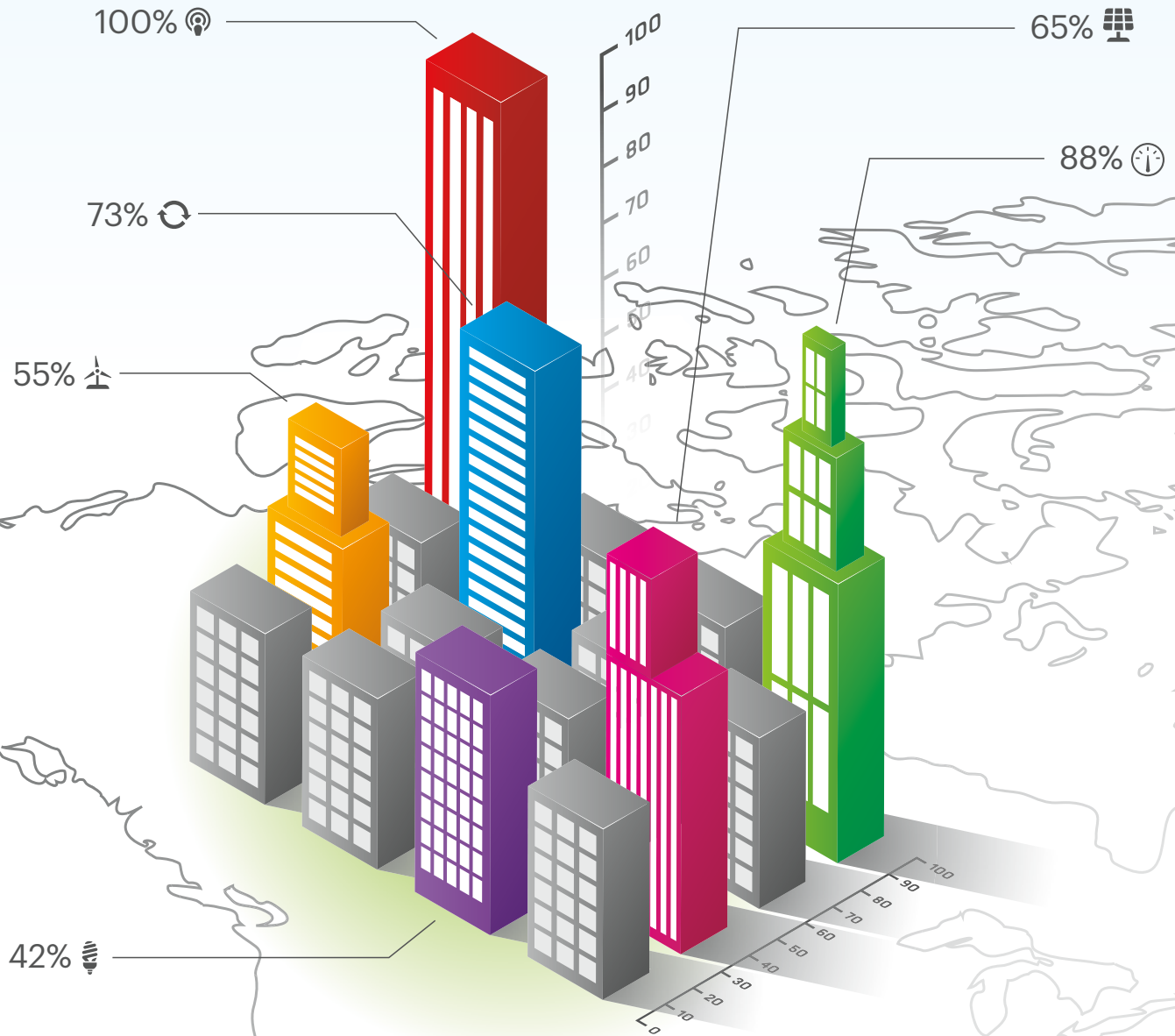


CABA INTELLIGENT BUILDINGS MARKET SIZING NORTH AMERICA 2015 REPORT

EXECUTIVE SUMMARY



CABA and the following CABA members funded this research project:



CABA INTELLIGENT BUILDINGS MARKET SIZE NORTH AMERICA 2015 REPORT

This research provides an update to the CABA Research Report entitled “Intelligent and Integrated Buildings Technologies: Market Size in North America 2010”. The 2010 report provided an in-depth analysis of the growing North American market for integrated and converged intelligent building control systems including: environmental control technologies, fire detection, security, lighting systems and IT convergence.

This updated research will also include a market review of the threats to the building automation and control systems (BACS) business, including: new DX AC entrants, increasing sophistication of AC and heating controls, VRF systems equipped with own controls and energy management functionality, new developments in smart homes and communicating room controllers.

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This report was prepared for CABA by **BSRIA**.



TABLE OF CONTENTS

1 INTRODUCTION	5
1.1 SPONSORS OF MSNAV2	5
1.2 SCOPE AND DEFINITIONS	6
1.3 ECONOMY	7
1.4 CONSTRUCTION.....	8
1.5 MARKET SIZING NORTH AMERICA – MSNA (V2).....	10
2 BUILDING AUTOMATION AND CONTROL SYSTEMS (BACS)	11
2.1 TRENDS AND DRIVERS	11
2.2 THREATS AND OPPORTUNITIES IN BUILDING AUTOMATION	12
2.3 BACS MARKET PERFORMANCE.....	13
3 LIGHTING SYSTEMS	14
3.1 TRENDS AND DRIVERS	14
3.2 ADDRESSABLE BALLAST MARKET	15
3.3 LIGHTING SYSTEMS MARKET PERFORMANCE.....	16
4 FIRE DETECTION AND ALARM SYSTEMS	17
4.1 TRENDS AND DRIVERS	17
4.2 FDA MARKET PERFORMANCE	19
5 SECURITY SYSTEMS (CCTV/VIDEO, ACCESS CONTROL, INTRUDER ALARM)	20
5.1 TRENDS AND DRIVERS	20
5.2 ELECTRONIC SECURITY MARKET PERFORMANCE.....	22
6 CONVERGENCE	23
6.1 DEFINITION AND METHODOLOGY	23
6.2 THE LEVELS AND INFORMATION FLOW	25
6.3 IT / HORIZONTAL CONVERGENCE.....	26
6.4 VERTICAL CONVERGENCE.....	27
6.5 SERVICES CONVERGED AND INTEGRATED.....	27
6.6 CHARACTERISTICS AND TRENDS.....	28

FIGURES

Figure 1	USA and Canada – size and growth of the economy	7
Figure 2	USA and Canada – key economic indicators	7
Figure 3	Private and public construction in the USA	8
Figure 4	US construction growth.....	9
Figure 5	Total market sizes, North America.....	10
Figure 6	Threats and opportunities in building automation and control systems.....	12
Figure 7	Past performance of building automation and control systems.....	13
Figure 8	The North American dimmable ballast market	15
Figure 9	Past performance of lighting systems.....	16
Figure 10	Past performance of fire detection and alarm systems.....	19
Figure 11	Trends and drivers of the security systems market	20
Figure 12	Past performance of security systems	22
Figure 13	Definition and methodology	23
Figure 14	The levels and information flow.....	25
Figure 15	IT convergence vs stand-alone systems (% share by value), 2013	26
Figure 16	Verticals and trends	28

TABLES

Table 1	IT converged solutions segmented by vertical convergence, integration and stand-alone solutions, by value (% split), 2013	27
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1

INTRODUCTION

In May 2014, the Continental Automated Buildings Association (CABA) commissioned BSRIA to update their 2010 survey of the North American market for intelligent and integrated building technologies.

The purpose of this study has been to provide a detailed assessment of the current and future markets around intelligence in non-domestic buildings in North America (USA and Canada). The emphasis is on a quantitative assessment of the products, installed systems, maintenance and converged solutions markets, supported by qualitative description and explanation where required. The study was broken into the following five areas:

- Environmental (HVAC) Building Automation and Control Systems (BACS)
- Lighting Systems
- Fire Detection and Alarm Systems
- Security Systems (CCTV/Video, Access Control, Intruder Alarm)
- Convergence

1.1 SPONSORS OF MSNAV2

BSRIA and CABA would like to acknowledge all the sponsors and the many respondents who helped to make this study possible.



A kick-off meeting was held on 8th May 2014 and regular Steering Committee meetings were held by webinar. Careful and iterative preparatory work was made in conjunction with the Steering Committee. This included discussion to incorporate the desires of the Steering Committee with respect to project scope and to ensure their organizations were given the opportunity to contribute to field interviews. The output of this process then fed into questionnaires and aide-memoires prepared by BSRIA.

The analysis in this report is based on a balanced mix of desk research plus face-to-face and telephone interviews. We would like to take this opportunity to thank the sponsors and CABA, as well as all those companies that contributed their valuable time and information. In particular, we appreciate the "open attitude" shown by the majority of respondents in providing confidential information. Without the help of all these organizations it would not have been possible to produce such an in-depth and detailed survey.

It was agreed that in order to get maximum cooperation from the respondents, a short synopsis of key findings would be offered to all respondents on completion of the survey.

The final presentation was delivered by webinar in November 2014.

About BSRIA

The Building Services Research and Information Association (BSRIA) has nearly 60 years of experience in independent and authoritative research, product testing, consultancy and market intelligence. The international Worldwide Market Intelligence (WMI) section has nearly 30 years' experience in business-to-business industrial market research and marketing consultancy. WMI is a highly respected source of both multi-client and private-client research and consultancy. BSRIA Proplan is a dedicated team within WMI focused on intelligent and integrated building technologies. Please visit www.bsria.co.uk for more information.

About CABA

The Continental Automated Buildings Association (CABA) is an international not-for-profit industry association dedicated to the advancement of connected home and building technologies. The organization is supported by an international membership of over 300 organizations involved in the design, manufacture, installation and retailing of products relating to home automation and building automation. Public organizations, including utilities and government are also members. CABA's mandate includes providing its members with networking and market research opportunities. CABA also encourages the development of industry standards and protocols, and leads cross-industry initiatives. In 2006, CABA integrated the Internet Home Alliance, an association of technology companies committed to research and development within the intelligent home sector. The working group became CABA's Connected Home Research Council. In 2010, CABA's collaborative research scope evolved and expanded into the CABA Research Program, which is directed by the CABA Board of Directors. The CABA Research Program's scope includes research for both large building technologies and home systems. Please visit <http://www.caba.org/> for more information.

1.2 SCOPE AND DEFINITIONS

This report provides a detailed statistical analysis of the current market for building systems, broken down by a number of logical segmentations. It analyzes the sales trends over the last five years and forecasts the future for the next five years. We have also examined the technology, standards, codes of practice, certification and regulations, as well as the drivers for demand. We have reviewed the impact that integration with other technical infrastructures in buildings to form Integrated Building Management Systems (IBMS) is having on the marketplace.

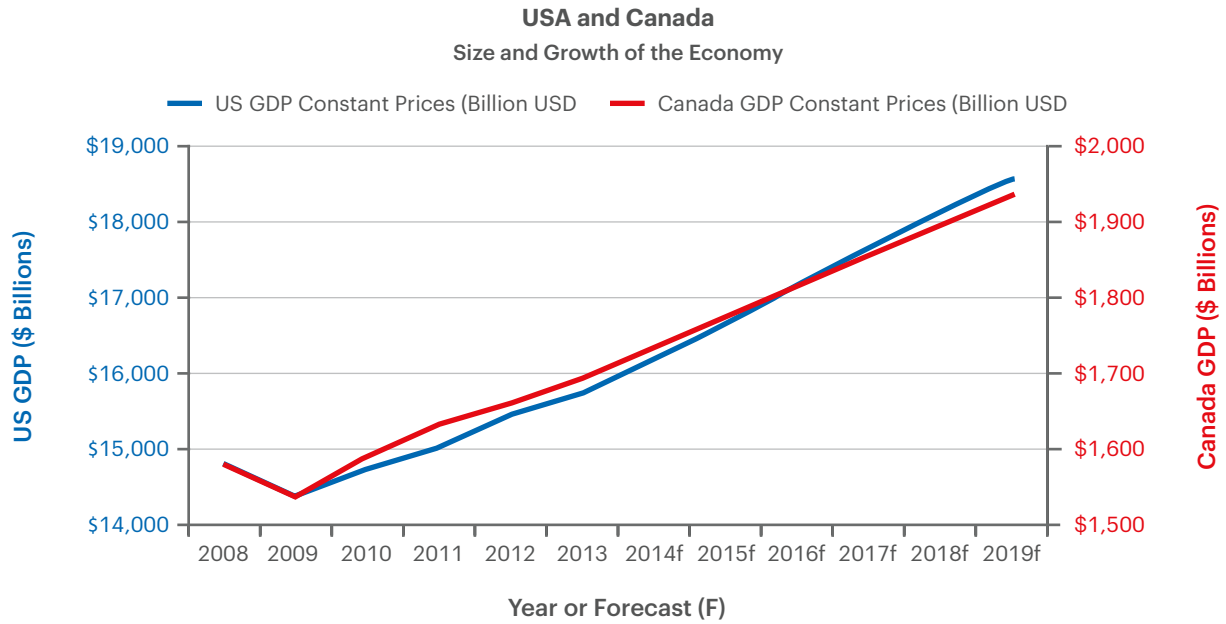
This study is confined to systems in North America, principally in non-residential buildings, but with the inclusion of systems in multi-family dwellings where relevant.

Unless otherwise stated, the term 'North America' in this research report refers solely to the United States of America and Canada (Not Mexico).

All monetary values are in historic prices and no adjustment has been made for inflation.

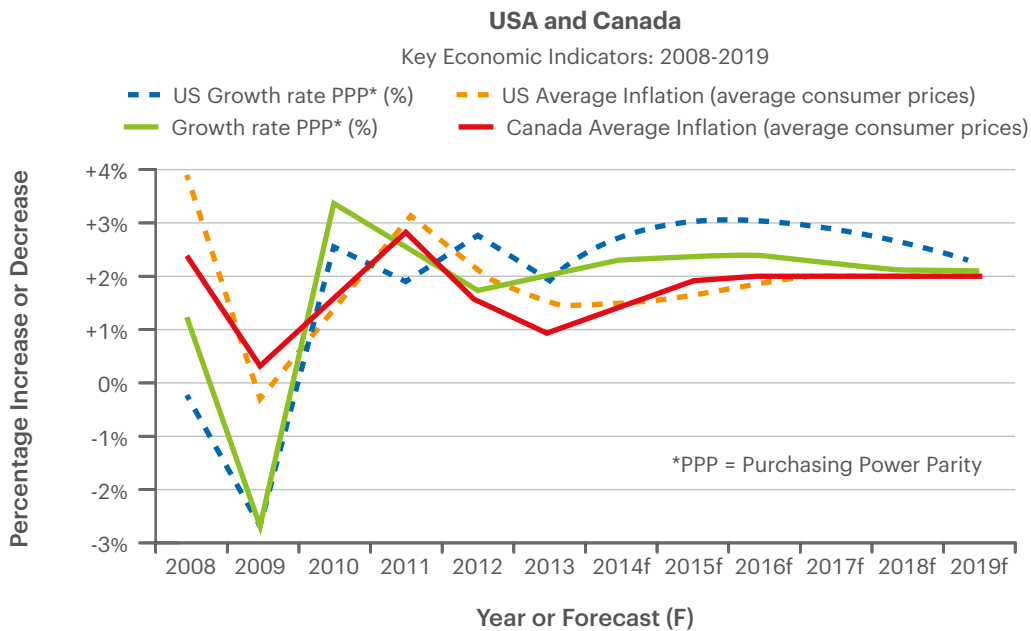
1.3 ECONOMY

Figure 1 USA and Canada – size and growth of the economy



Source: IMF

Figure 2 USA and Canada – key economic indicators



Source: IMF

- The economy has achieved 2-3% annual growth since 2009
- Growth in both countries expected to tail off towards 2% per annum by 2019.

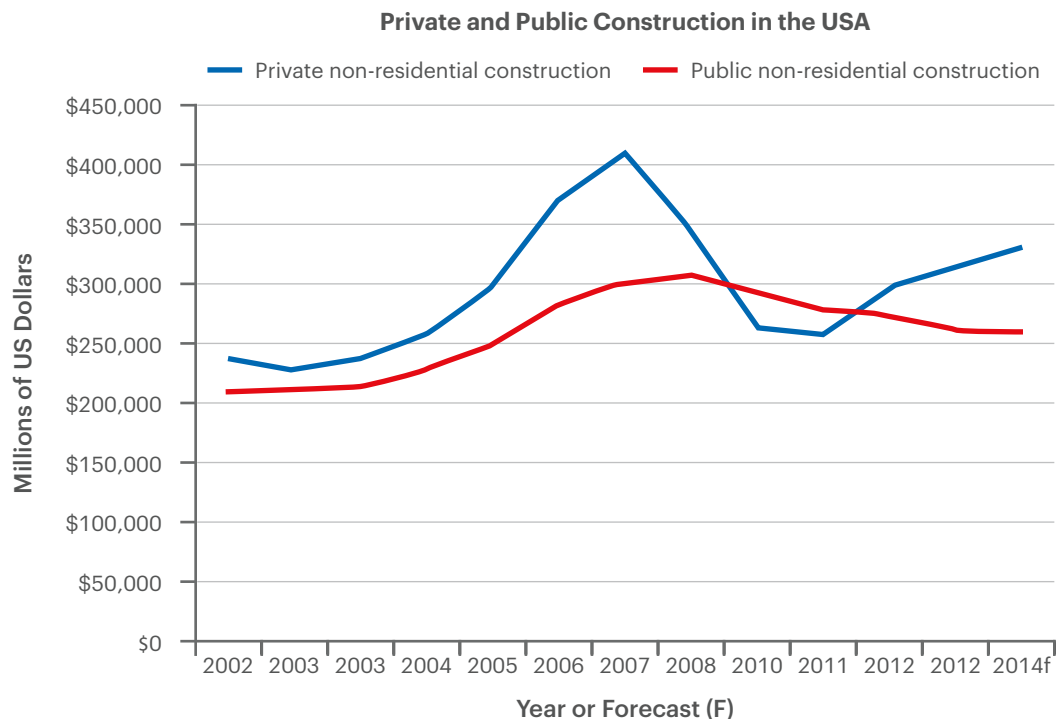
Since 2009, the Canadian economy has grown slightly faster than that of the USA. However, in the years 2014–2019 this difference is expected to be reversed.

Both the USA and Canada suffered a sharp fall in GDP following the onset of the recession in 2008-2009. While both rebounded strongly in 2010, Canada rebounded more so than the USA, and annual growth since then has generally oscillated within the range of 2-3%. This is a stronger performance than for many other developed countries, notably most of the EU, and Japan. However growth in both countries is expected to tail off towards 2% per annum by the year 2019.

Inflation in both the USA and Canada has remained low since the start of the recession, with the US briefly experiencing deflation in 2009. While inflation in the USA in 2013 was somewhat higher than in Canada, inflation in the two countries is expected to converge at about 2% by 2019 (Source: IMF).

1.4 CONSTRUCTION

Figure 3 Private and public construction in the USA



United States Census Bureau data, adjusted for inflation

- Public non-residential construction spend is much less volatile than private spend.
- Public construction briefly overtook private in 2010 and 2011.
- There is a gap from 2012 onwards, forecast to widen further in 2014.

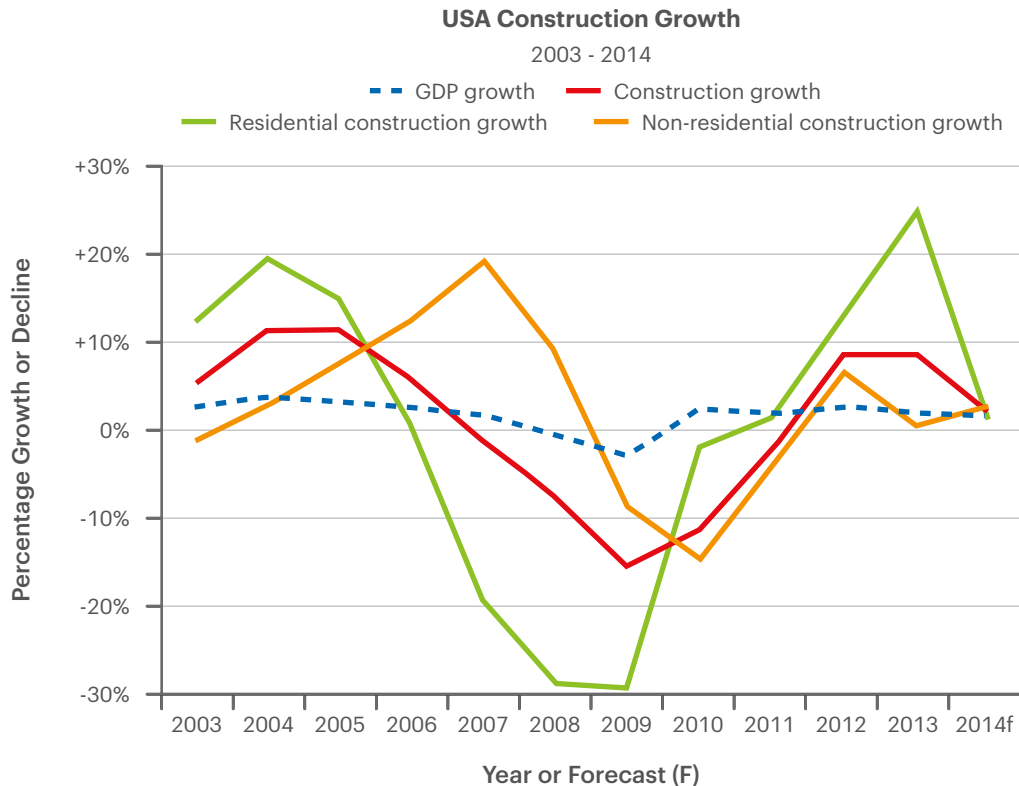
Public spend on construction is much less volatile than private spend, with less marked movements up or down.

Recent cycles in public spending on construction have lagged behind those in private construction. Thus, while private construction in 2009 showed a sharp decline from 2008, public construction continued its gradual rise and only started to decline in 2010. Conversely, by 2012, private spend on non-residential construction was

starting to rise, but public spend continued its decline.

As a result of this, public spend on non-residential construction briefly overtook private spend in 2010 and 2011, before falling back behind it again, with the gap from 2012 onwards, forecast to widen further in 2014.

Figure 4 US construction growth



Source: United States Census Bureau

- Construction fluctuates more dramatically than the economy as a whole.
- Non-residential construction decline did not begin until 2009, when recession was well underway, with a return to positive growth in 2012
- Forecast to fall back to very low growth in 2014.

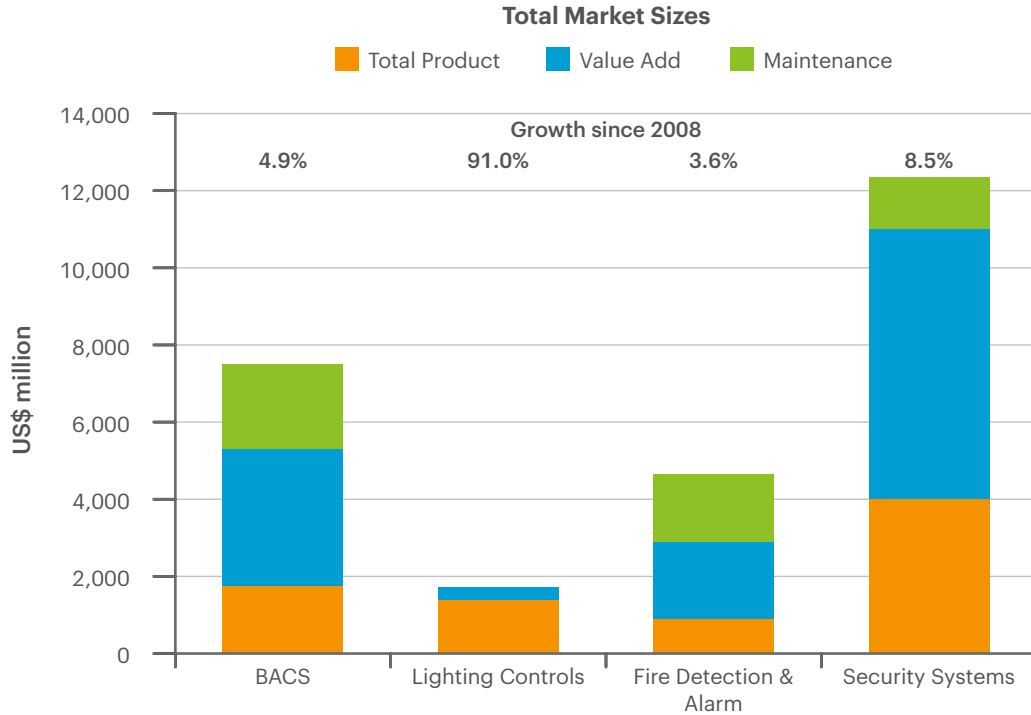
The experience of the US construction industry in the years 2003 – 2012 underlines the tendency for the value of output in the construction industry to fluctuate much more dramatically than that of the economy as a whole.

A slowdown in the residential construction industry started in 2005, and by 2007 was in heavy decline, before returning to positive growth in 2011.

With non-residential construction, the impact was more delayed, and the decline did not begin until 2009, when the recession was already well underway, with a return to positive growth in 2012, though forecast to fall back to very low growth in 2014.

1.5 MARKET SIZING NORTH AMERICA – MSNA (V2)

Figure 5 Total market sizes, North America



Source: BSRIA

The building automation and controls systems (BACS) market is among the most mature and was worth US\$7,556 million in 2013, having grown 4.9% since the last CABA Market Sizing North America in 2008.

The Lighting Controls market is the youngest market and was worth just US\$1,767 million in 2013, but has shown phenomenal growth of 91% since 2008.

The mature Fire Detection & Alarm market was worth US\$4,865 million in 2013 and grew just 3.6% since 2008.

The security market, comprising closed circuit television (CCTV), Access Control and Intrusion was worth US\$12,368 million in 2013 and has grown strongly, up 8.5% since 2008, led by CCTV.

2

BUILDING AUTOMATION AND CONTROL SYSTEMS (BACS)

2.1 TRENDS AND DRIVERS

- Uptake of Building Energy Management Systems (BEMS)
- Uptake of energy usage data analytics and 'Big Data'
- Concerns about energy efficiency
- Legislative requirements (e.g., Indoor Air Quality Standard)
- Uptake of 'Internet of Things'
- Impact of Automated Demand Response (ADR)

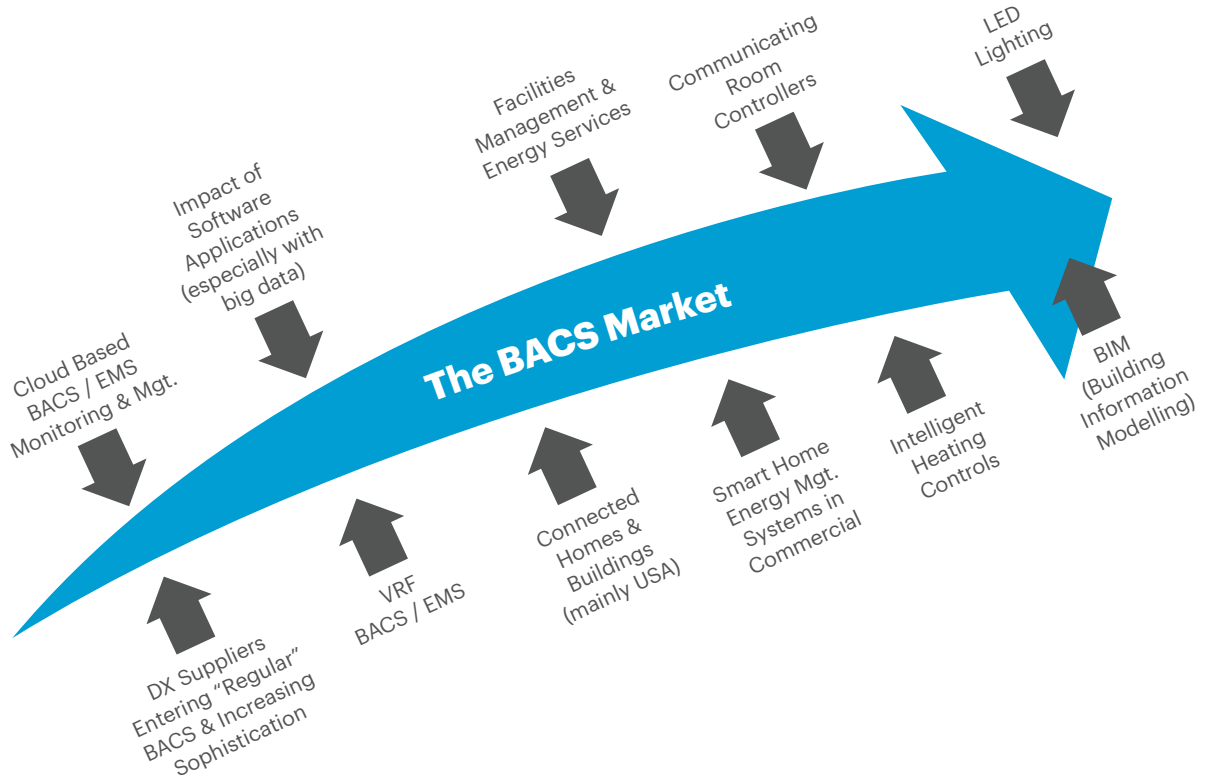
The uptake of Building Energy Management Systems (BEMS) and data analytics of energy usage are some of the main drivers behind BACS today. In addition to this, concerns about energy efficiency (due to increasing energy prices) and legislative requirements are also important factors.

Data analytics and the collection of data from multiple data points is one of the major emerging technologies in the past few years.

The emergence of "Internet of Things" is also an important trend, alongside the evolving Human-Machine-Interface (HMIs) in BACS systems. Connecting building automation components to the IT network exposed the risks of cybersecurity; developments regarding standardization of cybersecurity are also regarded as emerging technology by the industry. Connectivity and interoperability between BACS components and elements of the buildings are important trends, alongside 'Power over Ethernet (PoE)'.

2.2 THREATS AND OPPORTUNITIES IN BUILDING AUTOMATION

Figure 6 Threats and opportunities in building automation and control systems



Source: BSRIA

With the Building Automation segment continuing to grow in North America, there is an incentive for new players to enter the market in order to gain a share of this expanding business. This process is reinforced by the increasing trend towards integration of building automation and controls with other areas of smart technology. As one of the world’s largest markets for building automation, North America is a natural target for such activities.

At the same time, some of these developments represent opportunities for Building Automation suppliers to broaden or deepen their offerings, or to move into new market segments.

Some of the most significant trends include the following:

Cloud services

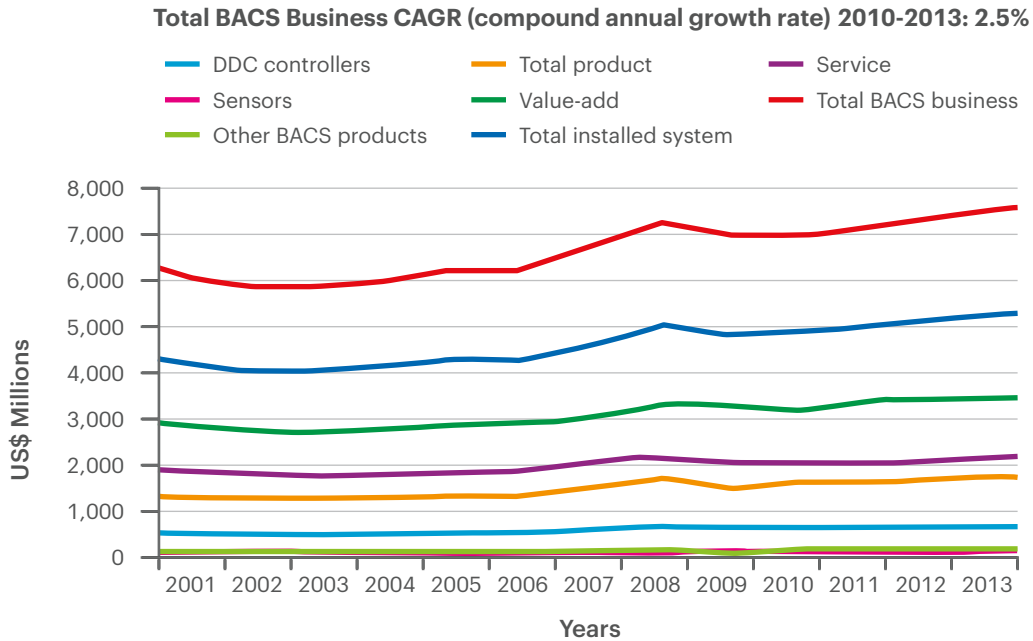
Currently the following applications are in the cloud:

- Fault detection
- Energy billing applications
- Metering/data analytics/data visualization

A clear distinction has to be made between cloud-based data visualization and cloud-based control.

2.3 BACS MARKET PERFORMANCE

Figure 7 Past performance of building automation and control systems



Source: BSRIA

The figure shows the development over the last 12 years of sales of BACS Products (DDC Controllers, Sensors and Other BACS products), as well as Total Product at factory gate prices (i.e., first point of distribution).

They also show the development of Value Add (engineering, commissioning, installation and panels) so that installed system sales at installed prices can be determined.

In addition, they show the development of the BACS service and maintenance business so that the total BACS business evolution can be tracked.

The Total BACS business (Total Product + Value Add + Service and Maintenance) showed a 2.5% annual growth rate after 2010.

A major trend is to add energy data analytics (BEMS) to existing BACS solutions, which continues to support retrofit/refurbishment sales, allowing BACS systems previously working in isolation to be integrated with other applications via open communication protocols.

3

LIGHTING SYSTEMS

Suppliers classification

The main players can be classified into three categories: General lighting companies, lighting control companies and niche players:

- General lighting companies: Philips, Osram, GE Lighting, Schneider Electric, and so on...
- Specialist lighting controls companies: Cooper Controls, CREE, Crestron and others.
- Niche companies: Daintree Networks (advanced wireless control), Redwood Systems (intelligent lighting network solutions), etc.

Installed market

Most of the installations are carried out by the building automation contractors, who sit in the middle of the contractual chain but take full ownership of the project. Therefore, most of the lighting controls suppliers work with the contractors or system integrators such as Johnson Controls, Schneider Electric, Honeywell, and many others. A new entrant in the NA market in 2012/2013 is Siemens.

3.1 TRENDS AND DRIVERS

Market drivers for lighting controls include:

- Need to reduce energy costs
- Necessity to comply with energy codes
- Need to promote sustainability
- Need to increase occupant comfort and productivity



There are many benefits to the deployment of lighting controls; however four of them assume the essential: need to reduce energy costs, necessity to comply with energy codes, need to promote sustainability and need to enhance occupant comfort and productivity.

1. Need to reduce energy costs

Lighting controls can reduce lighting energy consumption by 50% in existing buildings, and by at least 35% in new construction. It is commonly accepted that electric lighting contributes to around 30% of electricity

consumption in a commercial building or tenancy. Light dimming in response to the natural light levels. Maximum savings are realized by using daylight and

2. Necessity to comply with energy codes

Lighting controls help a building stay within the Lighting Power Allowance prescribed by the applicable energy code. Lighting controls enable building owners to qualify for numerous rebates and incentives from local utilities and state/federal energy program administrators.

Compliance with the ASHRAE/IES Standard 90.1 is almost considered a pre-requisite towards achieving energy efficiency standards in the US building industry.

Stringent provisions in the CEC Title 24 regulations (as well as local and state derivatives) stipulate maximum energy consumption per square foot and automated levels of light control that particularly impact the Commercial, Educational, Health care and Government sectors.

3. Need to promote sustainability

Lighting controls can contribute to Leadership in Energy and Environmental Design (LEED) Certifications.

4. Enhance occupant comfort and productivity

Ability for occupants to change the light levels to their optimum level of comfort and preference.

3.2 ADDRESSABLE BALLAST MARKET

Figure 8 The North American dimmable ballast market

The North American Dimmable Ballast Market



- 1 The 2013 North American dimming ballast market is worth US\$100 million
- 2 The 2013 North American LED driver market is estimated at US\$165 million
- 3 The North American LED Driver market will continue to grow on the back of a booming LED lighting market

Market Drivers for LED Drivers



- 1 Legislation: ASHRAE, DOE, Title 24
- 2 Energy performance of LED drivers
- 3 Integration: LED drivers are being integrated into the fixture
- 4 Other factors:
 - Lower cost of LED drivers
 - Growth of wireless control systems
 - Growth of open protocols
 - Increasing number of green buildings

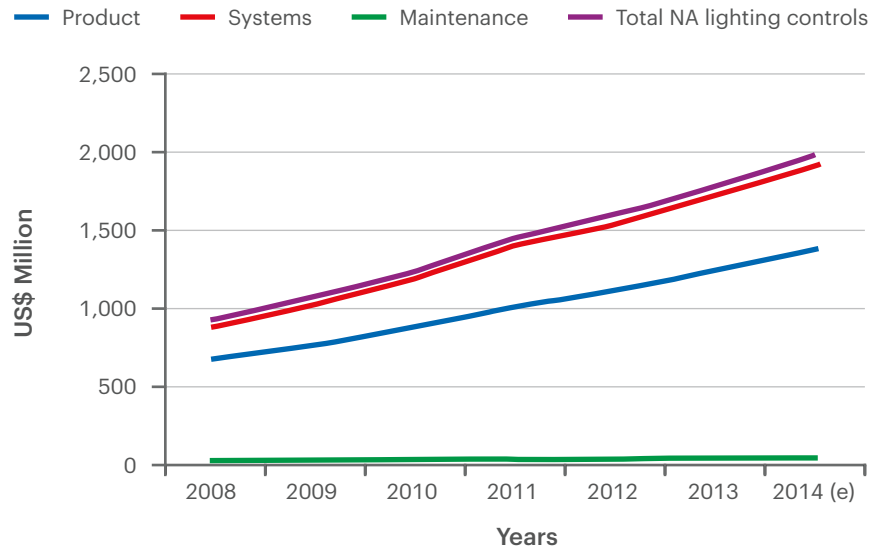
Source: BSRIA

The addressable ballast market is divided between the dimmable ballast market and the LED driver market.

3.3 LIGHTING SYSTEMS MARKET PERFORMANCE

Figure 9 Past performance of lighting systems

Total Lighting Business CAGR (compound annual growth rate) 2008-2013: 14%



Source: BSRIA

The study confirms that growth in the North American lighting controls business has been robust, despite the economic downturn during the period 2008-2013.

For the period 2008-2013 it was grown by 14% on the back of a booming LED lighting market and strong demand for integration of building applications.

Future demand for lighting controls in North America, as in the rest of the world, is partly linked to energy efficiency requirements. Net-zero energy buildings and net-positive energy buildings are the future and lighting controls is part of it. The forecast for the period 2014 – 2018 shows continued growth.

4

FIRE DETECTION AND ALARM SYSTEMS

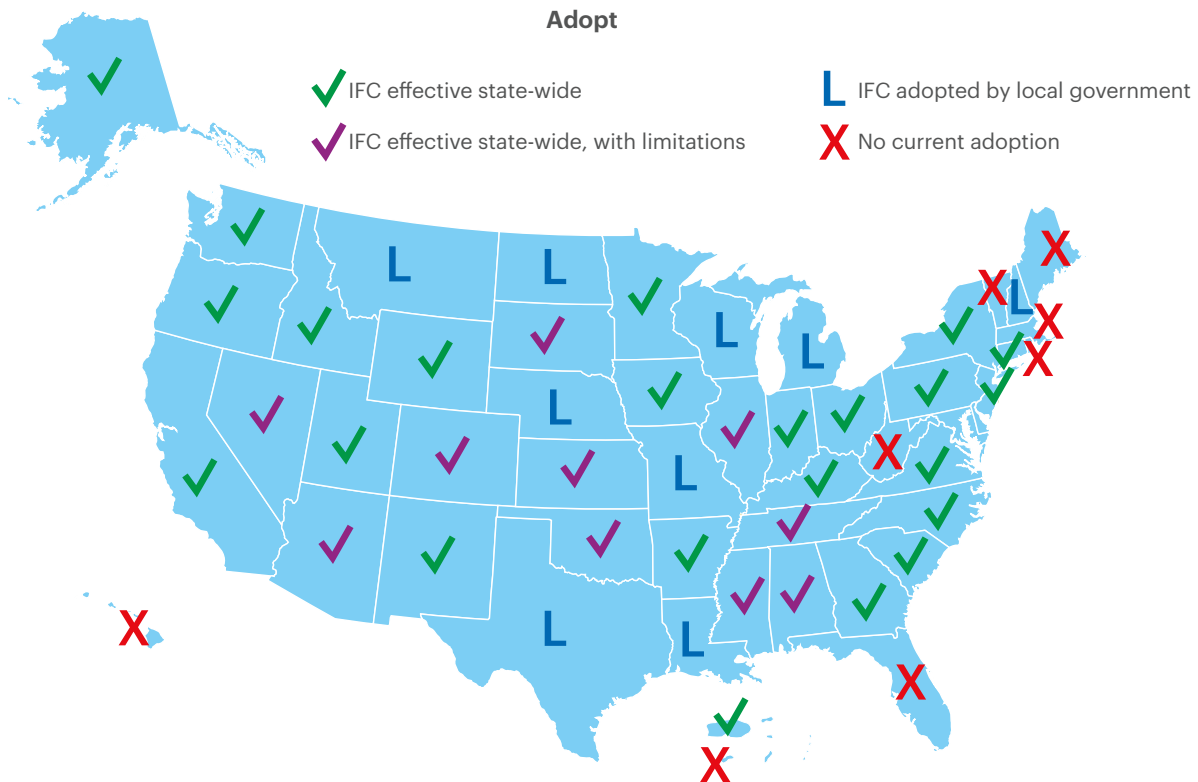
The product market is dominated by four main players: Honeywell, UTC, Tyco and Siemens accounting for over 90% of the market. Honeywell, UTC and Tyco have all acquired well established brands, some of them dating back to the 19th century.

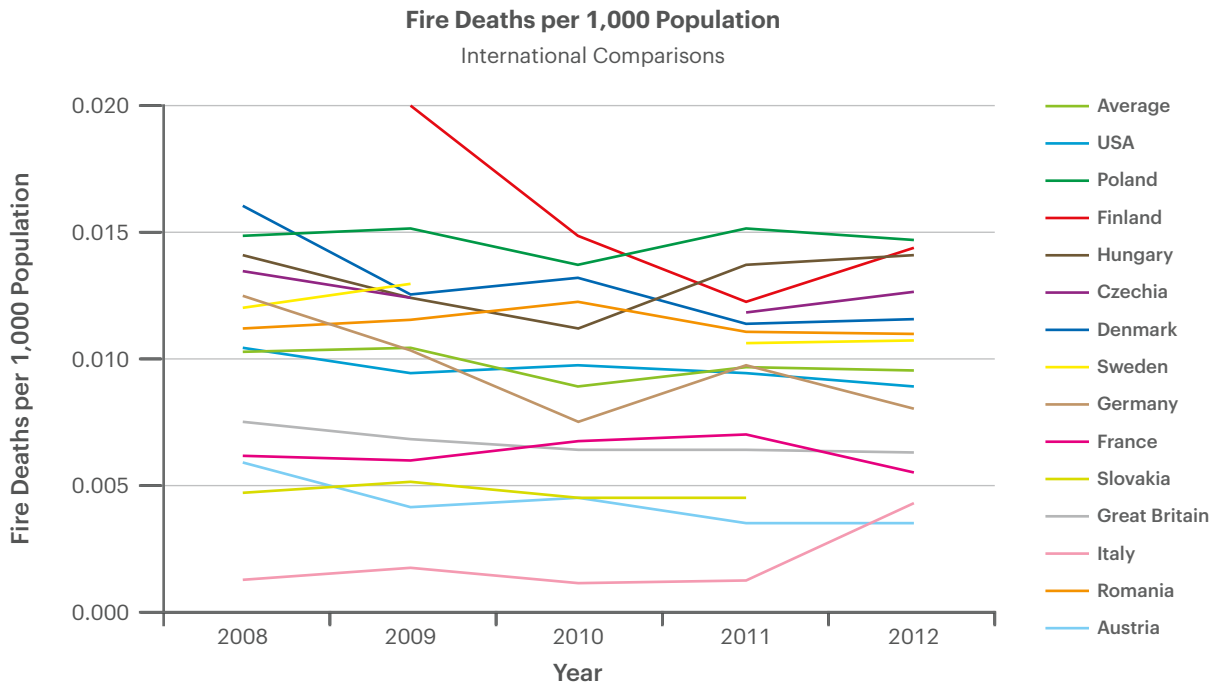
This reflects the fact that the market is very conservative. Businesses have, by law, to meet certain fire standards, so much of the spend is non-discretionary and there is little to be gained from “experimentation.”

The systems market could hardly look more different. Of the big product manufactures, only Tyco and to a lesser extent, Siemens have a significant presence. The market instead is occupied by a number of smaller suppliers, most of which have a market share of at most 1-2%.

5.3 TRENDS AND DRIVERS

1 Fire codes and regulations





To understand why the systems market is so fragmented it is necessary to need to understand the way that regulations and codes are rolled out across the USA.

There are national bodies which define and influence fire standards such as UL (Underwriters’ Laboratories) and NFPA (National Fire Protection Association). However, because of the USA’s size, federal government codes tend to be implemented at different times in different states. To make matters more complicated, many cities and local authorities also implement their own rules in their own ways.

This map shows for example, where one standard has been rolled out state-wide (red tick), where it has been rolled out in a limited way (green tick). The “L” indicates that it has been adopted by some local authorities. All of this creates a complex mosaic.

This makes local knowledge the key. Even bigger nationwide players depend on having local people on the ground, who understand the lie of the land in their area.

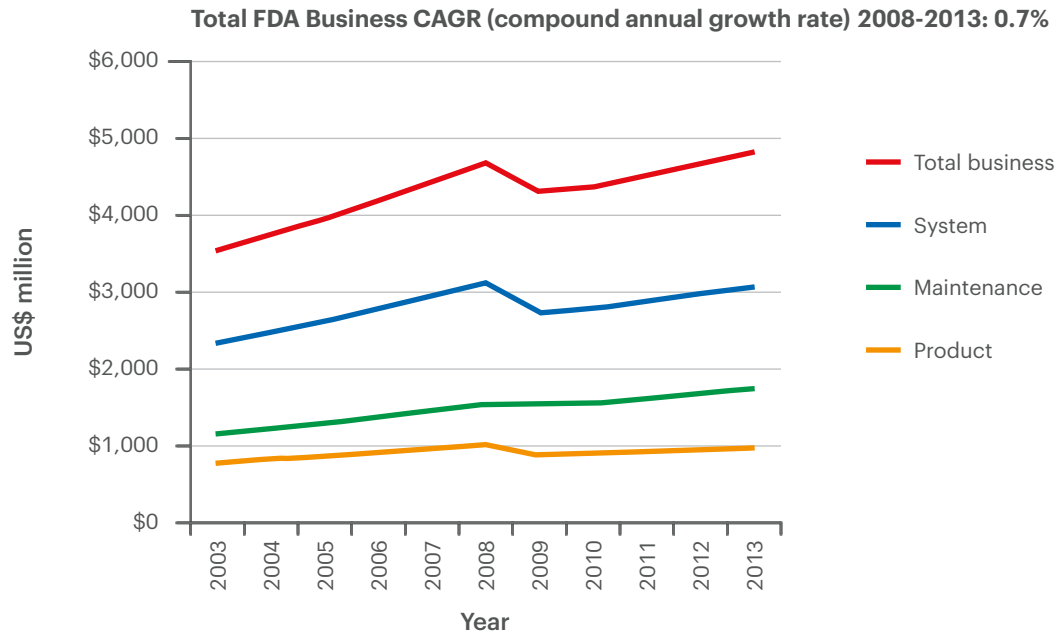
In terms of fire trends, the USA, like most developed countries is becoming safer. It can be seen here from the thick blue line that fire deaths in the USA have been declining slightly in the USA over the past five years, and that they are about average for the group of countries surveyed. This indicates that there is progress, but still more to be done.

The recession of 2008–2009 confirmed the general trend that when construction is depressed, retrofit becomes more important, and fire detection has been no exception.

A further important trend has been towards more integration of fire detection with other building services, such as building automation and security. While this has always been necessary in some respects, there remain barriers. On the one hand integration must not threaten the integrity of the fire detection system in the event of an incident. On the other, many of the communications systems remain proprietary.

4.2 FDA MARKET PERFORMANCE

Figure 10 Past performance of fire detection and alarm systems



Source: BSRIA

The study confirms that growth in the North American FDA business has been slow, and roughly in line with the economy as a whole.

For the period 2008-2013 it was just 0.7%. But this disguised the fact that in 2008 -2009 there was a fairly sharp drop for products, for systems and for total business, with only the maintenance sector holding up, as clients had to maintain existing systems and put-off upgrades. Since 2009 the business has been growing again though at a slower rate than pre-2008.

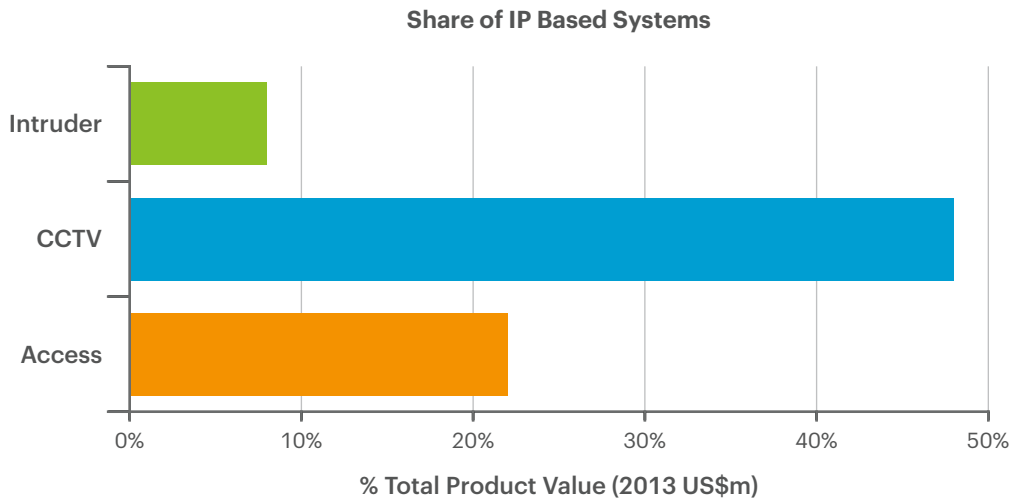
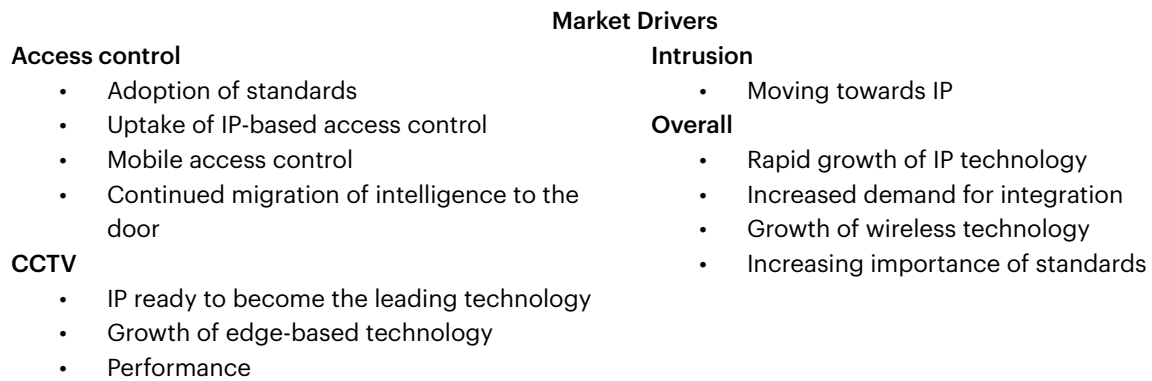
Short of major changes, for example in fire regulations, the industry is likely to continue to perform roughly in line with the economy.

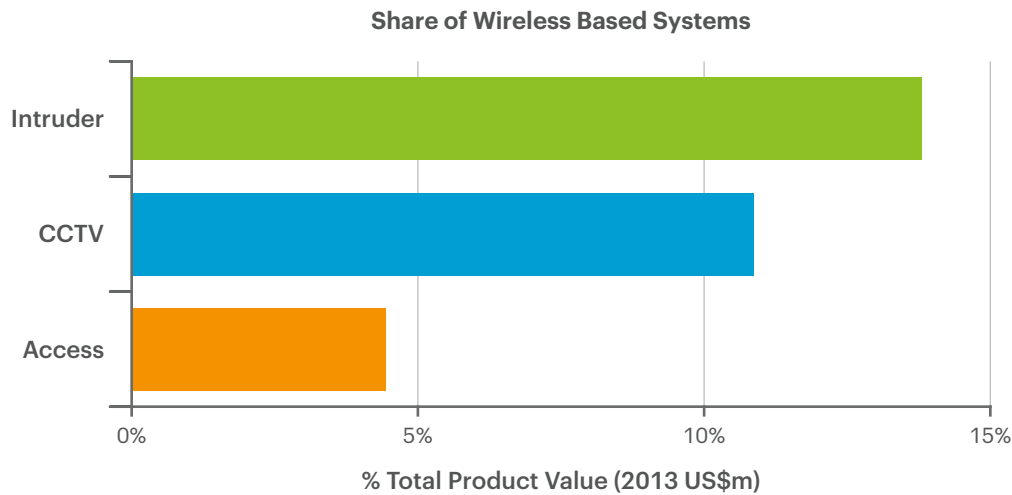
5

SECURITY SYSTEMS (CCTV/VIDEO, ACCESS CONTROL, INTRUDER ALARM)

5.1 TRENDS AND DRIVERS

Figure 11 Trends and drivers of the security systems market





Source: BSRIA

Main trends in access control include the adoption of solutions that are based on industry standards such as ONVIF (for the development of IP-based access control products), or SIA Open Supervised Device Protocol (OSDP). OSDP provides the industry with a sophisticated solution that adds security and value with features such as bi-directional communication. Mobile access control is a growing trend, still limited, but looking forward, the connectivity of smartphones is expected to allow most tasks that today are executed by card readers for example. The growth of wireless connection devices and digital locks will also drive the development of mobile solutions as new, lower-cost, energy-efficient models are introduced to the market.

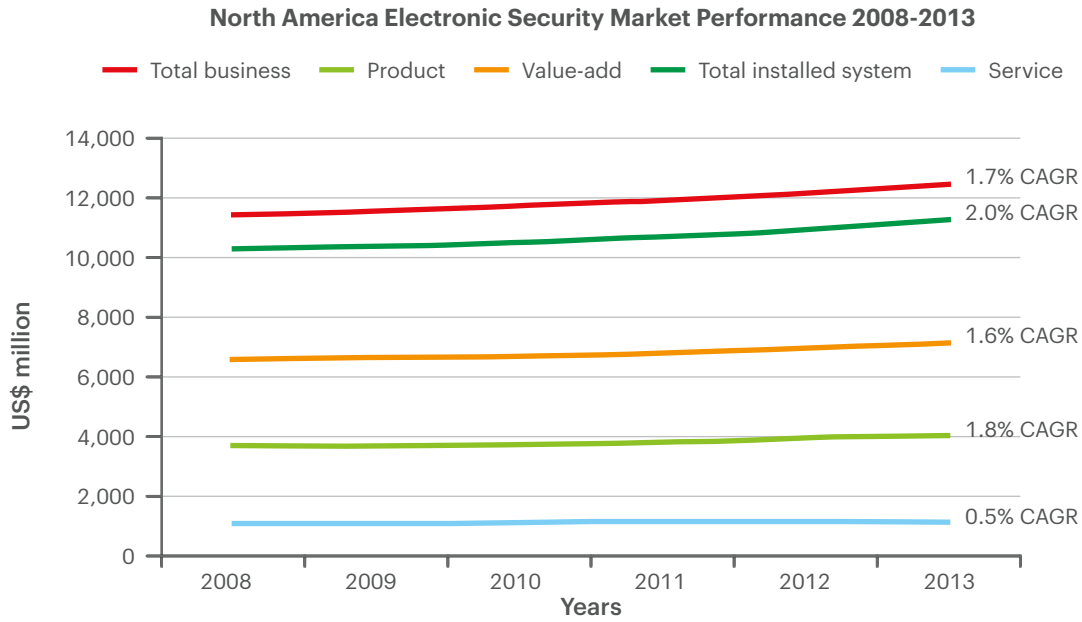
As for CCTV/video surveillance, IP is already the de facto choice today for large and medium size systems, and the penetration of the technology in small projects will keep improving. Cameras are starting to have storage units as well as analytical capabilities so that the workload of the central processor is lessened. Finally, image resolution keeps improving with “megapixel” digital cameras.

Trends in intrusion also include the move towards IP.

Overall, trends in electronic security products can be summarized as rapid growth of IP technology, increased demand for integration, growth of wireless technology and increasing importance of standards.

5.2 ELECTRONIC SECURITY MARKET PERFORMANCE

Figure 12 Past performance of security systems



Source: BSRIA

The study showed that growth in the North American electronic security business has been slow, in line with a depressed economic environment during the period 2008-2013. The CAGR for the total business during this period was 1.7%.

Future demand for electronic security in North America is much more attractive and the CAGR for the total business stands at 4.5%, with the installed market showing a slightly faster growth rate than the product market.

6

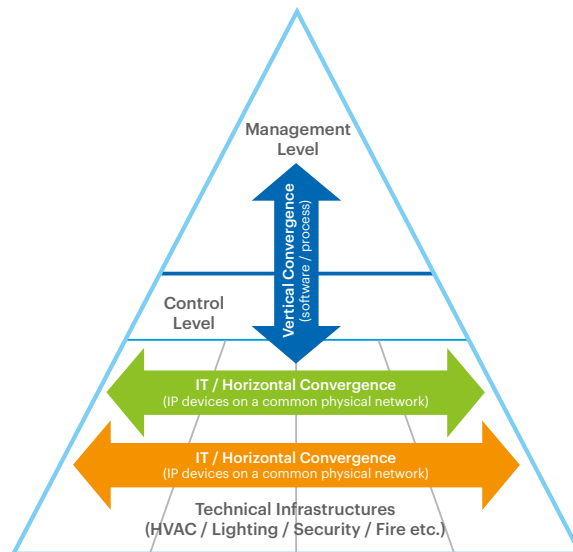
CONVERGENCE

6.1 DEFINITION AND METHODOLOGY

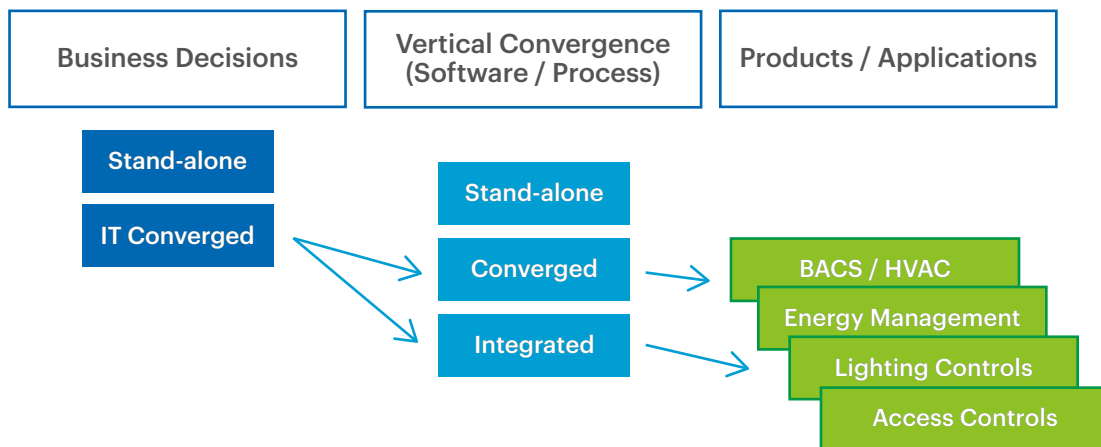
Figure 13 Definition and methodology

Definition

- It convergence or horizontal convergence: is connecting (converging) IP devices onto a comon physical network.
- Vertical convergnece: is the software, smart devices and process that provides a platform and applications for the convergence of independent devices.
- Integration: joining / linking products / applications. Data flows in both directions but the products do not use the same platform. Many products are integrated by adding a driver or a controller.



Methodology



Source: BSRIA

This study has looked at two types of convergence:

IT convergence or horizontal convergence: is connecting (converging) IP devices onto a common physical network.

Vertical convergence: is the software, smart devices and process that provides a platform and applications for the convergence of independent devices.

For products and services to be converged they need to use the same platform and the convergence needs to be seamless. If a system requires a third-party interface such as a driver it is not classified as convergence, but could be classified as integration.

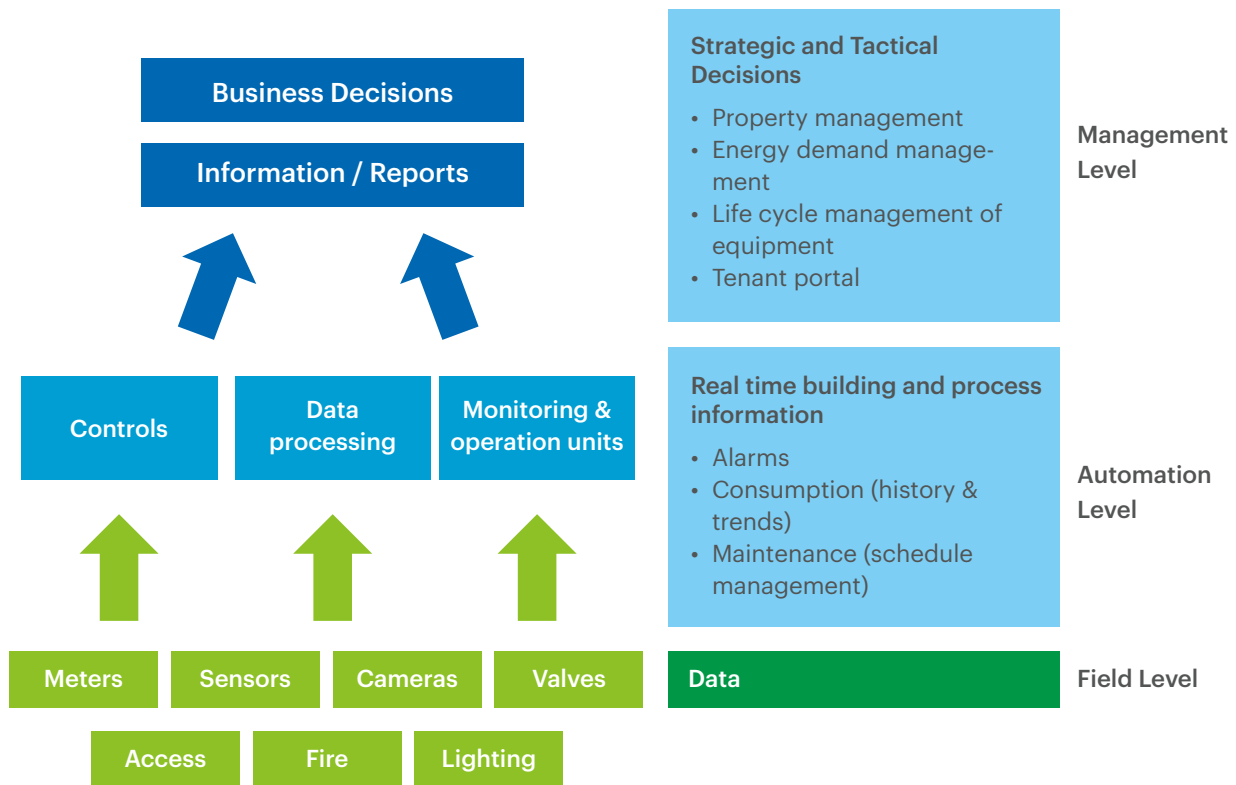
Integration: joining/linking products/applications. Data flows in both directions but the products do not use the same platform. Many products are integrated by adding a driver or a controller.

The estimated values for the markets included are based on the product value and the uptake of convergence and integration within each area. Compared to the last CABA market sizing study, the definition of convergence has been extended to show both IT or horizontal convergence (physical network) and vertical convergence (software, smart devices and process). The methodology follows that shown in Figure 3 below, first estimating the value of IT convergence and then estimating how much of the IT convergence is installed as integrated solutions or converged solutions. The third phase estimates the applications (products) integrated and converged.

It is not possible to differentiate between convergence and integration with regards to applications.

6.2 THE LEVELS AND INFORMATION FLOW

Figure 14 The levels and information flow



Source: BSRIA

Why is integration and convergence important? These charts illustrate how the data and the right processing of data can improve the decision making within an organization.

The data collected at field level via sensors, meters, etc. is analyzed and processed to provide:

- Energy consumption (ideally in real time)
- Overview of cost per energy supplier
- Building occupancy rates (daily, weekly, yearly)
- Overview of operational cost (by section, equipment type, building)
- Benchmark data (property cost/square meter, meter, energy cost/square meter)

The analyzed data collected can be used by the maintenance team for:

- Maintenance schedules
- To measure energy consumption and efficiency
- Life cycle costing

At management level the data can be used to optimize the decision making such as:

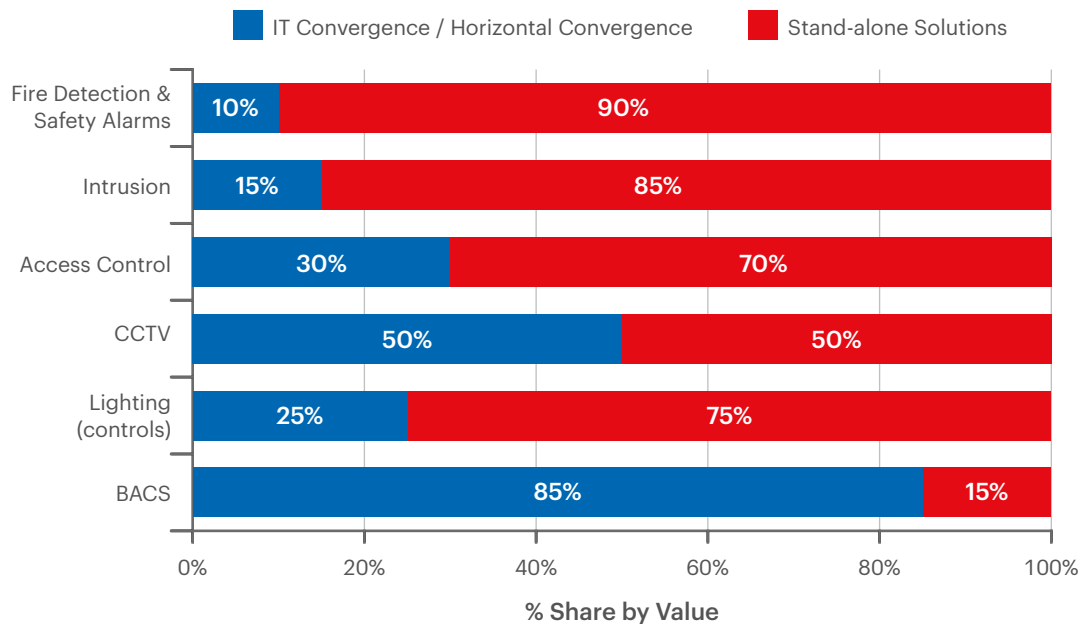
- Building management and investment decisions
- Outsourcing strategies

- Space allocation
- Choice of suppliers
- Implementation of supply – demand response strategies and an overall reduction in energy cost.

The definition of a smart building was, and is still often, focused on the BACS and related services, but this has evolved into a consolidation of all sub-systems into a single building service network. Most products are today IP at the control/automation and management level and be will installed as a stand-alone system, integrated with other products using software or be fully converged with other products using the same platform. The main drive for IP is accessibility both internally and from outside the building, as many facility operators are responsible for several sites and need to be able to access data and information from everywhere.

6.3 IT / HORIZONTAL CONVERGENCE

Figure 15 IT convergence vs stand-alone systems (% share by value), 2013



Source: BSRIA

Here we contrast IT convergence (also called horizontal convergence) with stand-alone systems (by value). IT convergence refers to convergence on the IP/physical network.

The highest uptake is for BACS (85%), where nearly all are on a common IP network. This is followed by CCTV (50%).

Access controls and lighting controls have a modest uptake (25%-30%).

Fire detection and safety systems and intrusion are mostly non-IP.

There is a general increase in horizontal convergence. It starts from very different positions and the uptake will be slow for intrusion and particularly fire detection.

6.4 VERTICAL CONVERGENCE

Table 1 IT converged solutions segmented by vertical convergence, integration and stand-alone solutions, by value (% split), 2013

Year	BACS	Lighting (controls)	CCTV	Access control	Intrusion	Fire detection & safety alarms
Stand-alone	50%	70%	22%	23%	22%	90%
Integrated	35%	20%	49%	49%	51%	10%
Vertical converged	15%	10%	29%	28%	27%	0%
Total	100%	100%	100%	100%	100%	100%

Source: BSRIA

The uptake of IT convergence varies significantly, as shown above, and that has a significant effect on the value of the segmentation of the product markets.

Nearly all BACS systems sold are IT converged (i.e., on a common IP network), but half are installed as stand-alone systems. Just over a third is integrated using drivers/software and 15% are fully vertically converged with other applications using one platform. Nevertheless, many specifiers still use two networks for converged solutions to keep facilities and IT separate.

One of the benefits of IP for security products is remote access, but the uptake is still low for access controls and intrusion, while a reasonable share of CCTV is IT converged. Vertical convergence is relatively high for security, often promoted and installed by the IT system integrator.

There are increasing levels of integration and convergence within the electronic security industry (especially between CCTV and access control), but much lower levels of integration and convergence with HVAC and lighting.

The uptake of vertical convergence is expected to increase significantly for BACS, lighting controls and CCTV. There is less growth for intrusion and access controls.

6.5 SERVICES CONVERGED AND INTEGRATED

The products integrated and converged will be IP, but some IP products are installed as stand-alone systems (not included below).

The applications typically integrated or converged with the BACS solutions are energy management, including demand response, sub-metering, lighting controls and security.

Lighting controls are typically integrated or converged with building automation/HVAC controls.

Most security products are integrated or converged with other security products but only a small proportion with the BACS.

The fire and alarm detection systems are typically integrated with smoke detection/extraction, security or BACS.

6.6 CHARACTERISTICS AND TRENDS

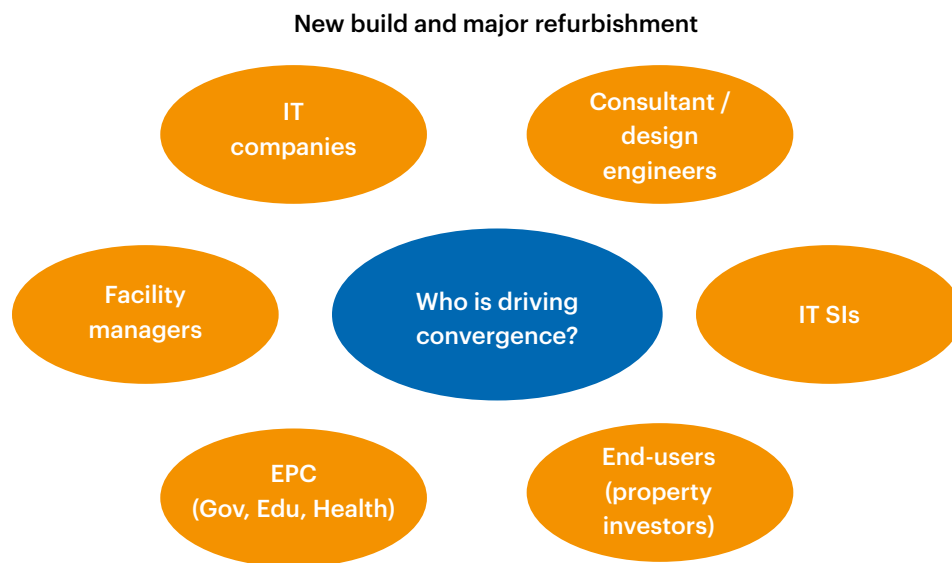
Figure 16 Verticals and trends

Verticals

- Higher education
- Healthcare, mainly hospitals
- Governmental buildings
- Transport (airports)
- Offices
- Sports stadiums
- Life science / pharmaceutical industry
- High tech / precision manufacturing

Trends

- Remote access to data (needs to be IP) – could be cloud based
- Cheaper sensors, processors and available application software
- Possibility of generation data from M2M/IoE
- PoE platform – low voltage lighting systems and sensors
- Uptake of wireless protocols
- Increasing use of software packages



New and Refurbishment

Most of the converged projects are new build and in major retrofit where the technology and infrastructure can be specified and installed from the beginning.

The actual work of installing a converged network can be very disruptive in an existing building.

Integration is easier in existing buildings if a new application, for example, needs to be added to the BACS such as a meter, energy management or lighting controllers.

Trends

- Mobility of staff and remote access is becoming a must. The penetration of cloud-based applications are increasing but still very low in the building service industry.
- Trend towards more connected devices and Internet of Everything.
- Low voltage (LV) lighting systems including lighting, movement and temperature sensors and natural evolution to LV PoE-like systems could be the hosting of more building services under the same platform.
- Wireless increasing.

- The use of software packages is increasing. Building Information Modeling (BIM) is one that potentially could have major impact but is still in its infancy.

Who is driving convergence?

- IT suppliers (sales of hardware, software) and IT system integrators (SIs) want to extend the scope of their business.
- Facility managers want relevant data to run the buildings more efficiently.
- End-users, property investors, consultants want to build buildings of a high standard with low operating costs.
- Energy Performance Contracting (EPC) is a driver for verticals with no need for upfront capital.



CABA INTELLIGENT BUILDINGS
**MARKET SIZING NORTH AMERICA
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