



***TRIACTA***  
SIMPLE SMART GREEN®

**Intelligent Buildings in an  
Intelligent Grid**

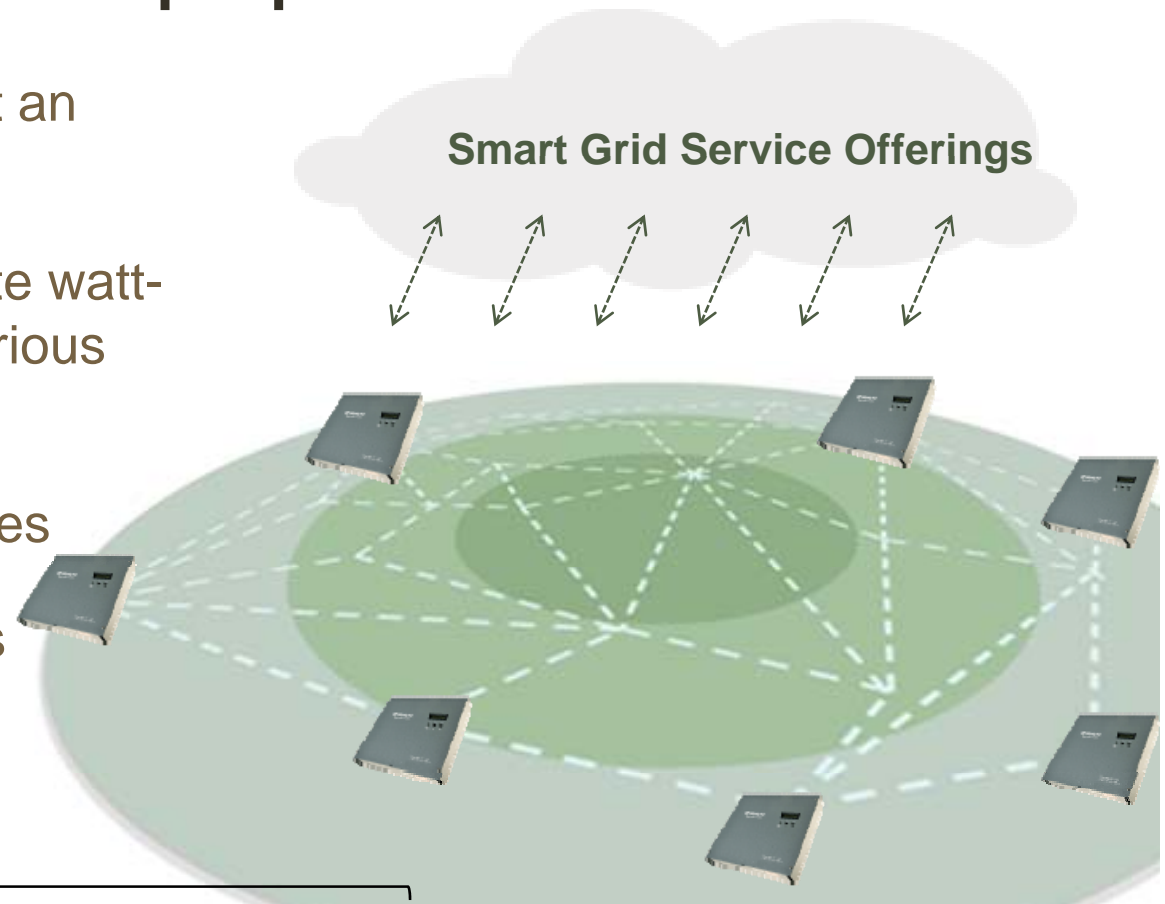
**IEEE Ottawa  
Sept 10<sup>th</sup> 2010**

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# A Smarter Electricity Grid – “different things to different people”



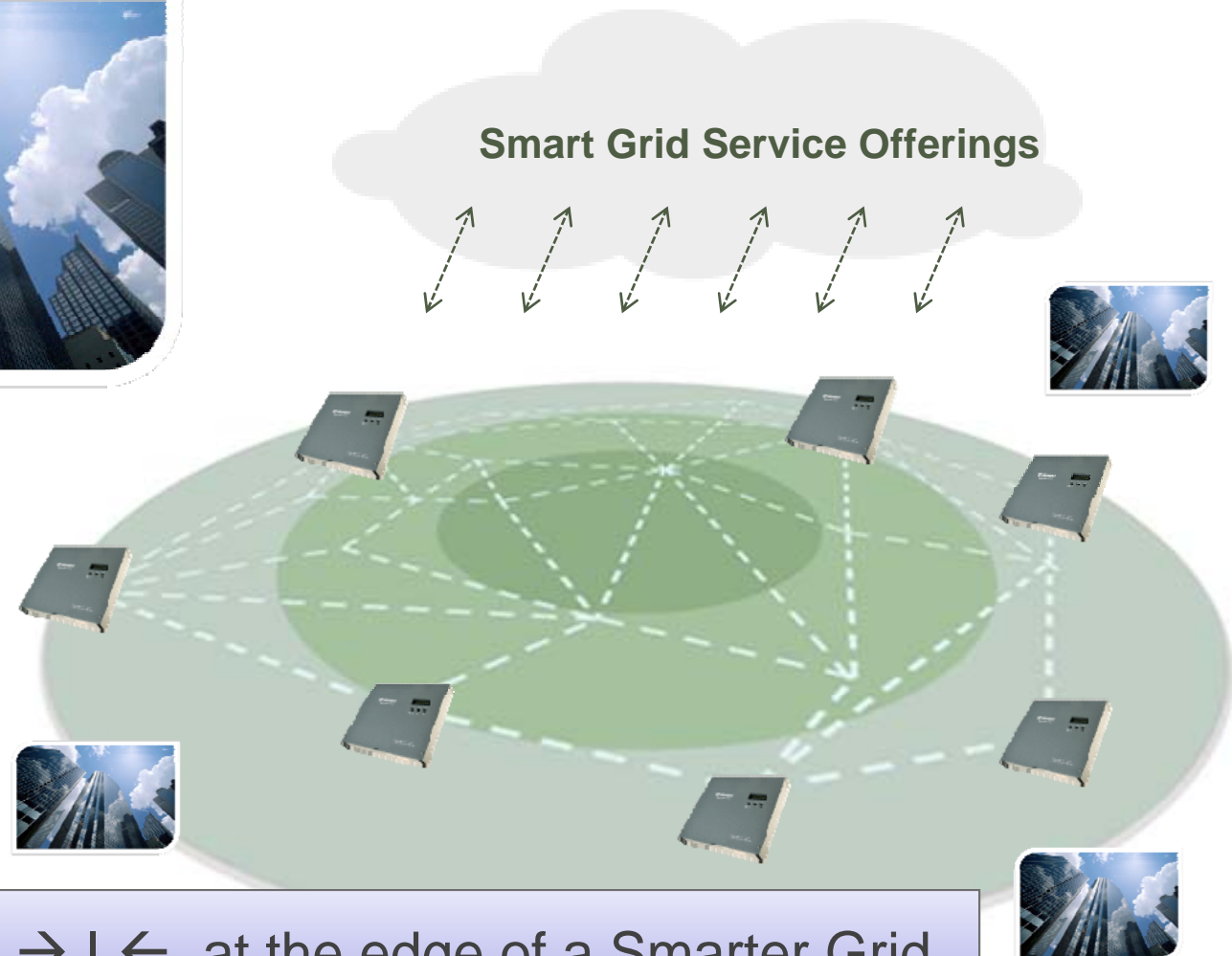
- Electricity grid no longer just an energy broadcast system
- The *Energy Internet* will route watt-hours to various users at various times
- Watt-hours will have attributes
- New Business Opportunities from a Smarter Grid



## Energy Packet

00:15, Nov 10, 09	Hydro1	Customer # 1	0.54 CO <sub>2</sub> e t/Wh	45 Wh	00:30, Nov 10, 09	Bullfrog Power	Customer # 2
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# Triacta - at the Edge



In the building → | ← at the edge of a Smarter Grid

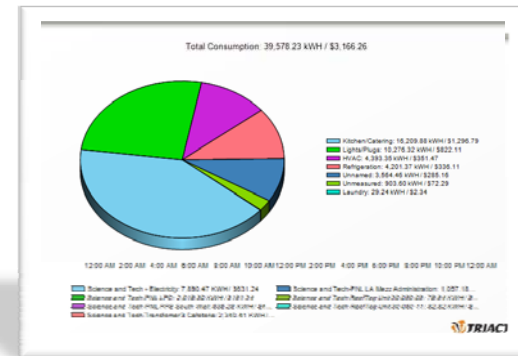
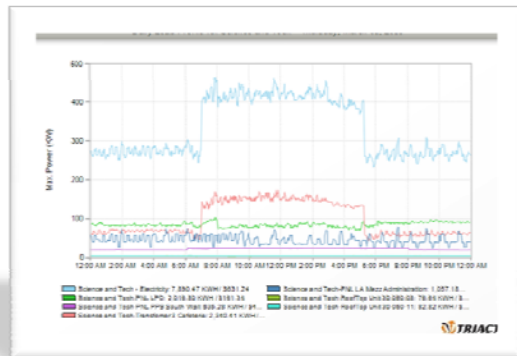
# What We Sell



Triacta provides “networked meter points” and value-added software to offer smarter services off a smarter grid

## Main Markets

- Multi-tenant SMART metering
- Intelligent Building infrastructure (SMART Buildings)



# Why More Intelligent Buildings



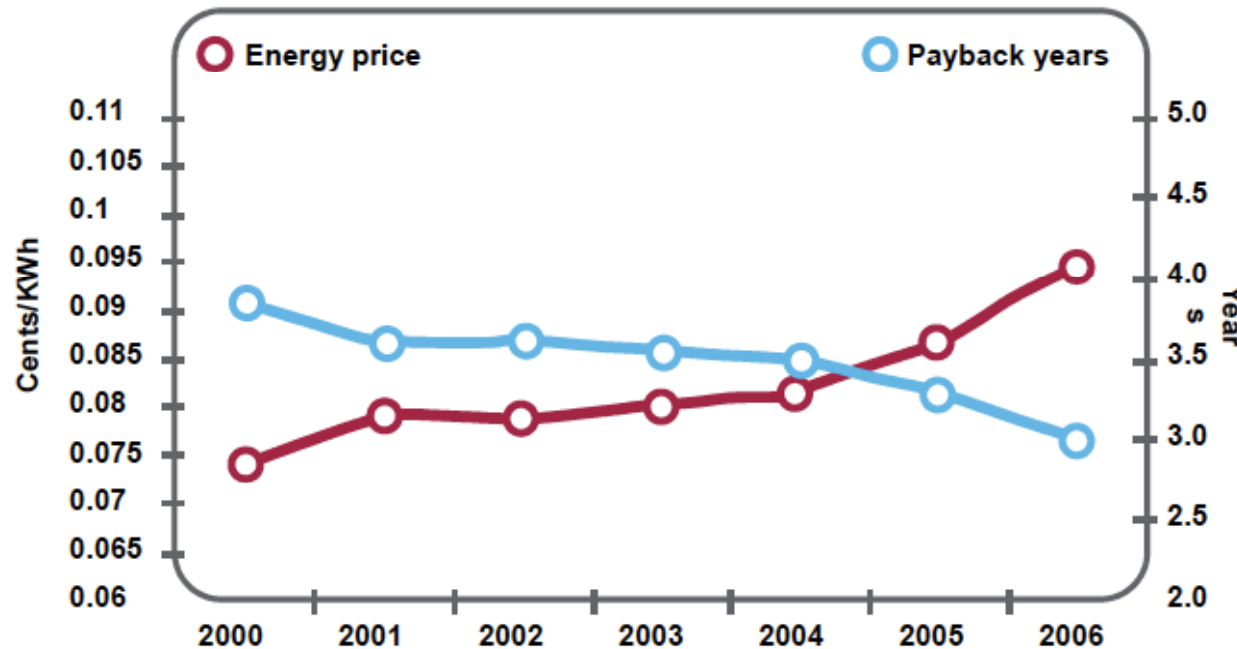
	2008	2001	2000	1995	1990	Increase
Total Income	23.56	\$24.03	\$22.72	\$19.33	\$17.26	Since 1990
Cleaning	1.43	1.2	1.17	1.2	1.15	0.28
Repairs & Maintenance	1.8	1.45	1.37	1.55	1.38	0.42
Utilities	2.42	2	1.86	1.87	1.84	0.58
Roads, Grounds & Security	0.95	0.71	0.68	0.61	0.5	0.45
Administrative	1.38	1.28	1.18	1.12	0.9	0.48
Tax and Insurance	<u>3.89</u>	<u>3.2</u>	<u>3.14</u>	<u>2.98</u>	<u>2.84</u>	<u>1.05</u>
Total Expenses	11.87	\$9.84	\$9.40	\$9.33	\$8.61	3.26
Net Operating Income	11.69	\$14.19	\$13.32	\$10.00	\$8.65	

**Income and expenses per square foot of the average office building**

2008 BOMA Experience Exchange Report, All Buildings

Energy costs are the largest and fastest growing facility cost behind tax and insurance

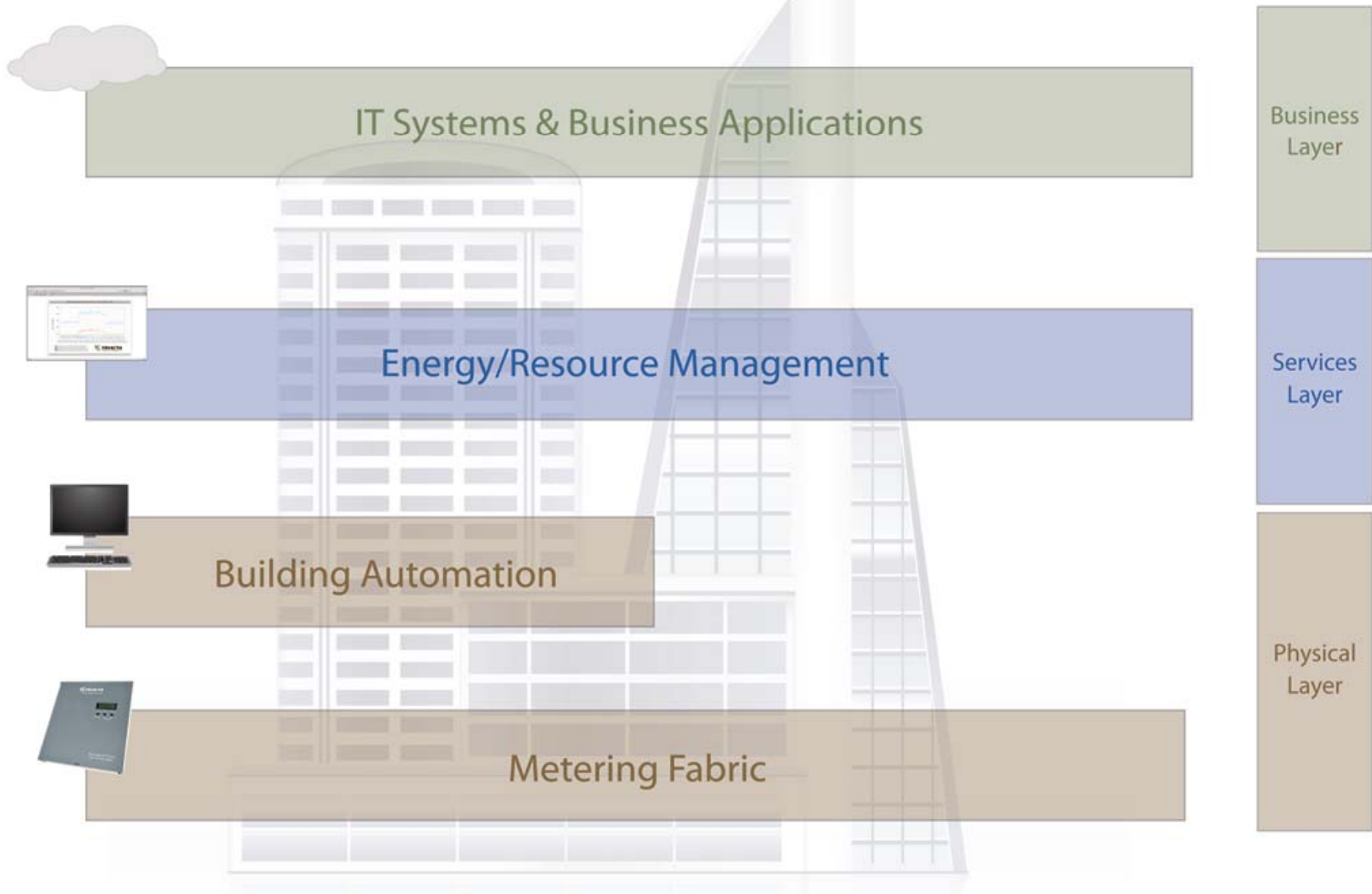
# Pay-Back Time Decreasing



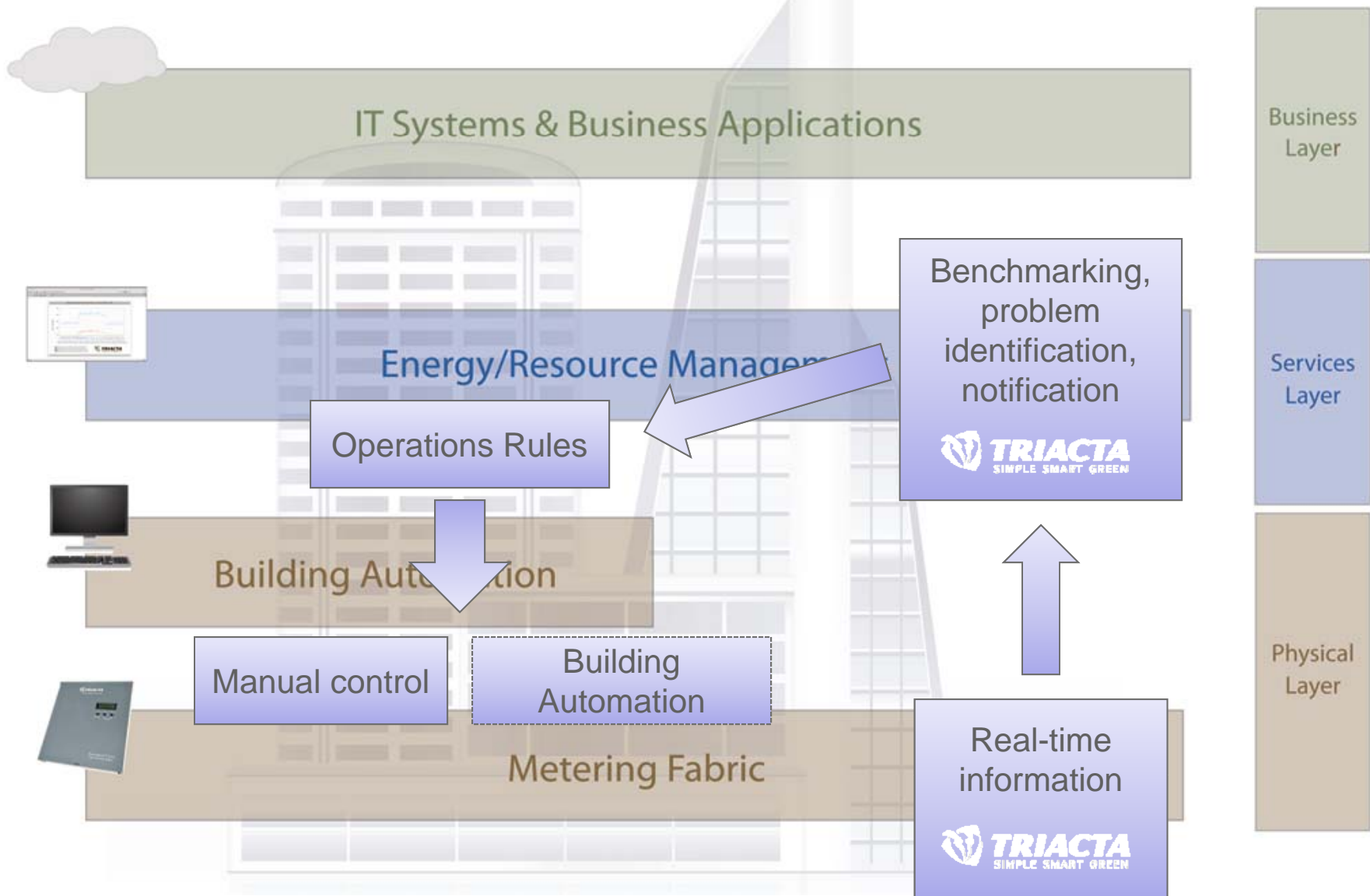
Payback time has decreased 30% over 5 years due to increase in energy prices

- Example based on a US commercial building project
- DOE -US Average Retail Cost of Electricity 1993 thru 2007

# The Intelligent Building – What Is It?

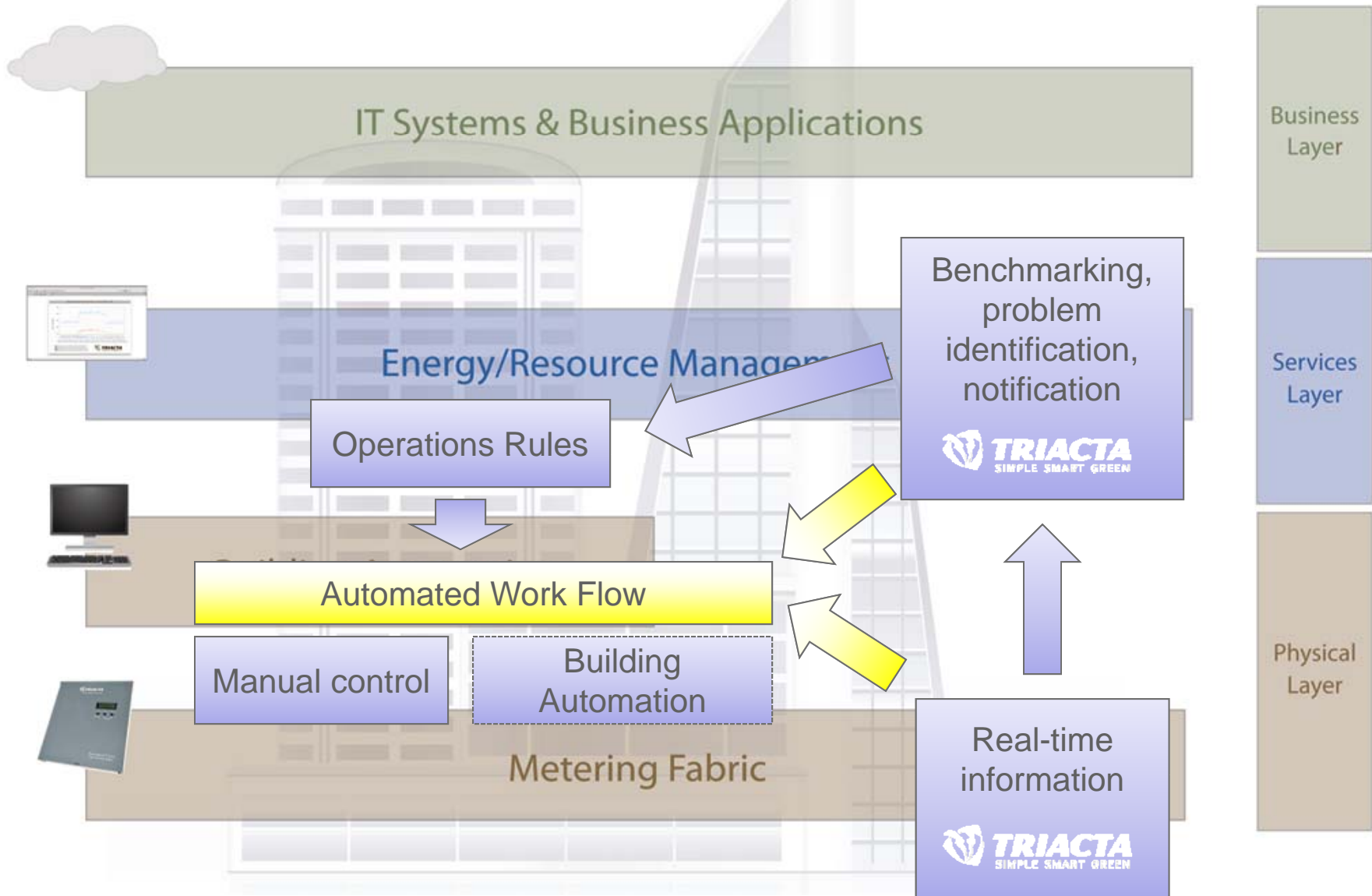


# The Intelligent Building — 1<sup>st</sup> Phase





# The Intelligent Building — 2<sup>nd</sup> Phase



# Phase 2 – Energy Awareness

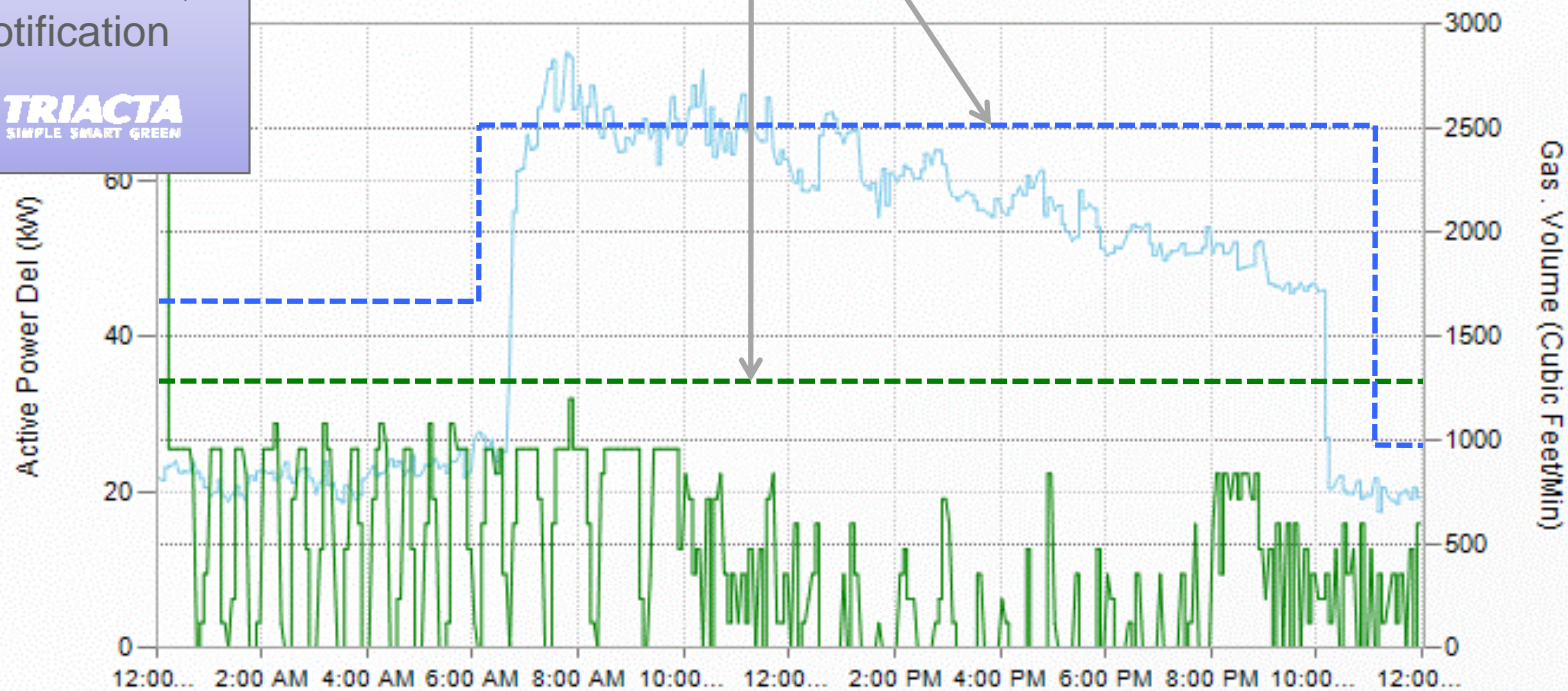
## Implementation of Target Curves



Benchmarking,  
problem  
identification,  
notification



Daily Load Profile for **Building X** – Tuesday, March 16, 2010



Active Power Del - : 1,107.42 kWh  
Gas Volume - : 10,144.00 Cubic Feet



# Phase 2– Energy Awareness Alarms via PowerHawk Mgr



Powered by Triacta Power Technologies Inc.

Reports Configuration Logout Help

Meter Management Dashboard

Start Date: April 5, 2010

End Date: April 5, 2010

Refresh

Active Units: 22 -- Active Metering Points: 166

- KRP
  - 303 Terry Fox Dr
  - 340 Terry Fox Drive
  - 349 Terry Fox Dr.
  - 350 Terry Fox Dr.
  - 362 Terry Fox Dr.

Meterpoints with excessive wh consumption 2 - 1.20 %

Meterpoints with excessive litres consumption 1 - 0.60 %



Benchmarking,  
problem  
identification,  
notification



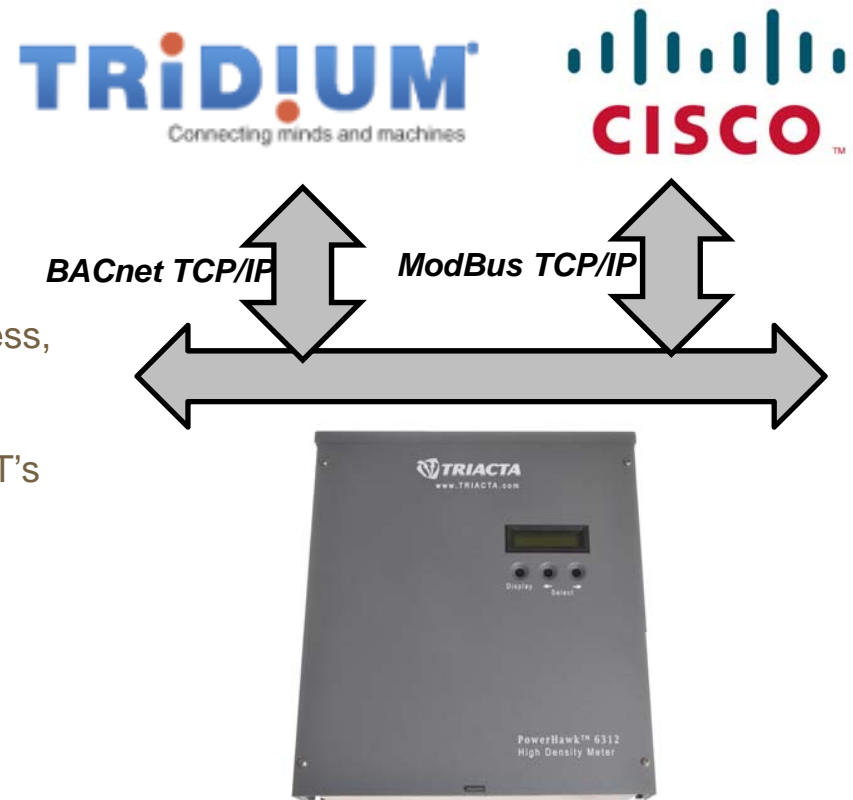
Consumption outside set operating limits are coloured ‘

# Phase 2- BAS Integration

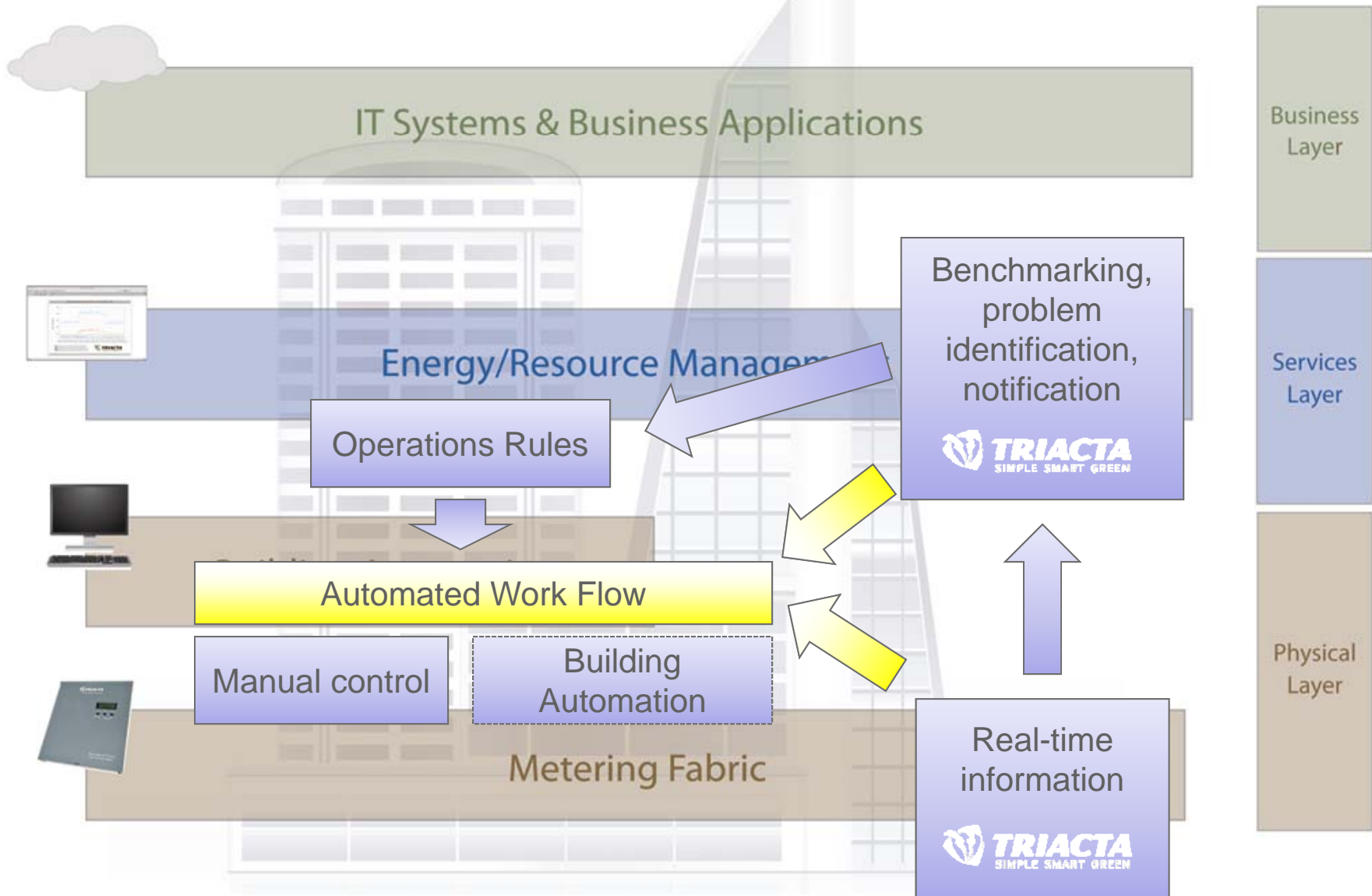


## PowerHawk 6X12 - Watt-Hour & VAR-Hour Metering

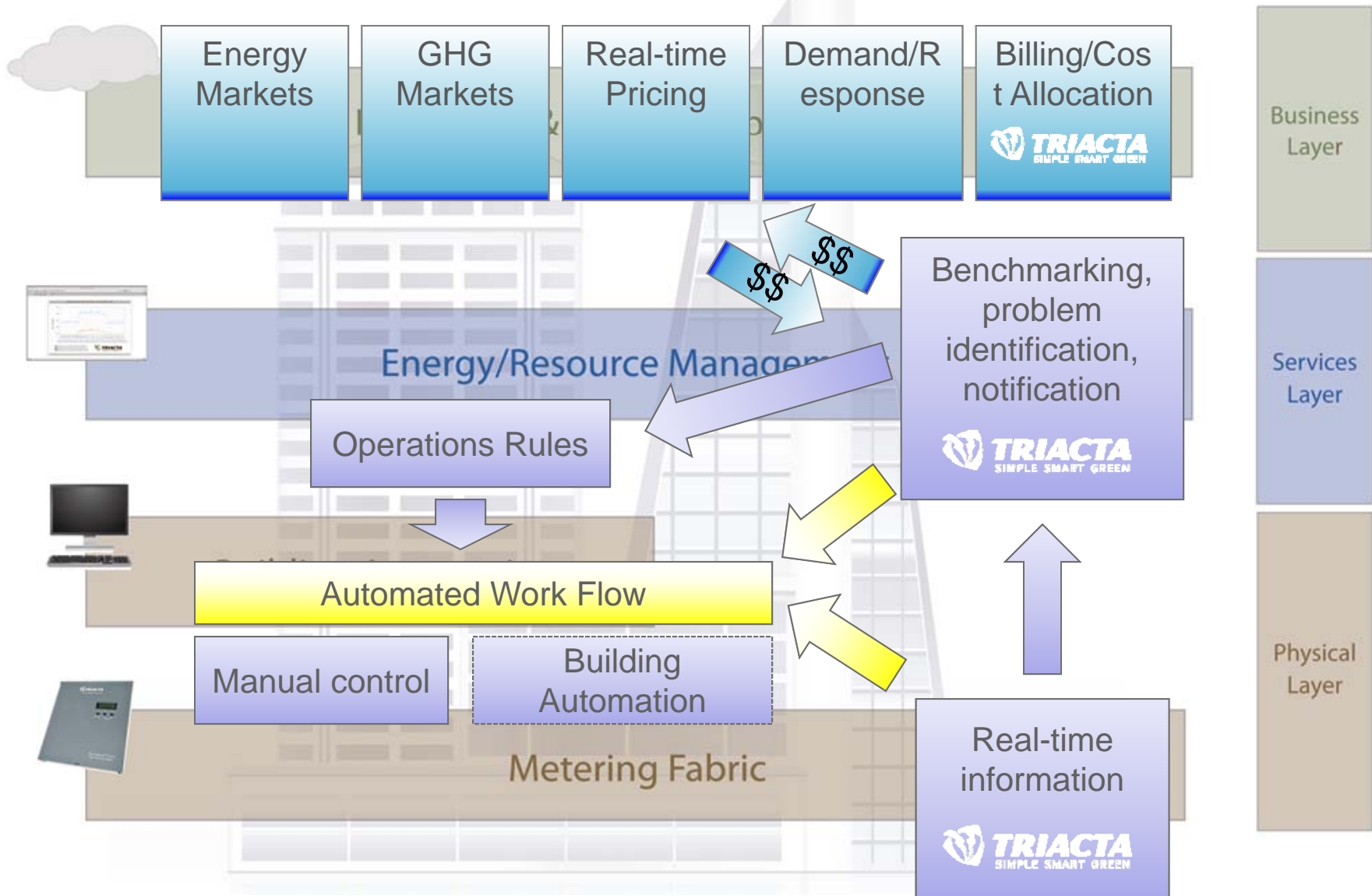
- 8-24 meter points (24 CT's total)
- Wh, VARh, VAh, W, VAR, VA, V,I
- Programmable Interval data
  - 1min. to 60 min.
- Native Ethernet,
- **ModBus TCP/IP**
- **BACnet TCP/IP**
- **2 Pulse Inputs (Gas/Water Meters)**
- Modem Module, RS-232
- Expanded Socket Modem Position for Wireless, PLC integration(future)
- S/W Configurable (remote or local)
- 120/240V, 240/416V - higher with external PT's
- Measurement Canada Approved
- 50/60 Hz
- 1Ph,2Ph & 3Ph Applications
- -40 to +70°C
- mV, mA or 5A CT's Native



# The Intelligent Building — 2<sup>nd</sup> Phase



# The Intelligent Building — 3<sup>rd</sup> Phase

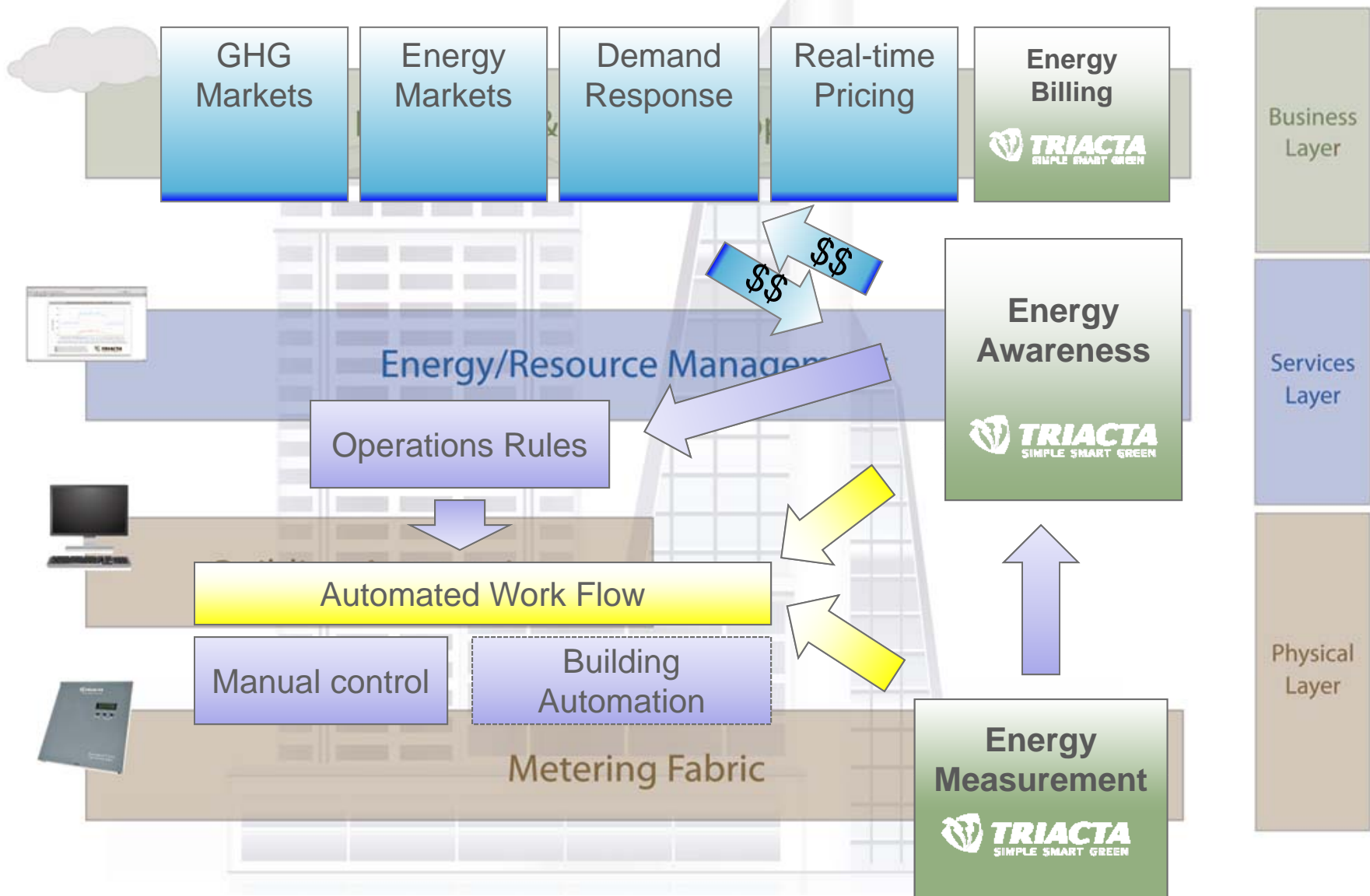


# Why Executives will Care



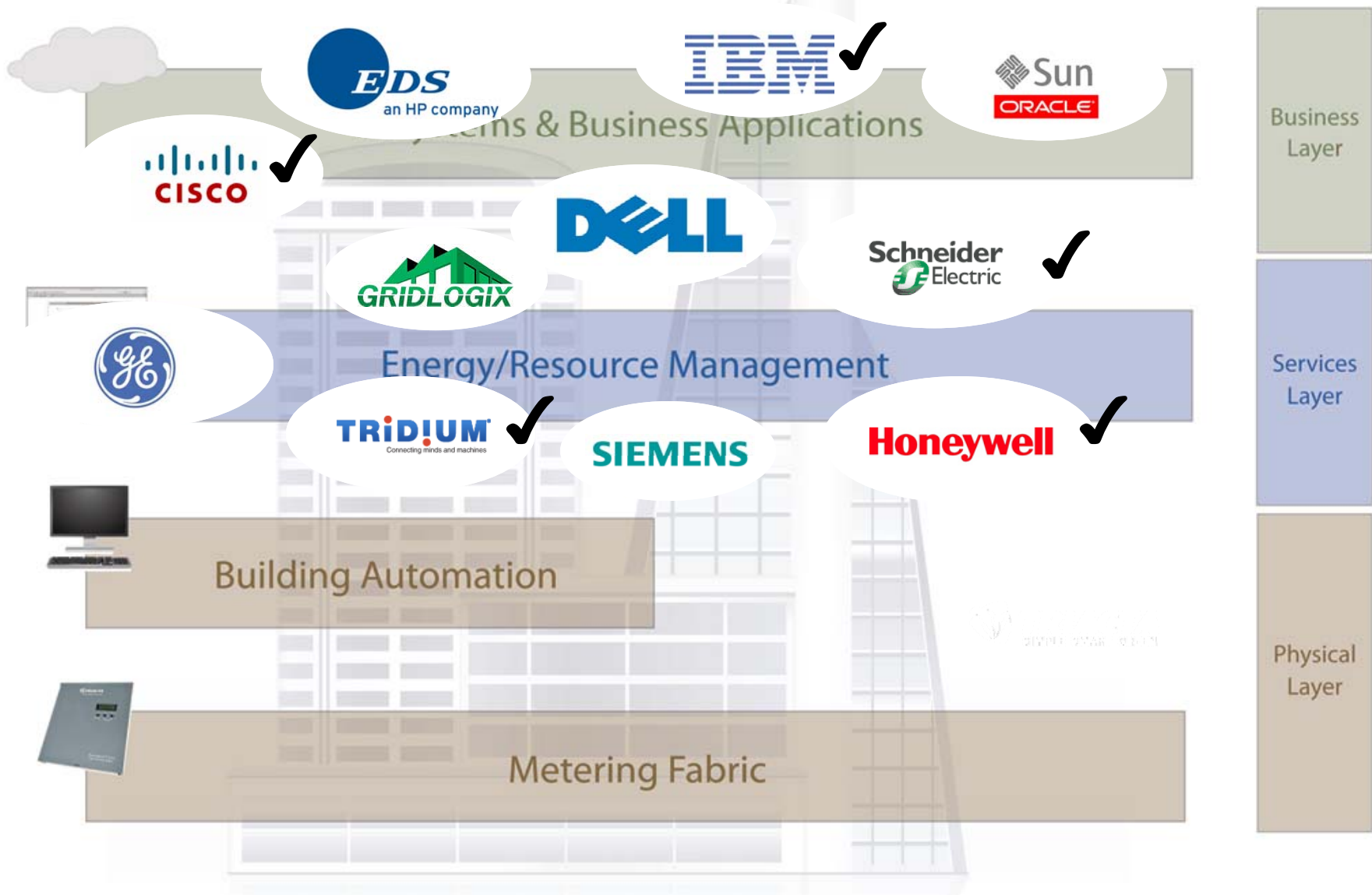
- Energy “visibility” will be a must have for mgmt
- CEO’s/CFO’s will need to know their carbon footprint
- Energy legislation/mandates will be widespread and enforced
- Continuous Commissioning will be widespread

# Triacta – a Unique Vantage Point





# The Intelligent Building — The Players



# The Intelligent Building — The Players



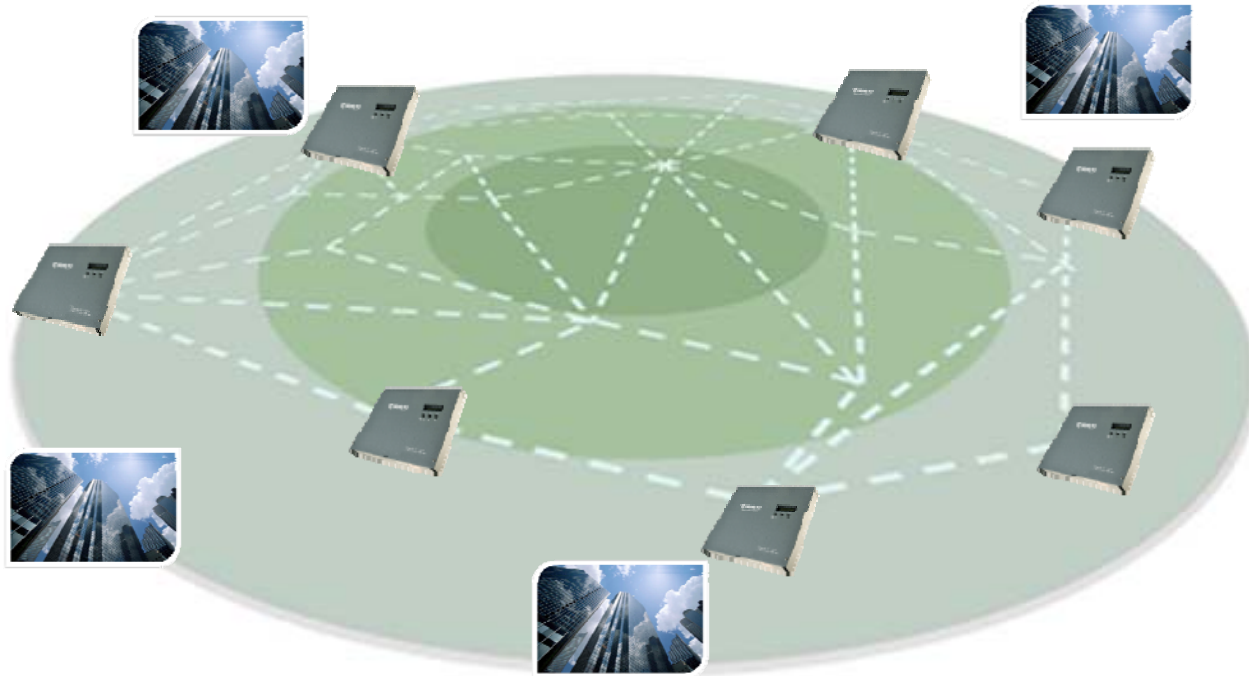
# Why Cisco and others care



- US Building stock of 4.4 million non-residential in 2008
- Buildings constructed after 1970 consume significantly more energy/sq. ft as compared to older buildings. These comprise of 60% of building stock
- Sectors with highest retrofit opportunity are education and office (about 50% of all retrofit activity)
- Retrofit activity expected to increase over 10-15 years after major legislative, competitive drivers force building owners to engage in retrofit projects to address climate change

Source McGraw-Hill Construction, Dec 2009: Green Building Retrofit & Renovatio

# The next large network build-out is happening today





**Thank You**

**Wes Biggs**

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