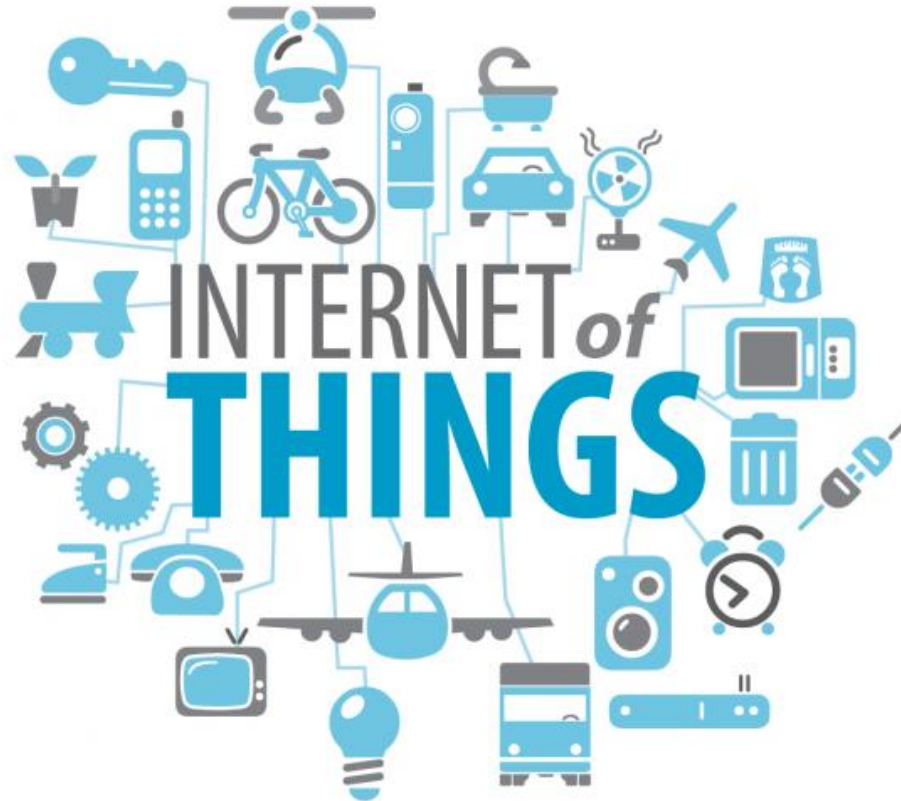


# District Energy and the Industrial IoT

## Benefits of a Connected System



**Presented by:**

Adam Strynadka  
*Managing Director*  
DeviceLynk

# What is the Industrial Internet of Things?

The Internet of Things (IoT) can best be described as connecting objects to the internet in order to collect and exchange data and create new informational value.

The basic concepts behind the IoT initiative involve the thousands of devices that already and will soon exist in the world that are connected to the internet to facilitate data exchange to drive visualization, optimization and autonomy of those devices.

Applying IoT technology to industry, the Industrial Internet of Things (IIoT) is the next evolution of existing technologies, but now taking advantage of lower cost connectivity, cloud and mobile capabilities.

# What is the Industrial Internet of Things?

## Today



# What is the Industrial Internet of Things?

## Vision

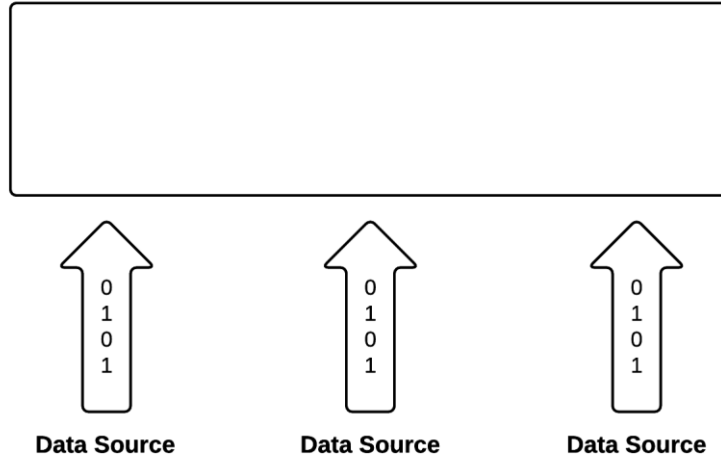


# What is the Industrial Internet of Things?

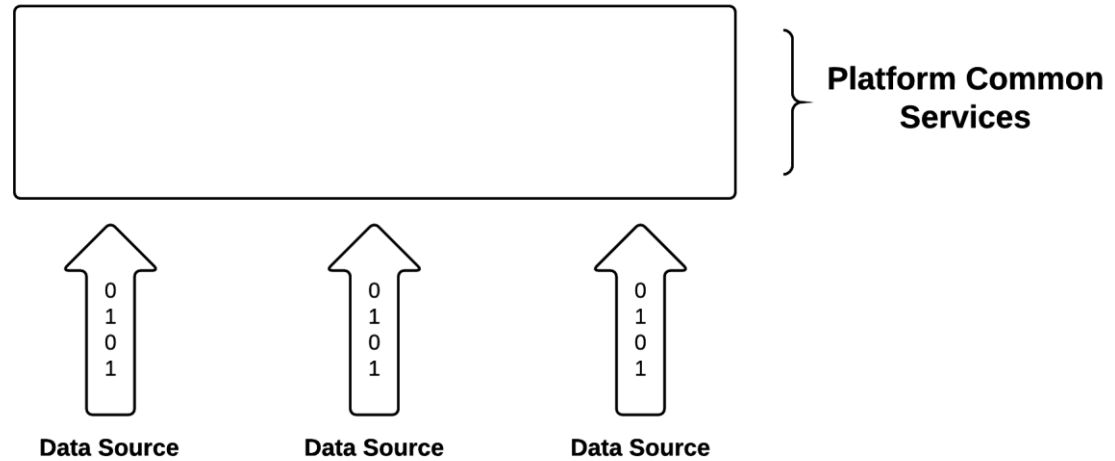
## Vision



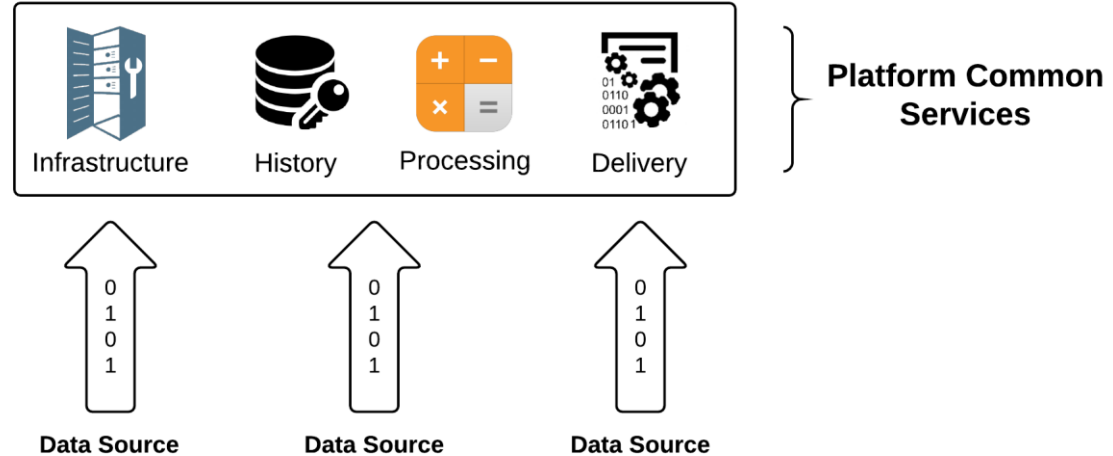
# Platform Concept



# Platform Concept

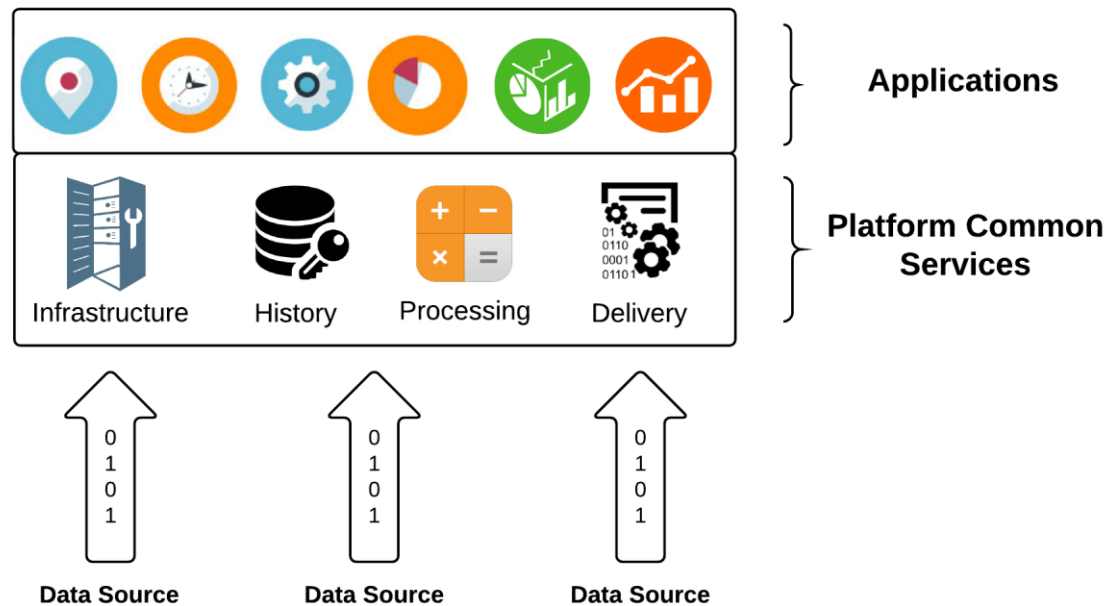


# Platform Concept

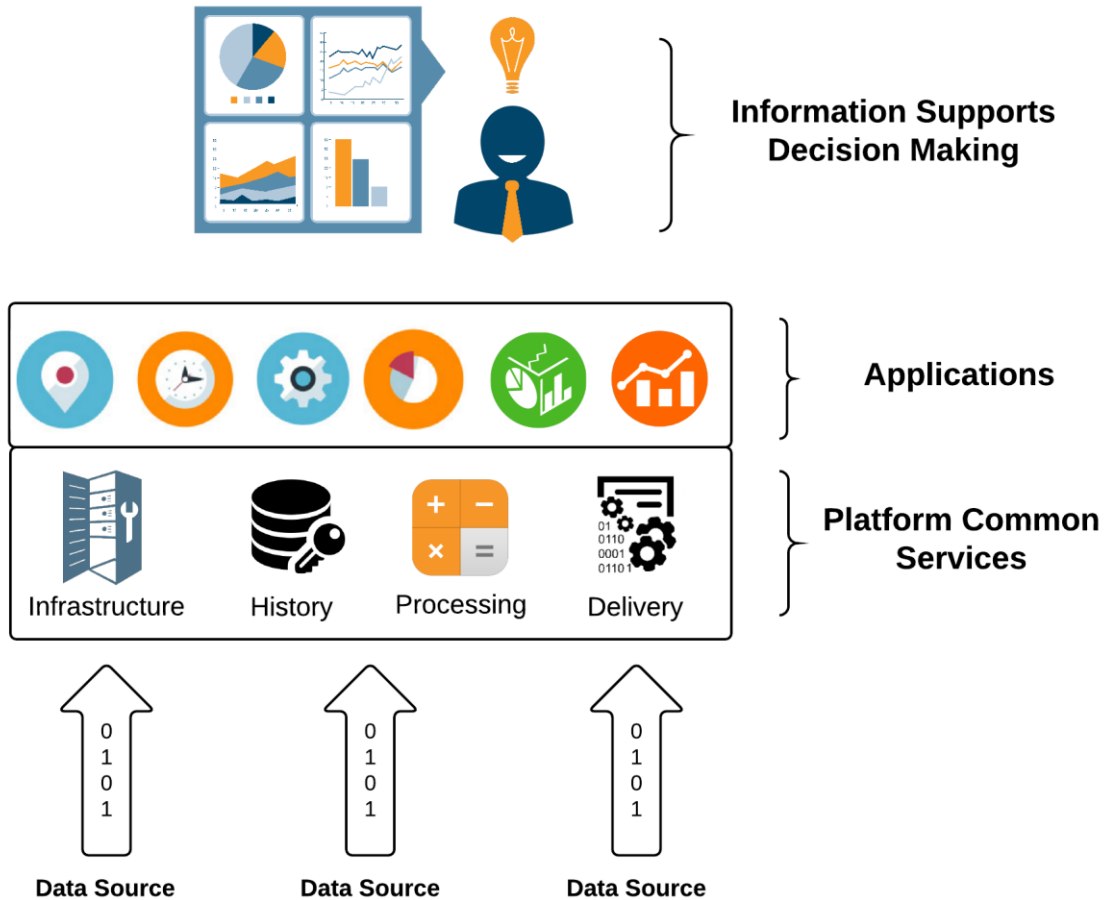




# Platform Concept



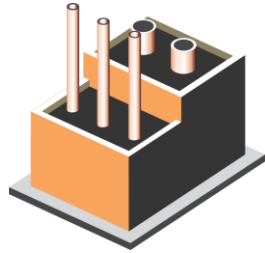
# Platform Concept



# Benefits of Platforms

- Low-cost access to reliable shared infrastructure
- Provide customers access to operations data without risk
- Ability to tie in additional data-sources (sensors, building system, meta-data of other similar buildings, etc.) to create comprehensive overview
- Access to “app-store” functionality for advanced functions like energy optimization and machine learning for predicting failures
- Value of community “Meta-Data”

# Benefits of Connected Systems



## Generation Facility

- View key plant data outside the control room without affecting production
- Remote assistance for inexperienced operators with unique and challenging situations



## Customer (building operator)

- Understand energy usage and invoicing
- Relate external data to usage (like weather data)
- Integrate building automation system (BAS) data into a single dashboard



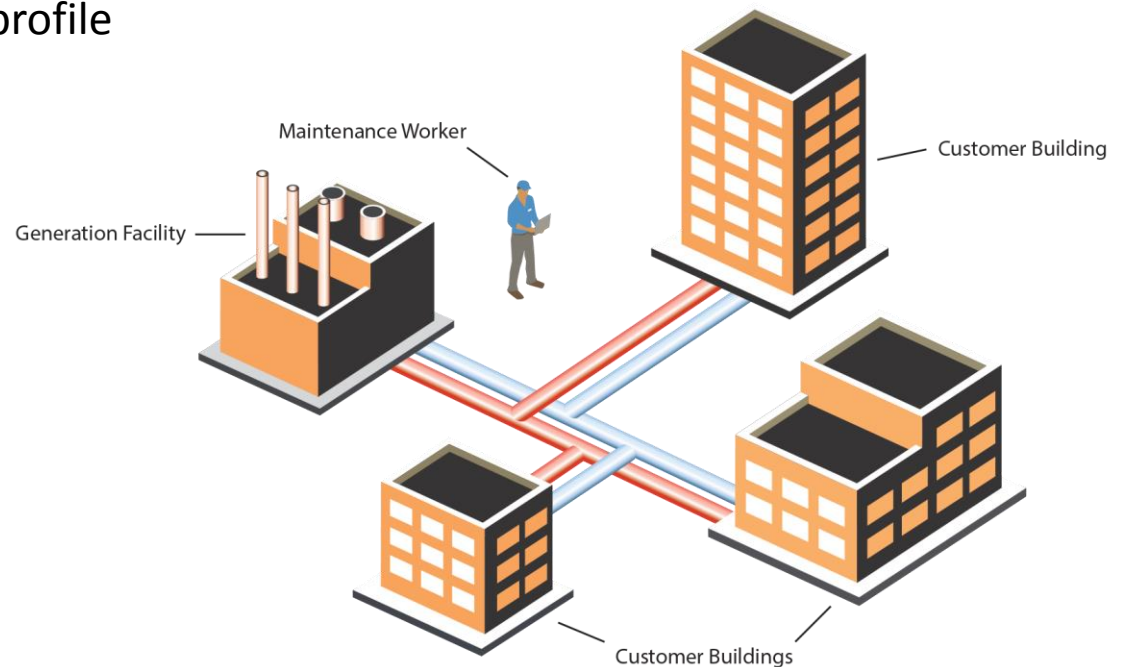
## Mobile Worker

- Save time and money by automating meter-reads
- Have access to customer operations data any-time, anywhere.

# Benefits of Connected Systems

## District Energy System Operator

- Improve accuracy and timeliness of billing
- Assist customers develop energy saving strategy
- Provide customers access to real-time and historical operations data without a security risk
- Incorporation of 'meta-data' allows customers to rank themselves against others of their same profile



# Case Study:

## Sheraton Wall Centre – Vancouver Canada



# **Problem Set and Requirements**

## **1. Customer Retention**

- Detailed explanation of monthly bill
- Information enables customers to make smart, energy saving investments

## **2. Automated Data Collection (Meter Reading)**

- Enhance existing infrastructure

## **3. Tie in Building Automation System system of customer**

## **4. Integration with District Energy provider's billing software**

## **5. Customer portal for real-time viewing**



# Parties Involved in Project

**Creative Energy** – District Energy Provider

**Sheraton Wall Centre** - Customer

**Kerr Controls** – Electrical and Controls Contractor

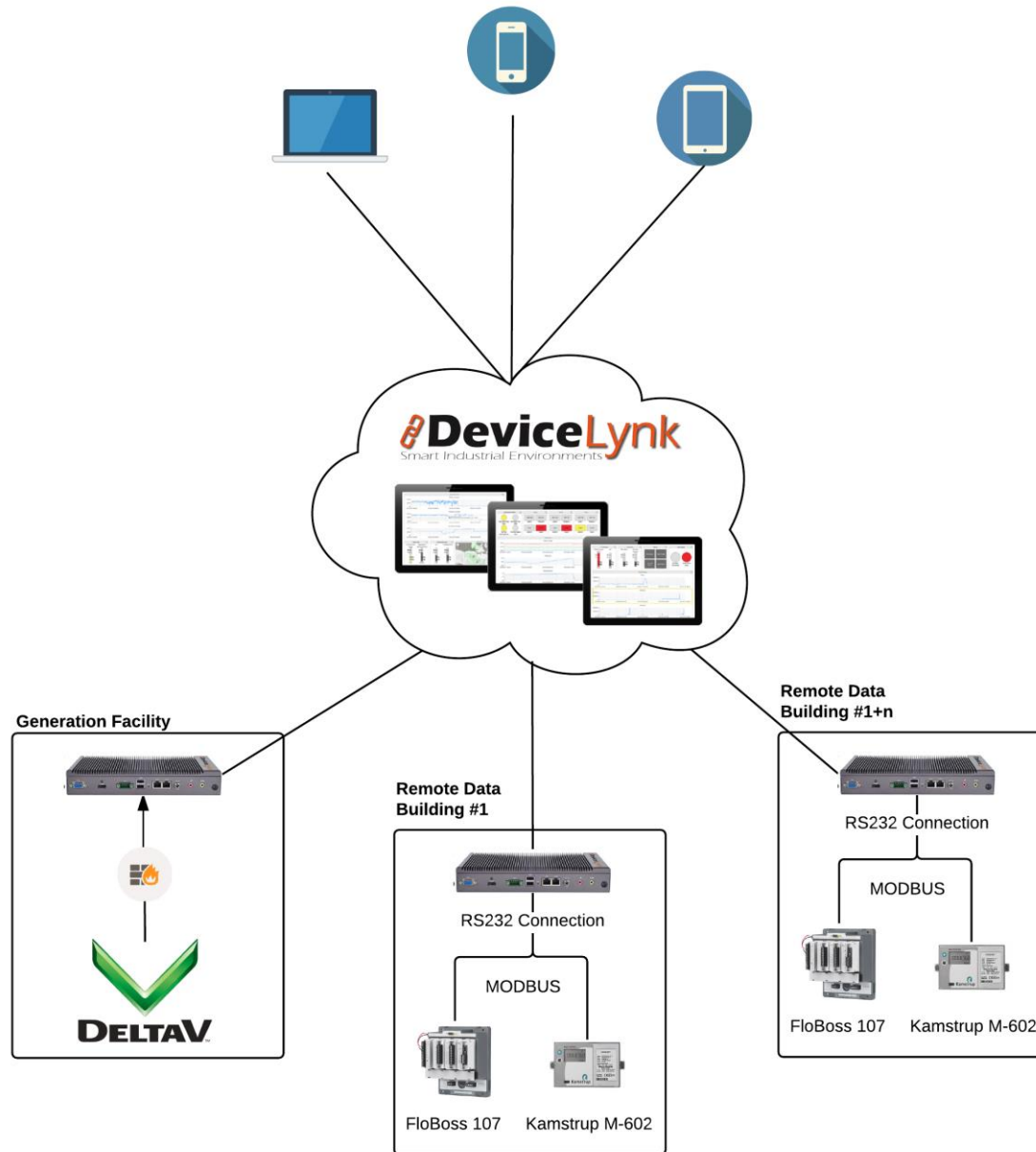
**Spartan Controls** – Hardware Supplier

**DeviceLynk** – Solution Vendor





# Architecture Diagram



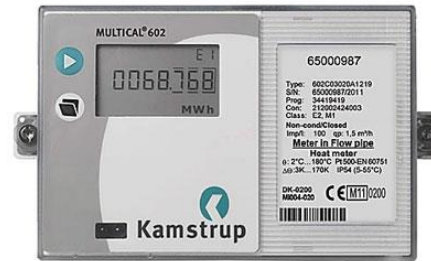
# CREATIVENERGY

## General Tags:

Outdoor Air Temp  
Supply Water Setpoint

## Energy:

Energy Consumption  
Accumulated Product  
Water Consumed  
Operating Hours  
Supply Water Temp  
Return Water Temp  
Energy Differential



Kamstrup M-602



FloBoss 107

## Current Usage:

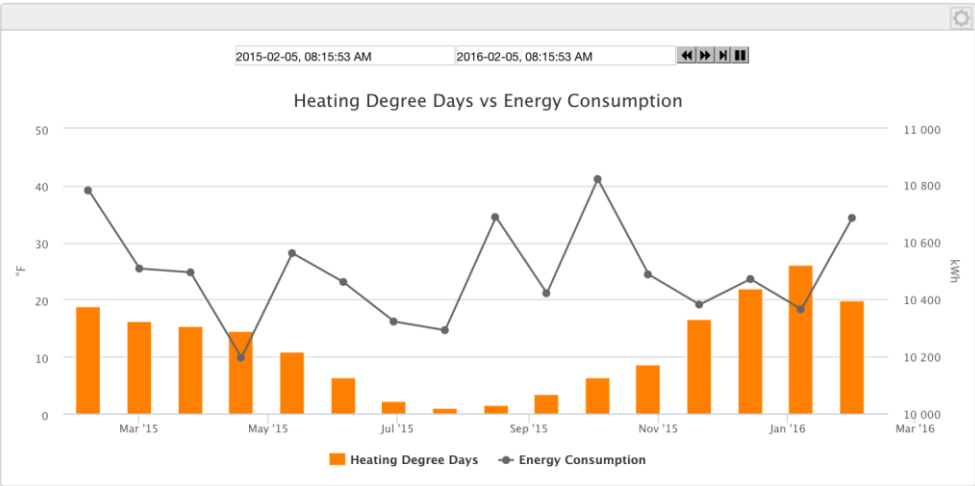
Energy Supply  
Water Valve Position  
Current Flow 1  
Current Flow 2  
Total Flow 1  
Total Flow 2

## Other:

Tariff TA2  
Tariff TA3  
Info Code  
Customer Number

Time	Flow 1	Flow 2	Total Flow	Energy	Temp	Valve	Info	Code	Customer
1/1/2011 00:00	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 00:05	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 00:10	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 00:15	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 00:20	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 00:25	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 00:30	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 00:35	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 00:40	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 00:45	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 00:50	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 00:55	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 01:00	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 01:05	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 01:10	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 01:15	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 01:20	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 01:25	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 01:30	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 01:35	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 01:40	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 01:45	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 01:50	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 01:55	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 02:00	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 02:05	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 02:10	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 02:15	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 02:20	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 02:25	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 02:30	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 02:35	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 02:40	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 02:45	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 02:50	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 02:55	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 03:00	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 03:05	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 03:10	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 03:15	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 03:20	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 03:25	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 03:30	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 03:35	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 03:40	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 03:45	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 03:50	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 03:55	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 04:00	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 04:05	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 04:10	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 04:15	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 04:20	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 04:25	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 04:30	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 04:35	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 04:40	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 04:45	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 04:50	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 04:55	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 05:00	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 05:05	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 05:10	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 05:15	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 05:20	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 05:25	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 05:30	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 05:35	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 05:40	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 05:45	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 05:50	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 05:55	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 06:00	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 06:05	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 06:10	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 06:15	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 06:20	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 06:25	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 06:30	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 06:35	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 06:40	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 06:45	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 06:50	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 06:55	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 07:00	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 07:05	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 07:10	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 07:15	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 07:20	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 07:25	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 07:30	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 07:35	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 07:40	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 07:45	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 07:50	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 07:55	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 08:00	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 08:05	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 08:10	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 08:15	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 08:20	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 08:25	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 08:30	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 08:35	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 08:40	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 08:45	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 08:50	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 08:55	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 09:00	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 09:05	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 09:10	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 09:15	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 09:20	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 09:25	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 09:30	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 09:35	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 09:40	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 09:45	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 09:50	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 09:55	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 10:00	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 10:05	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 10:10	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 10:15	0.00	0.00	0.00	0.00	18.0	0	TA2	1234	1234
1/1/2011 10:20	0.00	0.00</							

# Dashboard Images / Gadgets Deployed



# Customer Portal

Long-term sustainability ✓

---

Robust, reliable system ✓

---

Regulated by the BC Utilities Commission ✓

---

24/7 monitoring for peace of mind ✓

---

**Monitor your energy consumption in real time** ✓

---

**Understand your *Energy Profile*** ✓

Creative Energy is pioneering a real-time metering infrastructure that enables customer's to view their energy usage and access an '*Energy Profile*'.



# Scalable



# Industrial IoT and DeviceLynk

- PO to delivered system in less than 30-days
- Retrofit and modernize existing system
- SaaS model for application deployment on reliable inexpensive infrastructure
- Extension of customer's business



**Questions?**

