



The future of buildings as micro energy hubs



Enhancing the Impact of Energy Efficiency and Renewable Energy Policies

Joint workshop of the IEA Renewable Energy and Energy Efficiency Working Parties

Paris, 27 March 2018

Knowledge

Policy

Implementation



Investing in energy efficiency
in Europe's buildings
A view from the construction
and real estate sectors



Guidebook for
Strong Implementation

EU ENERGY LAW

Energy Efficiency
in the European Union

Energy Efficiency – the first fuel
for the EU Economy
How to drive new finance for energy
efficiency investments

Energy Efficiency
Institutions Group
Interim Report

Climate Change:
Implications for Buildings

IMPLEMENTING NEARLY ZERO-ENERGY
BUILDINGS (nZEB) IN BULGARIA –
TOWARDS A DEFINITION AND ROADMAP

IMPLEMENTING A CLIMATE-RESILIENT
APPROACH TO NEARLY ZERO-ENERGY
BUILDINGS (nZEB) IN ROMANIA –
AN INTERIM REPORT ON PROGRESS

SMART BUILDINGS
IN A DECARBONISED
ENERGY SYSTEM

The active role of buildings in a
transforming energy market
Discussion paper

Buildings
modernisation strategy:
Roadmap 2050
Summary

Energy Performance
Certificates across Europe
From design to implementation

INDOOR AIR QUALITY,
THERMAL COMFORT
AND
DAYLIGHT

ANALYSIS OF RESIDENTIAL BUILDING REGULATIONS
IN EIGHT EU MEMBER STATES

RENOVATING GERMANY'S
BUILDING STOCK
AN ECONOMIC APPRAISAL FROM THE INVESTOR'S PERSPECTIVE

BUILDING
RENOVATION
PASSPORTS
Customised roadmaps
towards deep renovation
and better homes

SAFEGUARDING
ENERGY SECURITY
IN SOUTH-EAST EUROPE
WITH INVESTMENT IN
DEMAND-SIDE INFRASTRUCTURE

RENOVATION IN PRACTICE

IMPLEMENTING THE COST-OPTIMAL
METHODOLOGY IN 22 COUNTRIES

ENERGY EFFICIENCY POLICIES IN BUILDINGS –
THE USE OF FINANCIAL INSTRUMENTS
AT MEMBER STATE LEVEL

ACCELERATING THE RENOVATION
OF THE BULGARIAN BUILDING STOCK
A CONSULTATION FOR THE CHANGING RENOVATION POLICY
AND BUILDING STOCK

RENOVATING ROMANIA
A CONSULTATION FOR THE CHANGING RENOVATION POLICY
AND BUILDING STOCK

Financing Energy Efficiency (EE)
in Buildings

Background Paper

Input to the European Roadmap
Strategy, 18 November 2016

www.bpie.eu

Accelerate the smart and sustainable energy transition

Centralised

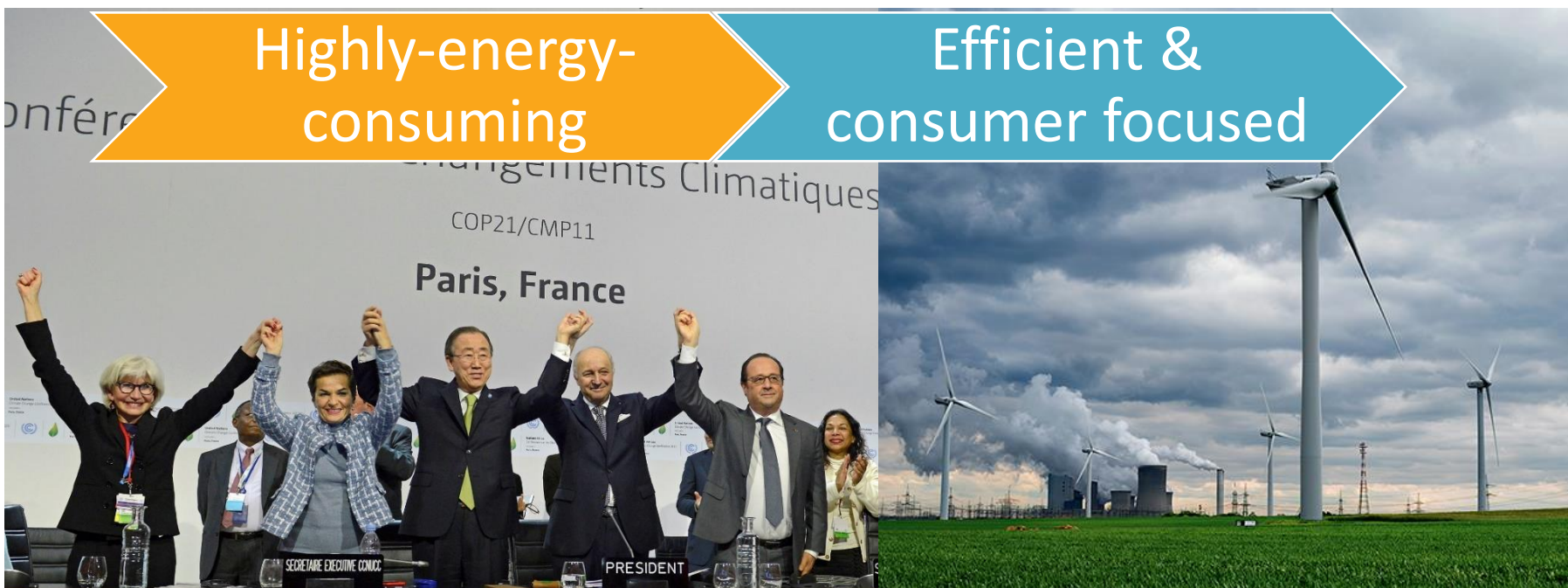
Decentralised

Fossil fuel-based

Powered by
renewable energy

Highly-energy-
consuming

Efficient &
consumer focused



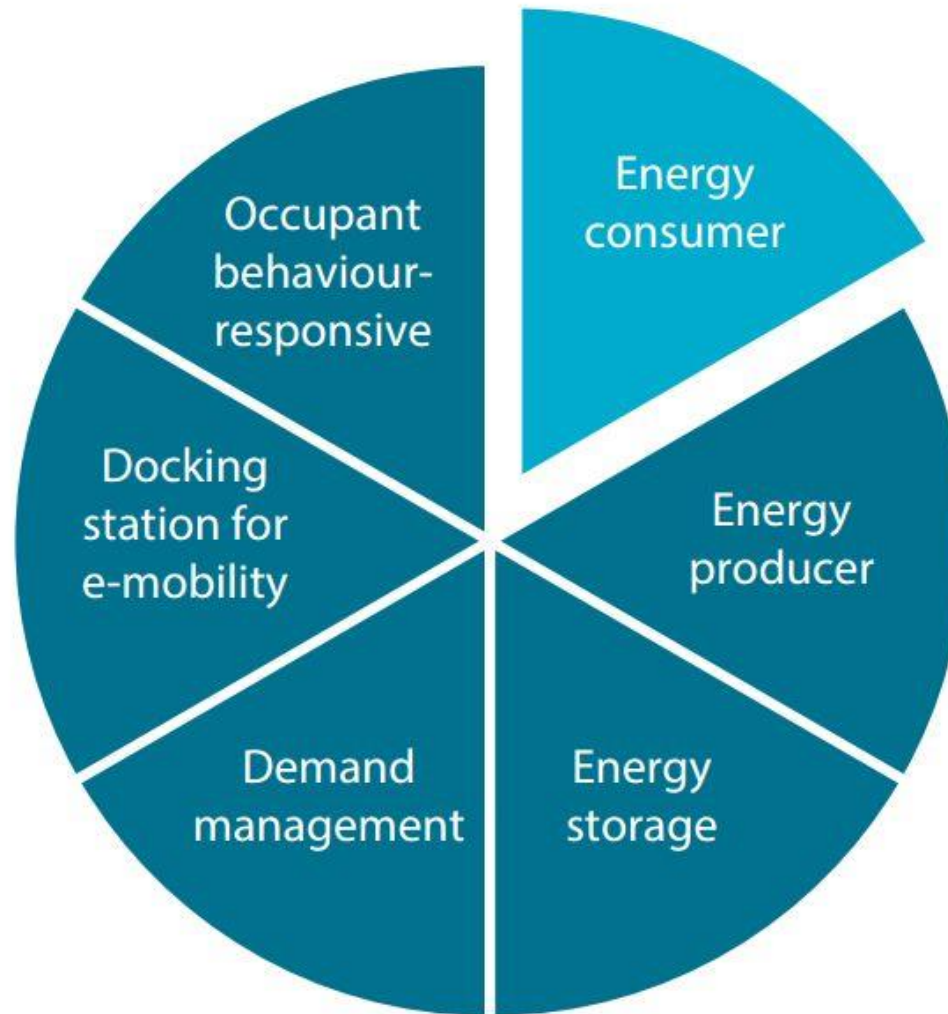
The evolution of buildings

SMART BUILDINGS IN A DECARBONISED ENERGY SYSTEM

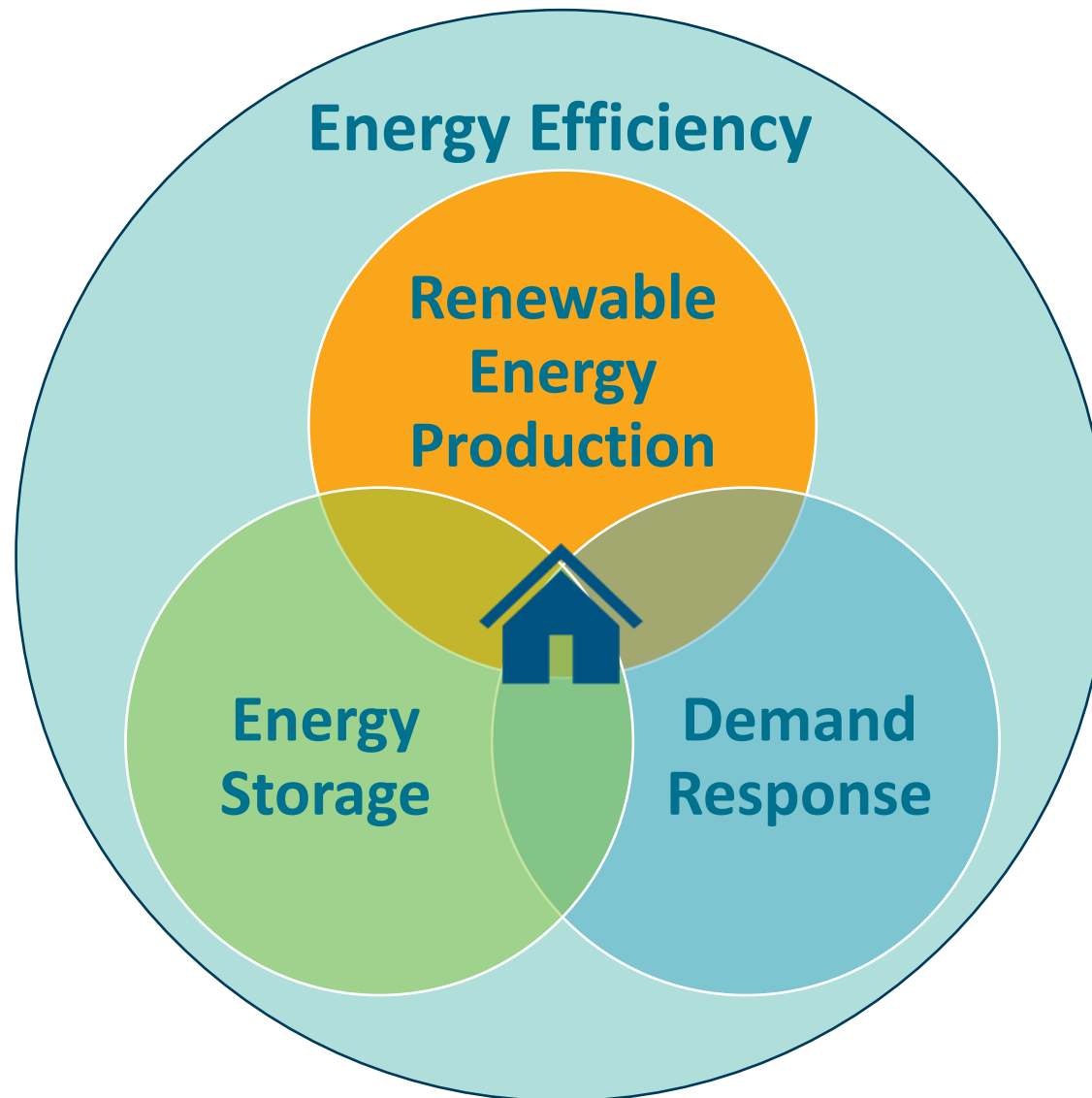


10 PRINCIPLES TO DELIVER REAL BENEFITS FOR EUROPE'S CITIZENS

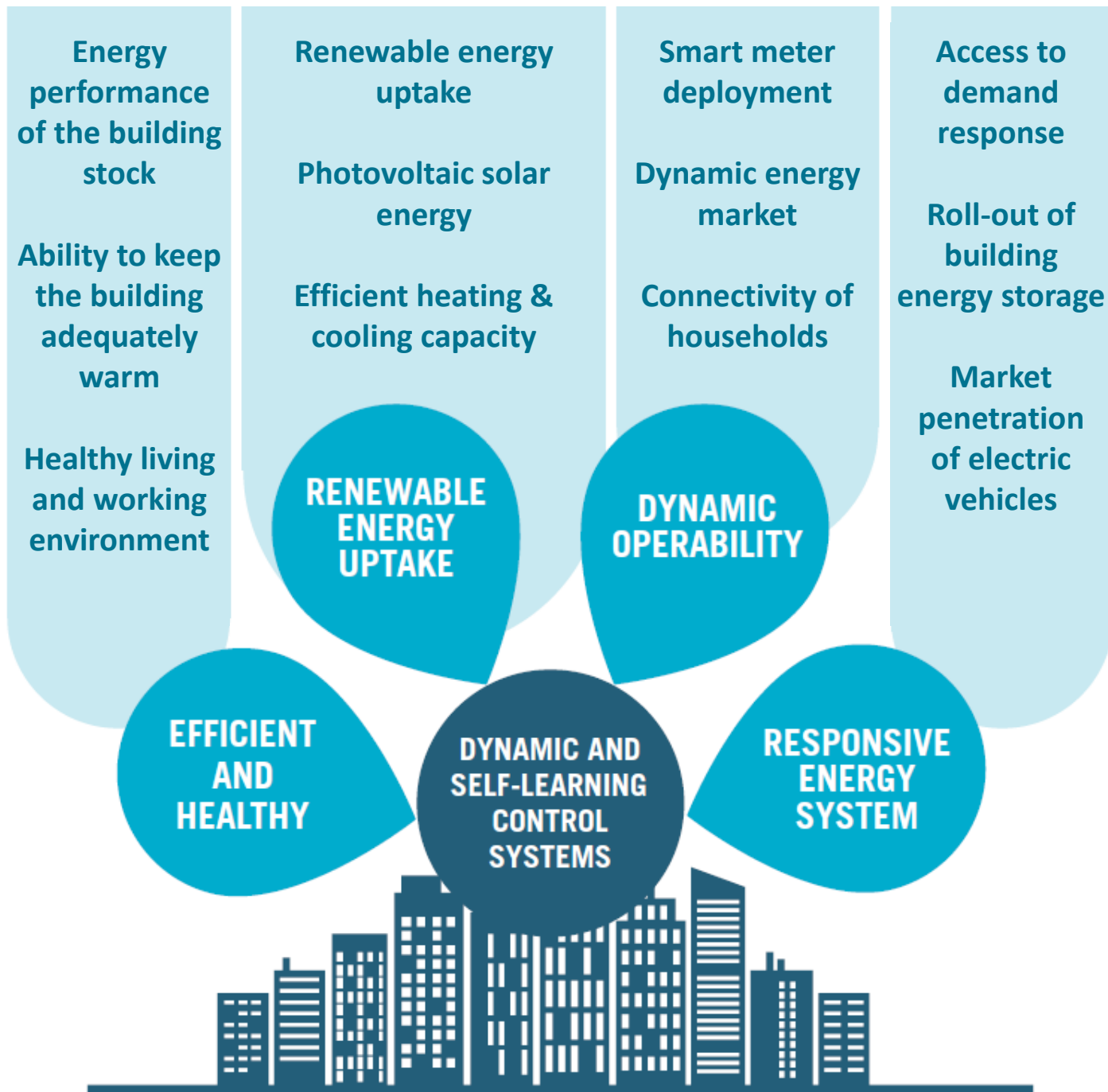
New functions of smart buildings



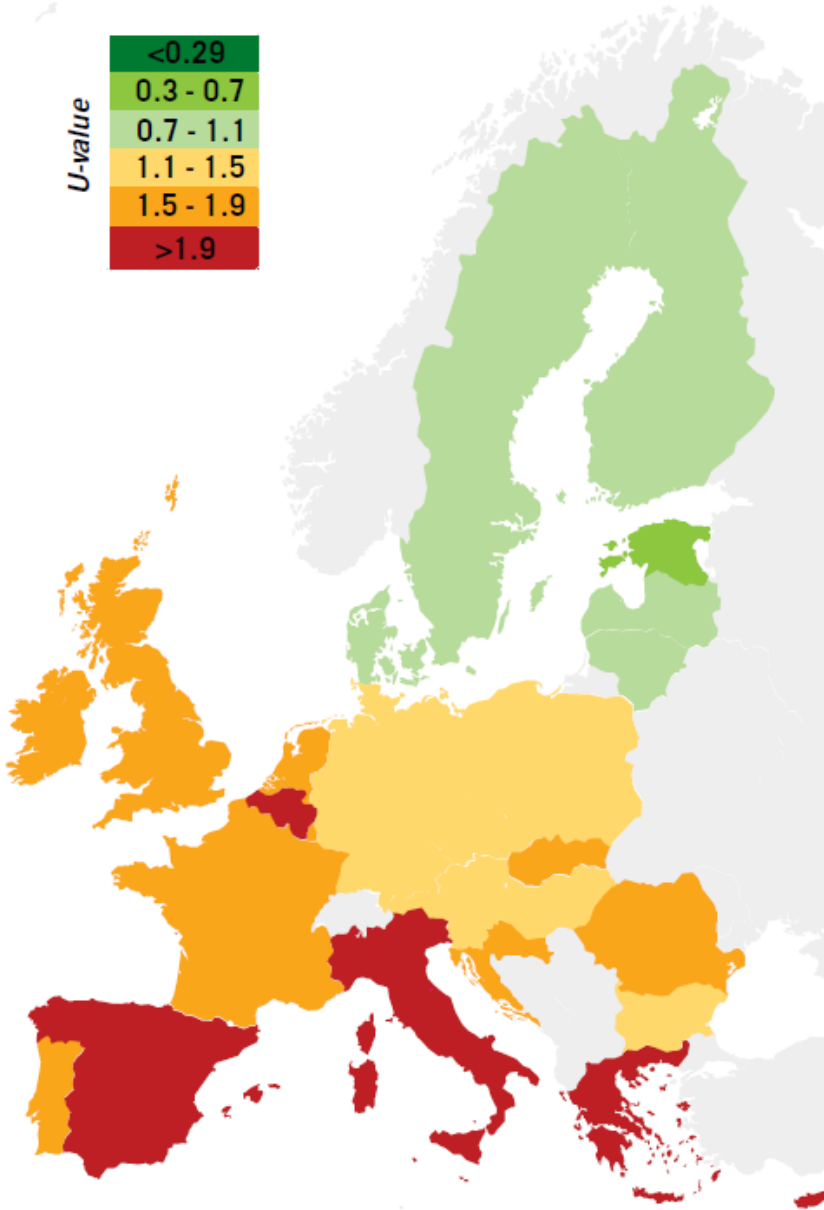
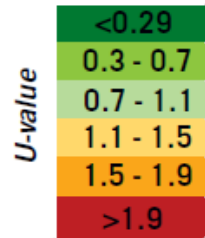
Buildings are becoming micro-energy hubs



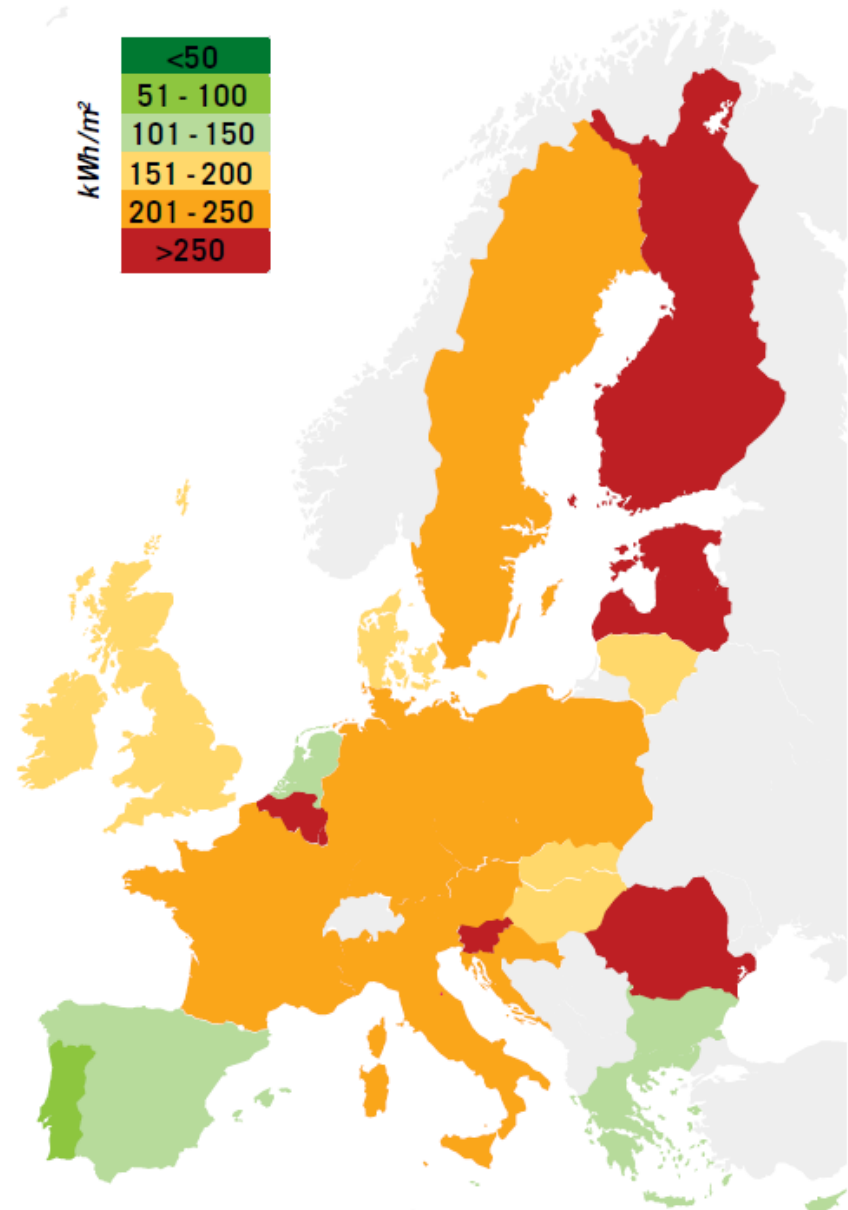
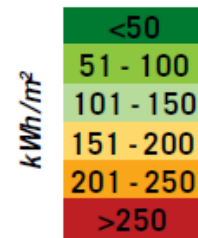




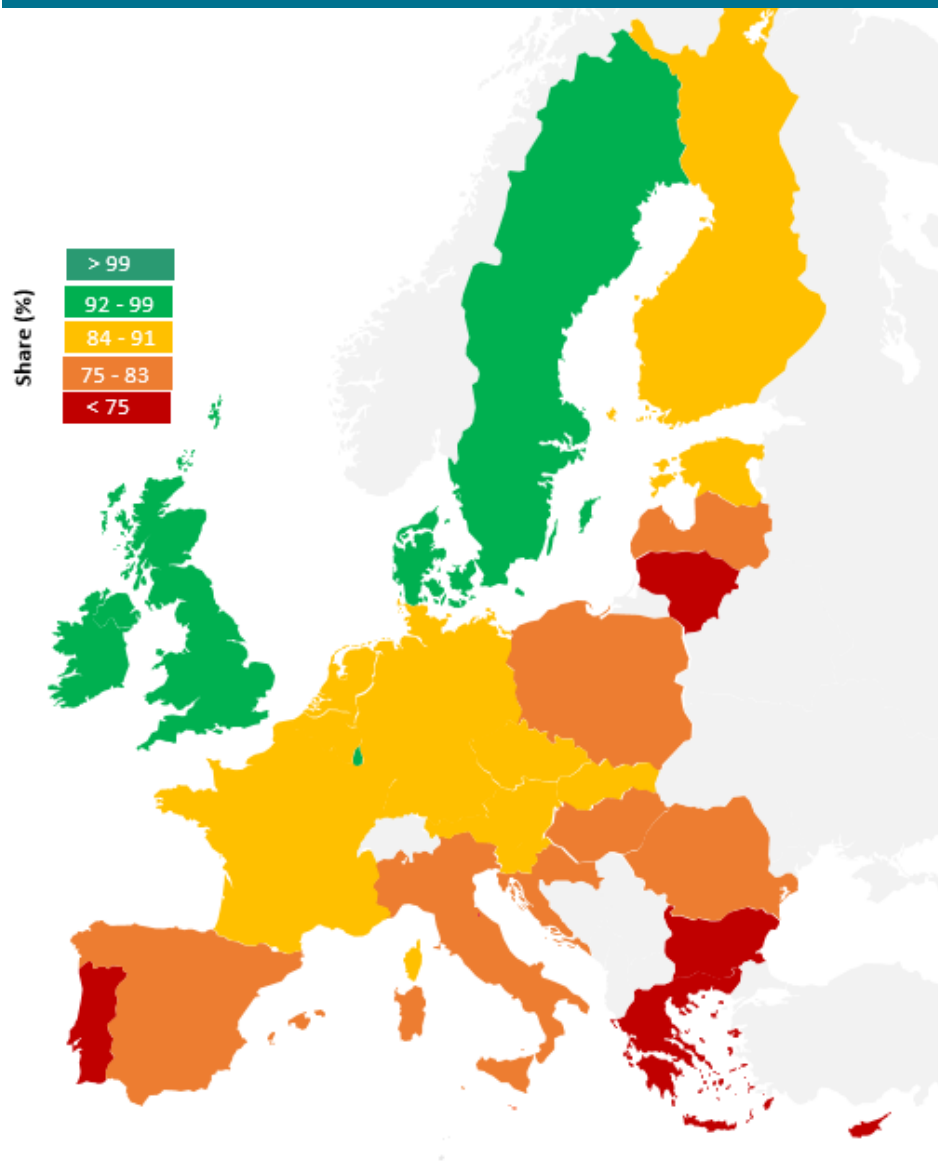
Building Envelope



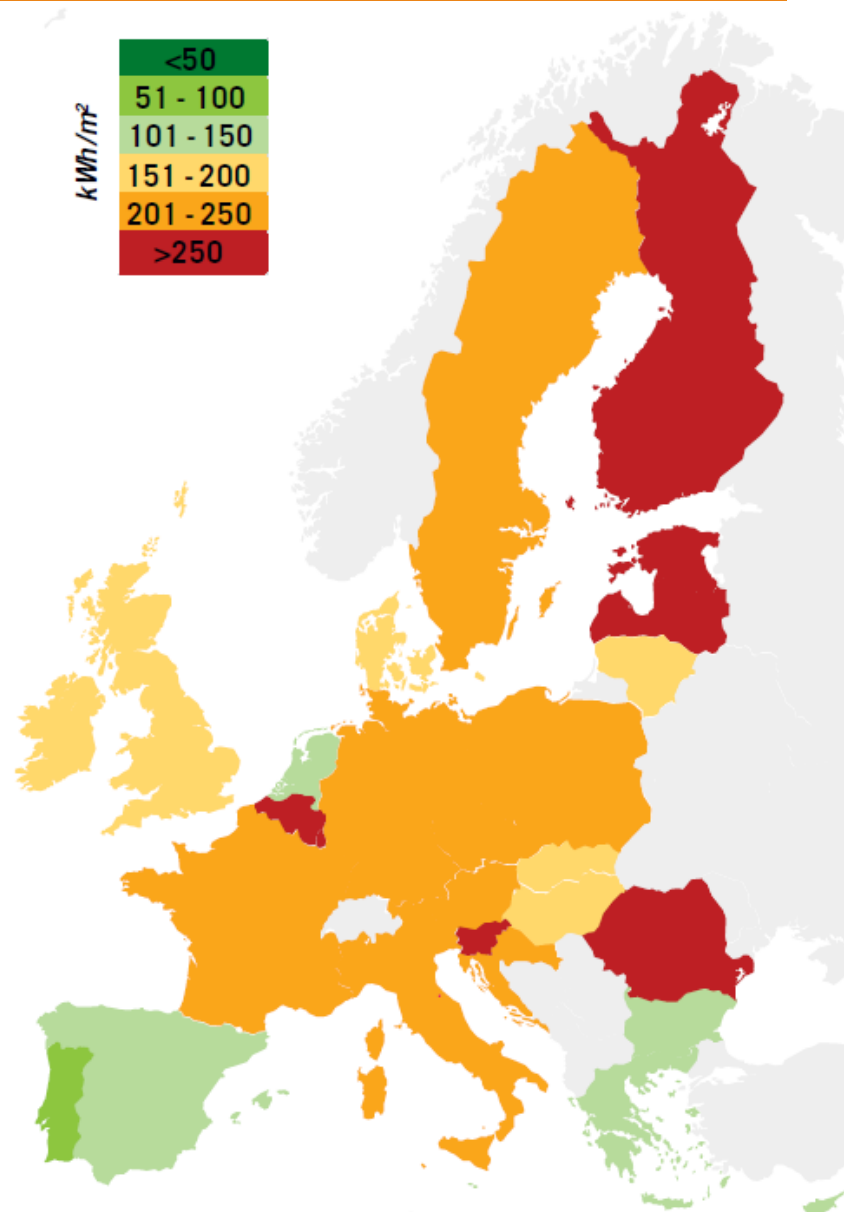
Final energy consumption



Ability to keep adequately warm

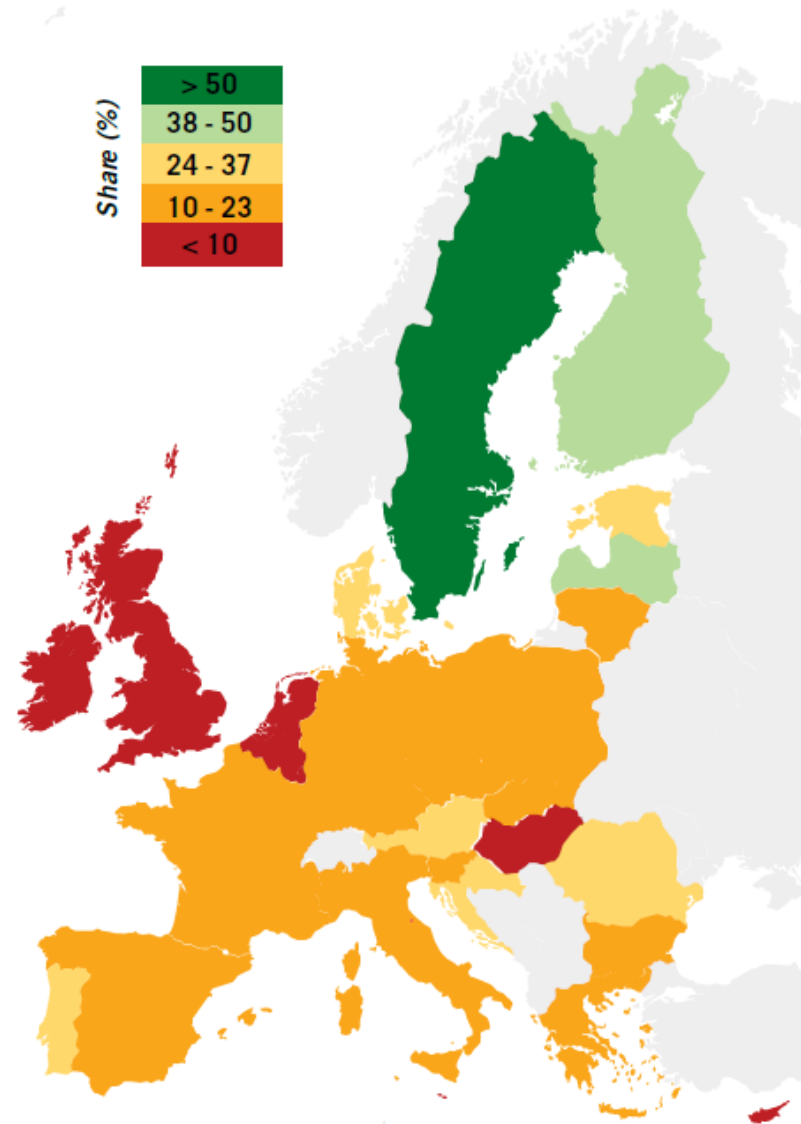


Final energy consumption



Renewable energy uptake

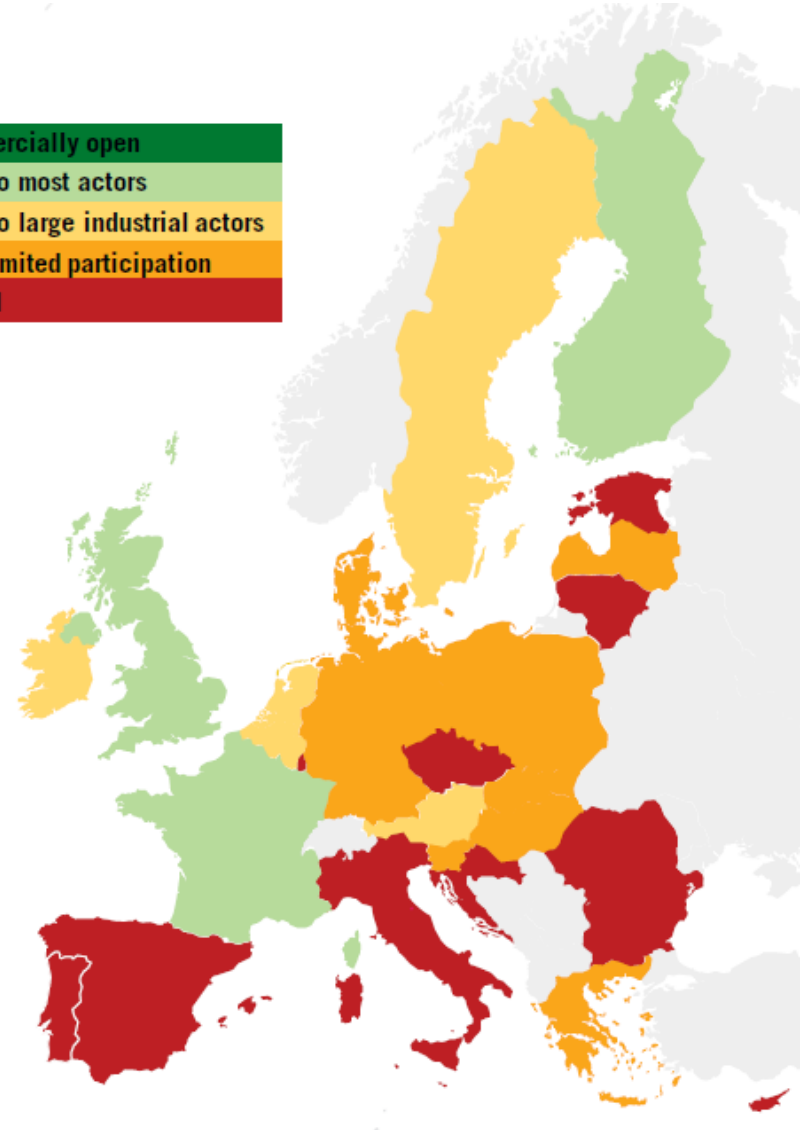
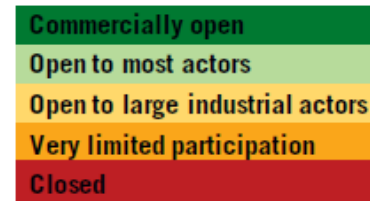
- Share of renewable energy in gross final energy consumption
- More RES = incentives for storage, demand flexibility and a dynamic energy market
- No evaluation on the national renewable energy targets



Demand response availability

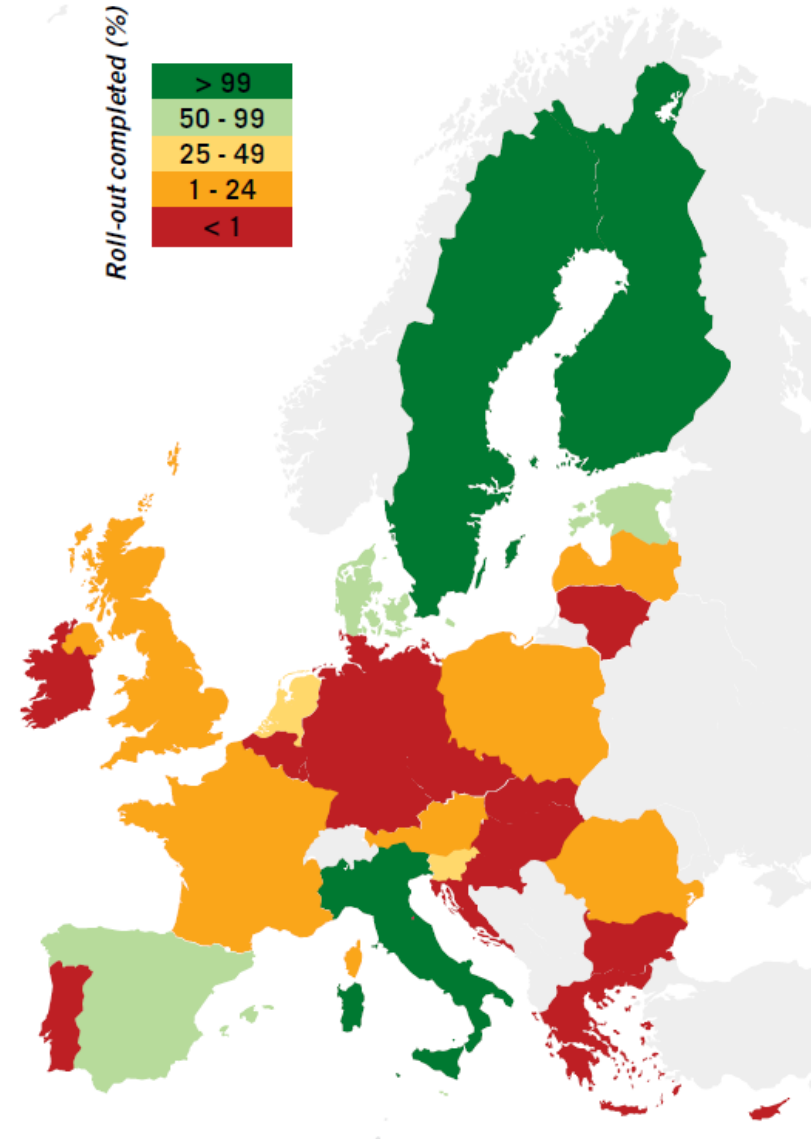
- Indication of the authorisation of DR and aggregation of demand
- FI, FR and UK are the leading countries
- Reducing peak consumption to avoid grid imbalance
- Enabling security of supply, renewable energy and increased market competition

Demand response market



Smart meter deployment

- SE, FI and IT have completed their roll-out of smart meters
- Smart meters empower end-users with a better understanding and control over their energy consumption
- A two-way communication between the consumer and the utility company should be enabled
- Accurate measurement is a requirement to valorise demand response services



IS EUROPE READY FOR THE SMART BUILDINGS REVOLUTION?

Why this result?

- Rigid regulatory frameworks, e.g. preventing demand response
- Lack of investment, e.g. in building energy performance or smart meters
- Only recent market penetration of some technologies, e.g. building energy storage and electric vehicles



All indicator overview

		Sweden	Finland	Denmark	Netherlands	Austria	United Kingdom	Germany	France	Ireland	Italy	Spain	Poland	Luxembourg	Slovakia	Slovenia	Czech Republic	Lithuania	Romania	Greece	Portugal	Bulgaria	Hungary	Cyprus
BUILDING PERFORMANCE	Building Envelope (U-value)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
	Final Energy Consumption	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
HEALTHY LIVING & WORKING ENVIRONMENT		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
ABILITY TO KEEP ADEQUATELY WARM/COOL		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
SMART METER DEPLOYMENT		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
DYNAMIC MARKET	Flexibility in the market	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
	Dynamic pricing	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
CONNECTIVITY		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
DEMAND RESPONSE		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
BUILDING ENERGY STORAGE		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
ELECTRIC VEHICLES		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
EFFICIENT HEATING CAPACITY	District heating	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
	Heat pumps	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
RENEWABLE ENERGY		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
PHOTOVOLTAICS		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
SMART-READINESS		Sweden	Finland	Denmark	Netherlands	Austria	United Kingdom	Germany	France	Ireland	Italy	Spain	Poland	Luxembourg	Slovakia	Slovenia	Czech Republic	Lithuania	Romania	Greece	Portugal	Bulgaria	Hungary	Cyprus

Source: BPIE (2016)
Is Europe ready for the smart buildings revolution?

CHALLENGES BENEFITS

AIR POLLUTION AND HEALTH ISSUES RELATED TO THE BUILDING STOCK

Between 30% and 50% of excess winter mortality is attributed specifically to housing conditions (Kneafsey)

AN INEFFICIENT BUILDING STOCK

75% of the building stock is energy inefficient (EC)

AMBITIOUS DECARBONISATION TARGET

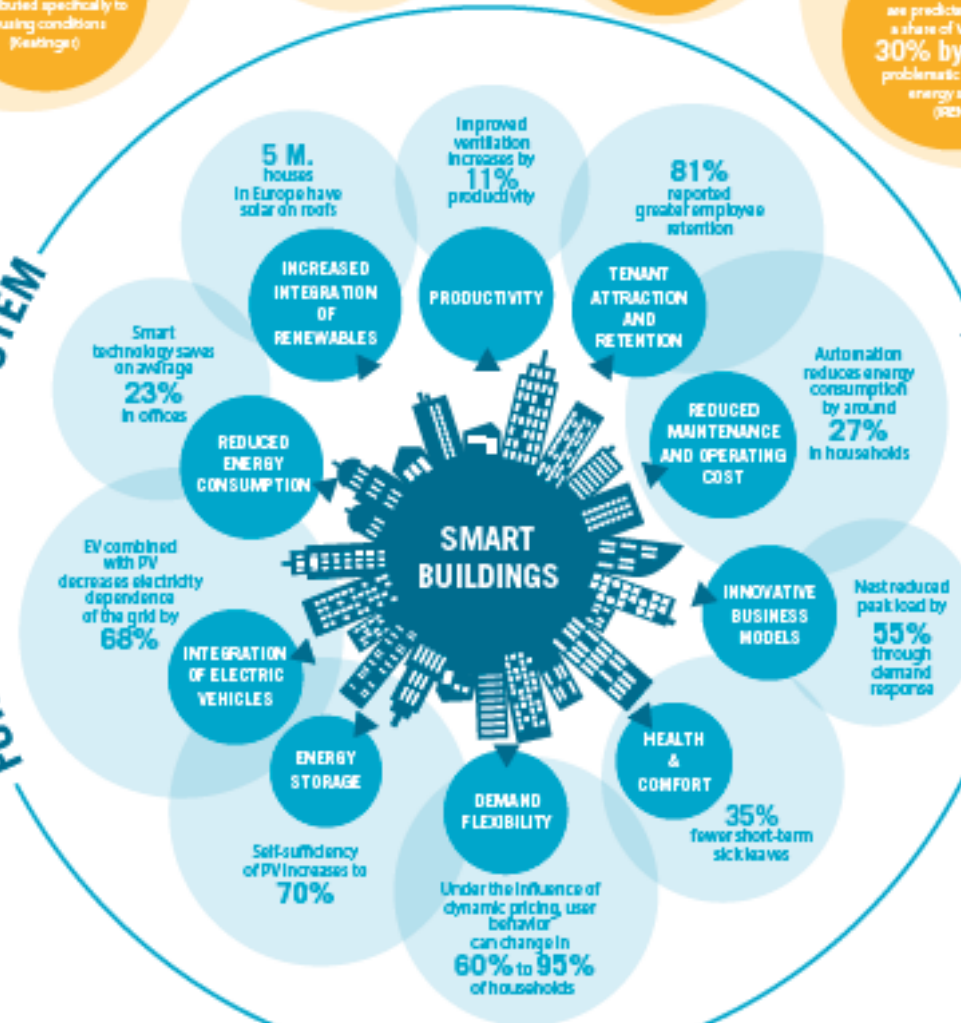
EU aims to cut emissions from houses and office buildings by around 90% by 2050 (EC)

AN INCREASED SHARE OF VARIABLE RENEWABLE ENERGY

A number of EU countries are predicted to have a share of VRES over 30% by 2030, problematic for a static energy system (REN4)

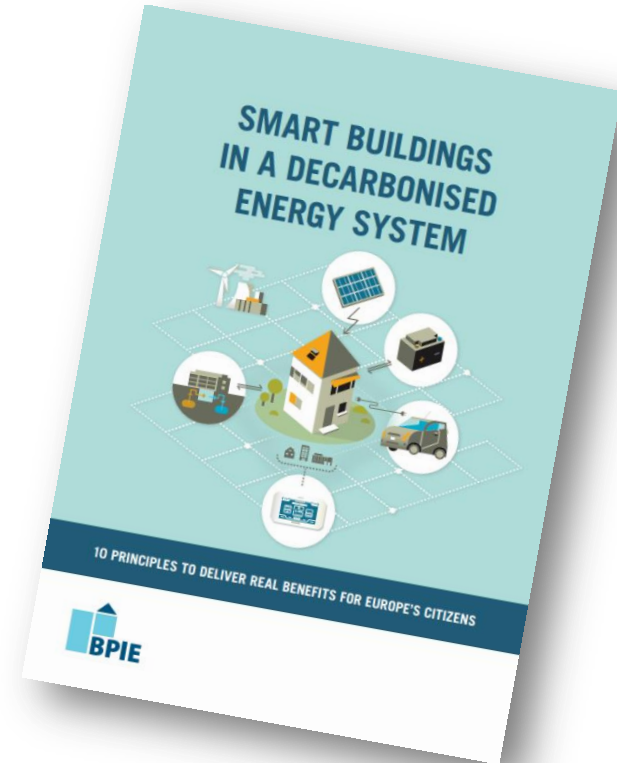
FOR THE ENERGY SYSTEM

FOR THE OCCUPANTS



Conclusions

- Buildings are energy infrastructure and need to be prioritized as such!
- High efficiency is the prerequisite for smart and consumer oriented buildings.
- Policy making should abolish divergence between RES and EE and move to sectoral convergence
- In Europe, the Clean Energy Package is the golden opportunity to introduce such a policy change.
- The biggest personal investment of people is in real estate, but the service offering of the construction industry is archaic. Significant business model disruption and innovation needed!





Thank you...

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