How Controls, Commissioning and Collaboration Enhance building performance

Part L 2010 Compliant

Part L 2013 Compliant

20% Less Carbon

40% Less Carbon

Part L Regulatory Compliance

20% Carbon Reduction

40% Carbon Reduction
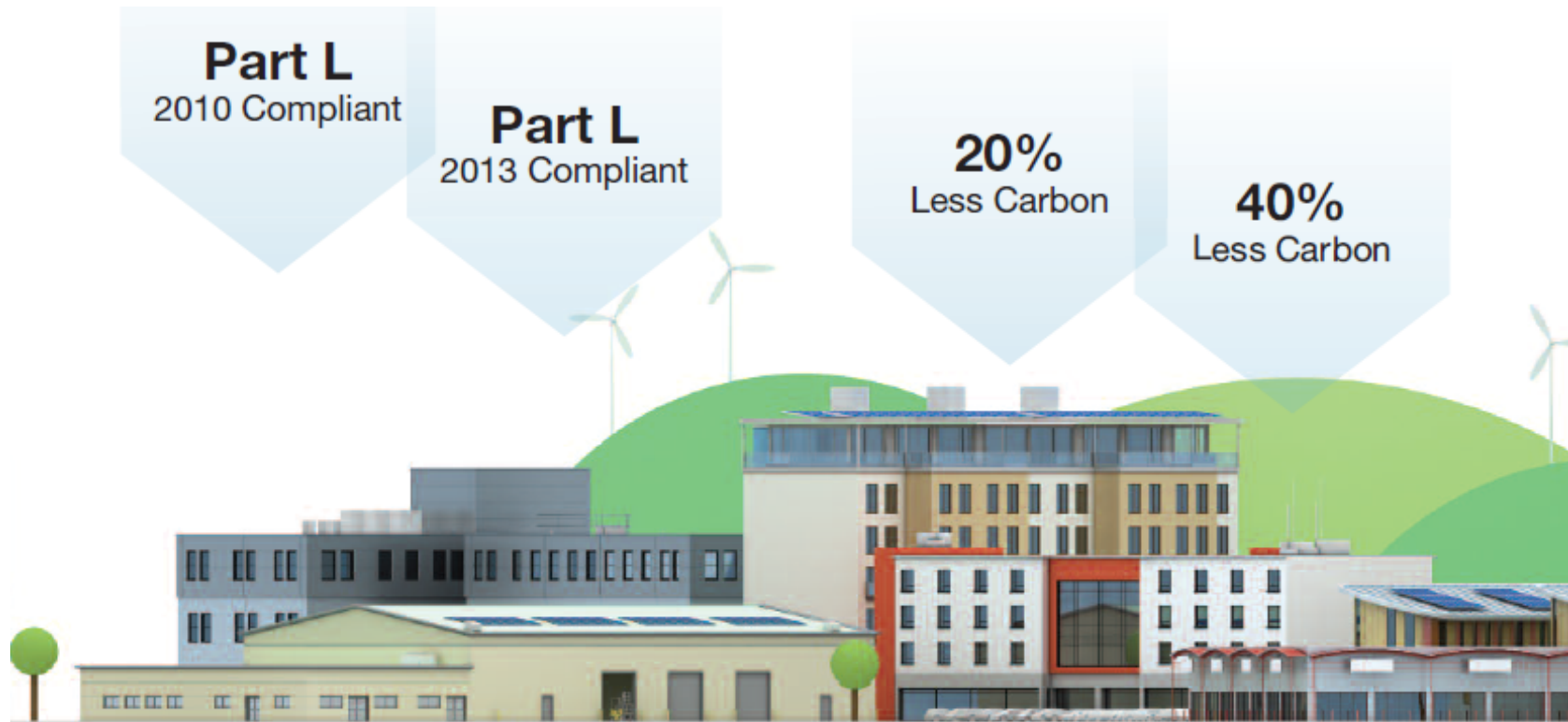
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Steve Harrison

President

Building Controls Industry Association

ABB

Bell CONTROL SOLUTIONS LTD

CH CrownHouse

eclipse

LCSL linear control systems ltd

Sontay

ABEC

bg energy solutions

CLOVER CONTROLS Control Systems & Software Specialists

EEC

LLORET CONTROL SYSTEMS LTD

SMART

AC Controls

BMSI

COMFORTCONTROLS

esg

matrix

SYSCOM BUILDING MANAGEMENT LTD

Acorn Integrated Systems

bowker ltd building services engineers

combined services

ETA SOUTHERN CONTROLS

MS Controls

System Five

AES

BUILDING ENERGY SYSTEMS

CONTEMPORARY Controls

ETON

MITSUBISHI ELECTRIC

TOTAL CONTROL

Ambiflex

Building Technology Systems Ltd.

CURA

frese Energy-saving valves

neptronic

TRANE

ASTRAL CONTROL SERVICES

Cylon

horizon controls

next control systems

TREND

AUTOMATEDLOGIC CORPORATION

bac

Canham

DDE detail design engineering

IMPACT CONTROL SYSTEMS LIMITED

PcVue Solutions

TRI

Carrob

PRIVA

TRIAD CONTROLS LTD

BAS

Beacon Control Associates Limited

CENTRA LINE by Honeywell

DAIKIN

STANDBY

realtime

TRIDIUM

WEMS

BEC

clarksoncontrols LIMITED

DISTECH CONTROLS

Johnson Controls

Schneider Electric

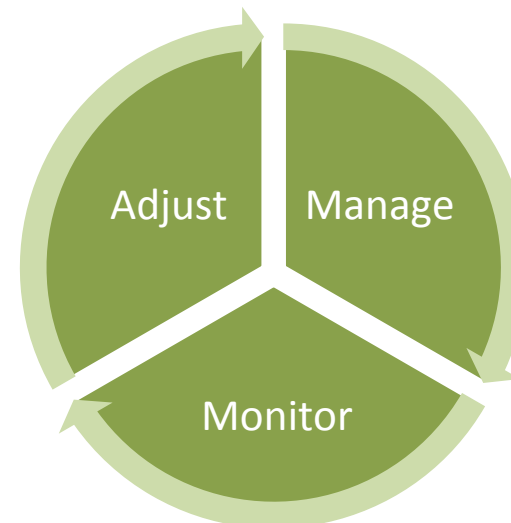Western Automation

BELIMO

C CONTROLS

ebmpapst

kes

SIEMENS

Voice of UK BACS

Our main message is that building controls are key to saving energy (and hence money) in buildings.

Users need to understand controls to manage how much energy is used in their buildings.

Monitor, Adjust,
Manage then
Monitor some more. . .

BCIA – raising installation standards

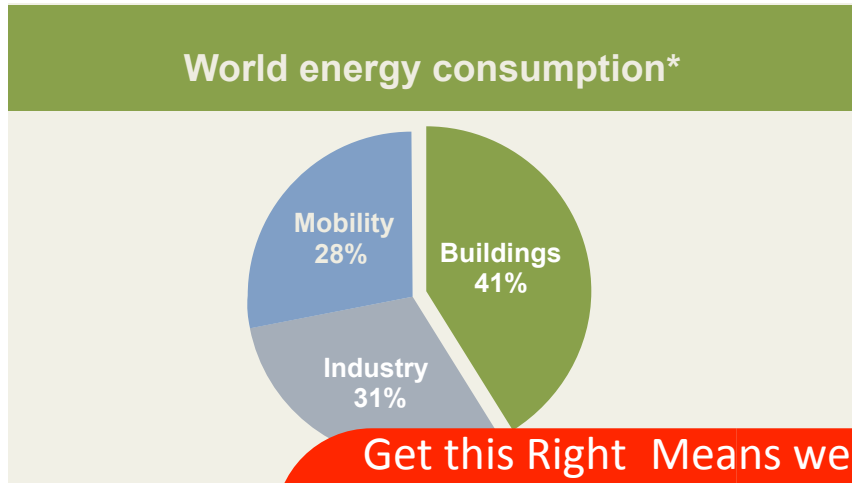
Building Controls Professional Assessment

End of course assessment for apprentices – and practising operatives too

A 2.5 day assessment of skills; our equivalent of the electricians' AM2 test

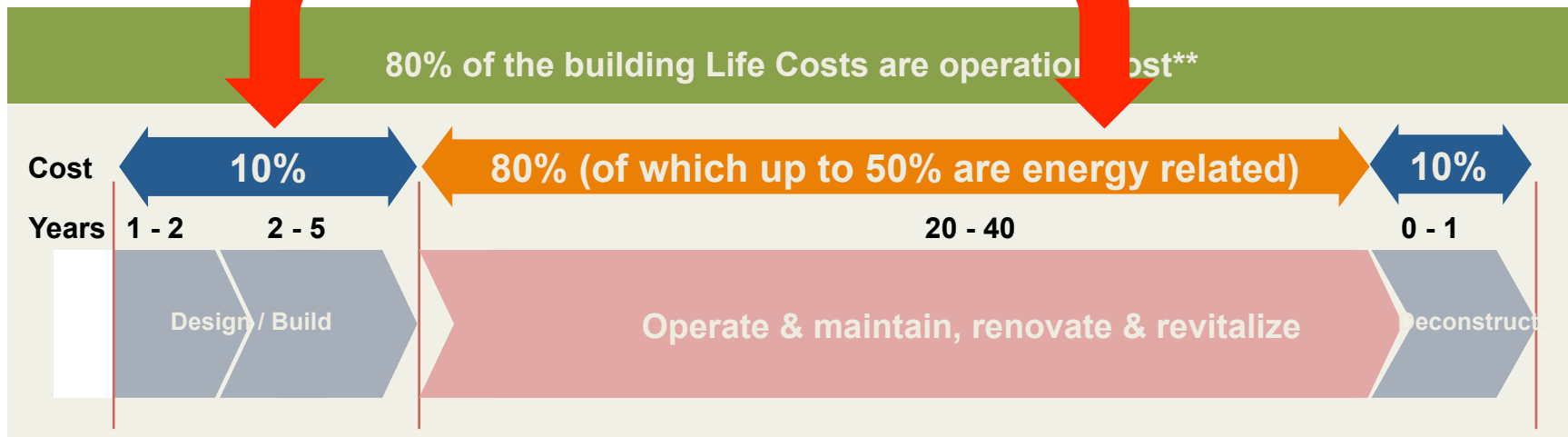Will be linked to a new ECS Gold Card

Facts about Buildings

World energy consumption*

Mobility
28%

Buildings
41%

Industry
31%

OPEX is to be considered over
CAPEX to ensure the life cycle
efficiency of the building.
Better Design
Better Collaboration
Better Results

Get this Right Means we Get this Right

80% of the building Life Costs are operational cost**

| Cost	10%	80% (of which up to 50% are energy related)	10%
Years	1 - 2 2 - 5	20 - 40	0 - 1
	Design / Build	Operate & maintain, renovate & revitalize	Deconstruct

*International Energy Association, auf weltweiter Basis, im Jahr 2002 / ** Dena Congress, Berlin, 2008 / *** „Global Mapping of Greenhouse Gas Abatement Opportunities up to 2030", Building Sector deep dive, June 2007, Vattenfall AB, basiert auf Information von IEA, 2002, % der weltweiten Treibhausgasemissionen; Total 40 Gt CO2e

Demand Based Management

Sensors continuously monitor and compare conditions in the controlled space, they provide real time feed back to the controller which adjusts the generator load and distribution channel to match the exact demand and occupancy of the building.
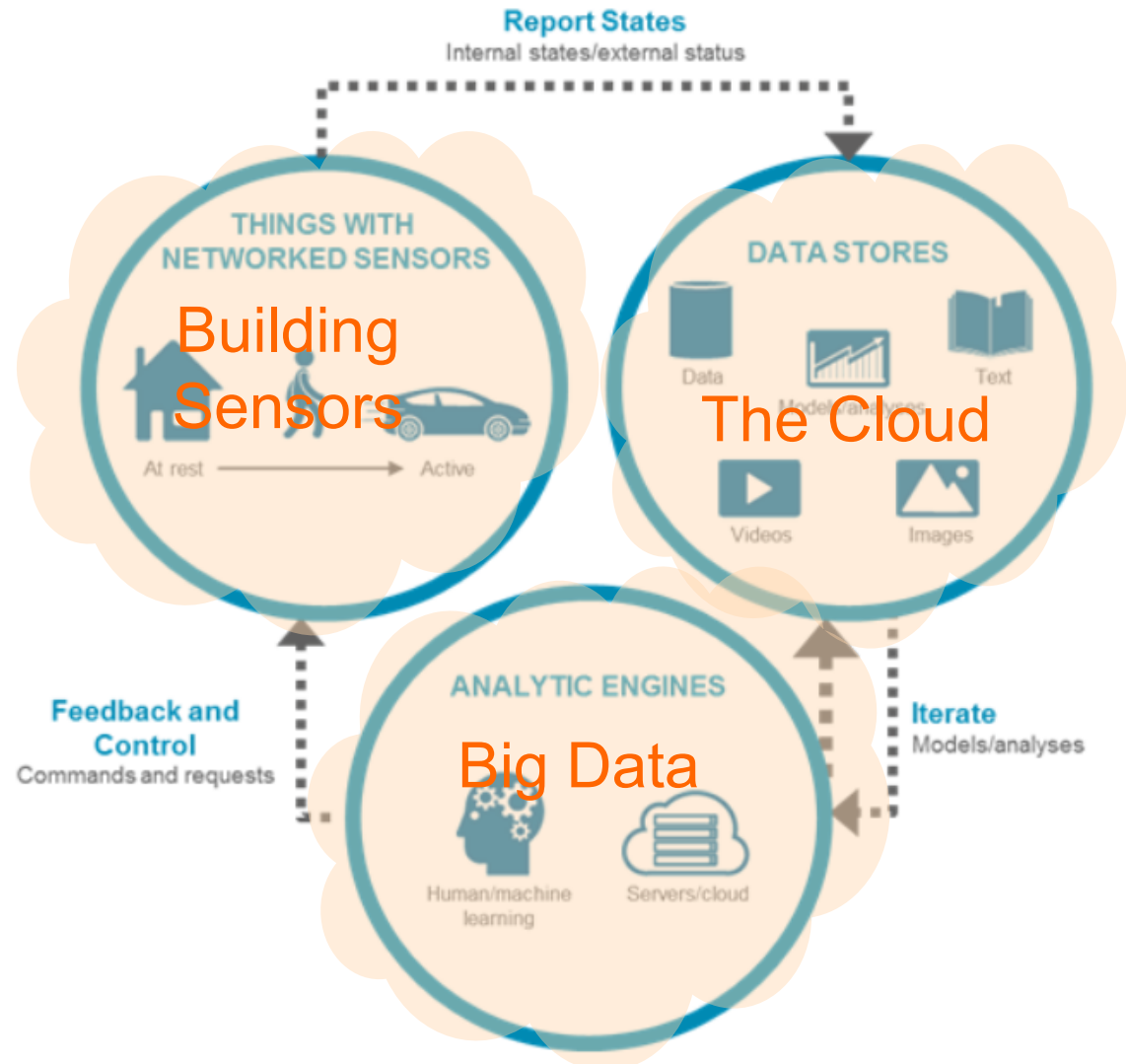
How can we best use all this Data ?
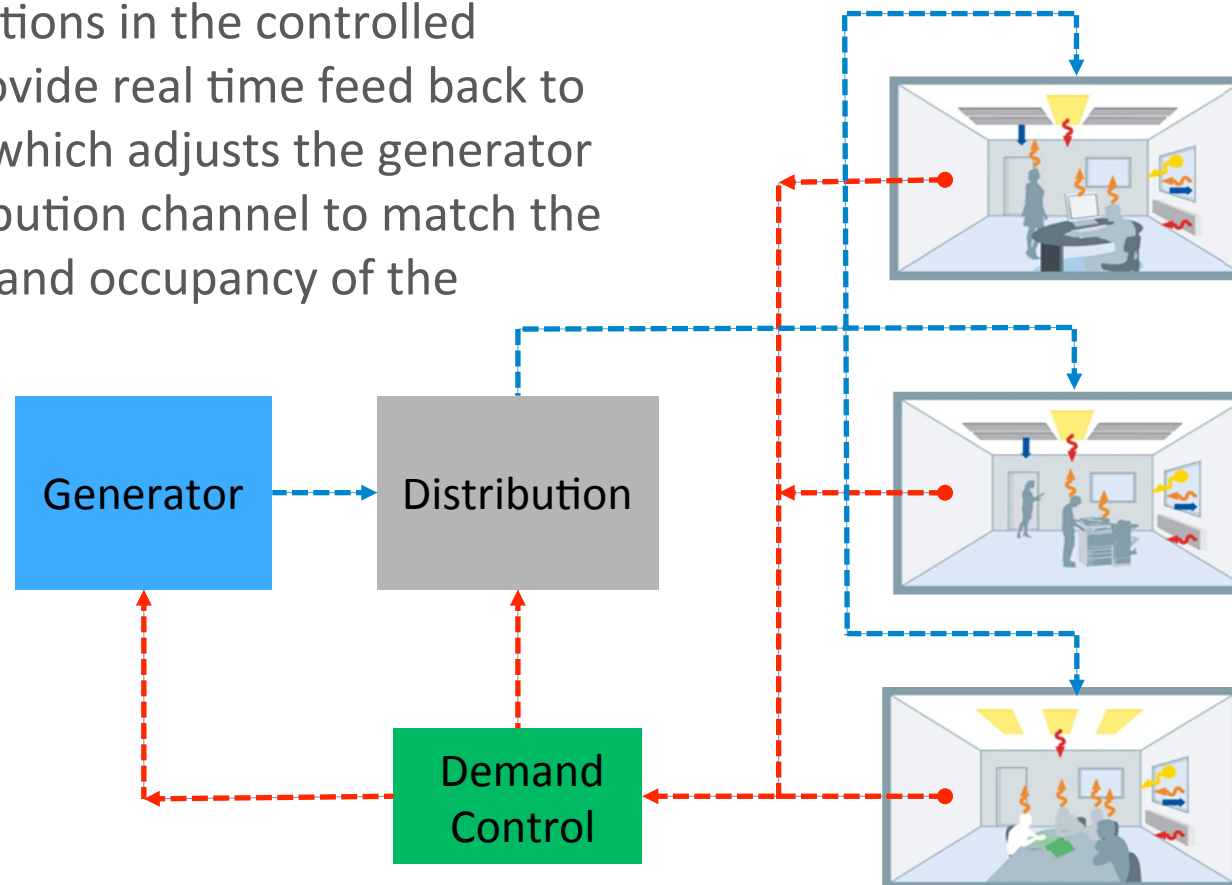
Cloud based Data Analytics (IoT)

bcia
the building controls
industry association

The Internet of Things (IoT) refers to the ever-growing network of physical objects that connect to the internet, the information that they create, the method of storage, and the analytics that can be realised between these objects.

Sensor data will exceed social media by factors 10 to 20 times in 5 years. . .

Report States
Internal states/external status

THINGS WITH NETWORKED SENSORS

Building Sensors

At rest → Active

DATA STORES

Data   Model/analyses   Text

The Cloud

Videos   Images

Feedback and Control
Commands and requests

ANALYTIC ENGINES

Big Data

Human/machine learning   Servers/cloud

Iterate
Models/analyses

A Guideline for control - EN 15232

This standard was created to establish conventions and methods for estimating the impact of building automation and technical building management on energy performance and use in buildings.

BS EN 15232 specifies a method to estimate energy-saving factors which can be used in conjunction with an energy assessment of a building.

It also supplements a series of standards drafted to calculate the energy efficiency of technical building services, such as heating, cooling, ventilation and lighting systems.

EN15232 should be used both for assessing existing buildings and during the design of new or renovated buildings.

Part "L" Non Domestic Building Services Compliance Guide 2013

Energy Performance Class's

BACS Energy Performance Classes

Class A: High energy performance BACS

Class B: Advanced Integrated BACS

Class C: Standard BACS (Reference Point)

**Class D:** Non energy efficient BACS

Calculated efficiency – EN 15232

Class	Thermal energy				Electrical energy			
	D	**C**	B	A	D	**C**	B	A
Offices	1,51	1	0,80	0,70	1,10	1	0,93	0,87
Lecture hall	1,24	1	0,75	0,50	1,06	1	0,94	0,89
Education	1,20	1	0,88	0,80	1,07	1	0,93	0,86
Hospitals	1,31	1	0,91	0,86	1,05	1	0,98	0,96
Hotels	1,31	1	0,85	0,68	1,07	1	0,95	0,90
Restaurants	1,23	1	0,77	0,68	1,04	1	0,96	0,92
Wholesale & retail	1,56	1	0,73	0,60	1,08	1	0,95	0,91
Residential	1,10	1	0,88	0,81	1,08	1	0,93	0,92

EN15232 is to be included BREEAM, and Soft Landings

Sustainable operation – EN15232
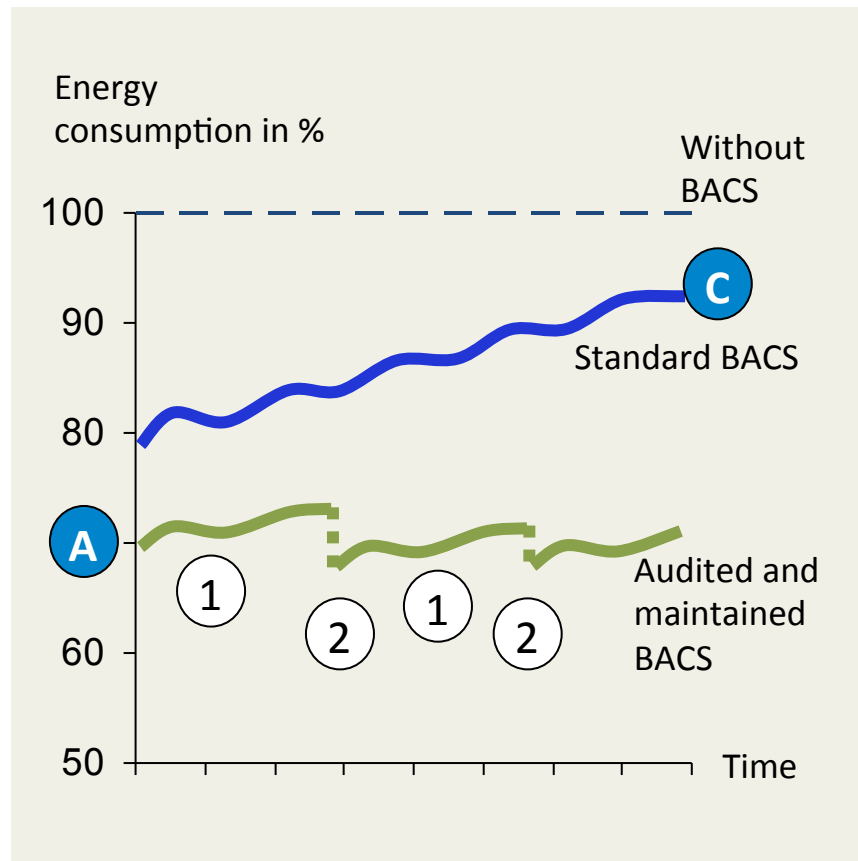
For illustration purpose only.

A Advanced Integrated BACS
- Optimal BACS specification
- Improved cost-benefit ratio

1 Functional Assessment
- Check ordered and installed functionality
- Assure equipment availability

2 Management and Adjustment
- Adjust to building profile
- Meet comfort requirements
- Check parameterization
- Meet specified energy performance class

Ongoing Improvement – EN15232

Even with building automation, you still need

- To identify optimisation potential
- To know the synergies between the technical installations, the environment and the user
- To master guidelines, directives and laws
- A willingness to constantly face new technology!

**The intelligence is still sitting in front
of the monitor!!**

The eu.bac Certification Mark and Label assures users the conformity of products and systems defined in European Directives and European Standards.

eu.bac members

BELIMO®

BROEN
INTELLIGENT FLOW SOLUTIONS

COMAP

Danfoss

DELTA DORE

frese

DIGI CONTROL DIGI VISION GFR

:hager

HERZ

Honeywell

invensys
Controls

Johnson Controls

kieback&peter

TA HEIMEIER

SAUTER
Creating Sustainable Environments.

Schneider Electric

theben

PRIVA

oventrop

TRiDiUM

SIEMENS

saia-burgess

SONDER
Energy control

TREND

eu.bac Certification

Product certification

eu.bac Cert

Zone controllers

Tested in labs

NEW

System certification

System eu.bac european building automation controls association

A+
A
B
C
D
E
F

Complete installations in individual buildings

Inspected on site

Combining the two maximizes the assurance that the products and systems meet the requirements and will provide the opportunity of achieving the best energy performance in buildings
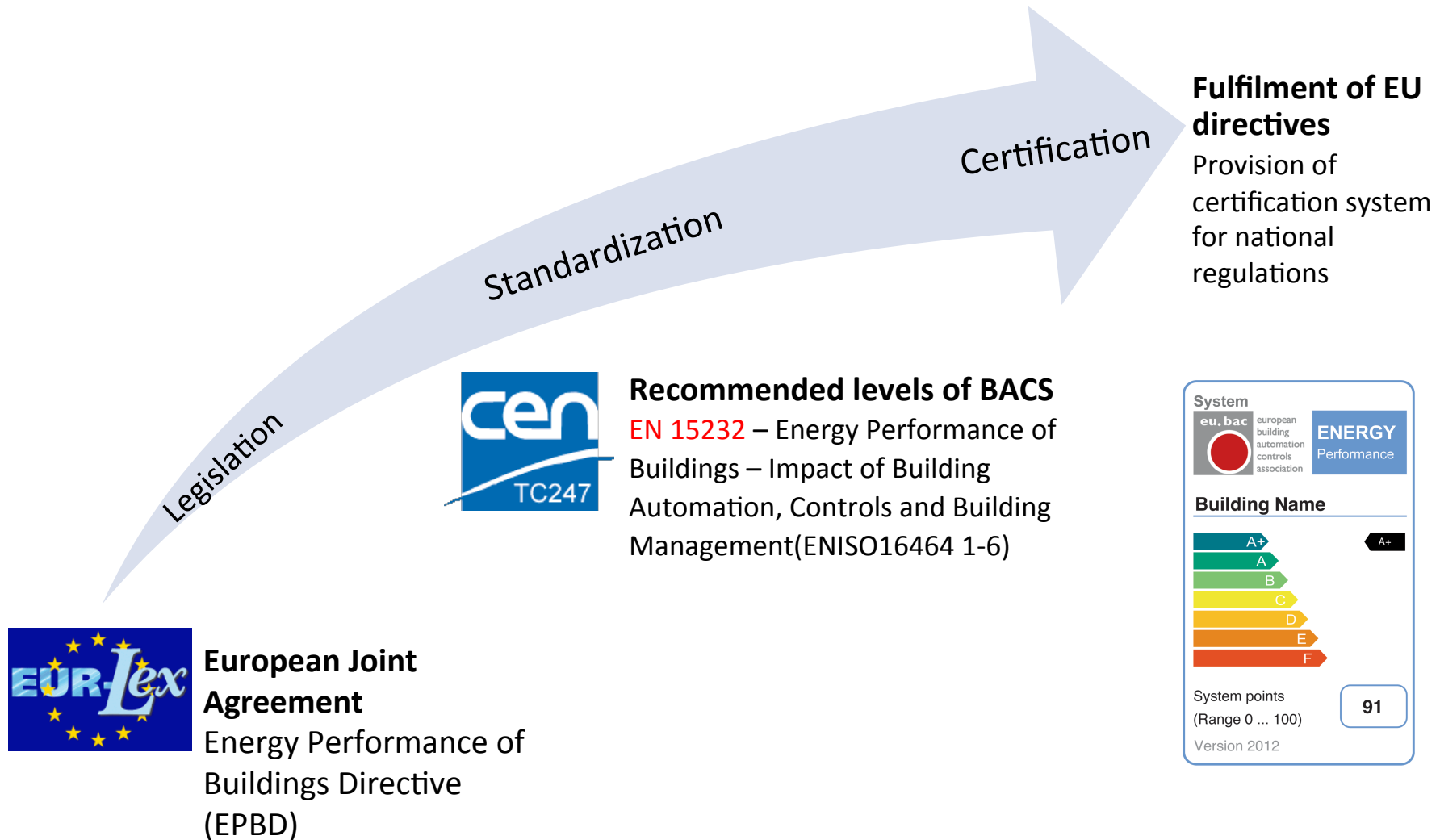
eu.bac - Systems

A structured, standardized and scientifically proven tool for assessing **Energy Efficiency in Building** Automation Systems (BACS)
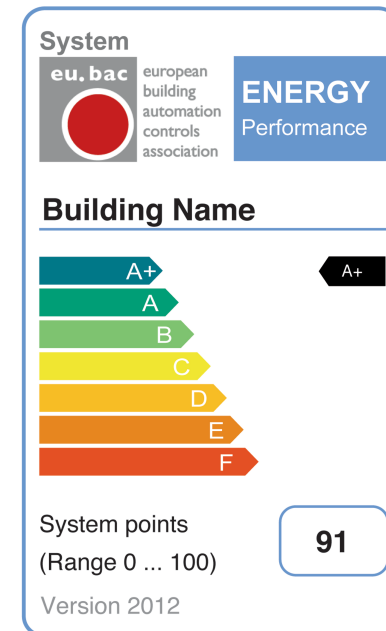
Based on EN15232

Evolution from European directives to BACS Certification

Certification

Standardization

Legislation

Fulfilment of EU directives
Provision of certification system for national regulations

Recommended levels of BACS
EN 15232 – Energy Performance of Buildings – Impact of Building Automation, Controls and Building Management(ENISO16464 1-6)

European Joint Agreement
Energy Performance of Buildings Directive (EPBD)

System
eu.bac european building automation controls association

ENERGY Performance

Building Name

A+
A
B
C
D
E
F

A+

System points
(Range 0 ... 100)

91

Version 2012

EN 15232 & eu.bac System Check-list

EN 15232:2012

				D	C	B	A
AUTOMATIC CONTROL							
1		**HEATING CONTROL**					
1.1		Emission control					
Points		*The control system is installed at the emitter or room level, for case 1 one system can co*					
0	0	No automatic control		▓			
0	1	Central automatic control		▓			
1	2	Individual room control		▓	▓		
2	3	Individual room control with communication		▓	▓	▓	
3	4	Individual room control with communication and presence control		▓	▓	▓	▓

The standard EN15232:2012 is reflected in the eu.bac Check List

Audit Check-list

eu.bac Points System

POINTS AND CLASS SUMMARY		Importance	Actual Imp.	Norm. Score	POINTS
Section	Description	Importance	Actual Imp.	Norm. Score	Result
1	Heating control	10	10.00	97.92	**17**
2	Domestic hot water supply control	2	2.00	89.25	**3**
3	Cooling control	10	10.00	94.97	**17**
4	Ventilation and air conditioning control	10	10.00	87.68	**15**
5	Lighting control	5	5.00	100.00	**9**
6	Blind control	5%	2.87	100.00	**5**
7	Technical building management	10	10.00	100.00	**17**
8	eu.bac Key Performance Indicators	5%	2.87	46.51	**2**
9	eu.bac Extended Functionality	5%	2.87	55.56	**3**
10	eu.bac Certified Products	3%	1.72	100.00	**3**
NORMALIZED TOTAL (0-100)			57.32		**91**
			eu.bac System (F–A+):		**A+**

System

eu.bac european building automation controls association

ENERGY Performance

Building Name

A+
A
B
C
D
E
F

A+

System points
(Range 0 ... 100)

91

Version 2012
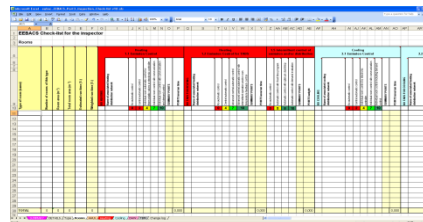
10 points improvement means 5% energy savings!

eu.bac Systems Execution. . .

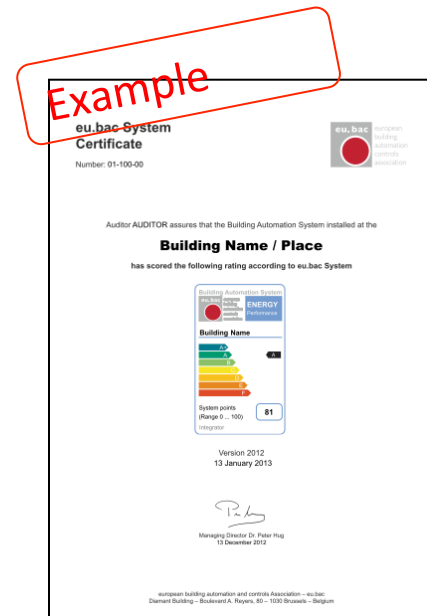| Preparation	Inspection	Registration	Declaration
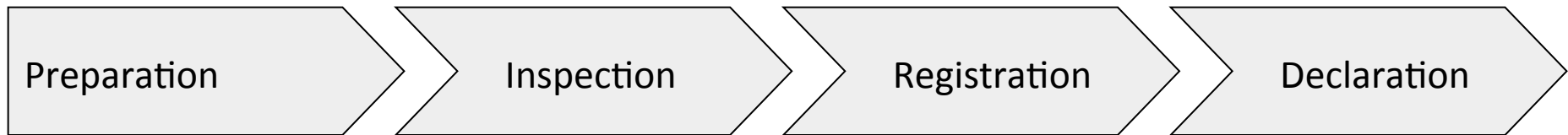
Preparation

- Overview on floor plans
- Understand flow of heating, cooling, ventilation
- Prepare Check-list based on BACS documentation

Inspection

- Record building data in eu.bac System Check-list
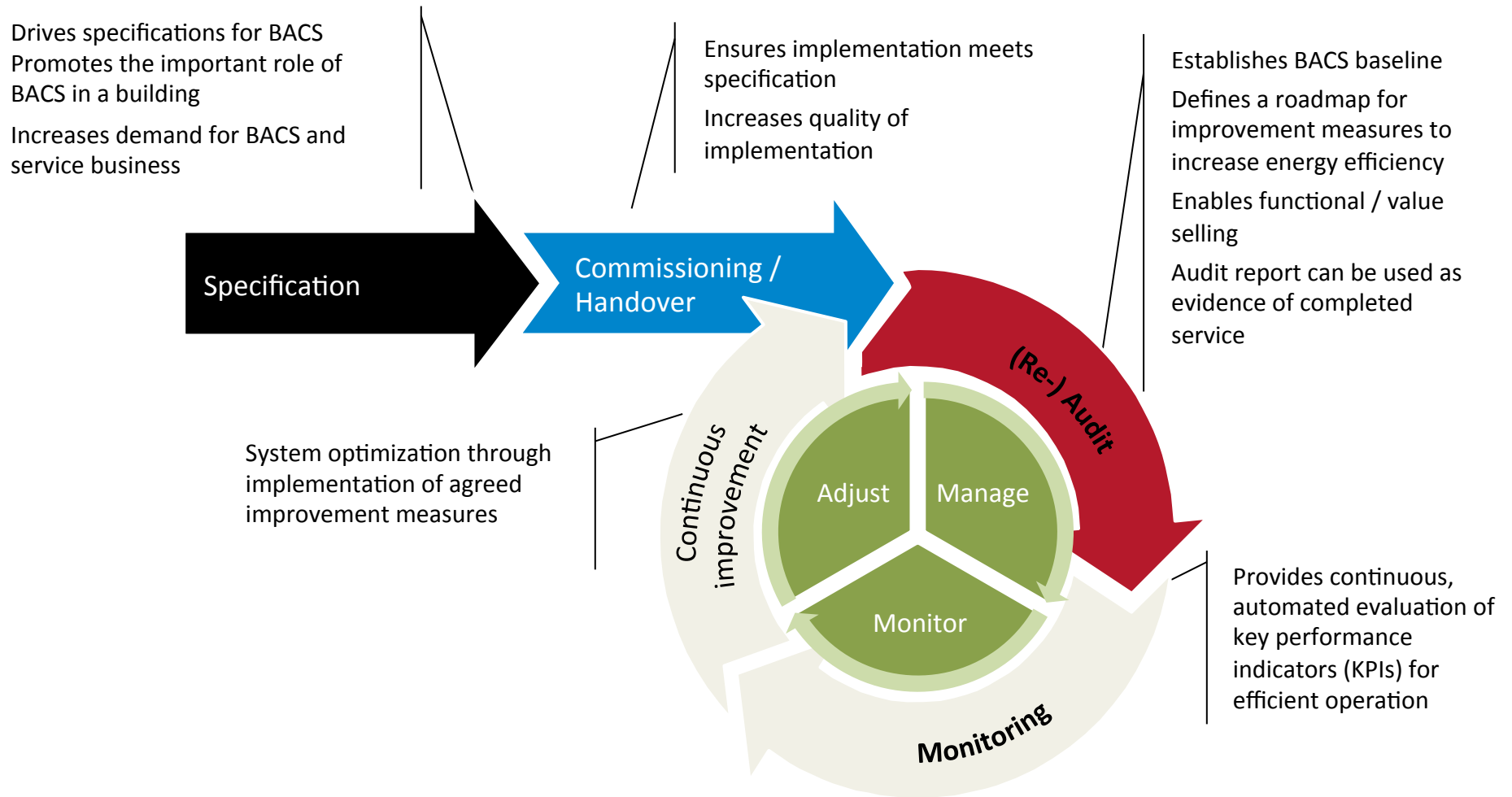- Do partial checks to verify functionality

Registration

- Register BACS on eu.bac database
- Review inspection
- Clarify deviations
- Audit report

Declaration

eu.bac System – Doesn't end there !

Drives specifications for BACS
Promotes the important role of BACS in a building

Increases demand for BACS and service business

Ensures implementation meets specification

Increases quality of implementation

Establishes BACS baseline

Defines a roadmap for improvement measures to increase energy efficiency

Enables functional / value selling

Audit report can be used as evidence of completed service

Specification

Commissioning / Handover

(Re-) Audit

System optimization through implementation of agreed improvement measures

Continuous improvement

Adjust   **Manage**

Monitor

Monitoring

Provides continuous, automated evaluation of key performance indicators (KPIs) for efficient operation

eu.bac Systems Stake Holders

Building Owner - Operator
Reduce predicted running cost, and increase the market value in both new and existing building stock by specifying a eu.bac System audit.
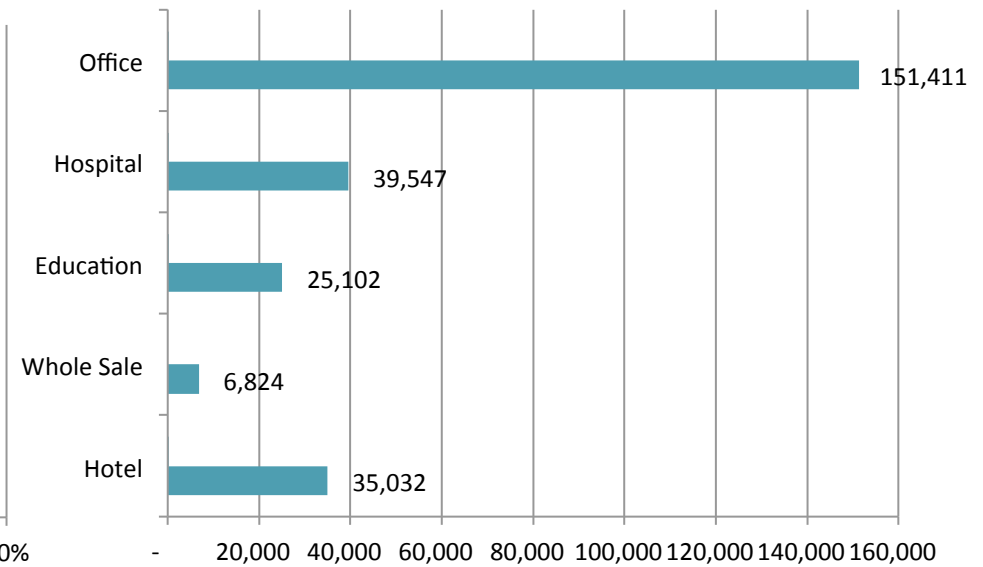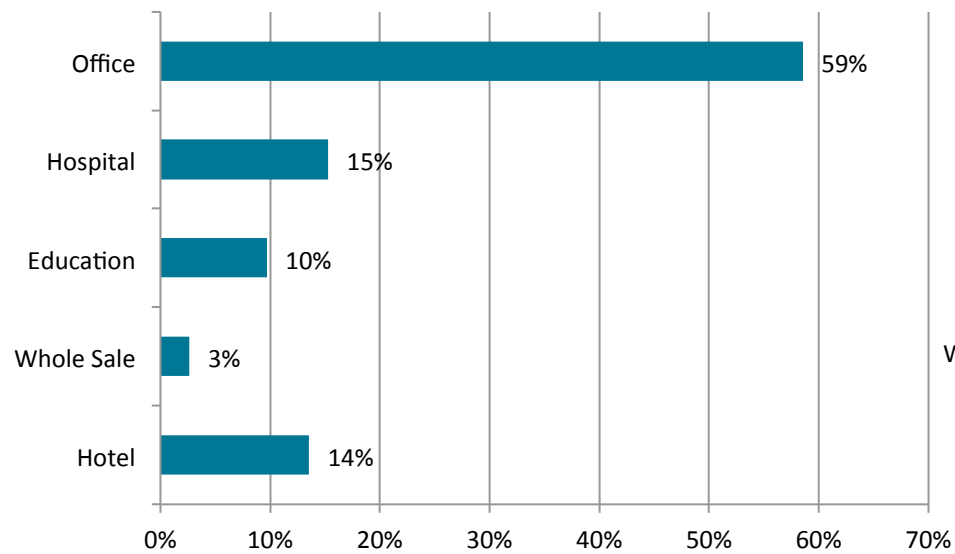
Engineering Consultants
Extend the range of consulting services and formalize identification of improvement measures.

System Installers – Maintenance Providers
Include with Service Level Agreement, recommending products to create "Greener" buildings and provide a lifecycle system to measure ongoing energy efficiency in accordance with the standard EN15232.
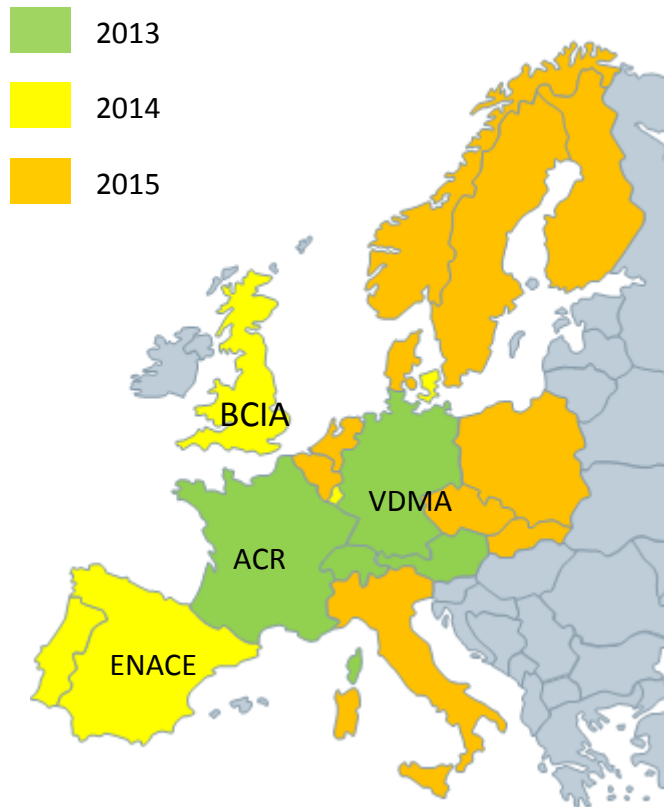
eu.bac System – 258,637 m^2 audits
(Oct 14)

	Percentage
Office	59%
Hospital	15%
Education	10%
Whole Sale	3%
Hotel	14%

	Area
Office	151,411
Hospital	39,547
Education	25,102
Whole Sale	6,824
Hotel	35,032

September 2013   – 157.185 m^2

eu.bac System EU Partners

Legend:
- 2013 (green)
- 2014 (yellow)
- 2015 (orange)

Map labels: BCIA, VDMA, ACR, ENACE
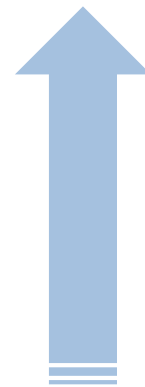
38 Authorized Auditors:-
D, CH, FR and UK

50 Junior Auditors :-
D, CH, FR and UK

129 trained people

eu.bac System:

http://system.eubac.org/

BCIA:

http://bcia.co.uk/

thank you!