data sources were defined in an editable configuration file – this will facilitate changes or additions to the data sources or reuse of the reporting utility for other projects

Project at a Glance

Client: Greater Toronto Airports Authority / Johnson Controls

Field: Energy Monitoring Industry

Location: Toronto

Project: Utility Reporting Tool

Date of Completion: February 2010

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Sample Reports generated by the Utility Reporting Tool

Daily Cooling Report			
For the day of:	09/23/2010	12:00am - 11:59pm	
Printed:	09/24/2010		
Electricity			
Total Consumption	24,678.80 KWH	CLGELEC	
Enersource	0.00 KWH		
Energy			
Cooling Energy Delivered	385.84 GJ		
Water			
Condenser Make-up	169.42 M3	FI0319	
Chilled Water Make-up	1.03 M3	FI0330	
Miscellaneous	0.00 M3		
City Water Consumption	187.01 M3	FI0551	
Irrigation	0.00 M3	FI0553	
Condenser Blowdown	9.10 M3	FI0303	
Outdoor Temperatures			
Average	15.62 Degree Celcius		
High	20.34 Degree Celcius		
Low	10.31 Degree Celcius		
Degree Days	0.00 Degree Celcius		
Cost Summary			
	Consumption	Price	Cost (\$)
Electricity	24,678.80 KWH	0.08	1,974.30
Condenser Make-up Water	169.42 M3	1.0196	172.74
Chilled Water Make-up Water	1.03 M3	1.0196	1.05
Miscellaneous Water	0.00 M3	1	0.00
		Total Operating Cost :	2,148.09
Irrigation Water	0.00 M3	1.0196	0.00
Condenser Blowdown Water	9.10 M3	1.0196	9.28

Sample Reports generated by the Utility Reporting Tool

Daily Heating Report

For the day of: 09/23/2010 12:00am - 11:59pm
 Printed: 09/24/2010

Boiler

	SG1	SG2	SG3	SG4	Total	Enbridge Meter	COGEN
Gas(M3)	0.00	83.56	0.00	0.00	83.56	878.00	39,179.00
	FIC1142	FIC2142	FIC3142	FIC4142			KG
Oil(KG)	0.00	0.00	0.00	0.00	0.00		
	FIC1143	FIC2143	FIC3143	FIC4143			
Steam (KG)	0.00	102.59	0.00	152.23	254.81		
	LIC1113	LIC2113	LIC3113	LIC4113			
Input Energy(GJ)	0.00	3.18	0.00	0.00	99.39	Total Input Energy(GJ)= SG1+SG2+SG3+SG4+COGEN + Total Electricity Consumption	
Output Energy(GJ)	0.00	0.20	0.00	0.30	0.51		
Efficiency (%)	0.00	6.43	0.00	0.00	4.26		

Electricity

Total Consumption 1,368.19 KWH HTGELEC
 Enersource 0.00 KWH

Energy

Heating Energy Delivered 4.23 GJ

Water

Deaerator Make-up 0.00 M3 FIX119
 Hot Water Make-up 5.53 M3 FI0220
 Miscellaneous 0.00 M3
 City Water Consumption 187.01 M3 FI0551

Outdoor Temperatures

Average 15.62 Degree Celcius
 High 20.34 Degree Celcius
 Low 10.31 Degree Celcius
 Degree Days 0.00 Degree Celcius

Cost Summary

	Consumption	Price (\$)	Cost (\$)
Gas	878.00 M3	0.45	395.10
Oil	0.00 KG	0.98	0.00
Electricity	1,368.19 KWH	0.08	109.46
Deaerator Make-up	0.00 M3	1	0.00
Hot Water Make-up	5.53 M3	1	5.53
Miscellaneous Water	0.00 M3	1	0.00
Total Operating Cost :			510.09