

Comprehensive Building Retrofit Solutions Provide Opportunities for Growth in a Chal- lenging Economic Climate

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Summary

Smart grid development is pointless if the aging building infrastructure in the US isn't updated too. Bringing digital control to old pneumatic systems while minimizing costs and downtime is essential to the success of the smart grid and BA suppliers alike.

Lately there has been a lot of talk surrounding the smart grid in the United States and many people believe the smart grid will revolutionize electric energy distribution and help usher in "smart buildings" and eventually "smart cities." However, estimates suggest that as much as 70 percent of existing buildings in the United States still rely on old pneumatic HVAC systems and there are approximately 60 million pneumatic thermostats still in use today. If left in their current state, these buildings will not be able to leverage the advantages of the smart grid nor any other benefits associated with a digital control system, and a smart grid is useless if the majority of buildings cannot communicate with it.

The adoption of internet communication standards and web services in the building automation market extends the concept of smart buildings by enabling intelligent analysis of building data. In sharp contrast to traditional pneumatic HVAC solutions, new digital solutions provide facilities managers the tools to perform sophisticated analysis of building data to expose inefficiencies and optimize energy consumption. Recognizing the need for increasing business intelligence and the heightened focus on energy data, more HVAC controls suppliers are now focusing on providing these capabilities. The goal is to develop intelligent solutions capable of providing facilities managers the ability to base operational decisions on real-time building performance data, uncover hidden costs, find opportunities to reduce energy consumption and save money through comprehensive facilities management, and communicate and react to signals sent by utilities (such as demand response variable energy pricing models). The challenge is to accomplish these goals while minimizing costs, downtime, and the invasiveness of the installation. Often times the most efficient and cost effective way to meet these challenges is by maintaining as much of the existing legacy system as possible and



adding new components that deliver web-accessability and bidirectional digital control.

Who Says Old Buildings Can't Learn New Tricks?

A common misperception is that pneumatic HVAC systems are unable to take advantage of the benefits of digital control systems or the smart grid. This isn't the case any longer with recent advances in wireless technology. Wireless has matured in terms of ease of installation, functionality, reliability, and the cost continues to decrease. These advancements in wireless technology have spawned innovative products designed to introduce web-connectivity and digital control in pneumatic HVAC systems while maintaining the bulk of the legacy system.

San Jose, CA based Cypress Envirosystems (CE), a subsidiary of Cypress Semiconductor, has developed a range of non-invasive, wireless-enabled measurement solutions that can be installed over existing infrastructure at a fraction of the cost of a system overhaul. Of Cypress Envirosystem's recent product releases, the Wireless Gauge Reader (WGR), Wireless Pneumatic

Thermostat (WPT), and Wireless Steam Trap Monitor (WSTM) have applications in building automation.



**Cypress Envirosystems
Wireless Pneumatic
Thermostat**

CE's Wireless Pneumatic Thermostat (WPT) (patent pending) enables building managers to reduce HVAC costs by replacing existing pneumatic thermostats in older buildings with a digital WPT that facilitates bidirectional wireless communication. The wireless connectivity and design of the pneumatic connections allows retrofits in minutes, not days or weeks, and typically costs 20 percent as much (80 percent less!!) as conventional DDC thermostats, which are, on average, approximately \$2,500 per zone). Once installed, the

WPT automatically connects to the network and enables remote temperature sensing and control of set points, programmable zone control, and night/weekend setback, with automatic self-calibration. The available BACnet communications seamlessly integrate with existing automation systems, enabling use with utility demand response programs as well as other systems, such as energy management systems or enterprise asset management systems. CE claims the WPT can reduce HVAC costs by as much as 30 percent, which is impressive considering the low initial investment required; giving these products an attractive ROI. The WPT also took

home a prestigious “Buildy” award in the Smart Devices category at Connectivity week 2009.

Retrofit Projects Will Dominate the Market in Upcoming Years

Current market factors, such as a weak commercial real estate market; heightened consumer focus on corporate sustainability; increasingly stringent government regulations on energy consumption (especially in buildings); a desire by executives to reduce energy costs, increase control, and increase the visibility of building data; and various government stimulus packages stemming from the global recession (such as the ARRA in the US) that allocate federal funding for projects that increase energy efficiency, especially retrofit projects in old existing buildings, are creating an ideal climate for retrofit projects in the US. The ARRA allocates \$6.3 billion to state and local governments to make investments in buildings to increase energy efficiency, \$4.5 billion for federal buildings to increase their energy efficiency, \$6 billion in renewable energy power generation loans, and \$11 billion will be designated for the modernization of the US electric power grid. This funding will undoubtedly provide a spark to the building retrofit sector for the next couple of years and, as a result, the retrofit market is widely expected to be the strongest sector of the building automation market over this period.

Conclusion

Cypress Envirosystems' technologies enable older buildings to adopt the latest automation technologies at an affordable cost, and with minimal disruption to existing occupants, processes and staff. The products require minutes to install and typically provide payback within 12 months.

Without this technology from Cypress Envirosystems, buildings with pneumatic HVAC controls (a very large percentage of existing buildings in the US) would be unable to leverage the advancements that digital control and web-accessibility have created; rendering a large portion of the market unaddressable to suppliers of intelligent building systems. If these suppliers develop an OEM partnership with Cypress Envirosystems, it will unlock the vast opportunity that currently exists in the building automation retrofit market.

ARC anticipates the new construction market will remain weak, particularly in mature regions, in the near term. This means suppliers need to focus on the retrofit market to achieve growth targets in 2011 and beyond. Seeing how growth is the primary goal for all companies, it is reasonable to deduce that suppliers will increase their emphasis on the retrofit market, which will increase competition in this sector. Suppliers that align themselves with Cypress Envirosystems will have an inherent advantage when competing for retrofit projects, particularly ones involving pneumatic systems. CE partners will be able to offer a quick, minimally invasive, low-cost installation that utilizes the existing system while outfitting it for digital control. Those that choose to not integrate CE's technology into their own HVAC control offering run the risk of being uncompetitive in this dynamic market sector; a bright spot that will see significant growth in a market that otherwise has a gloomy outlook in the near future.

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