



ΙΝΣΤΙΤΟΥΤΟ ΕΝΕΡΓΕΙΑΣ
ΝΟΤΙΟΑΝΑΤΟΛΙΚΗΣ ΕΥΡΩΠΗΣ

The Role of Cogeneration and District Energy Under the New European Directive for Energy Efficiency (2012/27/EC)



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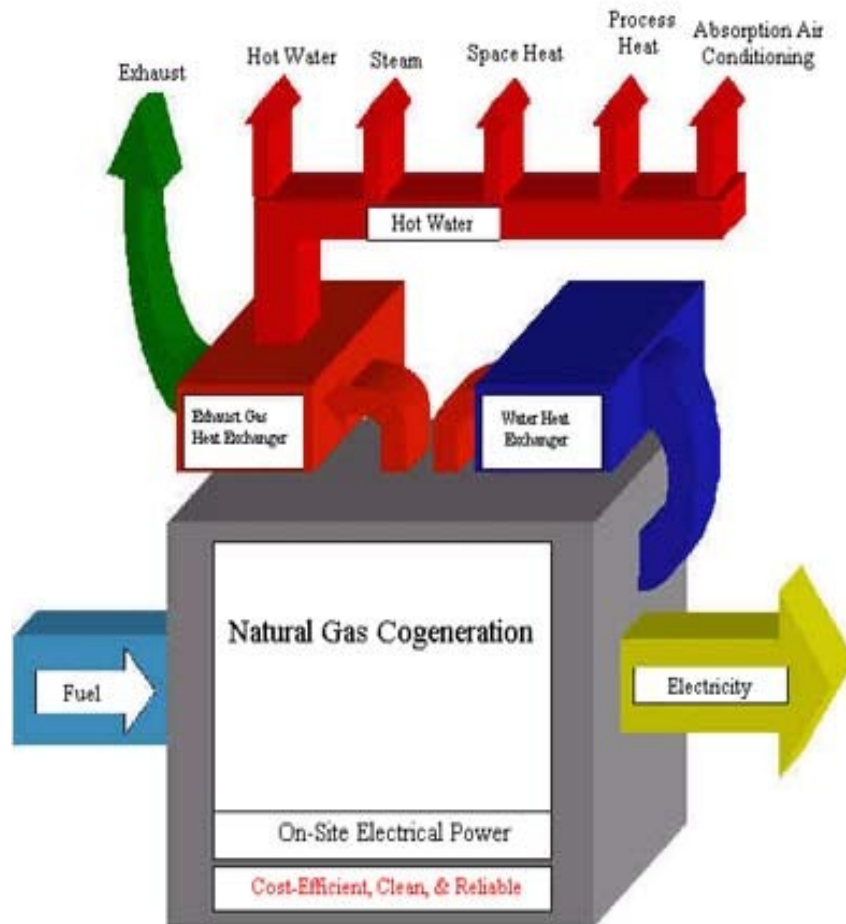
March 2013

Sustainability

Sustainable development

- Capable of being continued with minimal long-term effect on the Environment.
- In the terms of the 1987 Brundtland Report, sustainable development is development that: "Meeting the needs of the present generation without compromising the ability of future generations to meet their needs."
- **Target:** to minimize the CO₂ by 20% in 2020 (base 1990)
- **How:** by applying further **Energy Efficiency** and RES, in the European energy system.

What is CHP



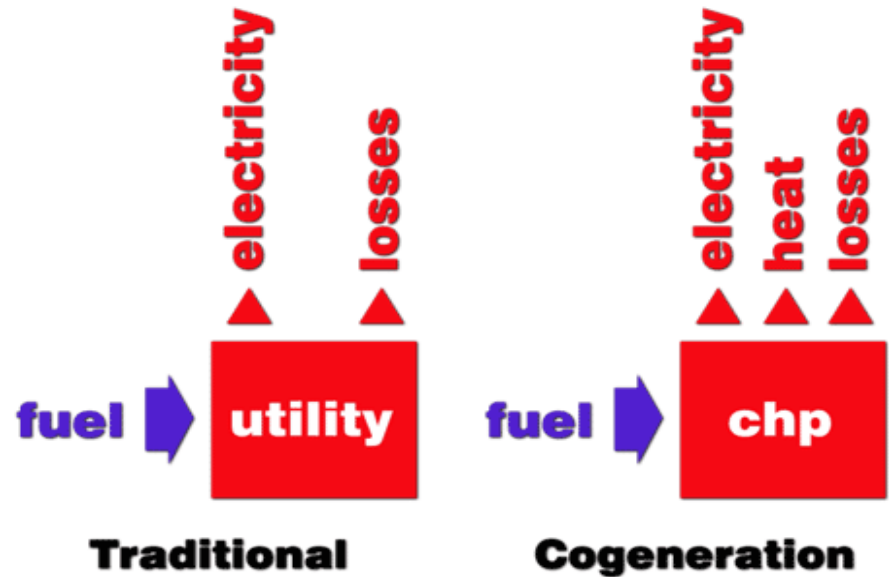
Cogeneration of Heat & Power- CHP is the simultaneous production of electricity and **useful** heat in one process.

Cogeneration solutions simply **reduce waste**, with only 10%-15% losses, compare that with the 55% or more using traditional generation methods and it is clear that **cogeneration** uses fuel more **efficiently**.

CHP is an Energy Efficient Technology – a **Green** Energy Challenge – as it is the most efficient way to use fuel.

Advantages of CHP

- CHP is more efficient than separate generation of electricity and heat.
- Higher efficiency translates to lower cost.
- Use of waste or byproduct fuel, where available, further reduces cost.
- On-site electric generation avoids distribution costs, a significant component of grid electricity price.
- Increased reliability and power quality can also add significant value.





District Energy (DE)

District Energy (District Heating & Cooling)

- Heating and/or cooling of multiple facilities from one or more central plants, via a network of thermal distribution piping

- Usually steam or hot water distribution for DH

- Usually chilled water or fluid distribution for DC

2 types of DE - technically similar; commercially distinct

- single owner-user systems (e.g. univ's, hospitals, industry)
- DE utilities - selling thermal energy to users



District Energy (DE) Benefits

DE systems typically provide:

- greater energy efficiency and reduced emissions
- electric, non-electric and hybrid energy options
- reduced life cycle costs for users
- increased reliability

Also, DE can be a platform for other technologies:

- Cogeneration or Combined Heat & Power (CHP)
- Thermal Energy Storage
- Combustion Turbine Inlet Cooling

Thus DE customers benefit, even when individual buildings may not justify such technologies.

Recommendations www.districtenergy.org

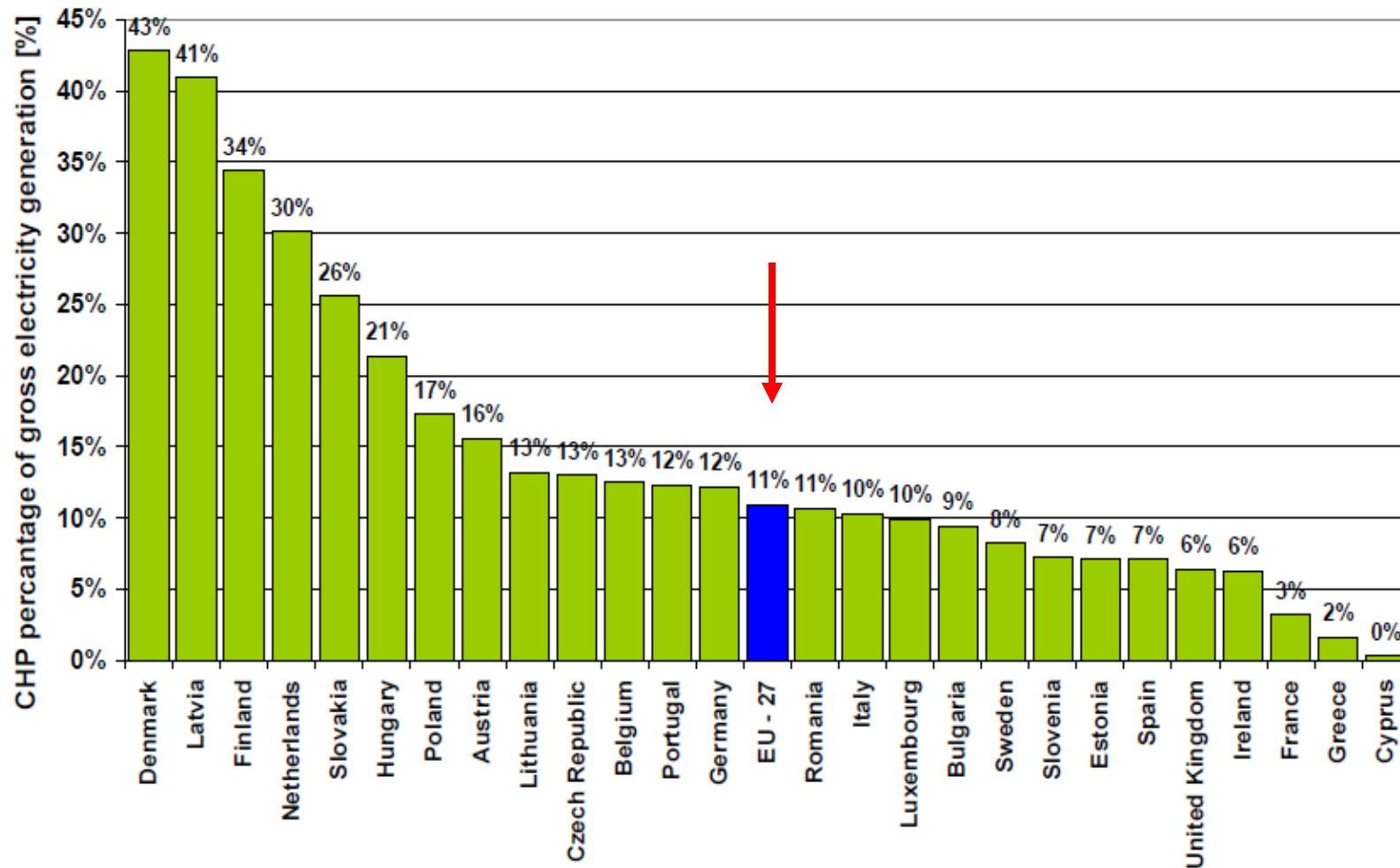
- Use DE to incorporate beneficial aspects that may be difficult or impractical in individual buildings:
 - Cogeneration or Combined Cooling, Heat & Power
 - Thermal Energy Storage
 - Outsourcing of HVAC equip. design, construction, O&M
 - High reliability via redundancy, operator training & maintenance
- Use DE to avoid users' capital for HVAC equipment

Look to District Energy for flexibility to capture efficiency, environmental, and economic benefits for customers and for communities & society.

Current situation of Cogeneration in European Union

Electricity generated by Cogeneration

- Total installed CHP electrical capacity: 99,7 GW_{el}
- Total CHP electricity production: 364,4 TWh_{el}
- Total CHP heat production: 845,1 TWh_h



European cogeneration additional economic potential

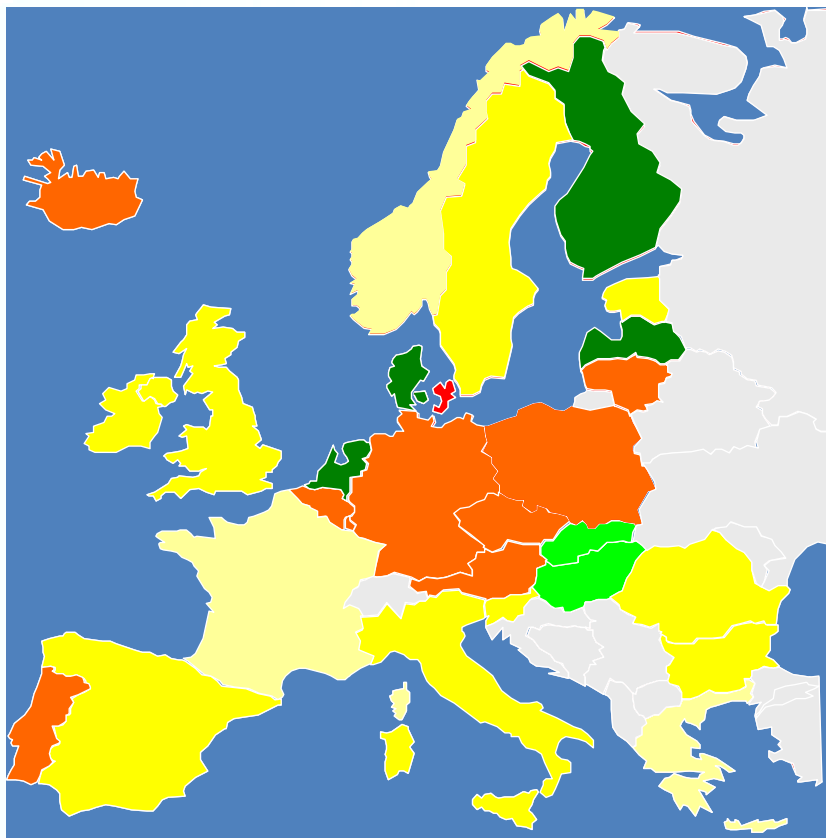
The additional economic potential as reported by Member States:

- Total additional Primary Energy Saving expressed as electricity (min) 46 TWh p.a.
- Total additional Electrical Capacity: 122 GW_e
- Total additional Electricity Generation: 455 TWh p.a.
- Total additional CO₂ avoided (min): 20 mton p.a.
- Value of CO₂ avoided: 798 mEuro* p.a.

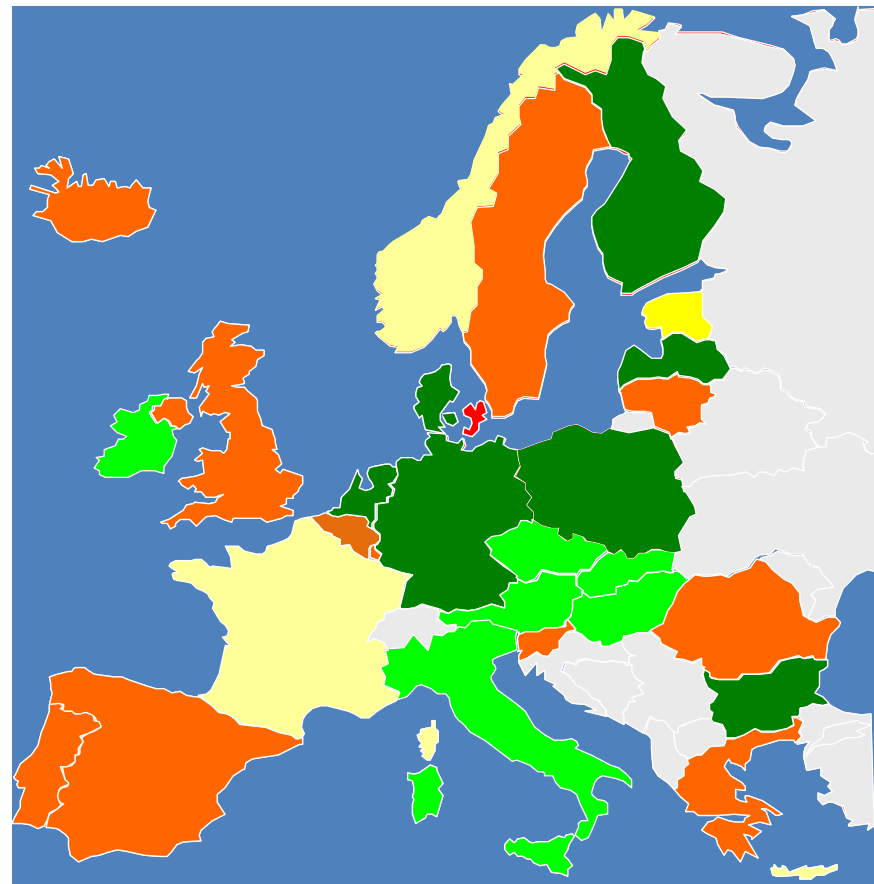
*Evaluated at carbon price of 39 E/ton CO₂ (ref. ETS impact study)

Share (%) of CHP in total generation

2008



2008 Plus 1000 TWh heat
with 122 GWe



< 5%
 5-10%
 10-20%
 20-30%
 >30%

Current opportunity for CHP in Europe

- Europe is failing in its 20% energy saving target for 2020; cogeneration is a fundamental energy efficiency measure in reaching the target.
- Heat is a larger part of end-use energy than electricity in the European energy system. It's efficient use and provision are vital.
- The additional potential for cogeneration identified as economic by the Member States identifies **opportunities** to combine the production of heat and electricity, saving a minimum additional 35mtoe a year of primary energy by 2020.



What does it take to grow CHP?

Hotels & complexes, breweries, hospitals, schools and industrial plants to find it advantageous to make their own electricity as well as heat/cool (or let someone else provide the service-ESCOs)

A large number of district heating schemes need to upgrade and renovate their infrastructure and the buildings they serve

Traditional electricity companies need to find it attractive to develop a business model for heat customers

Energy service companies need to create new CHP offerings

The new **Energy Efficiency Directive** was just published in Official Journal of EU in 14.11.2012 – **EU DIRECTIVE 2012/27/EC** - and by 2014 will be in action...

**The role of New Directive 2012/27/EC
for the promotion of CHP- District
Heating and Cooling
in the European Union by 2020**

Energy Efficiency Directive 2012/27/EC

The Directive came as a result of the March 2007 EU summit, when M-S had struck an agreement on a **20% energy efficiency target by 2020**, together with a 20% renewable energy target and a 20% CO₂ reduction target.

Whilst the latter two were dealt with immediately, the energy efficiency law was postponed to 2012.

The new Directive includes, as Appendices, the Directive for High Efficiency Cogeneration and the Energy Services one.

The **main changes** the Directive brings to existing legislation are:

- Energy companies are requested to reduce their energy sales to industrial and household clients by at least 1.5% each year.



Energy Efficiency Directive 2012/27/EC

- A 3% renovation rate for public buildings which are “central government-owned and occupied”.
- An obligation on each M-S to draw up a **Roadmap** to make the entire buildings sector more energy efficient by 2050 (commercial, public and private households included).

The new Directive also includes additional measures on energy audits and energy management for large firms, cost-benefit analysis for the deployment of CHP and public procurement.



**The role of CODE2 IEE-funded
Programme for the implementation
of 2012/27/EC Directive**

Introduction to CODE2

The CODE2 project jointly funded by the IEE and industry:

- Develops the first clear plan of action for cogeneration in each EU Member State
- Gathers experts and establishes information networks around cogeneration
- Reviews published data and presents conclusions
- Introduces in detail the new Energy Efficiency Directive (EED)
- Assesses the EED's impact with national stakeholders
- In depth analysis of micro-CHP and bio-energy CHP potential.

All in all, CODE 2 mobilises effort in each of the 27 EU M-S.

- The new CODE2 project runs from 1 July 2012 till 31 December 2014.
- It will develop 27 **national Cogeneration Roadmaps** and one **European Cogeneration Roadmap**. These roadmaps will propose actions on several fronts in close interaction with the key stakeholders (policy-makers, industry and civil society).
- The project uses a desk research/workshop format to develop and comment the roadmaps and raise all round awareness of the opportunity and existing resources for developing CHP deployment. Workshops in 7 pilot countries will specifically explore the implications and develop an interpretation of the new EED and will seek to develop **coalitions on CHP** at national level involving key stakeholders.
- The CODE2 project will identify explicitly the **potentials** for **micro-CHP** (up to 50 kW_e) and **bio-energy CHP**.

- A further strengthening of the CODE1 Regional Network.
- 27 national Cogeneration Roadmaps
- One European Cogeneration Roadmap with concrete proposals for policy improvement, and awareness raising
- Identification of micro-CHP and bio-energy CHP potentials
- 7 workshops in pilot countries where draft Roadmaps are discussed
- Establishment of CHP Coalitions in 27 EU M-S involving industry, policy-makers and interest groups
- Practical “How-to” guides for key sectors (paper, food, hospitals, SMEs)
- Best practice cases on cogeneration in target sectors



Summary and recommendations

- The new Directive is setting up the discussion for promoting Cogeneration in Europe, as the Directive 2004/8/EC is fully accepted as Appendix in this new Directive.
- There are stronger initials for the promotion of **Cogeneration** and **District Heating** and **District Cooling** in the new Directive.
- There was an on-going discussion on high efficiency CHP in Europe, but there are many non-HE CHP schemes left out of the discussion, of how they will be improved. This situation was straight out by the new Directive.

COGEN Europe

European Association for the Promotion of Cogeneration

- Representing the interests of the supply chain in the cogeneration heat and electricity market
- Aiding the promotion and expansion of cogeneration in the European market.
- Providing timely and appropriate information for policy makers on issues affecting cogeneration.
- An advocacy organisation participating in the European Union's legislative process

Structure

- National Members
 - National Promotional Organisations - 21
- Company Members – 72
 - Pan European Companies
 - Associate members

Activity

- EU Parliament lobby&EU Commission lobby
- IEE projects and COGEN working groups
- CENELEC working groups
- Outreach and member support

Secretariat : 4 people



WWW.COGENEUROPE.EU

THANK YOU FOR YOUR ATTENTION!
ANY QUESTION?