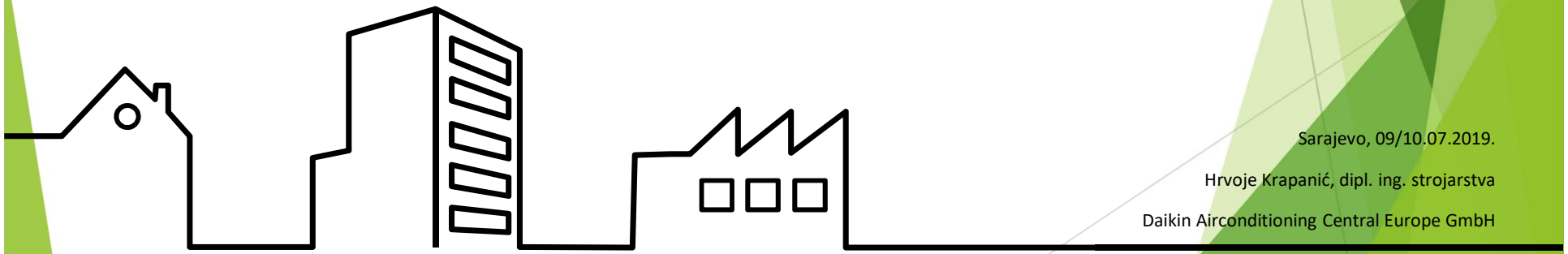
Smart Solutions and smart integrations - EPBD based

(EPBD – direktiva o energetskoj efikasnosti zgrada)



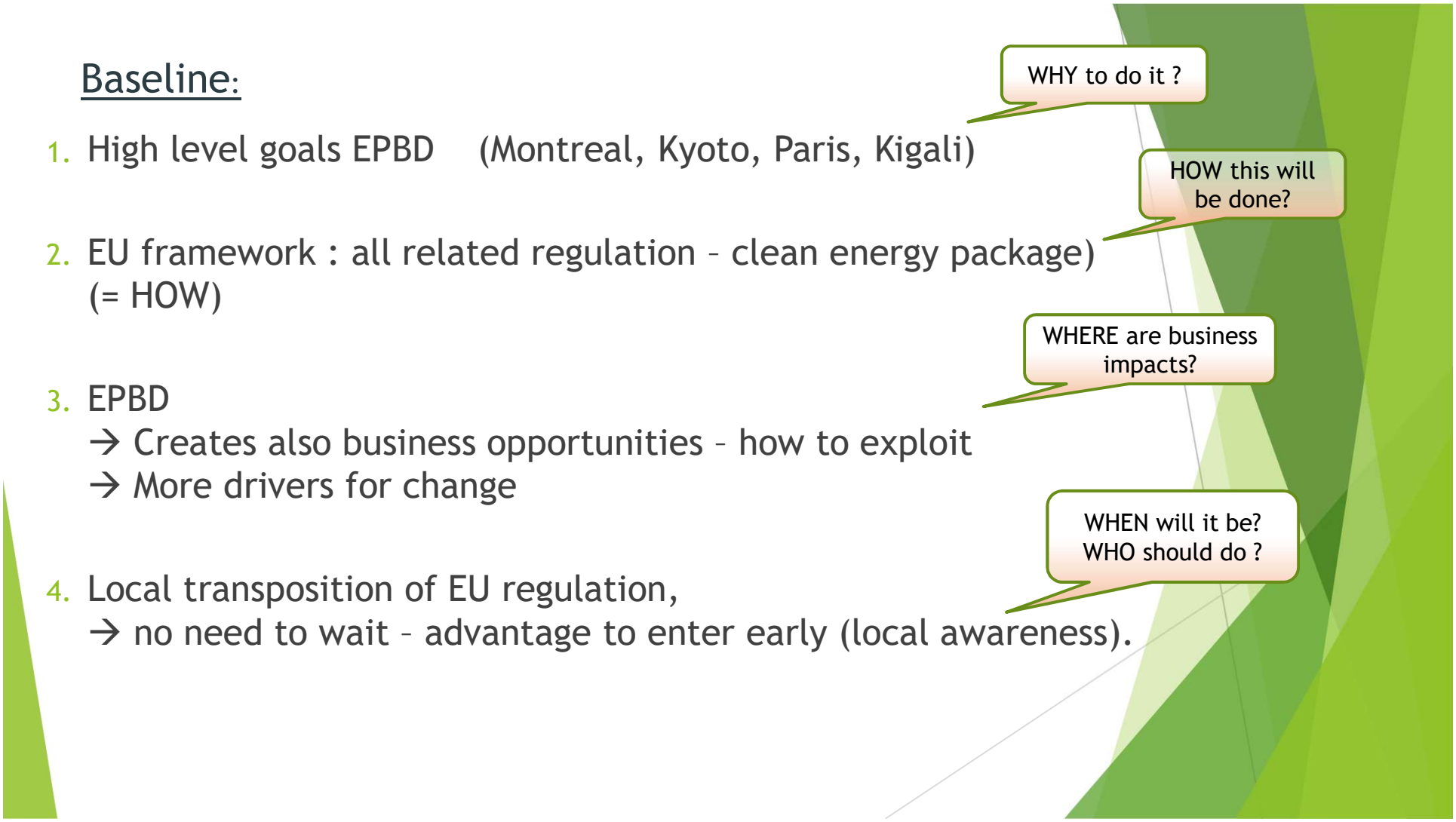
Sarajevo, 09/10.07.2019.

Hrvoje Krapanić, dipl. ing. strojarstva

Daikin Airconditioning Central Europe GmbH

Baseline:

1. High level goals EPBD (Montreal, Kyoto, Paris, Kigali)
2. EU framework : all related regulation – clean energy package) (= HOW)
3. EPBD
   → Creates also business opportunities – how to exploit
   → More drivers for change
4. Local transposition of EU regulation,
   → no need to wait – advantage to enter early (local awareness).



Climate strategies and targets in the EU

In 2015, the EU was responsible for 10% of world greenhouse gas emissions.

The EU is one of the major economies with the lowest per capita emissions.

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Strategy	Greenhouse gas emissions reduction target (compared to 1990)	Current Status
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Roadmap to a 2050 low-carbon economy	**-80% by 2050**	Long term vision, not yet committed. In line with IPCC assessment of reductions required from developed countries as a group to reduce by 80-95%.

INDC : Intended Nationally Determined Contributions to the Paris Agreement

https://ec.europa.eu/clima/policies/strategies/2050_en

To make the transition, the EU need to invest an additional €270 billion (or on average 1.5% of its GDP annually) over the next 4 decades.

How buildings sector should reach their targets, where to aim ?

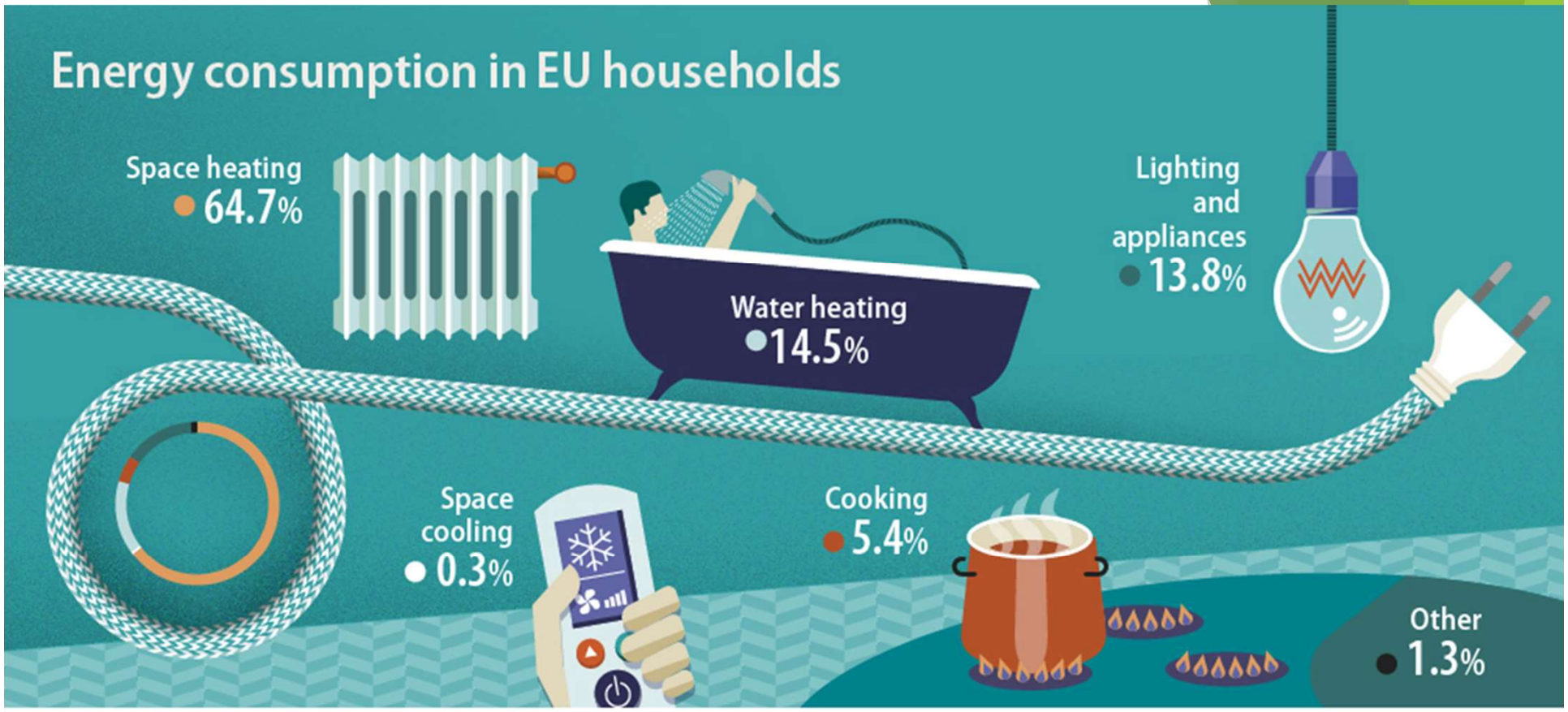
40% EU energy consumption

75-80% energy inefficient

36% EU CO2-emissions

1 out of 6 Europeans living in unhealthy building

35% >50 years old



ec.europa.eu/eurostat

Clean Energy Package (CEP)

8 LEGISLATIVE PROPOSALS

- √ **Energy Union Governance Regulation**
- √ Recast **Electricity Market** Regulation
- √ Recast **Electricity Market** Directive
- √ Regulation **on Risk-preparedness** in the electricity sector
- √ Recast **Renewable Energy Source Directive**
- √ Recast **Energy Efficiency Directive**
- √ Recast Energy Performance of Buildings Directive
- √ Recast Regulation establishing **ACER** (Agency for the Cooperation of Energy Regulators)

EPBD 2018 revision introduced on 9th July 2018.

EU countries will have 20 months to implement → 9th March 2020 !

Still 8 months to go…

Introduces amendments to the current Directive aimed at accelerating the cost-effective renovation of existing buildings, with the vision of a decarbonised building stock by 2050 and the investments increase.

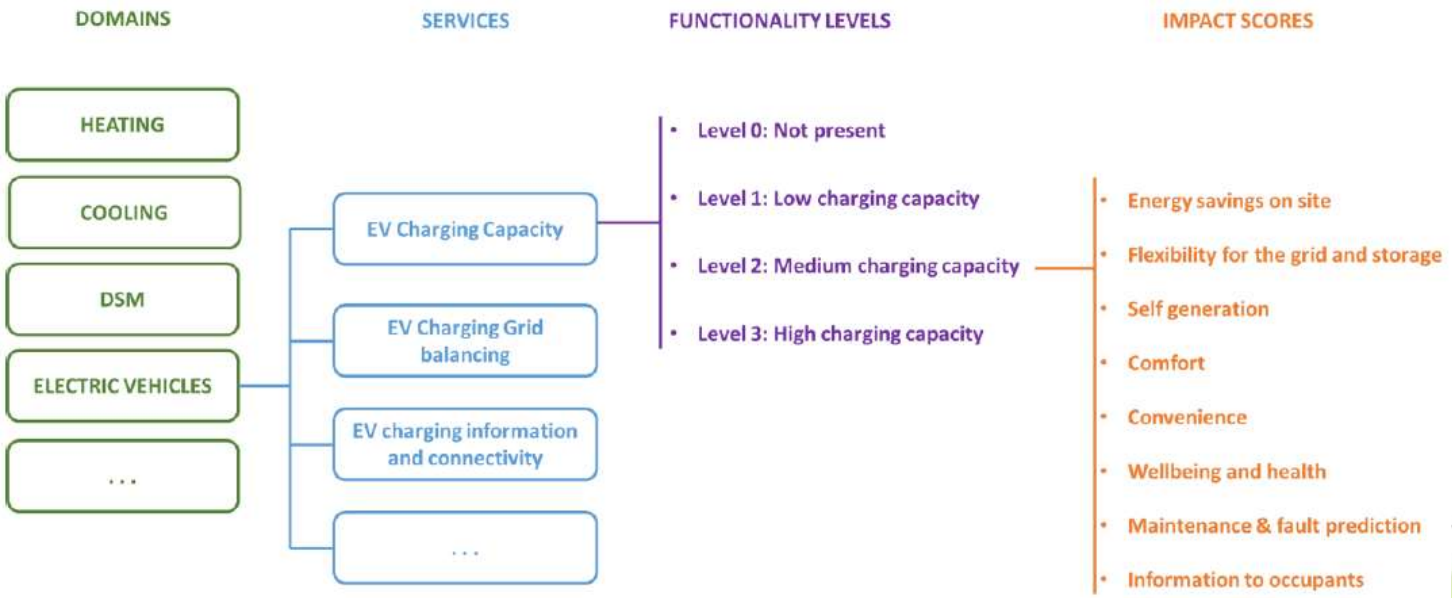
The revision also supports: electromobility infrastructure, deployment in buildings' car parks and introduces new provisions to enhance smart technologies and technical building systems, including automation.

SMART READINESS OF BUILDINGS

- Optional scheme to be established by end 2019
- Rating of
  - Buildings' capability to adapt its operation to the needs of the occupant and the grid,
  - To improve its energy efficiency and overall performance
- Level of smartness to be integrated in Energy Performance Certificates

SMART READINESS OF BUILDINGS

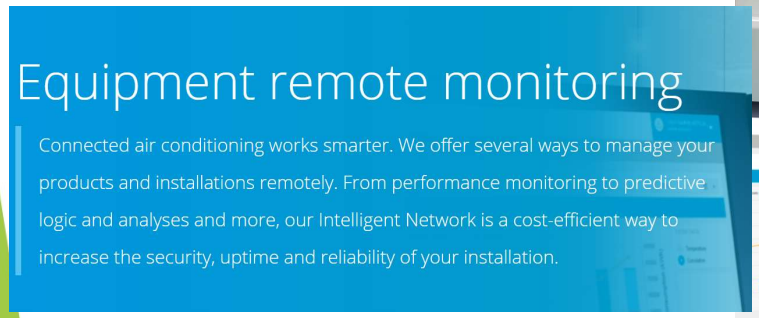
Example : Technology neutral methodology



INSPECTION TECHNICAL BUILDING SYSTEMS (TBS) - example

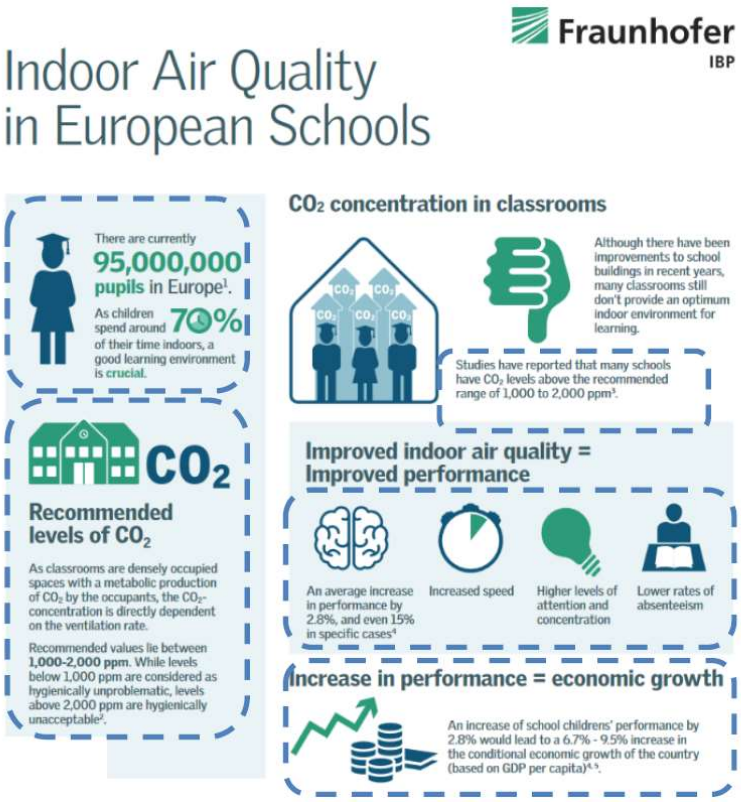
technical equipment for space heating, space cooling, ventilation, domestic hot water, built-in lighting, building automation and control, on-site electricity generation or a combination thereof, including those systems using energy from renewable sources, of a building or building unit.

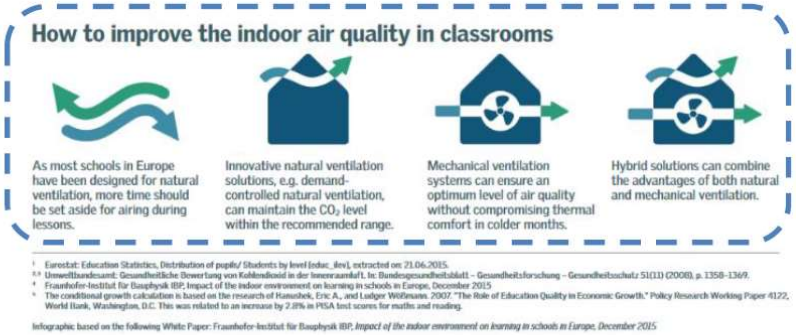
Inspections should evaluate performance of the system, but also should identify issues or problems, propose solutions or improvement measures and log the results of the inspection in a report for future reference.



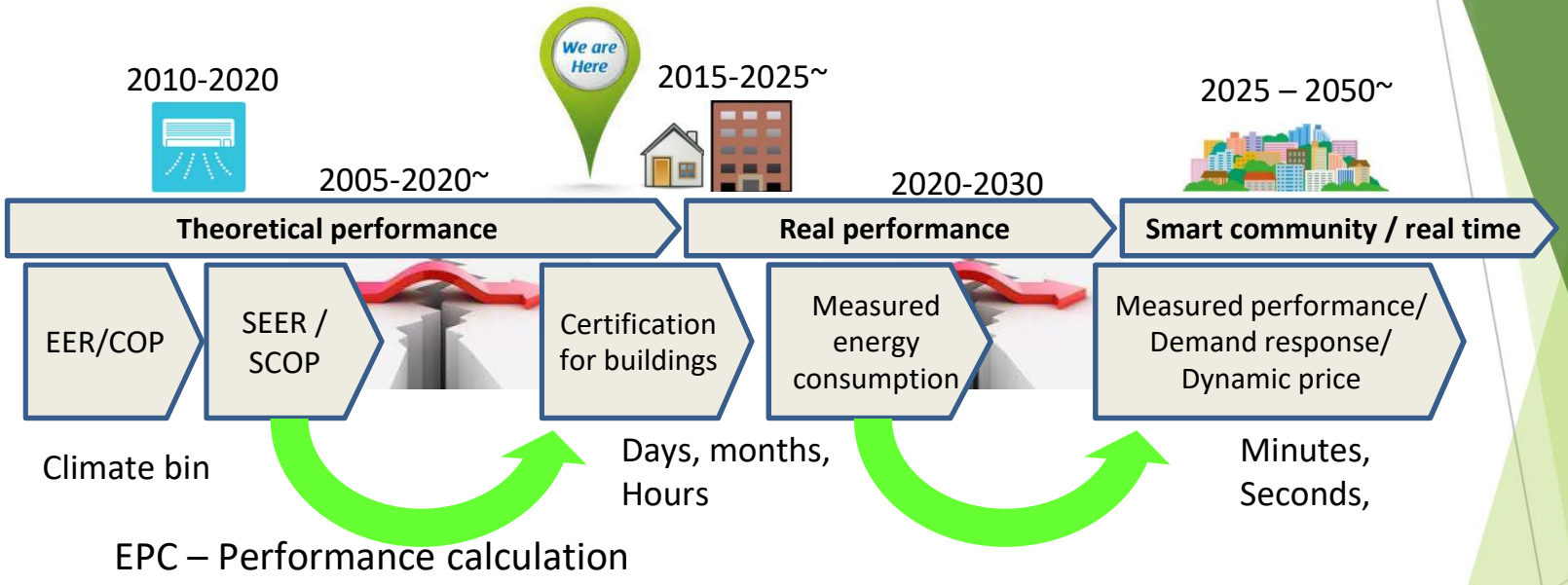
INDOOR AIR QUALITY (IEQ)

- More awareness related to IAQ
- To be reflected in buildings undergoing major renovations
- Energy performance calculation
- decision on Technical Buildings Systems





Roadmap for HVAC equipment



Legislation & standards + circular economy →

impact on every aspect of a product lifecycle

Recovery & reuse of materials (F gas, components : circular economy)

Factory	Transport	Product	Promotion	Building	Install Service	Energy source Energy grid	Waste

Examples (non exhaustive) :

Vlarem Reach CLP GHS	GHS CLP ADR IATA	Ecodesign F gas Reg. ODS Reg. RoHS Biocidal Prod. LVD, MD, PED Reach,… IEC/EN60335 EN14825	Ecodesign Energy label Ecolabel F gas reg. PEF	Building safety codes EPBD EN378 EN16798-9 EN16798-13 EN15316-4-2	F gas certificate Atex, CLP, GHS, Heat pump qualification Regular F gas & EPBD inspections	Renewable energy source directive Energy efficiency directive Ecodesign-Smart appliance	WEEE Packaging Directive Battery directive GHS

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English EN

European Commission > Energy > Topics > Energy strategy and energy union > Governance of the energy union > National Energy and Climate Plans (NECPs) >

Energy

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National Energy and Climate Plans (NECPs)

According to the governance of the energy union and climate action rules, which entered into force on 24 December 2018, EU countries are required to:

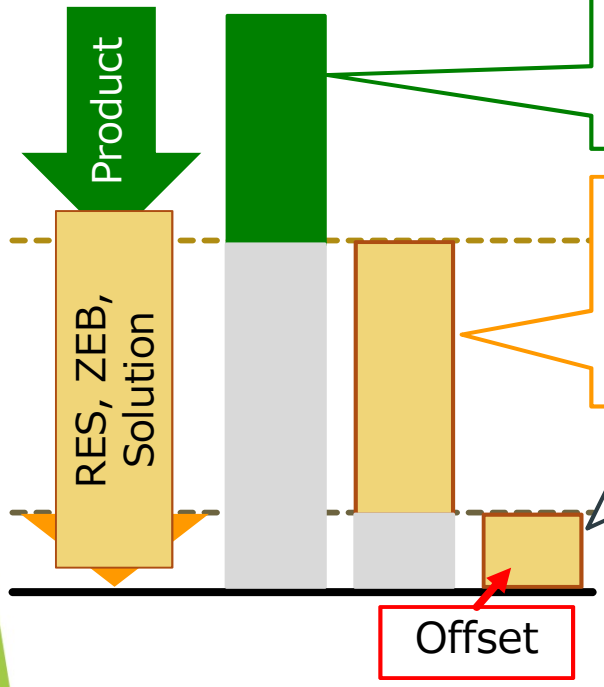
- develop integrated National Energy and Climate Plans (NECPs) that cover the five dimensions of the energy union for the period 2021 to 2030 (and every subsequent ten year period) based on a common template
- submit a draft NECP by 31 December 2018 and be ready to submit the final plans by 31 December 2019 to the European Commission
- report on the progress they make in implementing their NECPs, mostly on a biennial basis

We will reduce the CO2 emission generated throughout the entire life cycle of our products.

Furthermore, we will create solutions that link society and customers as we work with stakeholders to reduce CO2 emission to zero.

Using IoT and AI, and open solutions, we will meet the world's needs for air solutions by providing safe and healthy air environments while at the same time contributing to solving global environmental problem.

This is how corporation aims to carbon neutral technology



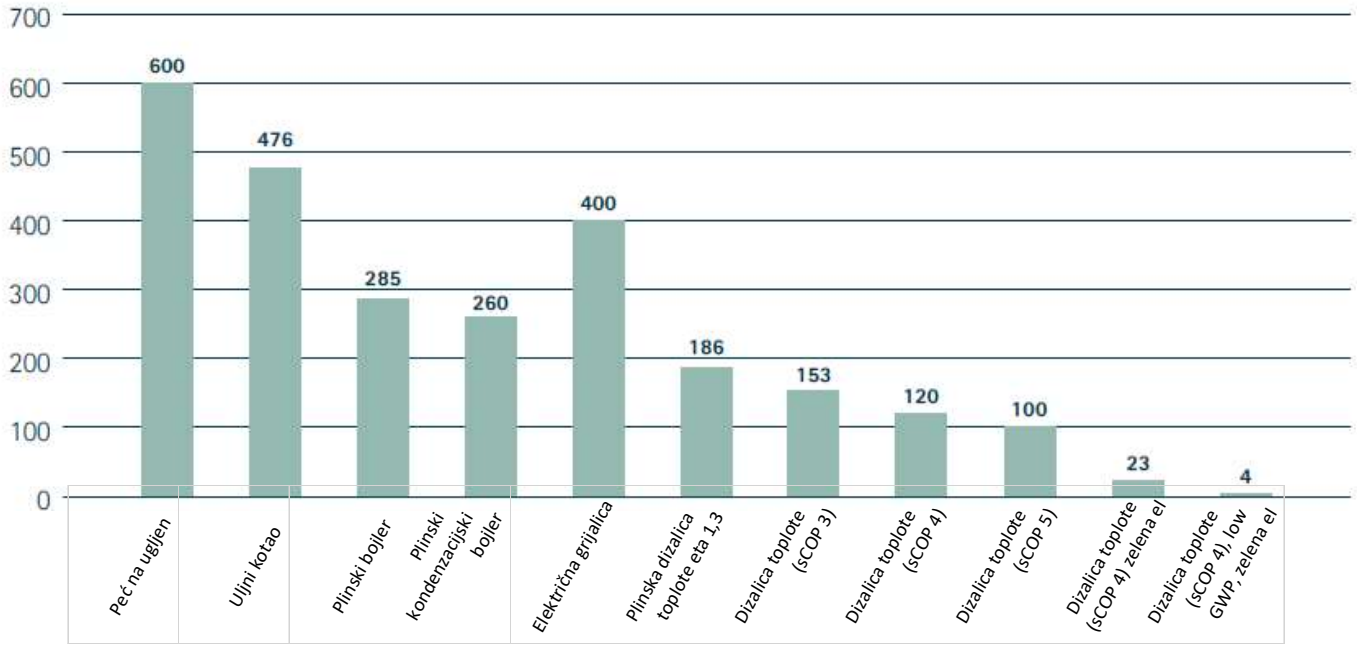
- More energy efficient products
- Refrigerants with lower global warming potential like R32, R1234ze R290, R744
- Heat-pump heating

Ongoing Process !

- Popularized low energy building (NZEB)
- Popularized renewable energy
- Use of energy management to carry out efficient operations in buildings with centralised systems
- Energy services throughout the value chain solution

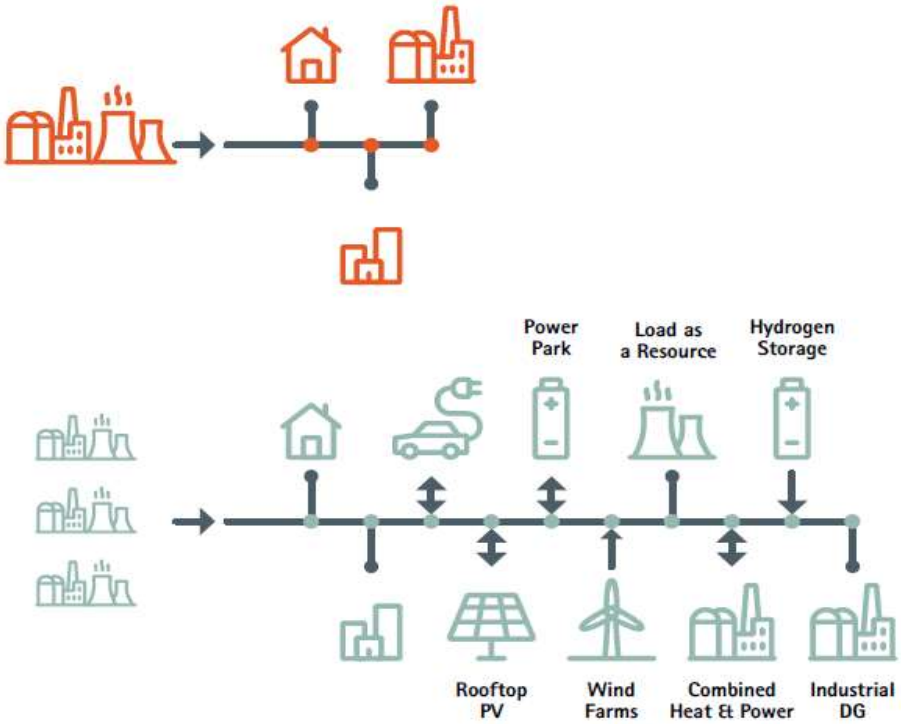
- Support to use HFCs with low GWP
- Recovery and recycle refrigerants (HFCs)
- Forest conservation etc.

Usporedba emisije CO_2 ekvivalenata različitih načina grijanja (po kW/h)



Source: EHPA white paper 2018

Figure 18 **TRADITIONAL GRIDS VERSUS THE GRID OF THE FUTURE**



TODAY'S ELECTRICITY
central power, decentral demand.

↓

GRID MODERNIZATION

↓

TOMORROW'S CHOICES
The future supply AND demand will be decentralised.

Source: IEE

EU – 20/20/20 Targets until 2050 targets of -80% of carbon emissions …

- New policy goals are impacting energy transformations globally
- With increasing renewable technologies, EVs : Loads are increasing on electrical distribution grids
- Need of optimisation of energy

TODAY: ONE-WAY POWER SYSTEM

- Large, centrally located generation facilities
- Designed for one-way energy flow
- Utility controlled
- Technologically inflexible
- Simple market structures and transactions
- Highly regulated (rate base) and pass through

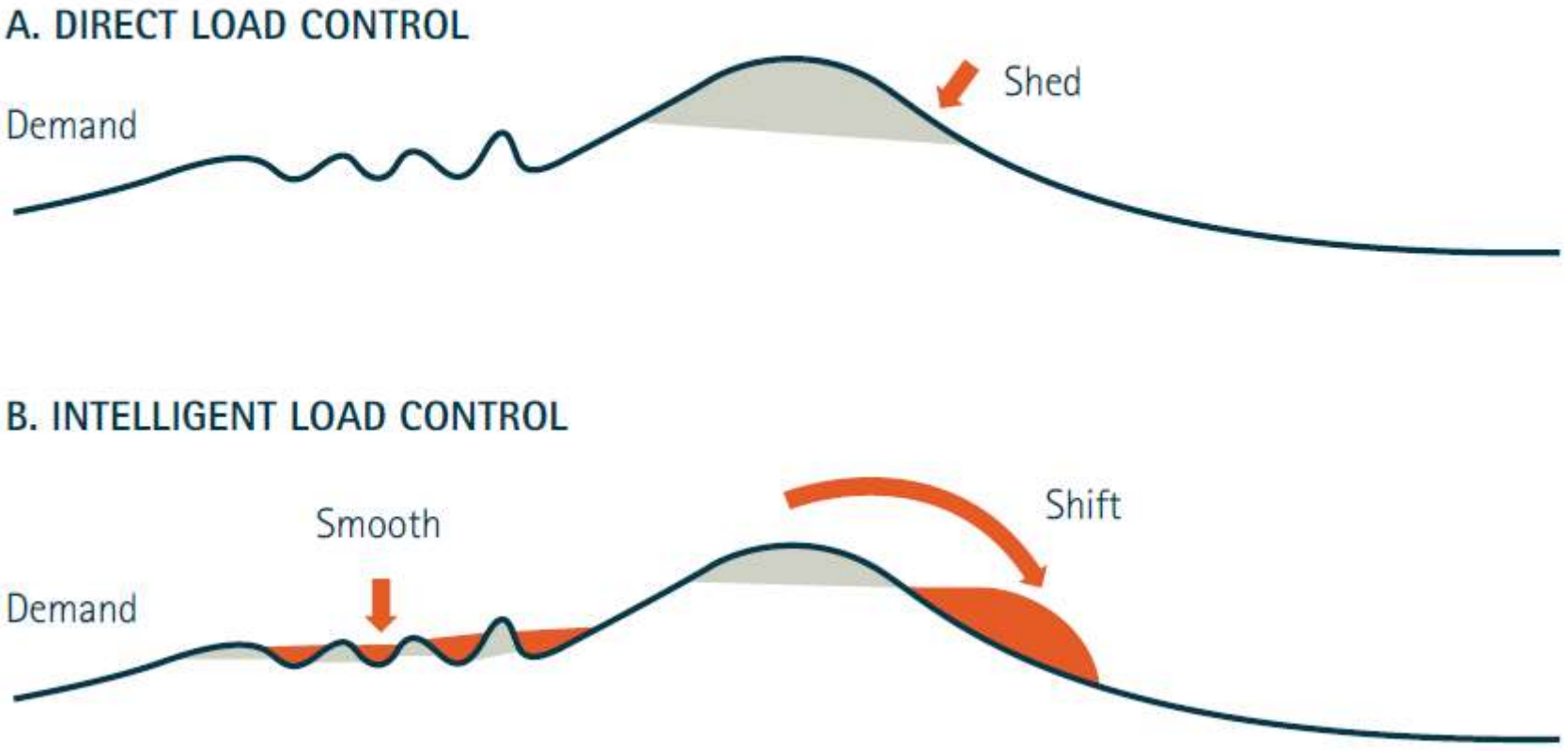
EMERGING: THE ENERGY CLOUD

- Distributed energy resources
- Multiple inputs and users, supporting two-way energy flows
- Digitalisation of the electric-mechanical infrastructure: smart grid and behind the meter energy management systems
- Flexible, dynamic, and resilient
- Complex market structures and transactions
- Regulation changing rapidly around renewables, distributed generation (solar, microgrid, storage), net metering etc.

National Grid Future Energy Scenarios [2018]

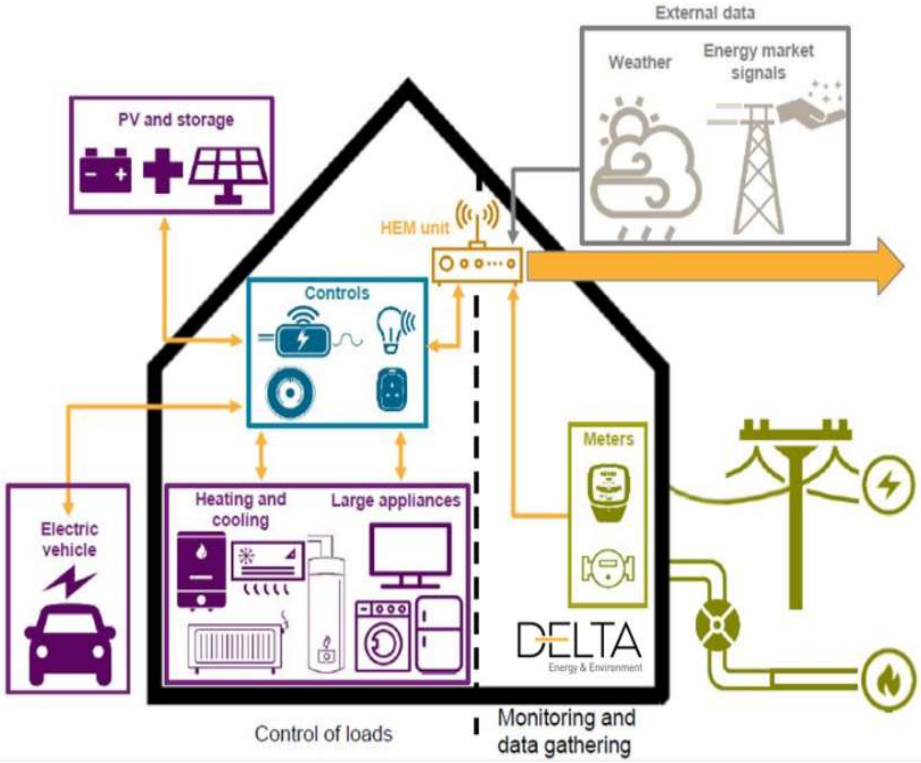
Figure 2.1
Scenario matrix for 2018

Figure 17 **THE EFFECT OF HEAT PUMP-INDUCED FLEXIBILITY ON THE DEMAND CURVE**



Source: Adapted from Integral Analytics Inc.

Vision for Smart Home, Connected Living and Consumer IoT

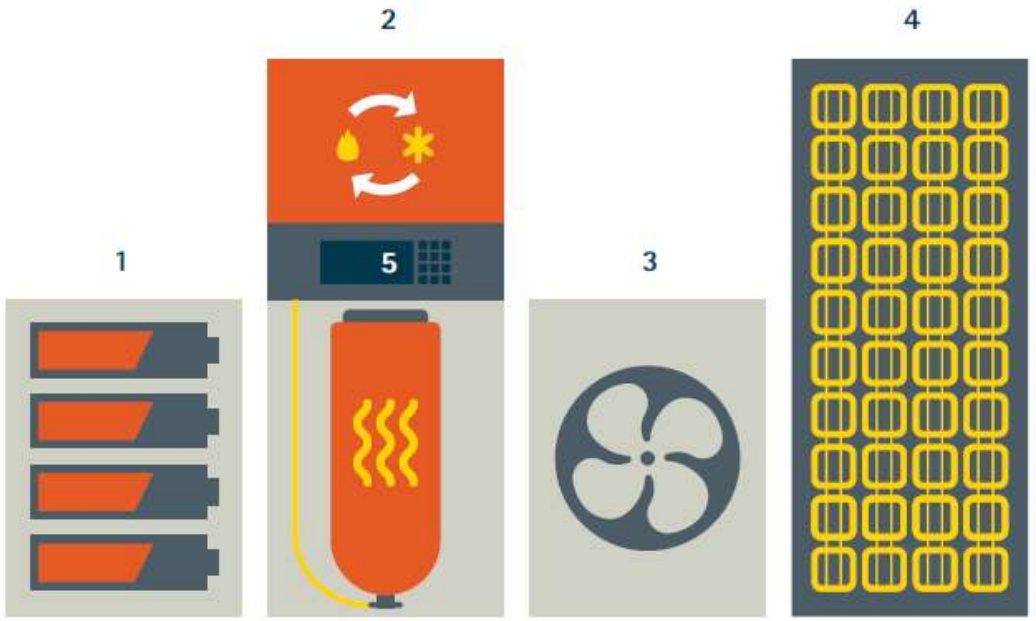


Integration Heating, Split, Cloud & unified App providing full control

Courtesy od Daikin Europe N.V.

Figure 19 **A FUTURE STANDARD CONFIGURATION FOR HEAT PUMPS?**

1. Battery stack with 4x 2,5kWh storage capacity (electric)
2. Air-water heat pump with a storage tank
3. Ventilation system
4. Photovotaltaic system
5. Controller optimising the system for a maximum use of locally-produced electricity and maintenance of user comfort



Source: EHPA white paper 2018

Heat pumps are beeing a environmental solution for

- Heating and hot water in residential buildings, both in single and multi-family homes. Depending on the local building tradition, heat is distributed via water-based systems (radiators, floor-heating) or via air-conditioning devices (ducted or ductless systems).
- High efficient low temperature regimes, enable meeting requirements in all new buildings including 'near-zero' energy, 'passive' houses and energy 'plus' building designs.
- *Replacing oil and gas boilers* in existing buildings is the biggest challenge. In some cases, heat pump solutions are available, but most likely, 'hybrid' heat pumps should be used. Hybrid systems combine heat pumps with other technologies (solar thermal, biomass, gas, oil) and provide these services during very cold winter periods.
- If at a later stage the building envelope is refurbished, then a heat-pump only solution is feasible and preferable.
- Connectable with smart solutions and fulfilling future needs, remote controlling available now already, easy integration in any system.

Source: EHPA white paper 2018

Hvala