

# KNX

## The worldwide STANDARD for home and building control

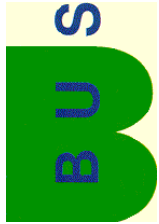
[www.knx.org](http://www.knx.org)

KNX Association  
**Vassilios Lourdas**  
System Engineer  
[vassilios.lourdas@knx.org](mailto:vassilios.lourdas@knx.org)

# Historical aspects

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Until 1997 three major associations on the building sector were active:



**BCI** (Batibus Club International)



**EHSA** (European Home Systems Association)



**EIBA** (European Installation Bus Association)

# Historical aspects



**KNX Association was found in 1999!**



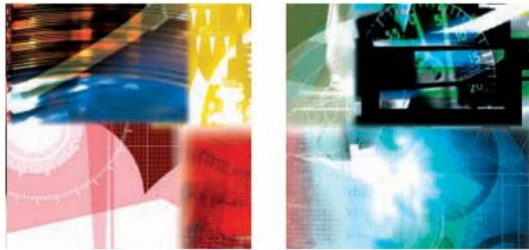
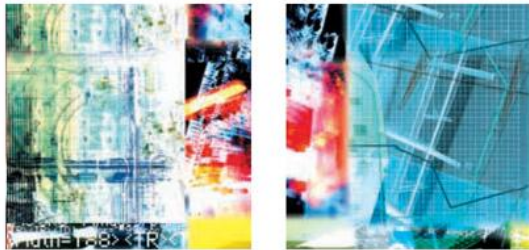
# Historical aspects

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## Many names, one system!

EIB, Instabus (Siemens), i-bus (ABB), EIBus, κλπ.





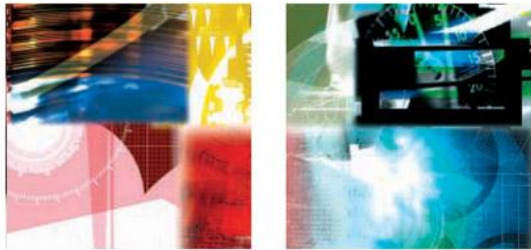
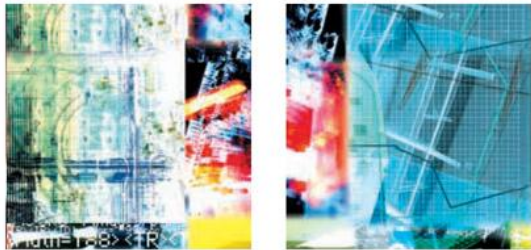
## Basic principles of KNX

[www.knx.org](http://www.knx.org)

# Basic principles of KNX

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- KNX is a **decentralised system** based on the serial data transmission.
- All the functions **are controlled independently.**
- **No need** for central computer.
- **Fast** exchange of information.
- **Interoperability and interworking** between other components.
- **Open and extendable** system

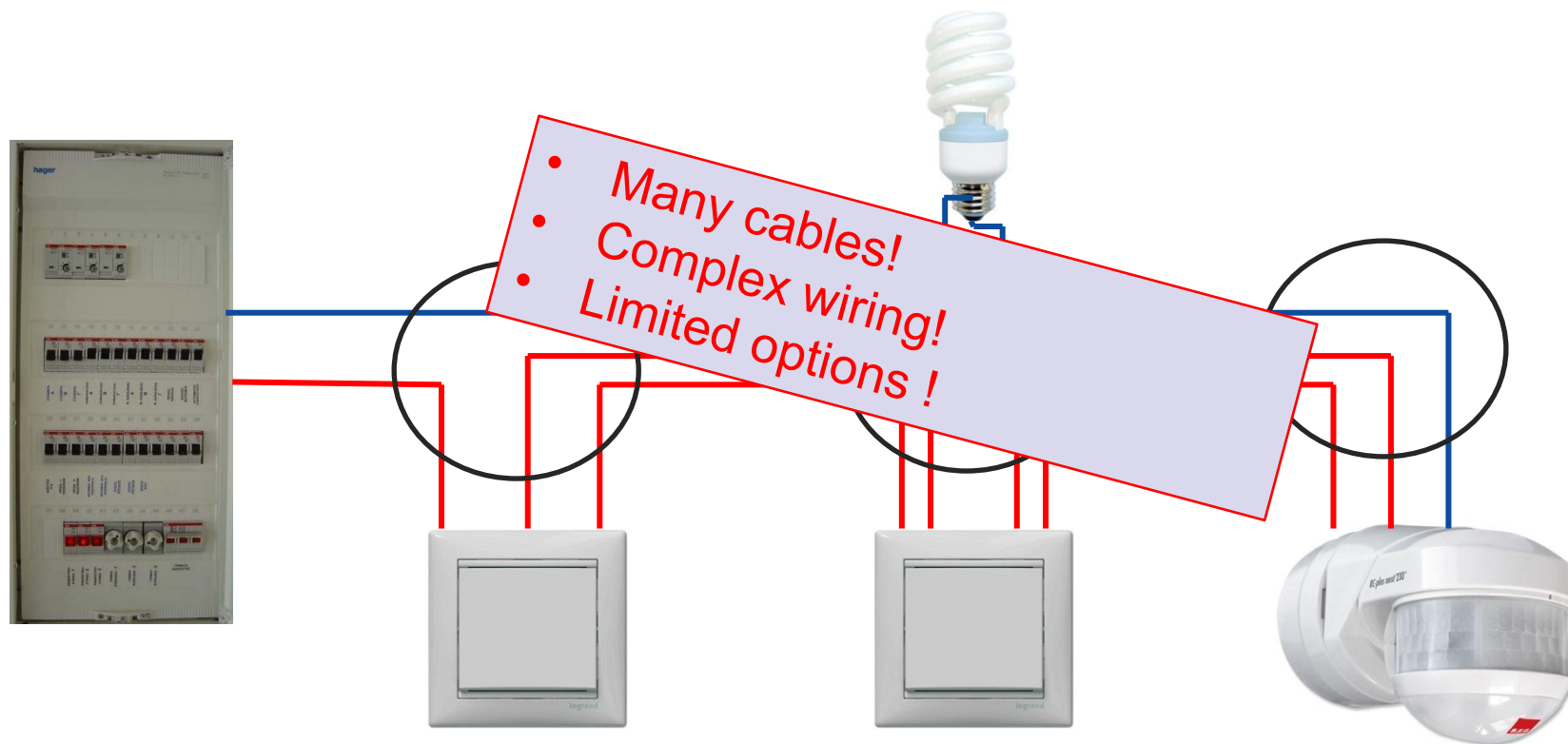


## KNX Installation

[www.knx.org](http://www.knx.org)

# KNX Installation

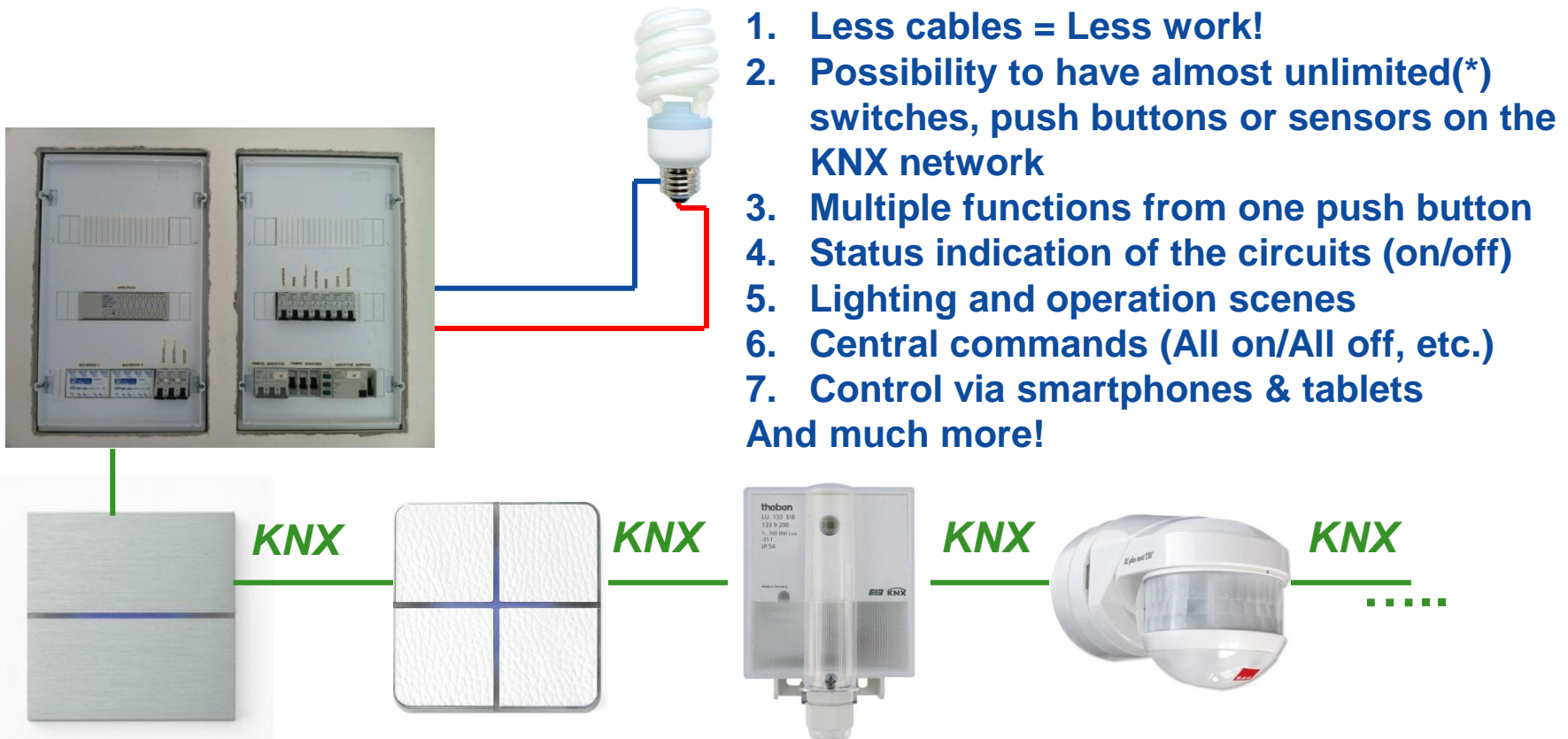
- Conventional installation of a multiple lighting control (“Aller-retour”)





# KNX Installation

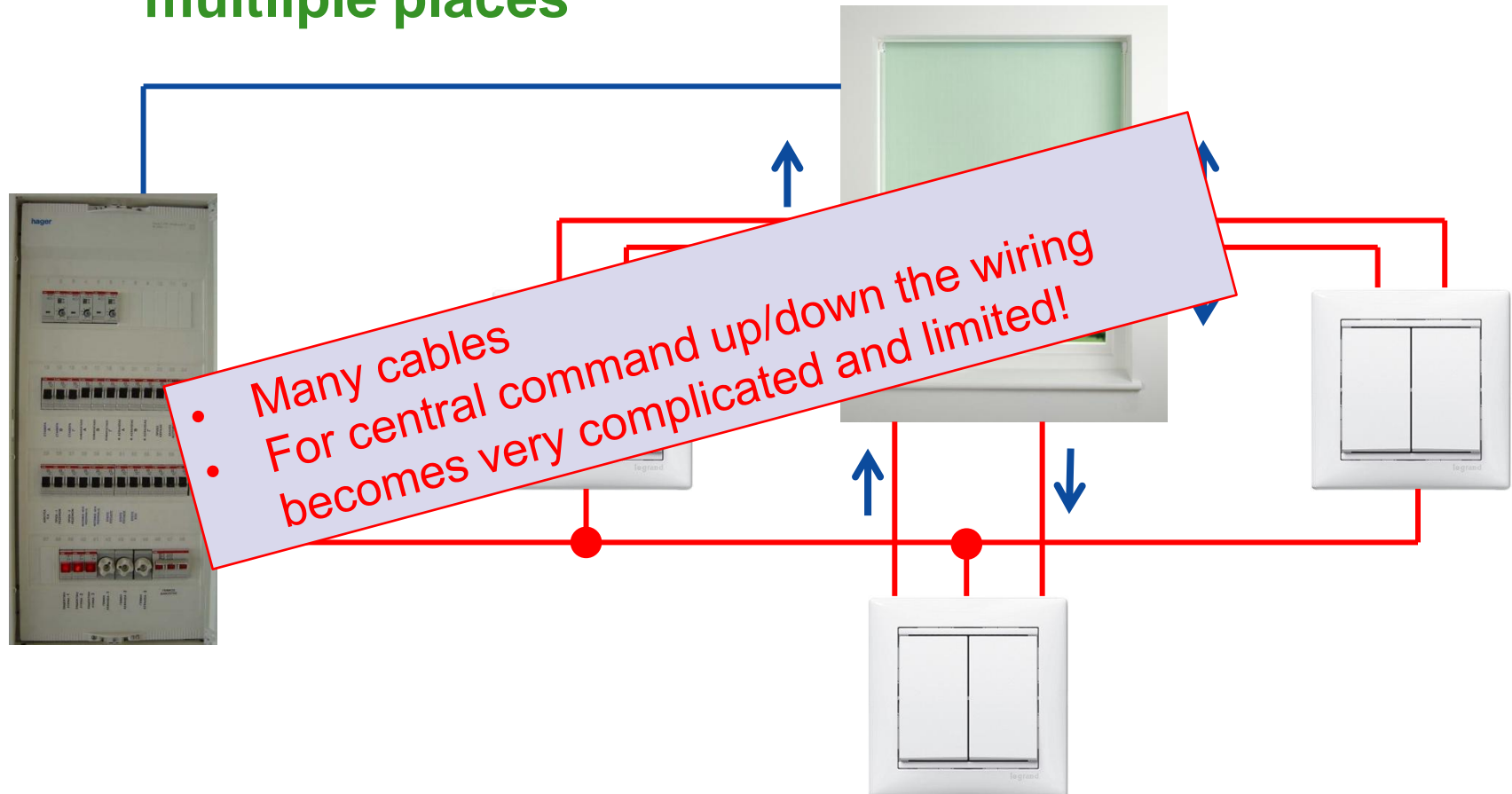
## ■ KNX installation of a multiple lighting control (Multiple “Aller retour”)



(\*) Maximum number of KNX devices in an installation ~ 15.500

# KNX Installation

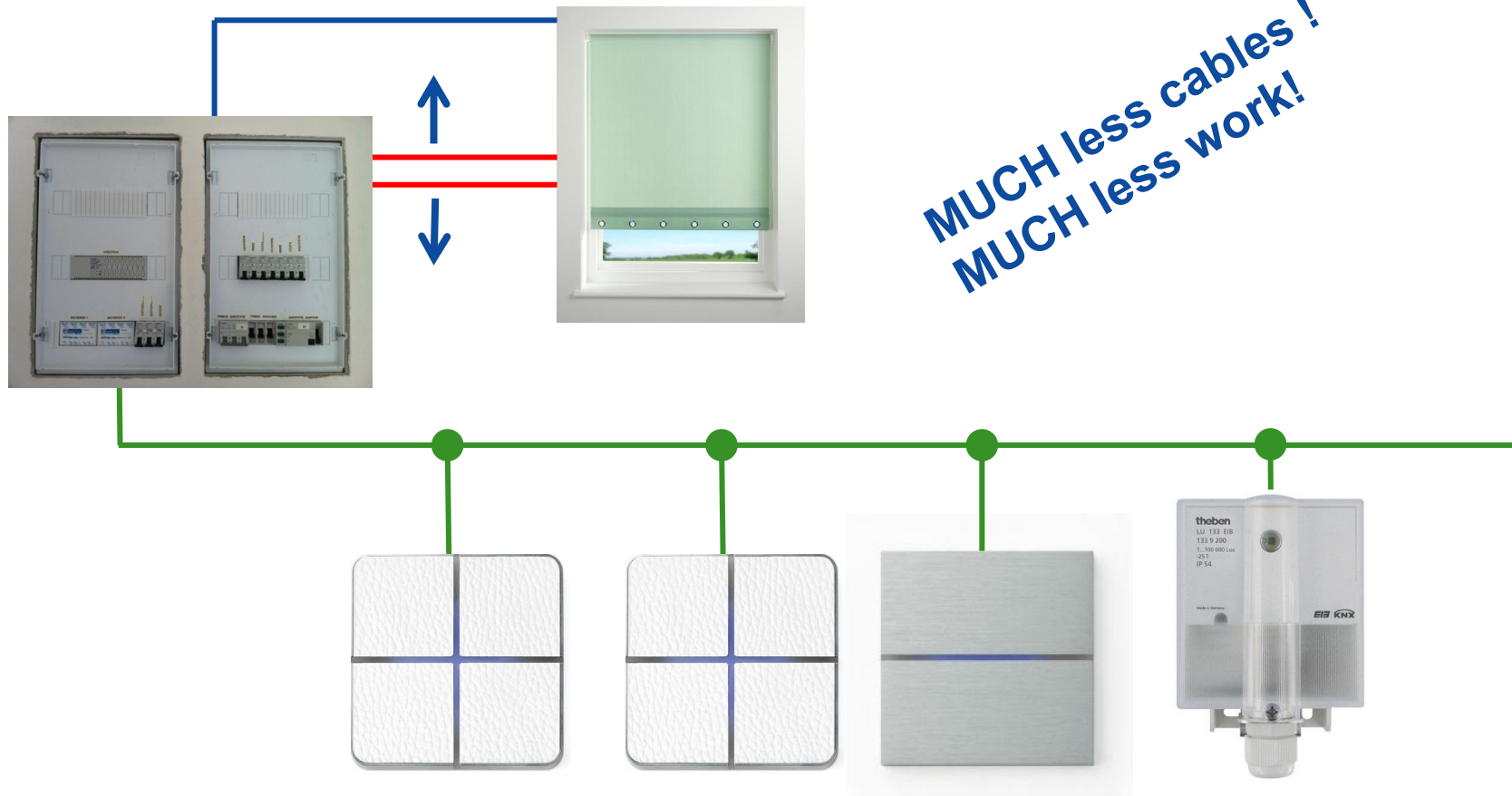
- Conventional installation for shutter control from multiple places



# KNX Installation



- KNX installation for shutter control from multiple places



# KNX – Commissioning

## One Tool – the Engineering Tool Software ETS™!

1. One PC software tool for

A. Design

B. Configuration

C. Diagnostics

of KNX all certified

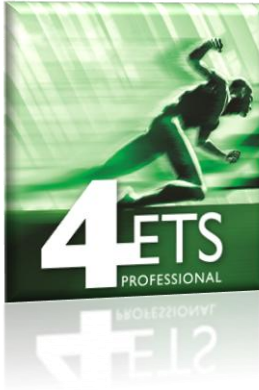
2. Tool for services and application

extendable with customised Apps



**Available in 17 languages!**

# KNX – Commissioning



- Chinese
- Czech
- Danish
- Dutch
- English
- Finnish
- French
- German
- Greek
- Italian
- Norwegian
- Polish
- Portuguese
- Russian
- Spanish
- Swedish
- Turkish

***More languages to come!***

# Summary of the KNX installation

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- The electrical installation of the building becomes simpler. Future modifications and extensions are done easier.
- In most cases, the adaption of the installation is realised fast only by reprogramming it, without having to move any cables.
- Control via IP, internet, WIFI, bluetooth, IR and telephone is possible today!
- One software for all the manufacturers (more than 350) and for all devices (more than 7000)

# KNX is the Standard

- CENELEC

**EN 50090** – the only European Standard for Home and Building Electronic Systems (HBES) based on KNX.

- CEN

**EN 13321-1** – the European Standard for Building Automation based on KNX.

- ISO/IEC

**ISO/IEC 14543-3** – the World`s only Standard for Home Electronic Systems (HES) based on KNX.

- GB/T

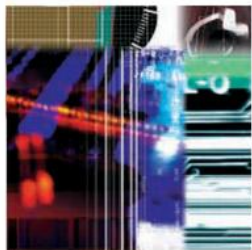
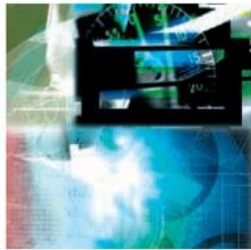
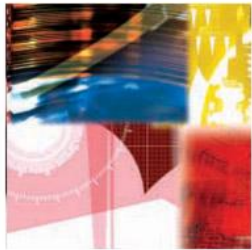
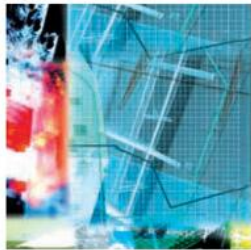
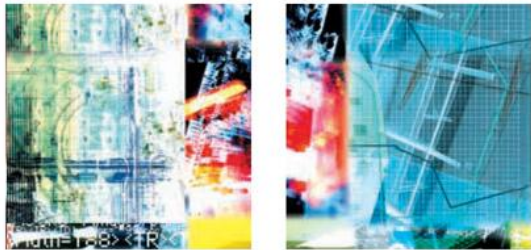
**GB/T 20965** – Chinese Standard for Home and Building Control based on KNX

- US Standard (ANSI/ASHRAE 135)

**KNX: The worldwide STANDARD for home and building control!**







## Advantages of KNX

[www.knx.org](http://www.knx.org)



# KNX – Advantage No. 1

**KNX is a standard here to stay!**

- CENELEC

**2003:** KNX became **EN50090**

- CEN

**2005:** KNX became **EN13321-1/2**

- ISO/IEC

**2006:** KNX became **ISO/IEC14543-3**

- SAC (P.R. China)

**2013:** KNX became **GB/T 20965**

- ANSI/ASHRAE

KNX referenced in **US ANSI/ASHRAE** standard **135**



# KNX – Advantage No. 2

## Guaranteed Interoperability through neutral certification

1. KNX is the only home and building control standard running global certification schemes for

- A. Products
- B. Training Centers
- C. Persons



2. Product compliance is checked at neutral third party test laboratories

**KNX Logo  
guarantees  
interoperability  
between products  
of different  
manufacturers  
and applications**

## KNX – Advantage No. 3

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### KNX = High Product Quality

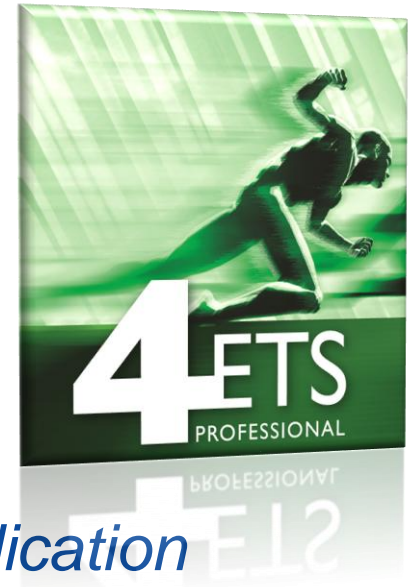


1. KNX Association requires *high level production and quality control* during all stages of the product's life
2. All manufacturers have to show compliance to *ISO 9001* = prerequisite for product certification

# KNX – Advantage No. 4

## One Tool – the Engineering Tool Software ETS™!

1. One PC software tool for
  - A. Design
  - B. Configuration
  - C. Diagnosticsof KNX all certified products
2. Tool is *manufacturer, devices and application* independent – integrator can combine products of different manufacturers and applications in one installation
3. Tool is extendable with customised Apps



# KNX – Advantage No. 5

Fit for use in ALL applications  
in home and building control!



# KNX – Advantage No. 6

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## Fit for use in all kinds of buildings!

1. New or existing buildings
2. One family houses or large size buildings
3. Easy extendible/adaptable to new needs



# KNX – Advantage No. 7

## Support for different transmission media

1. Twisted Pair



2. Power Line



3. Radio Frequency



4. Ethernet/WIFI



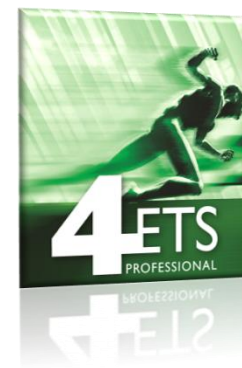


# KNX – Advantage No. 8

## Support for different configuration Modes

### 1. S-Mode

- A. Configuration with PC (ETS)
- B. Prior basic course training recommended
- C. Any size of installation



### 2. E-Mode

- A. Configuration without PC
- B. No prior training necessary
- C. Small or medium size installations





# KNX – Advantage No. 9

## Easy coupling to other systems

1. KNX members offer large variety of gateways to couple to other systems

2. Examples

A. Mapping to BACnet



B. Interfacing with DALI



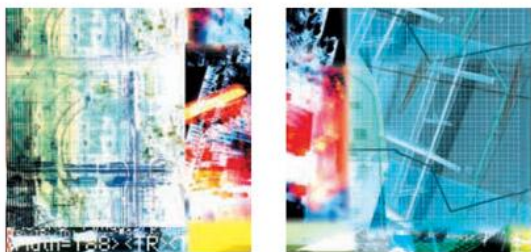
# KNX – Advantage No. 10

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## KNX is independent from any hard- or software technology

1. KNX manufacturers can develop own protocol solution
  1. From scratch
  2. On basis of existing certified system components from other KNX members
2. KNX is completely FREE of additional royalty fees: No IPR royalties to be paid for KNX standard features used in KNX certified products to other KNX members





# KNX Facts and Figures

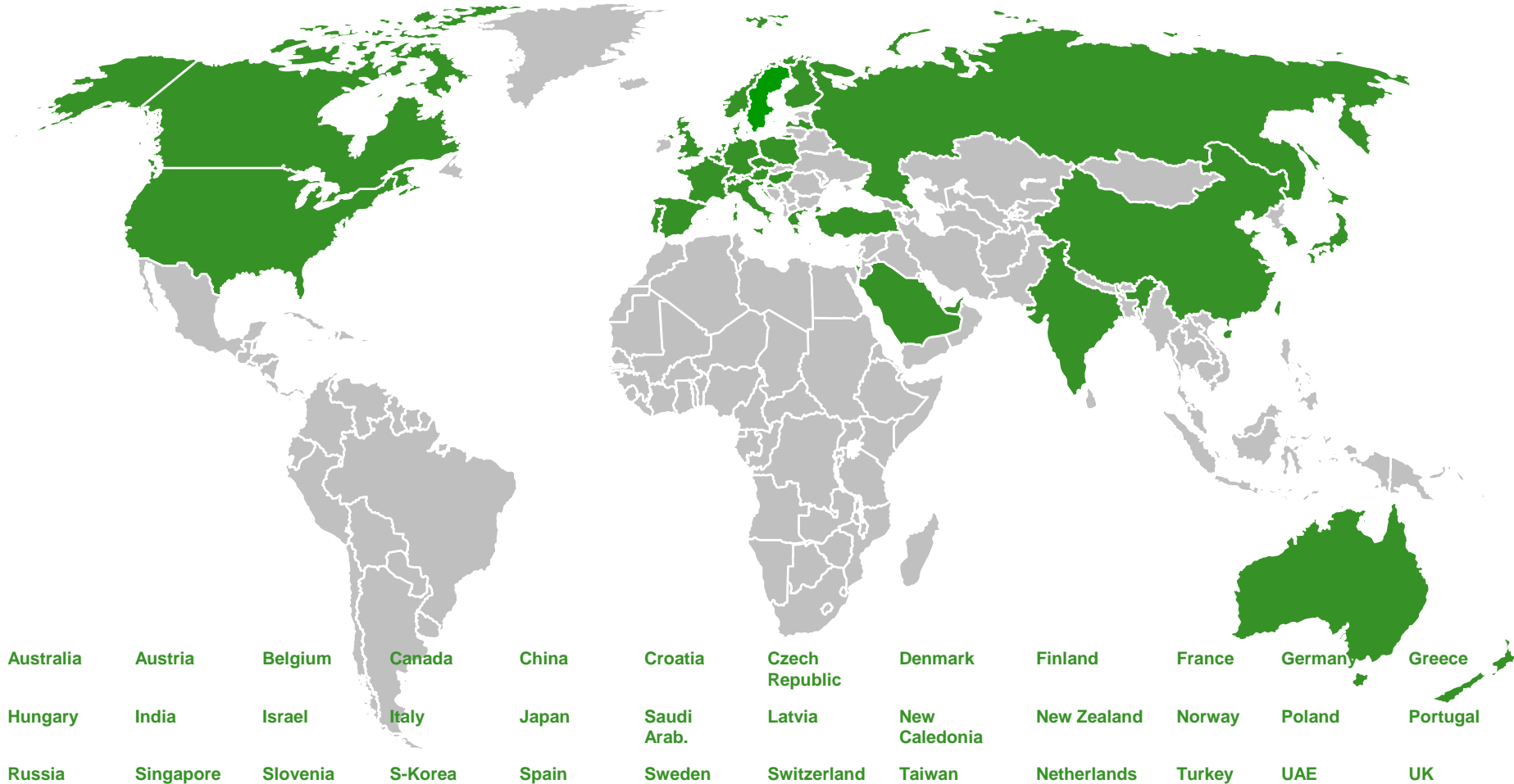
May 2014

[www.knx.org](http://www.knx.org)

# 350 Members in 37 countries

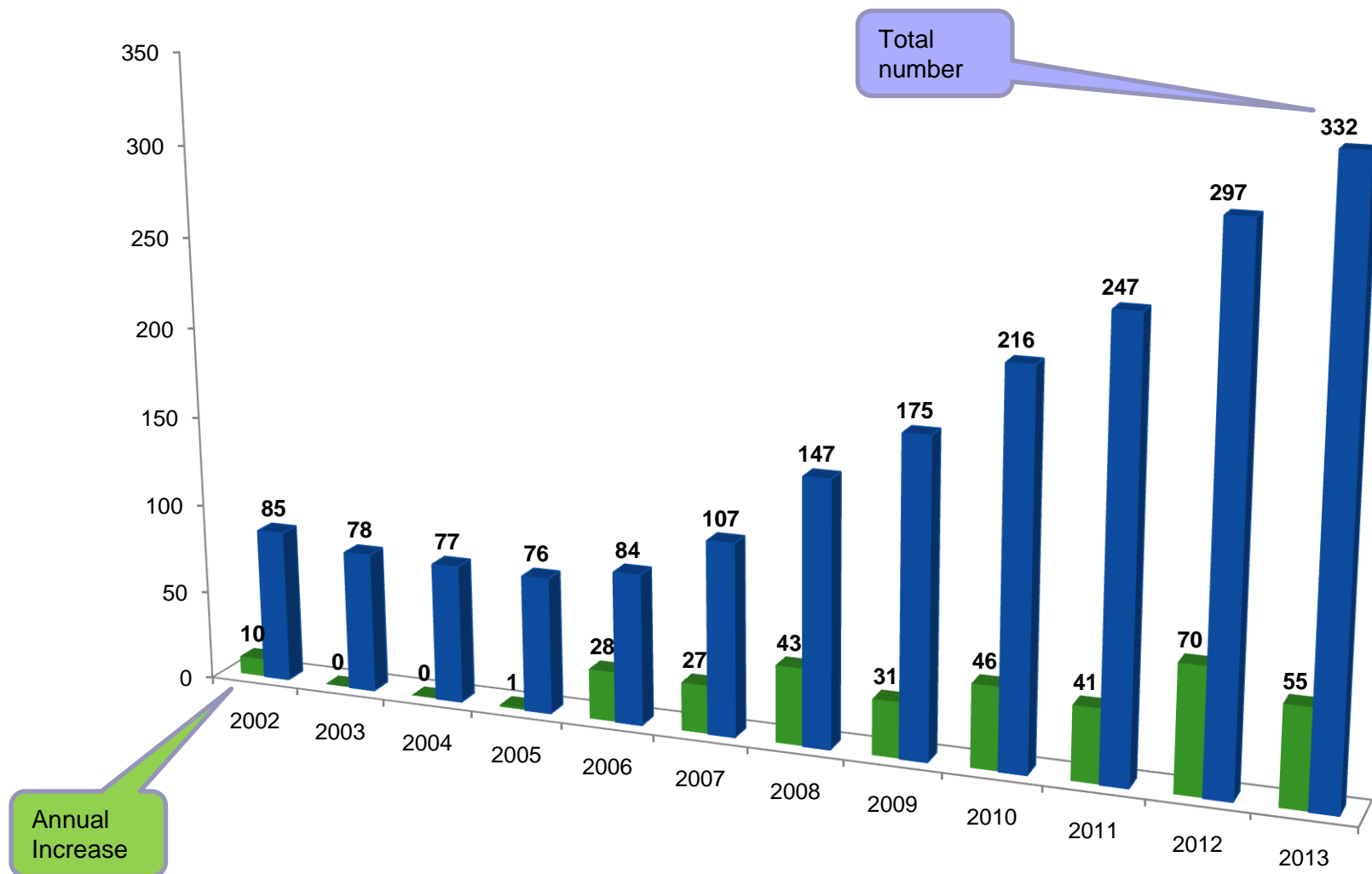


# 350 Members in 37 countries



USA

# KNX Members

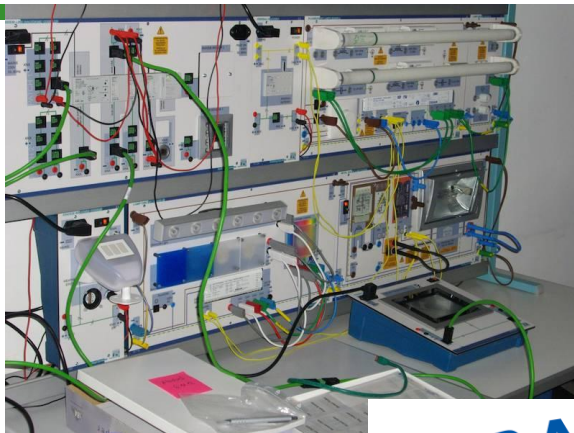




# More than 7000 certified KNX Devices



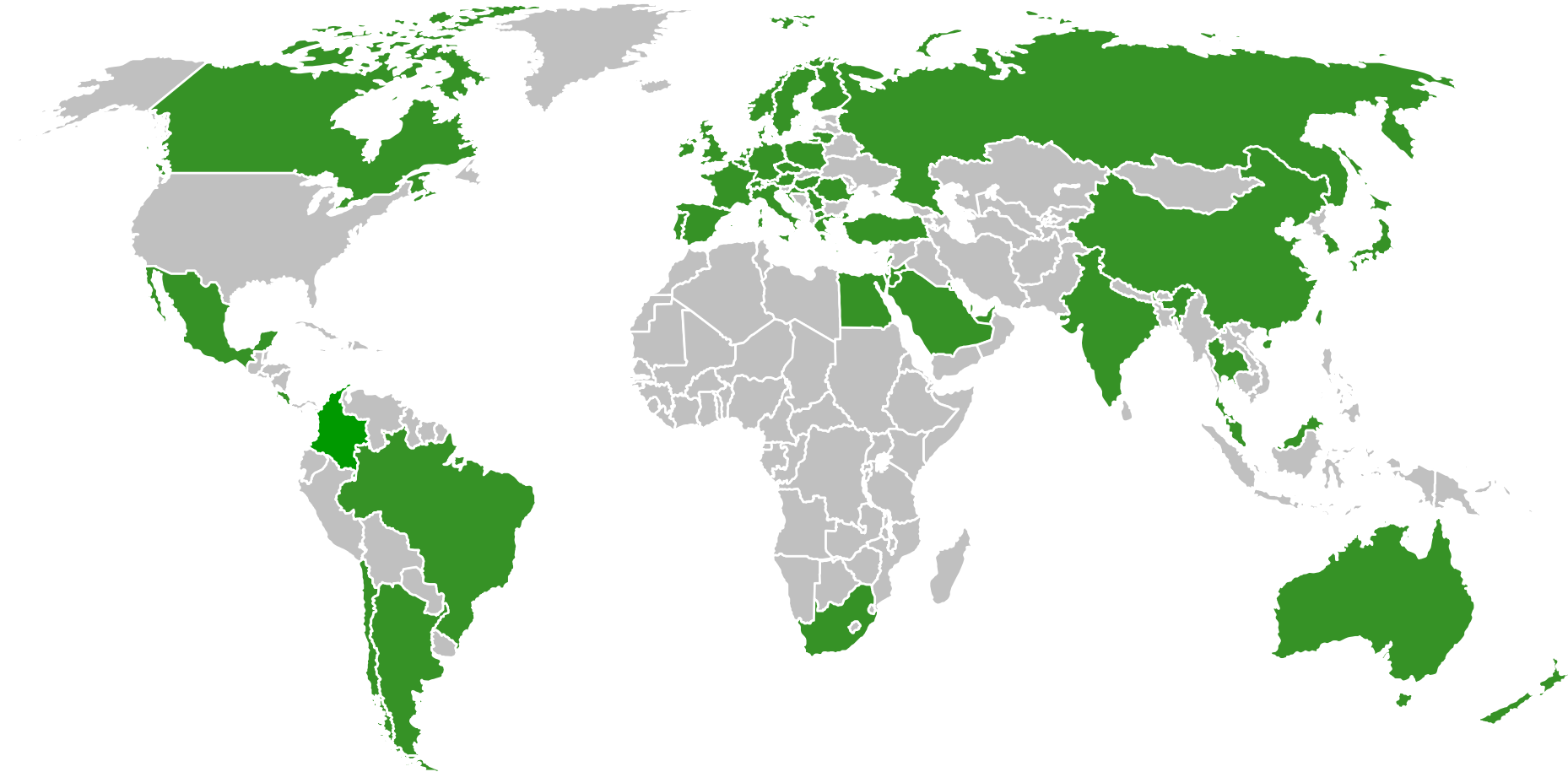
# 291 Training Centres in 54 countries



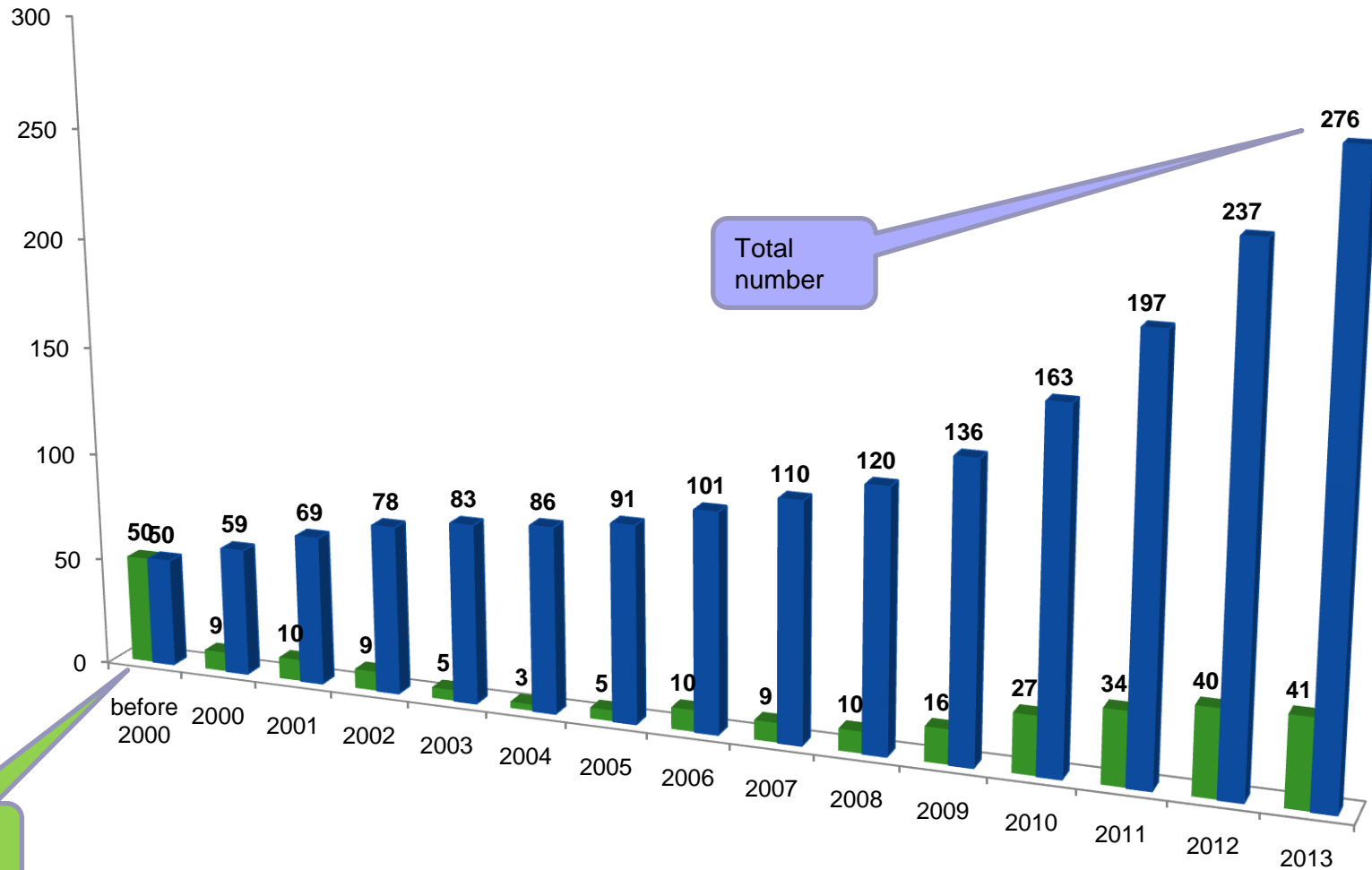


# 291 Training Centres in 54 countries

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# KNX Training Centres



# 42296 Partners in 127 countries

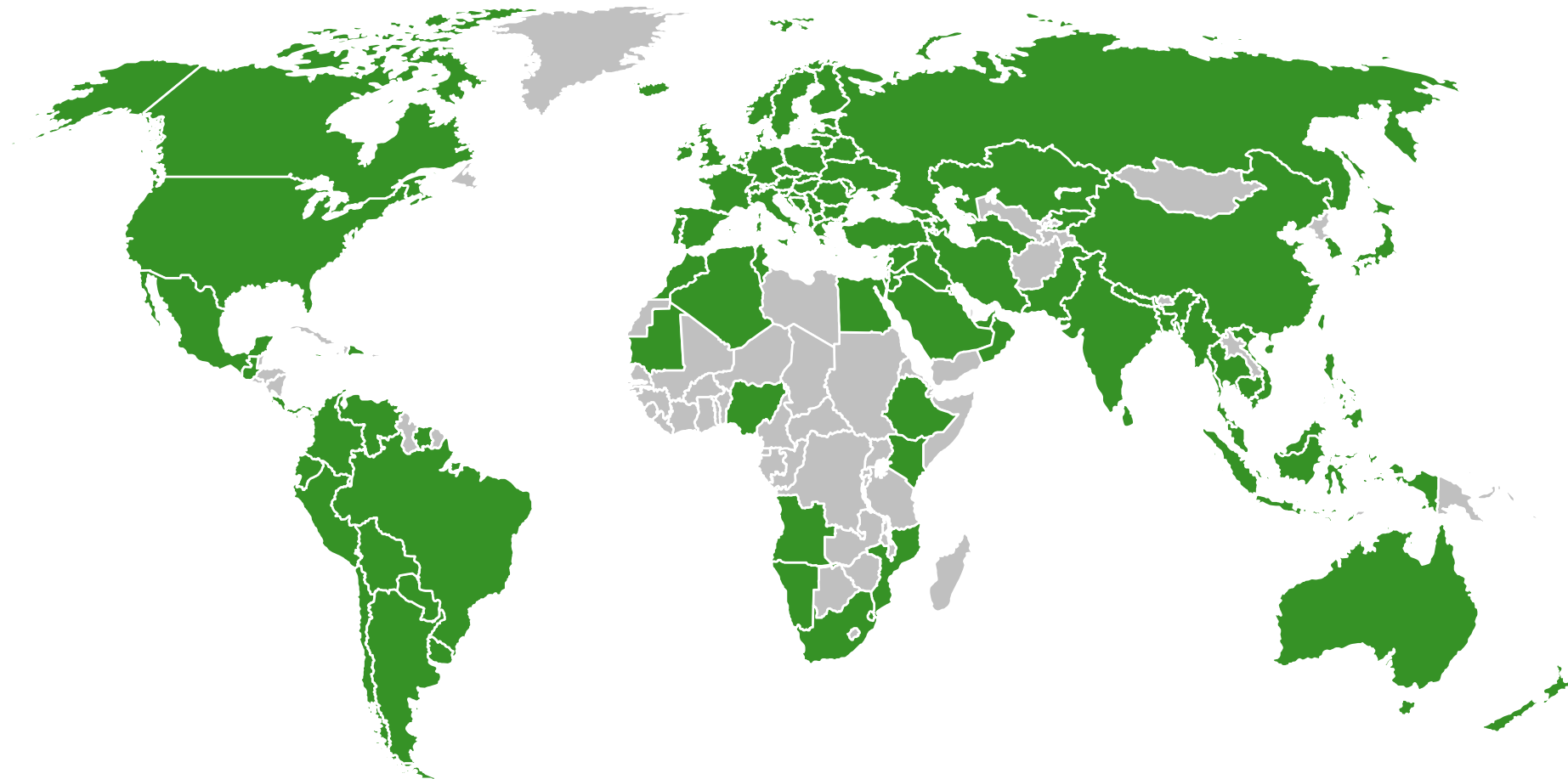


PARTNER



# 42296 Partners in 127 countries

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# KNX Partners



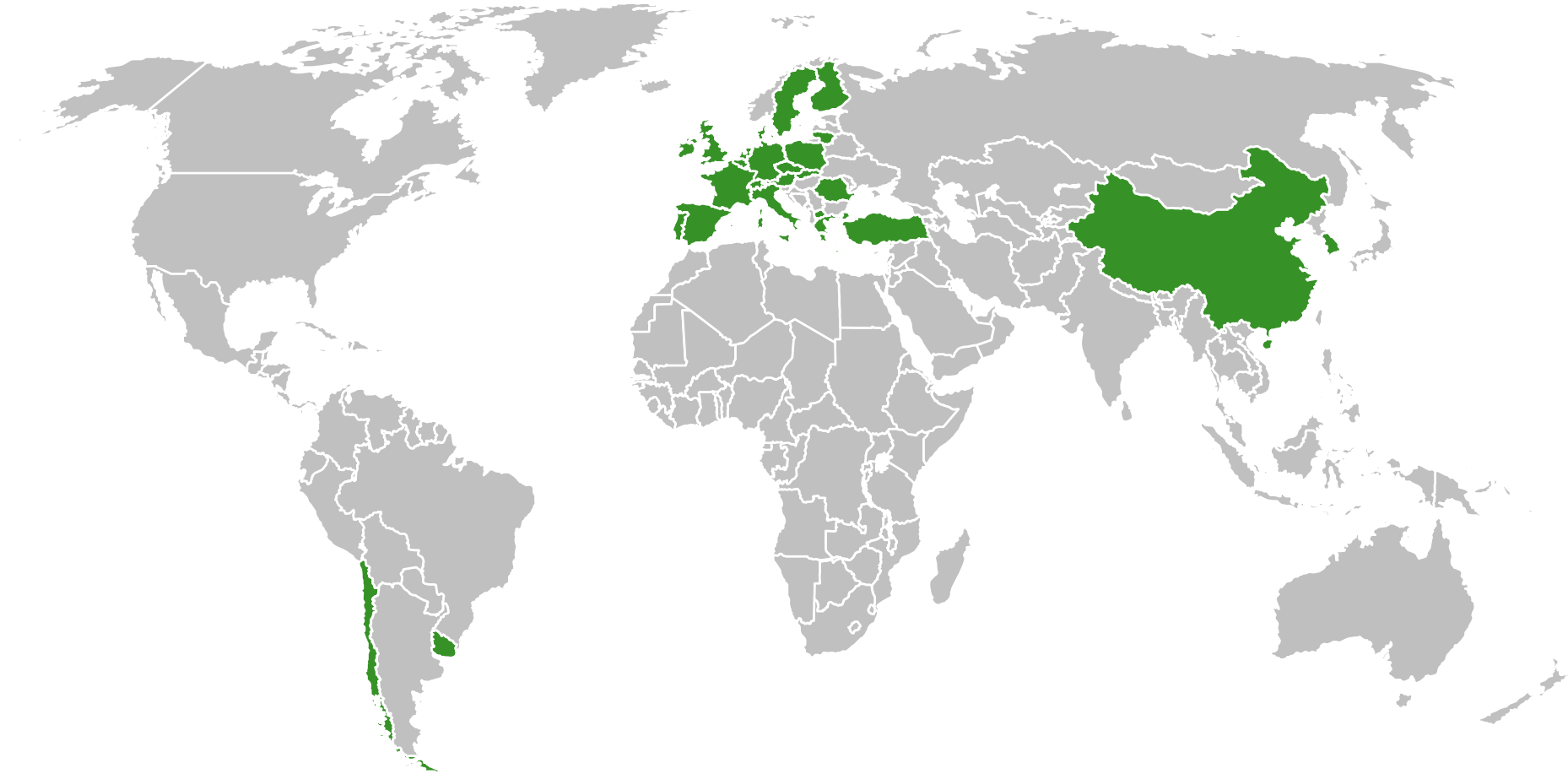
# 102 Scientific Partners in 28 countries





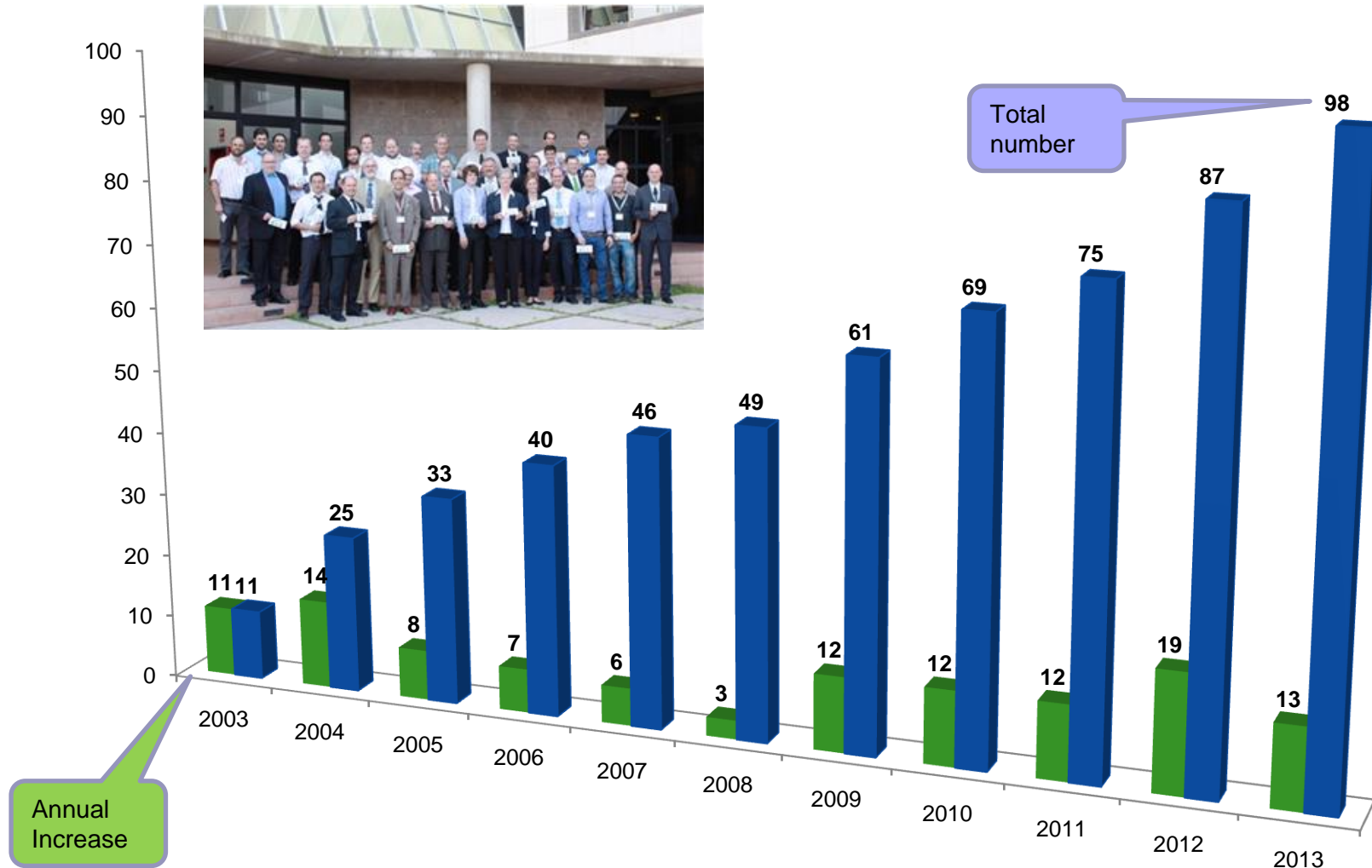
# 102 Scientific Partners in 28 countries

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# KNX Scientific Partners



# 16 Userclubs in 15 countries

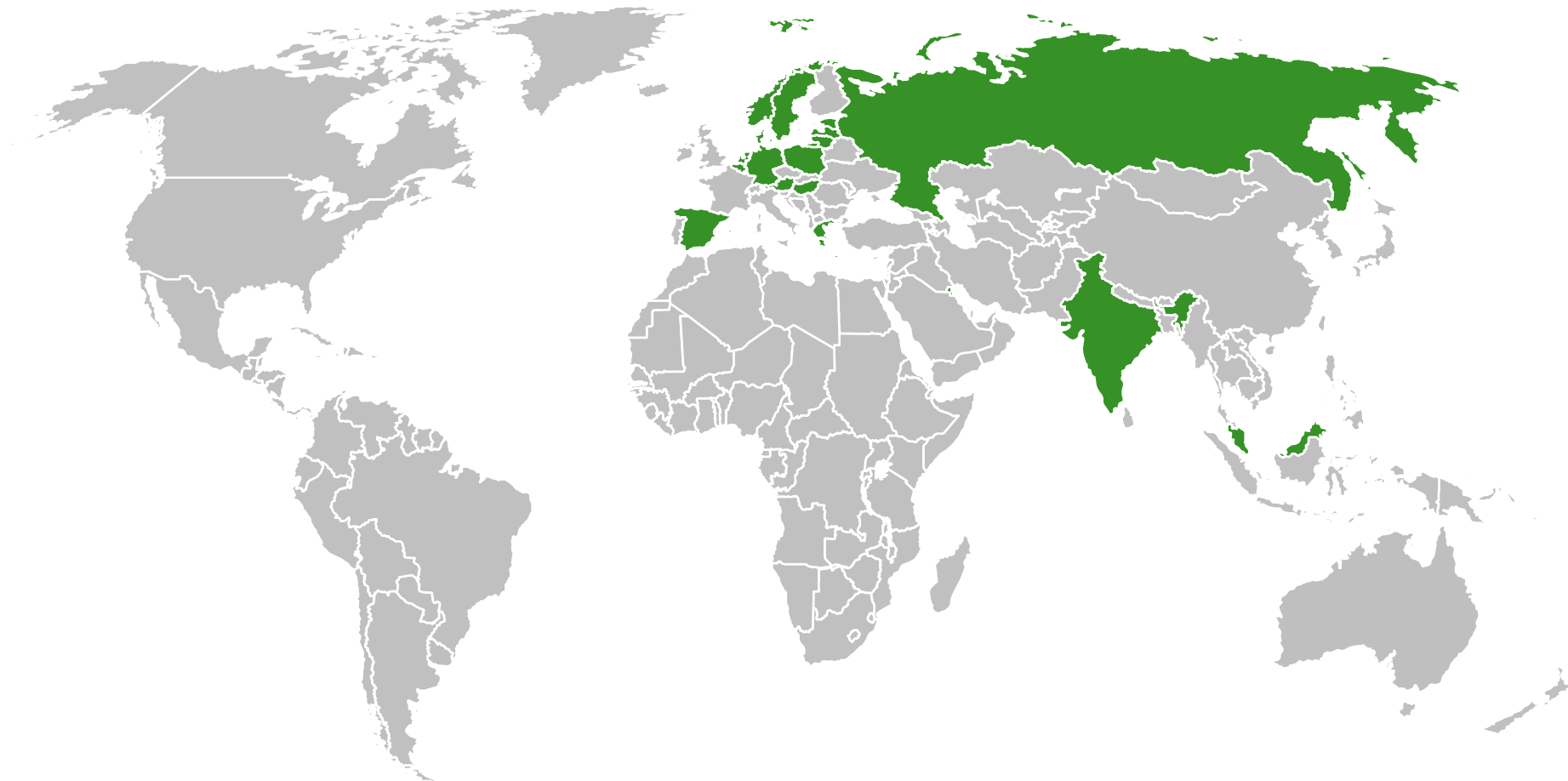
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Austria  
Belgium  
Germany  
Greece  
Hong Kong  
Hungary  
India  
Kuwait  
Malaysia  
Norway  
Poland  
Russia, CIS and Baltics  
Spain  
Sweden  
The Netherlands



# 16 Userclubs in 15 countries

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## 7 Associated Partners

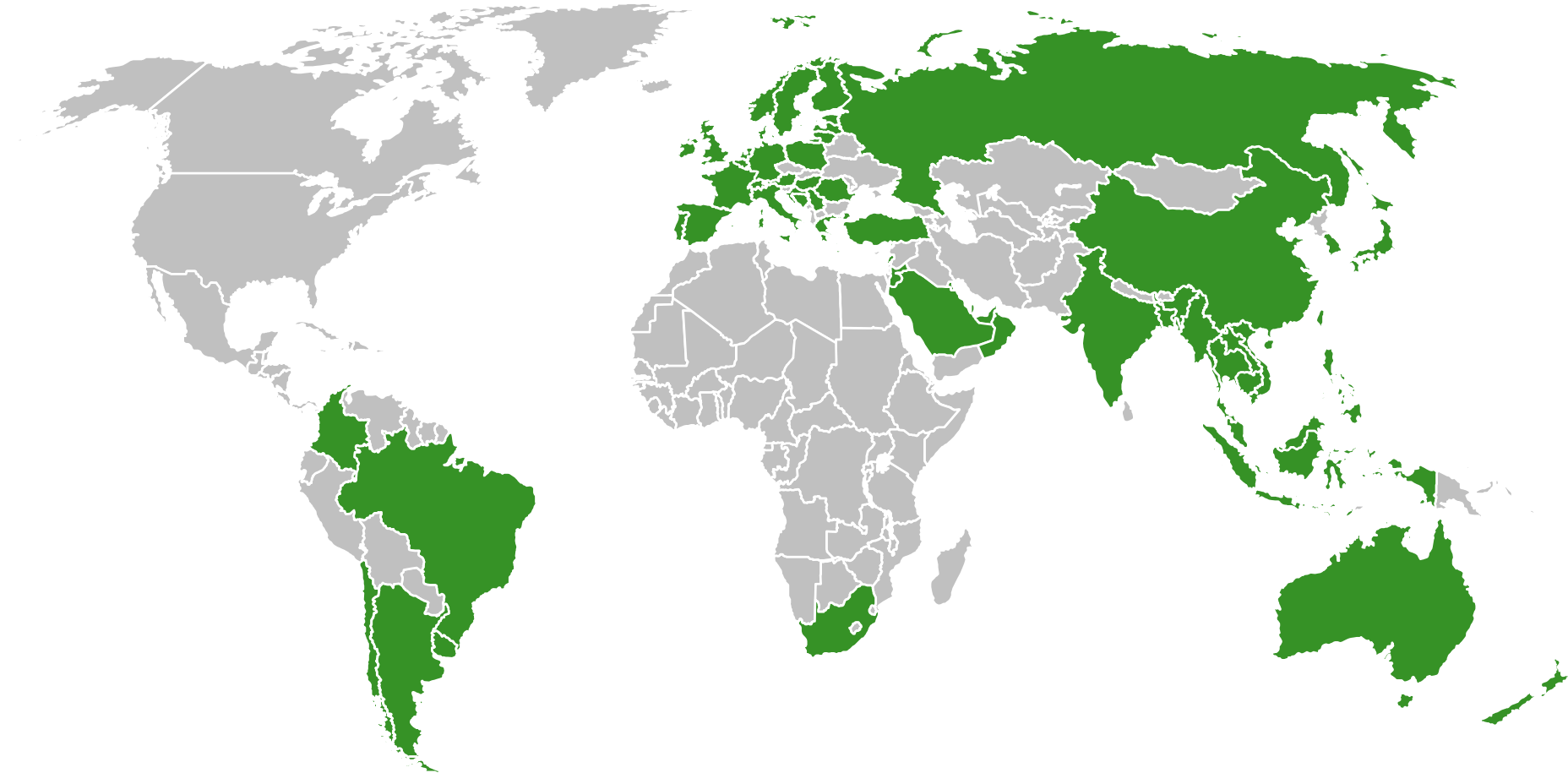


# Local representation of KNX: 41 KNX National Groups



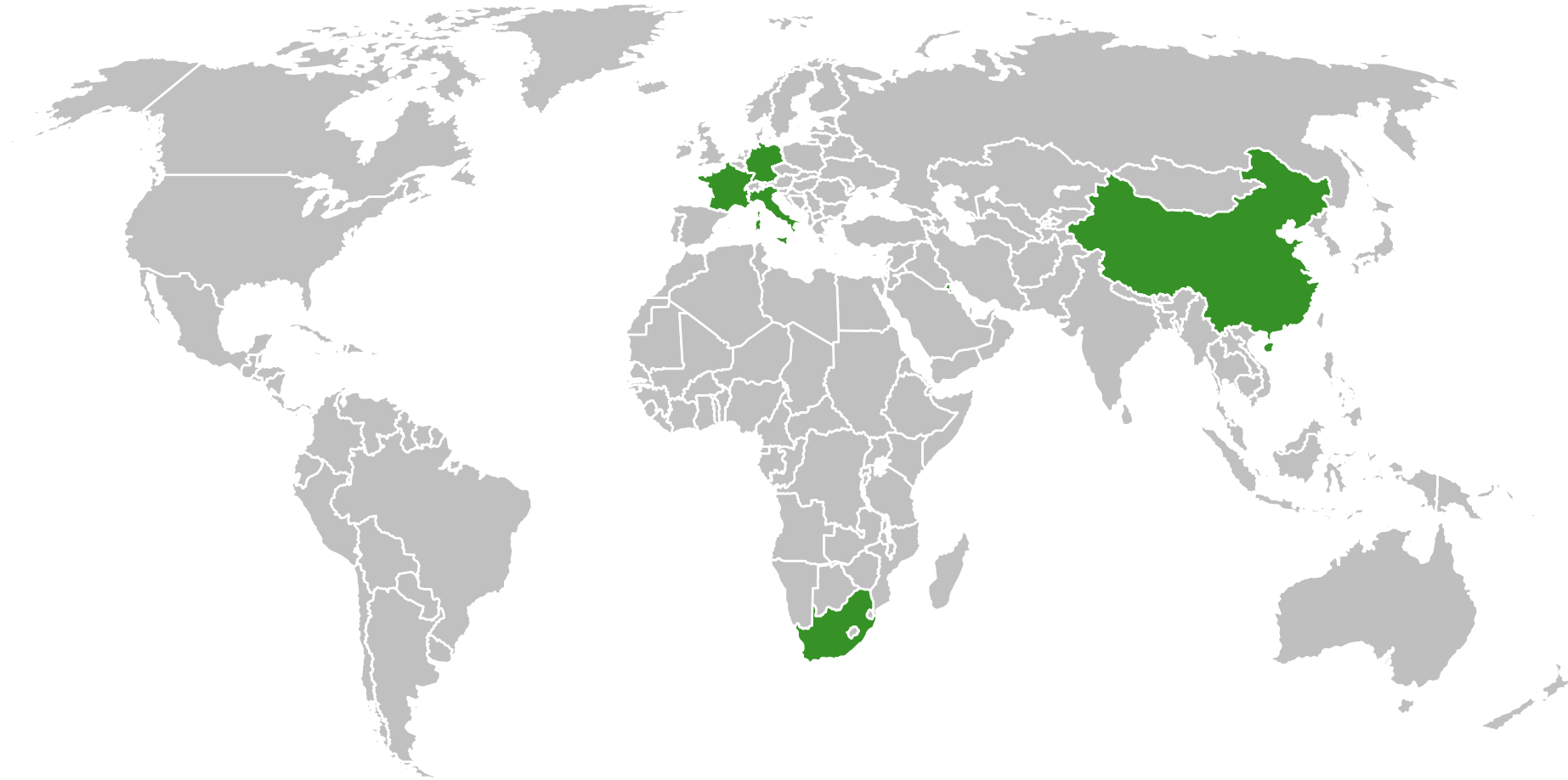
# 41 KNX National Groups

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# 11 Test labs in 5 countries

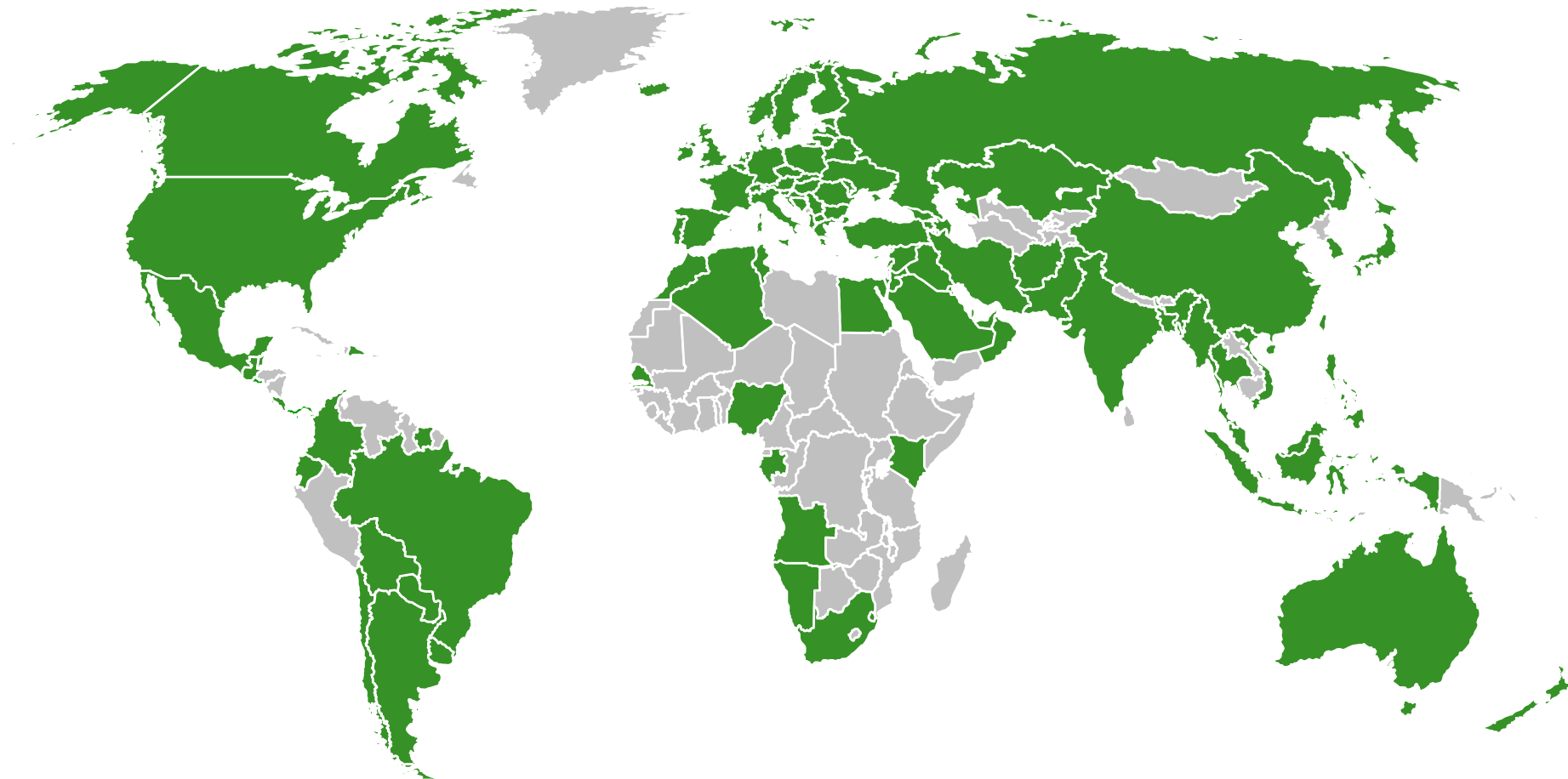
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# ETS Sold in more than 120 countries

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# KNX Facts & Figures May 2014

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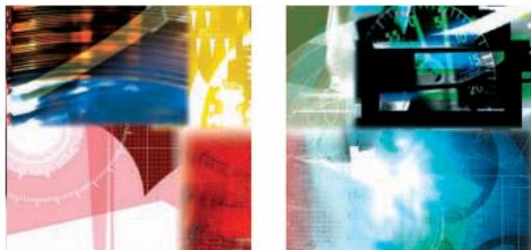


- 350 KNX Members in 37 countries
- 7000 certified product groups
- 42296 KNX Partners in 127 countries
- 291 Training Centers in 54 countries
- 102 Scientific Partners in 28 countries
- 16 Userclubs in 15 countries
- 7 Associated partners
- 41 National Groups
- 11 Test labs in 5 countries
- ETS sold in more than 120 countries

# Join the worldwide KNX community

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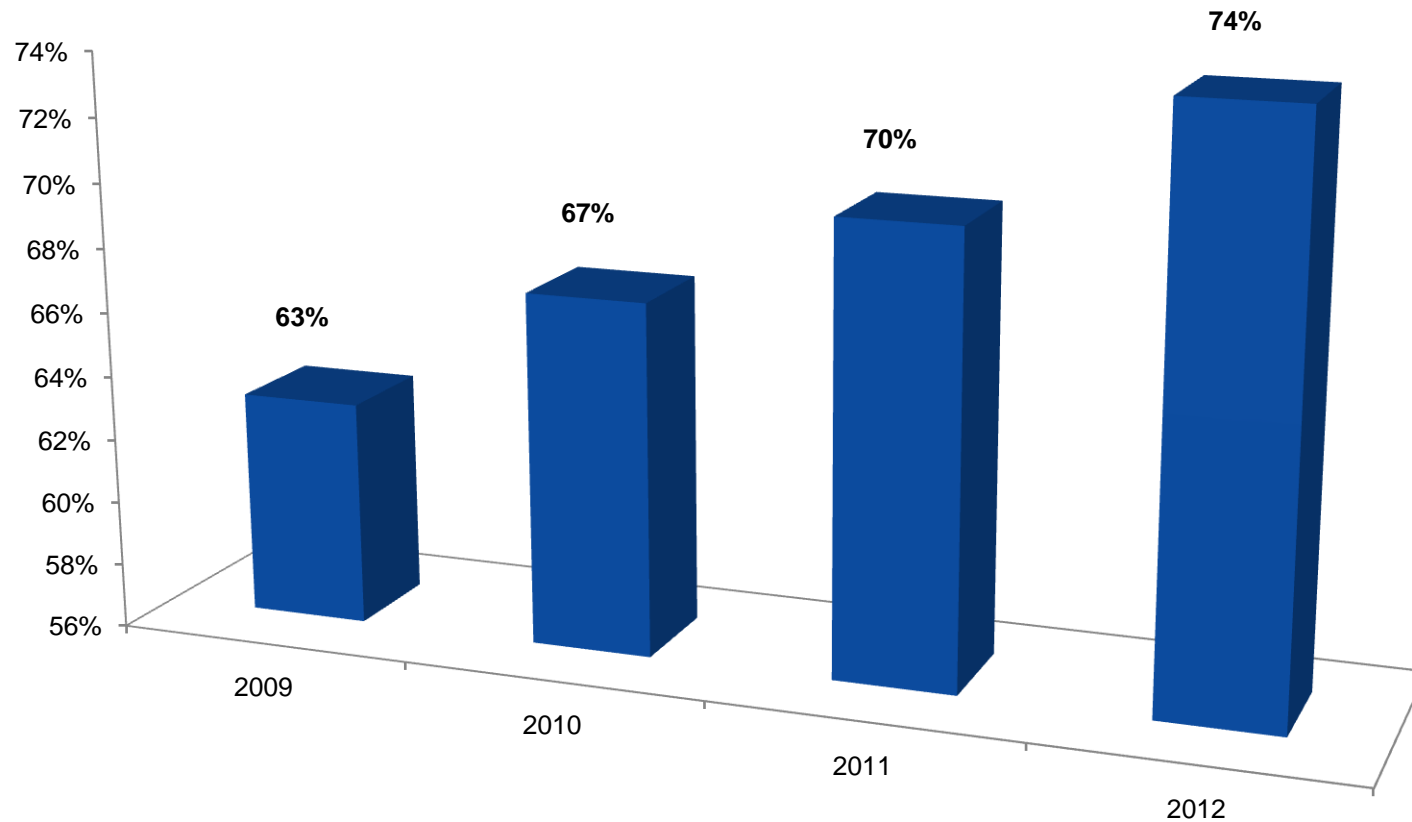
**BSRIA**

# European Smart Home Market Study

[www.knx.org](http://www.knx.org)

# European Smart Home Market Study

## Share of KNX in the total smart home market value



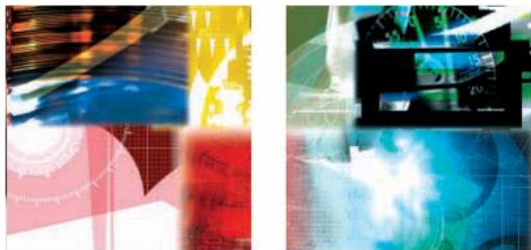
# European Smart Home Market Study

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„In 2011 the share of KNX-based solutions exceeded 70% of the total market value. In the last three years, the KNX share has been adding three percentage points on average, suggesting the growing importance of KNX“

*(„BSRIA - Smart home market: impressive growth; new opportunities“, June 20, 2012)*





[www.knx.org](http://www.knx.org)

**KNX city**

**New business opportunities**



# From the KNX building to the KNX city

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- Buildings are responsible worldwide for...
  - ...40% of the consumption of final energy
  - ...21% of the production of greenhouse gases
  - ...an increasing demand for energy

# Energy Efficiency in the KNX Buildings



## Energy Savings with KNX in the buildings:

- up to **40 %** with KNX shading control
- up to **50 %** with KNX individual room control
- up to **60 %** with KNX lighting control
- up to **60 %** with KNX ventilation control



Electricity for the City of Salzburg (Austria)



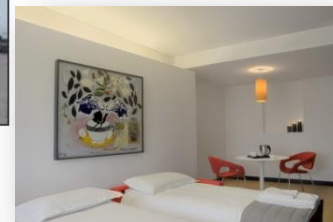
A new bioclimatic office building in Huesca (Spain)



The largest building in the Middle East



Energy efficiency in Guarda Polytechnic Institute



Nerocubo Hotel in Italy



Oundle School, Peterborough (Great Britain)



A family home in low energy standard in Innsbruck (Austria)



Improved energy balance in insurance company (Prague)

# From the KNX building to the KNX city

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- Cities are worldwide responsible for...
  - ...two third of the total energy consumption
  - ... 60% of the total water consumption
  - ... 70% of the production of greenhouse gases
- More than 50% of the world population live already today in metropolitan areas
  - ➔ Until 2050 it will be up to 70% of the world population

# KNX has its focus in the building...

... but considers Smart Grid and city issues



- A “Single solution” doesn’t meet city sustainability objectives
- Smart cities require buildings that interact with the city
- Different fields need to interact. Examples:
  - “Mobility” effects “buildings”, e.g. charging of electric vehicles
  - „Energy generation“ affects buildings, e.g. decentralized generation on roofs of “buildings”.
  - The building affects the “City”, e.g. by feeding in surplus energy into the grid.

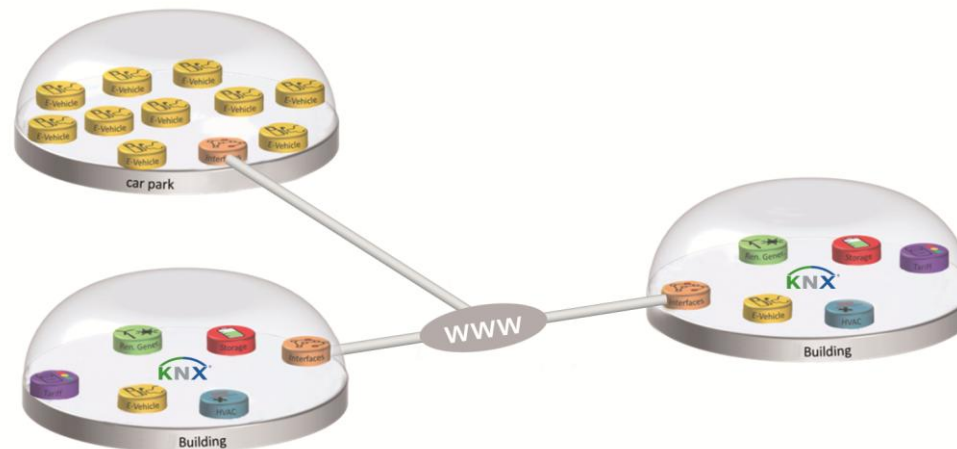


[www.knx.org](http://www.knx.org)

➔ **KNX city sets a new focus with existing KNX technologies in the buildings**

# KNX city distributed facilities

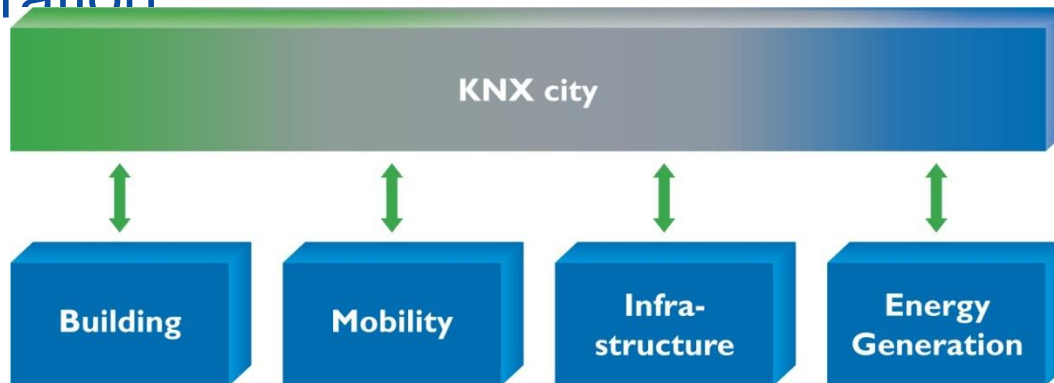
- KNX offers communication by twisted pair, IP and radio frequency
- Buildings can be connected to each other over distances by IP as if they were one building
  - Distributed facilities
  - Energy management over distances
  - Balancing of generation and consumption of different buildings.





# From the building to the KNX city

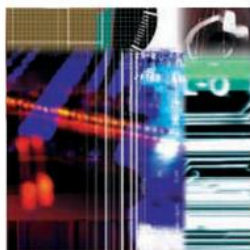
KNX city offers solutions in the interaction of buildings, mobility, infrastructure and energy generation





# KNX City





**Thank you very much  
for your attention!**

**Vassilios Lourdas**  
System Engineer  
KNX Association International

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