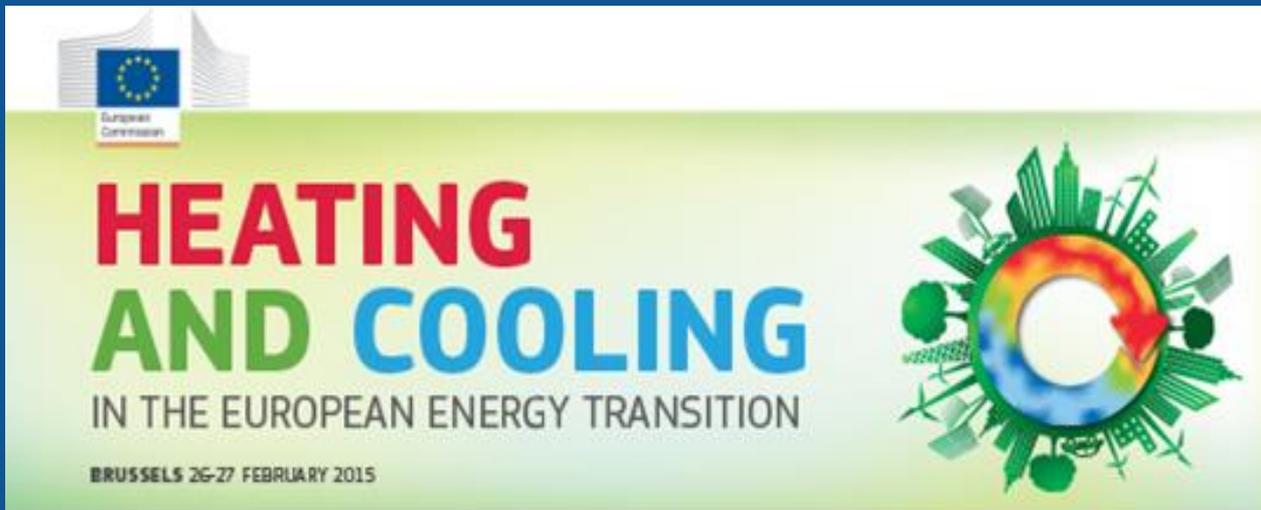




# District Heating and Cooling in the EU Energy Policy Framework and the EU Strategy for Heating and Cooling

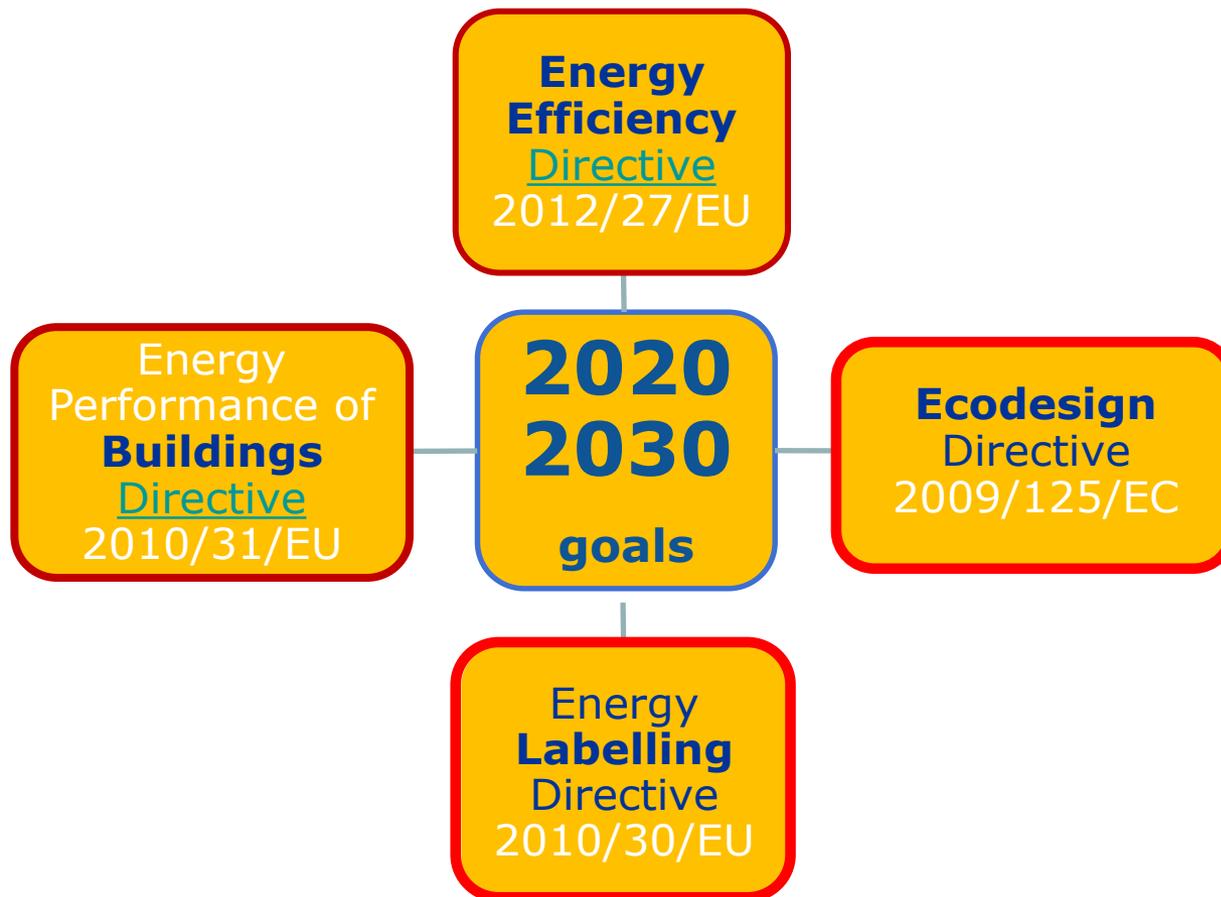
Copenhagen  
26 August 2015  
International  
Conference  
On Smart Energy  
Systems and  
4<sup>th</sup> Generation  
District Heating

Eva Hoos  
Unit Energy Efficiency  
DG ENER  
European Commission



# Current policy and legislative framework

# The legal framework of the EU energy efficiency policy





European  
Commission

## 2030 climate and energy Framework



**New governance system**



# The way towards: The Energy Union

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## Where we want to go:

A secure, sustainable, competitive, affordable energy for every European

## What this means:

Energy security, solidarity and trust  
A fully integrated internal energy market  
Energy efficiency first  
Transition to a long-lasting low-carbon society  
An Energy Union for Research, Innovation and Competitiveness

## How we want to reach it:



## 1 Secure supplies

**We have to become less dependent**

**on energy from outside the EU:** This means increasing transparency on gas supply; diversifying sources, supplies and routes; working together on security of supply and developing a stronger European role in global energy markets.

## 2 Internal energy market

**Energy should flow freely across the EU – without any technical or regulatory barriers:**

This means connecting markets through interconnections and implementing and upgrading the internal market's software while enhancing regional cooperation and empowering consumers.

## 4 Emissions reduction

**An ambitious climate policy is an integral part of our Energy Union:** The next challenge will be to enforce the 2030 energy and climate framework, while becoming the number one in renewables.

## 5 Research & innovation

**Developing EU technological leadership in low carbon technologies**

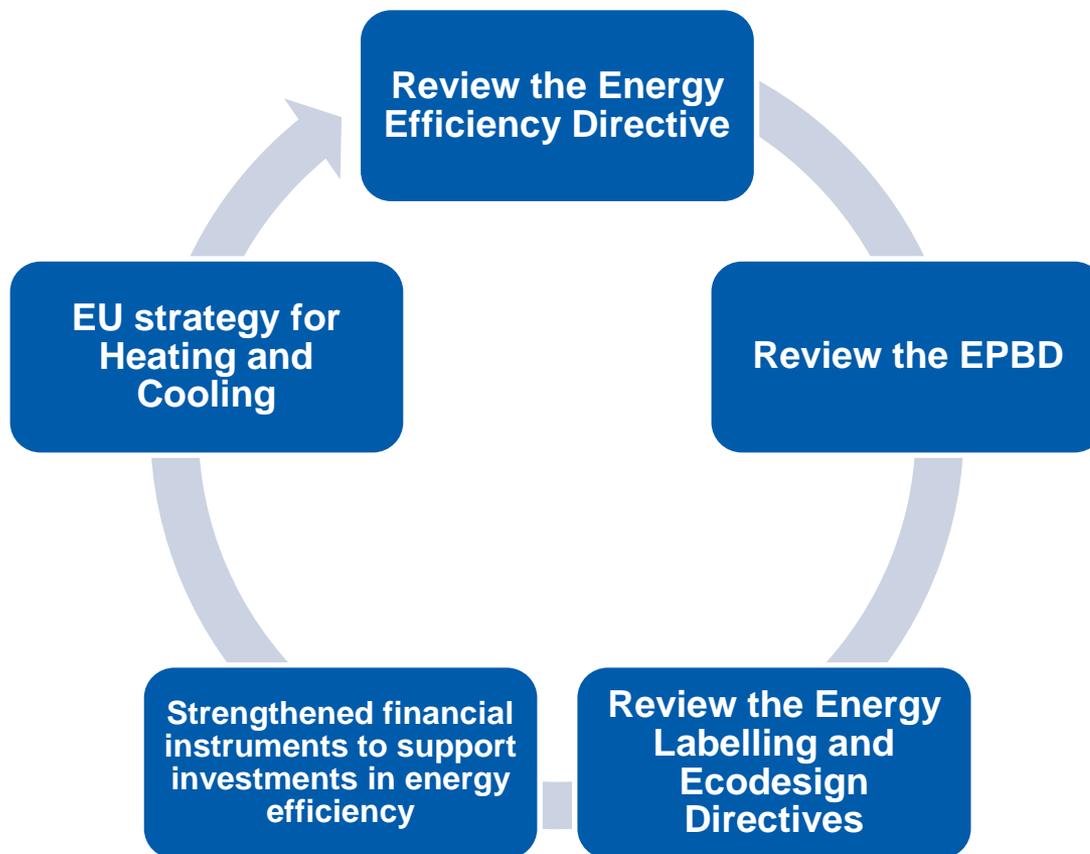
## 3 | Energy efficiency



# Rethink energy efficiency as an energy source in its own right

This means increasing energy efficiency, in particular in the building sector, and promoting an energy-efficient and decarbonized transport sector as well as efficient products.

# Energy efficiency - Concrete actions





## Directive 2012/27/EU

- Publication in OJ:  
14 November 2012
- Entry into force:  
4 December 2012
- Transposition:  
**5 June 2014**

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14 November 2012

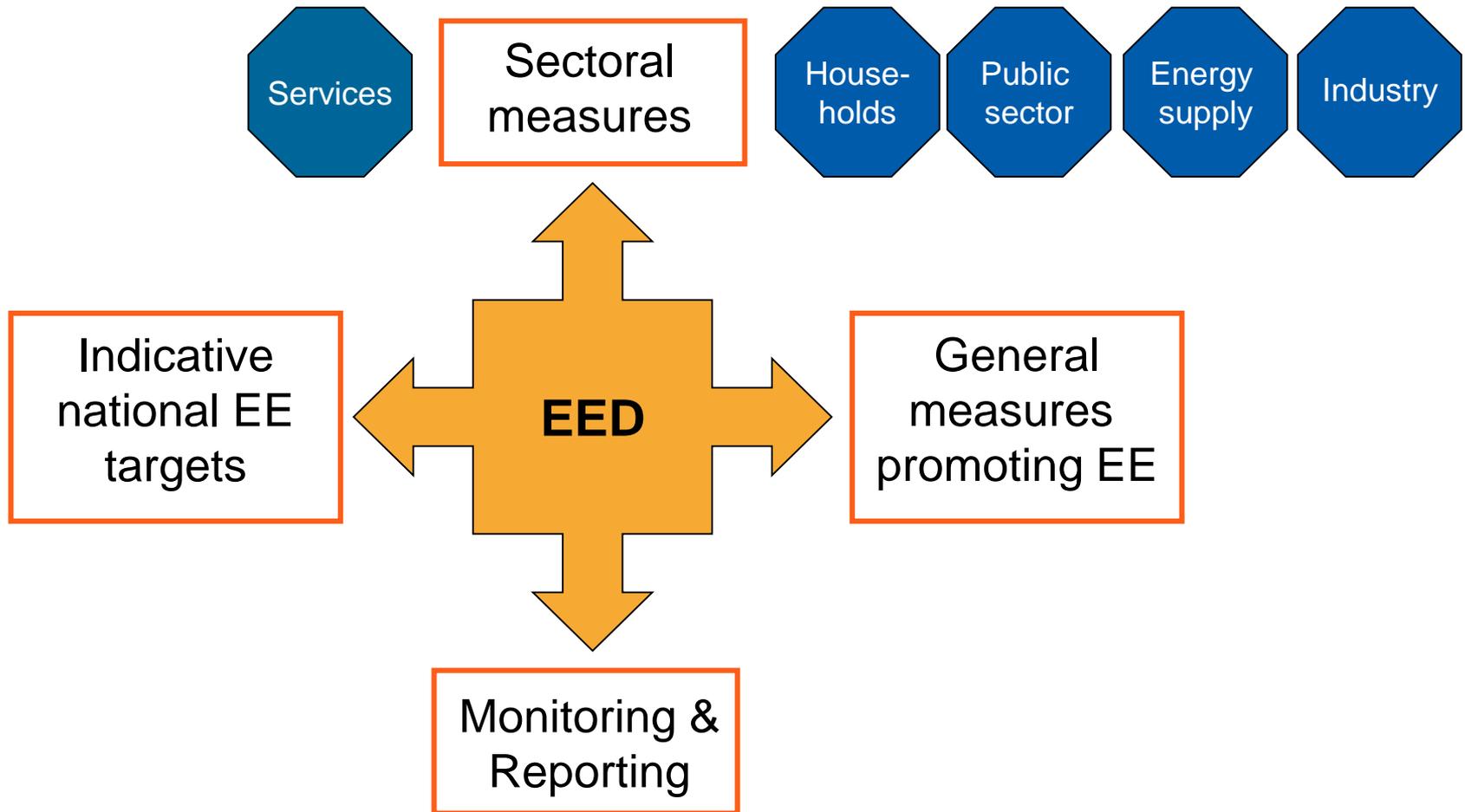
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# THE ENERGY EFFICIENCY DIRECTIVE



# District Heating and Cooling in the Energy Efficiency Directive



- ⇒ **Directive 2012/27/EU on Energy Efficiency promotes efficient district heating and cooling**
  - Article 14 (1)-(4): Comprehensive Assessment of CHP, DHC potentials - 31 December 2015
  - Article 14 (5)-(8): Cost-benefit analysis obligation for large power and industrial plants 5 June 2014
  - Article 24 (6): Statistics - April 2015 (delay)
  - Other directly relevant Articles: 2 – definitions; 3 – EU and national targets; 4 long-term building renovation strategies; 9-12 – metering & billing & consumer information; 20 – financing.
- ⇒ **Only six Member States declared full transposition of the EED**

# Comprehensive Assessment (CA) and country wide cost-benefits analysis (CBA)



- Current situation, trends – **baseline scenario**
  - Time horizon: min. 10 years, alignment with EU/MS long-term energy and climate goals
  - Comprehensive data of demand & supply, high granularity – Heat is local!
  - Existing and planned technologies, infrastructures
  - Heat mapping: energy supply sources (RES, waste, fuels, plants), demand points (cities, industries)
- EE and RES goals, options to achieve them – **alternative scenarios**
  - CHP, DHC, RES, waste, efficient individual technologies infrastructures (linking with electricity and industry)



- CBA – economic analysis + financial analysis
  - Economic, social and environmental benefits
  - Economic, social and environmental costs
  - Many of these do not have (full) market valuation - externalities
  - Financial analysis: discounted cash flows
  - Sensitivity analysis
- Geographical boundaries, system boundaries are key
  - Integrated approach
  - CBA in city/municipal/district boundaries
  - Taking into account national/EU goals



- Selection of alternative scenarios with cost-benefit surplus (key metric NPV)
  - ⇒ Scenarios with negative financial outcome but positive economic (social, economic, environment factors) outcome can be selected – gaps can be bridged by policies, regulations, support
- Measures to realize economic potentials for CHP and DHC (mandatory), other efficient H/C options (optional)
- ⇒ **If benefits exceed costs – MS must implement DHC**



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# EU Strategy for Heating and Cooling

# Heating and Cooling Strategy



- ▶ **Energy efficiency and decarbonisation (renewable energies) in buildings and industry:** cost-efficient balance between energy efficiency and decarbonisation
- ▶ **Long- term perspective and pathways for EE, decarbonisation (buildings, industry)**
- **Integrated holistic approach:** heat/cool as part of the energy systems, synergies between energy carriers, technologies, infrastructures and markets
- ▶ **Instruments?**
  - Energy planning and mapping
  - linking heat and electricity
  - linking industry and buildings (waste heat)
  - building refurbishment, building and product regulation,
  - technology deployment, better markets, consumer awareness,
  - financing, capacity building, R&D&I&D
- ▶ **Benefits: security of supply, climate and environment, consumer prices and choice, competitiveness**

# Heating and Cooling Strategy



- **Energy transition goals by 2050 versus current situation**

- Energy efficiency improvement (demand reduction)
- Decarbonisation levels (CO<sup>2</sup> emissions reduction)
- Renewable deployment levels

- **Gaps? How to bridge the gaps?**

- **Instruments, e.g.**

- Buildings' regulation (energy performance certificates, energy performance requirements, renovation rates)
- District heating and cooling
- CHP, storage, waste heat recovery
- Renewable deployment and linking heat/cool and electricity
- Technologies (deployment, I&R&D)
- Financing

- **The strategy is to impact the review of:**

- Renewable Energy Directive
- Energy Performance of Buildings Directive
- Energy Efficiency Directive
- Review of the EU internal energy market (electricity market design, retail markets)
- Security of supply package
- Smart financing framework
- R&D&I programmes

# Key issues: Buildings



- Effectiveness of the current framework in EPBD
- Cost-effective balance between energy savings and sustainable energy supply
- Refurbishment rates
- Integrate building level and district level energy efficiency and decarbonisation in building energy performance measurement and requirements in cities?
- District heating/cooling versus low-energy buildings
- Deployment of new RES and EE technologies in buildings
- Integrate electricity grid performance and smart grid/building/product performance parameters - buildings' role in demand response/management, self-consumption and decentralised production
- Financing

# Key Issues: Industry



- Overall technical potential 22% energy savings; 8-10% is economically viable (PB 2-5 years) – This is not enough to meet policy goals
- Potentials need to be realised! For this:
  - Information, specialised knowledge to overcome "herd mentality" - lack of awareness is pervasive
  - Tailor-made concepts and sharing best practices (sector, sub-sector specific)
  - Non-ETS sector: large potentials
- Breakthrough technologies are needed
- ▶ **Realise Potentials! Go Beyond Potentials!  
Integration! Partnerships and Cooperation!**

# Key Issues (3): Financing



- Tailor-made, easy-to-use, off-the-shelf instruments – build capacity of financing/investment community
- Standards for investment process, procurement, building renovation, measurement, valuation, verification of energy efficiency in projects



# Key Issues: Technology



- Technologies are there but broader deployment face many hurdles: trained installers are key!
- New business models for commercialisation and streamlined regulations
- Energy labels and eco-design are important
- Hybrid packages with renewables
- Replacement rates and link with building renovation
- Gaps in technologies: high-temperature process – R&D&D
- Technology highlights: Smart district heating/cooling able to level seasonal and load variation with storage, industrial heat pumps, solar technologies



# Key Issues (5): Heat markets



- Consumers in centre! information, personalised advice
- Level-playing field, competition
- Transparent prices
- Long-term national strategies, clear policy goals are the foundations for heat markets – rallies market actors, efforts
- Heat markets are local
- Role of local authorities is central
  - Heat mapping and planning,
  - Regulatory framework (e.g. for pricing, buildings),
  - Coordination, partnerships,
  - Project structuring, financing and investing
  - Coordinating with building renovation, construction



# Key principles (1)



- Better data and understanding of existing heat markets;
- Better understanding of long-term pathways to decarbonise energy use in buildings and industry;
- Clear identification of priorities for action, of trade-offs and of synergies between policies and measures;
- Viable solutions to accelerate the renovation rate of buildings and the synergies between energy efficient construction and heat supply from district heating and cooling;
- Overcoming of barriers to investment in energy efficiency and renewable energy in buildings and industry.



# Key principles (2)



- ▶ Untapped potential to increasing energy efficiency and renewable energy use in heating and cooling through:
  - Broader deployment of existing technologies;
  - The development of new technological solutions;
  - The use of waste heat from industry in buildings;
  - The use of thermal storage to smooth out peaks for electricity demand;
  - Integrated approach making the connection between the heating sector and the electricity sector.



# EU Heating and Cooling Strategy



- Adoption 2015: November 18 (planned)
- Communication + SWD
  - No I.A.: use of existing and on-going studies
- **Consultation Forum: 9 September**
  - ⇒ 5 issues papers: buildings, industry & tertiary, linking heat/cool and electricity, technology, integrated approach
  - ⇒ District heating and cooling is a key element in all papers
- Finalisation from September onwards



**Thank you!**

