

Prilike i prijetnje razvoju kogeneracije

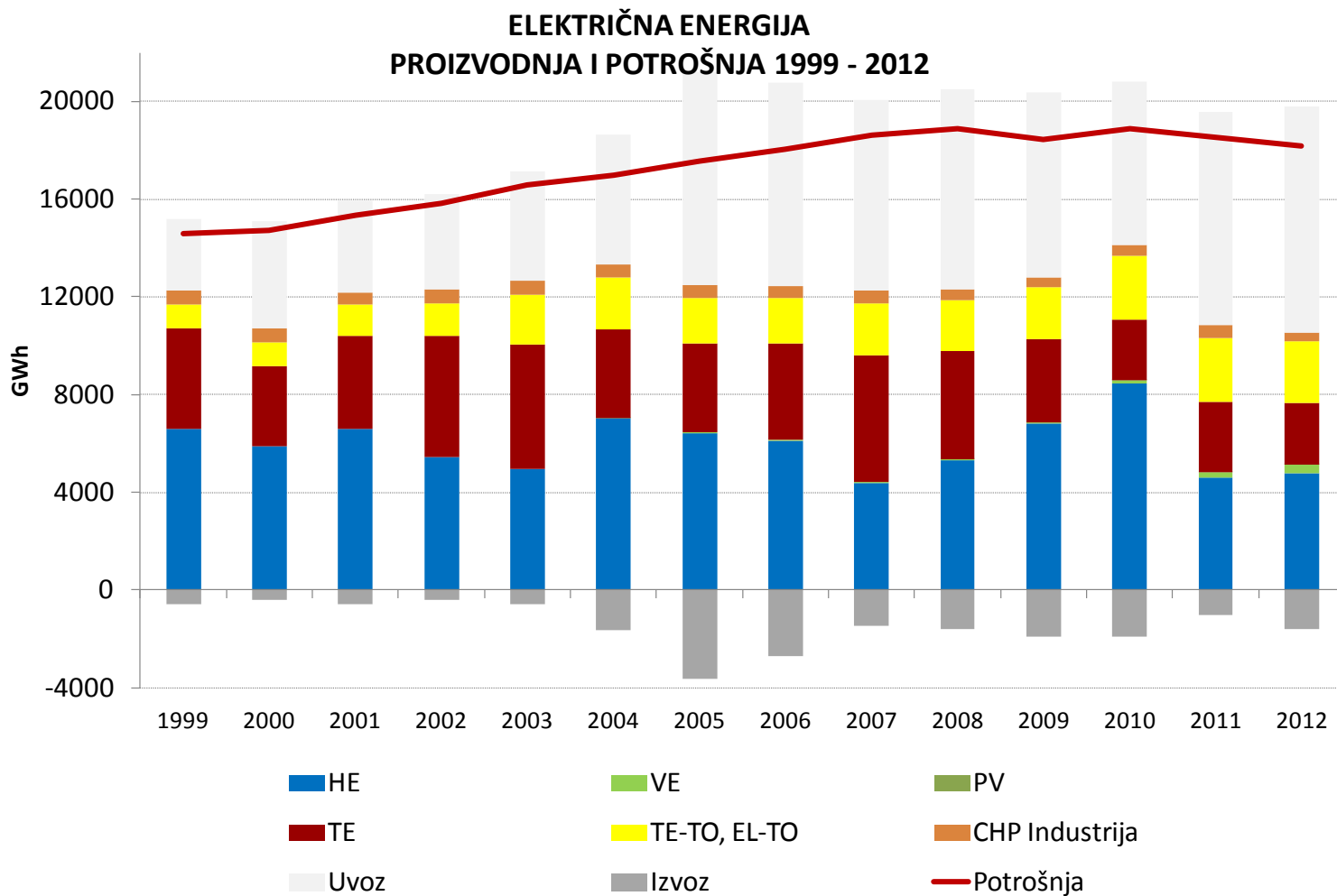
Dr.sc. Dražen Lončar, izv. prof.

Sveučilište u Zagrebu

Fakultet strojarstva i brodogradnje

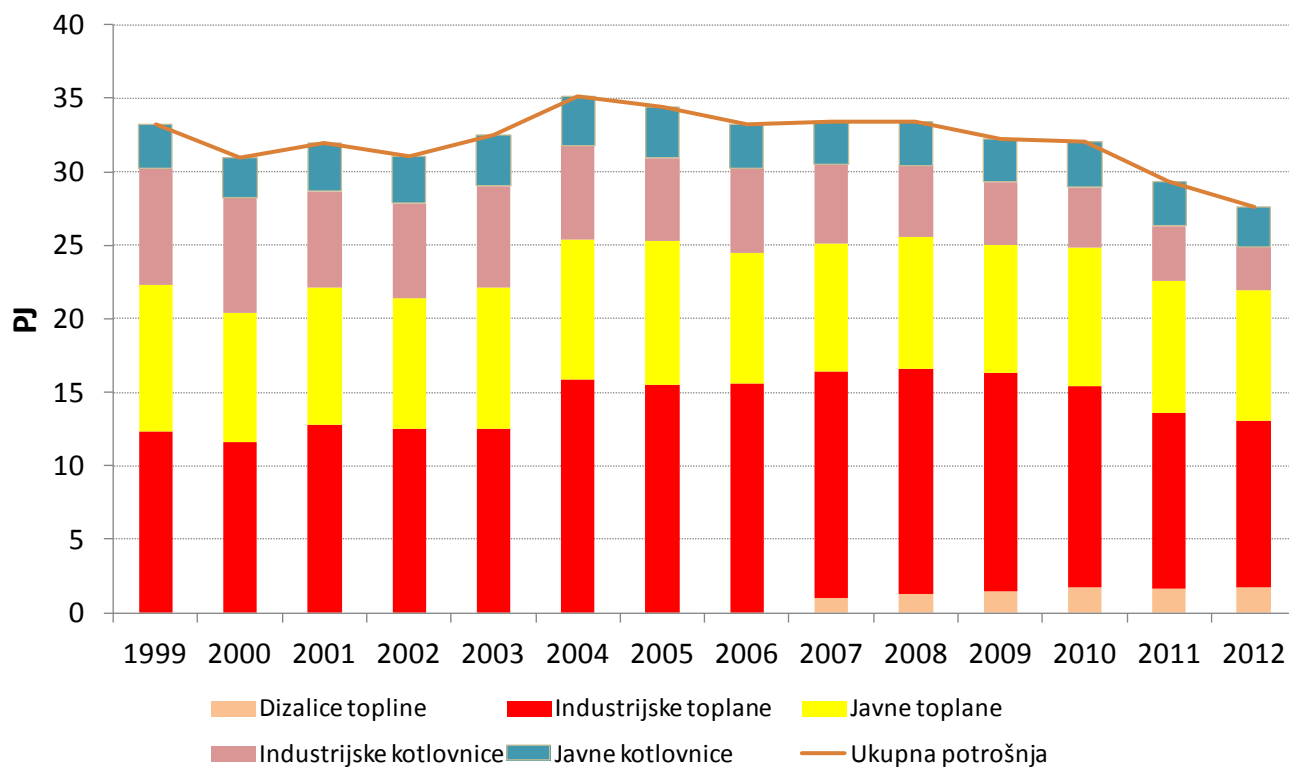
dloncar@fsb.hr

EL. energija u RH



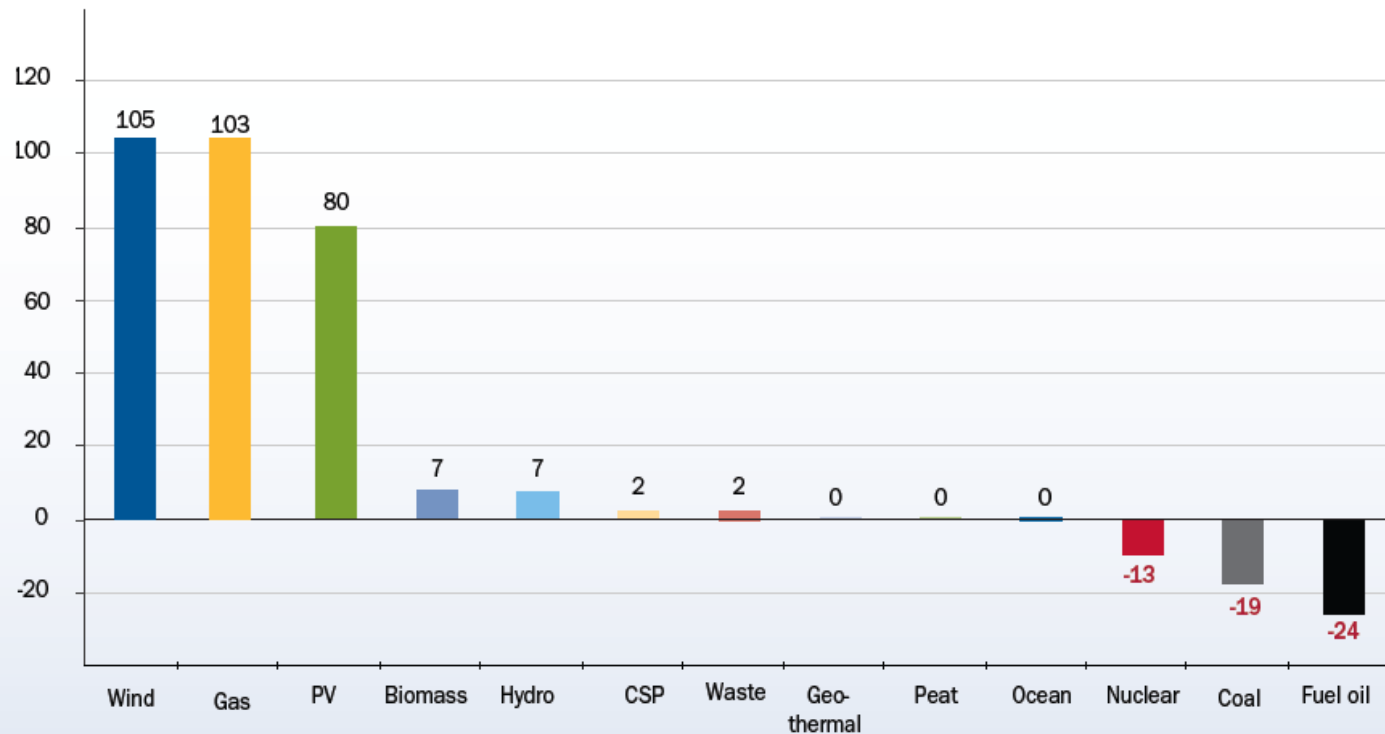
Para i vrela voda u RH

**PARA I VRELA VODA
PROIZVODNJA I POTROŠNJA 1999 - 2012**



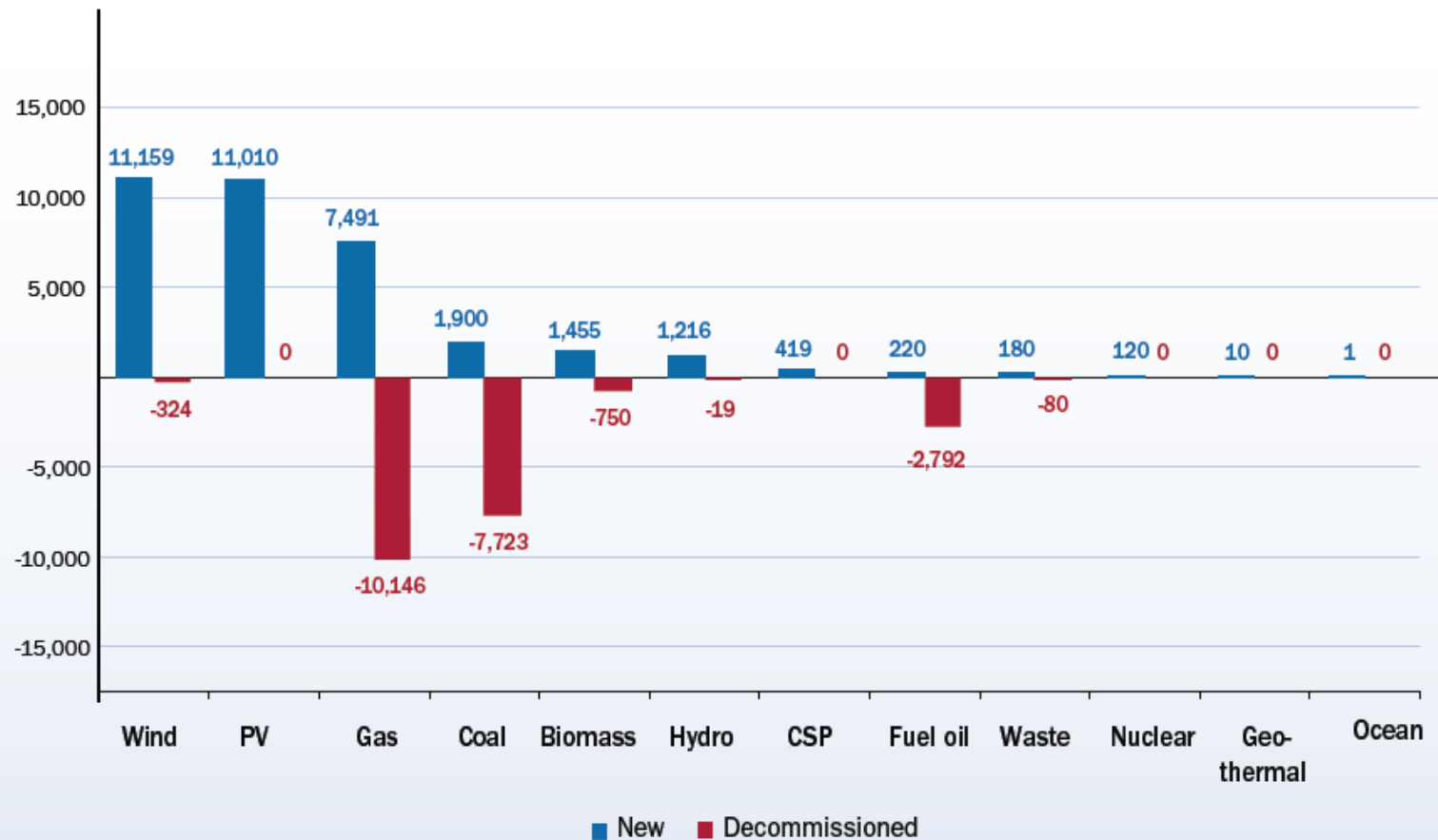
EU 2010.- 2013.

FIGURE 2.2: NET ELECTRICITY GENERATING INSTALLATIONS IN THE EU 2000-2013 (GW)

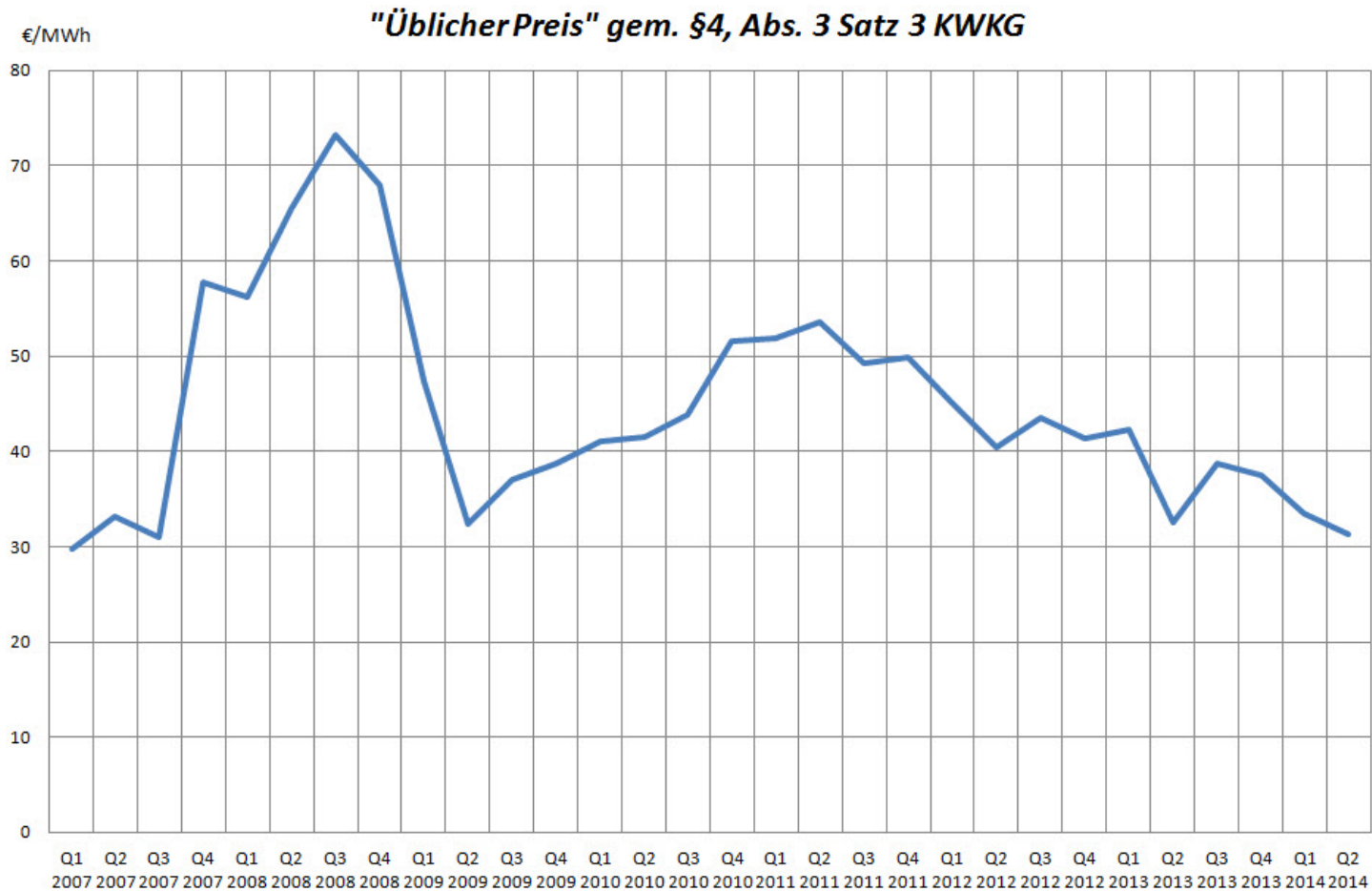


EU 2013.

FIGURE 1.3: NEW INSTALLED POWER CAPACITY AND DECOMMISSIONED POWER CAPACITY IN MW



Cijena bazne el.en. u DE



Postoji li prostor za CHP?

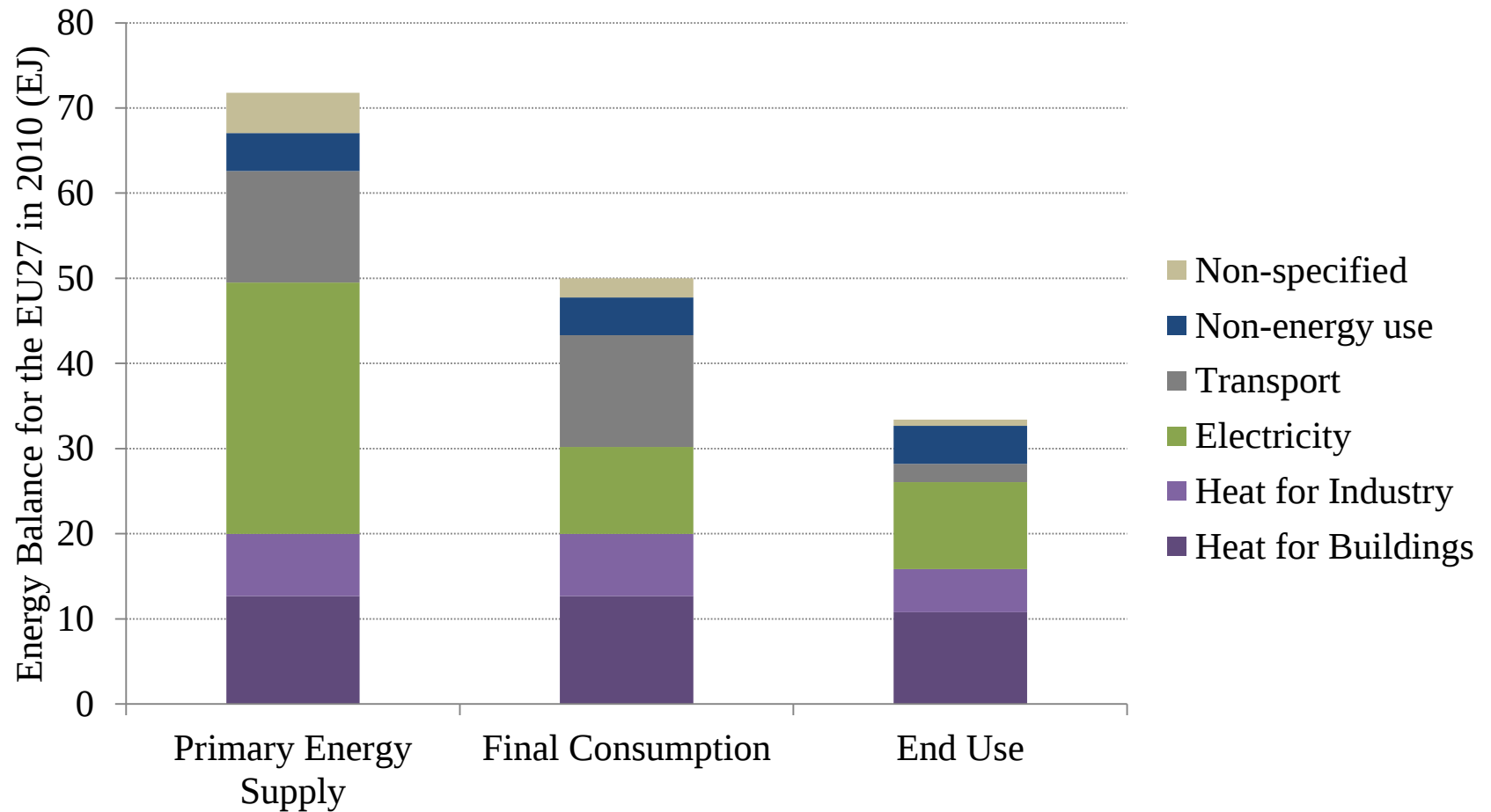
Ako se očekuje:

- smanjenje toplinskih i rashladnih potreba zbog bolje izolacije stambenih i poslovnih objekata;
- povećanje udjela OIE u proizvodnji električne energije (dekarbonizacija električnog “mixa” favorizira dizalice topline).

Razvijaju se dva scenarija:

- zadržavanje udjela u CTS sustavima (prema Heat Roadmap Europe);
- instalacije mikro CHP na postojeću plinsku mrežu;

HEAT ROADMAP EUROPE



Step 1: (Energy Efficiency)

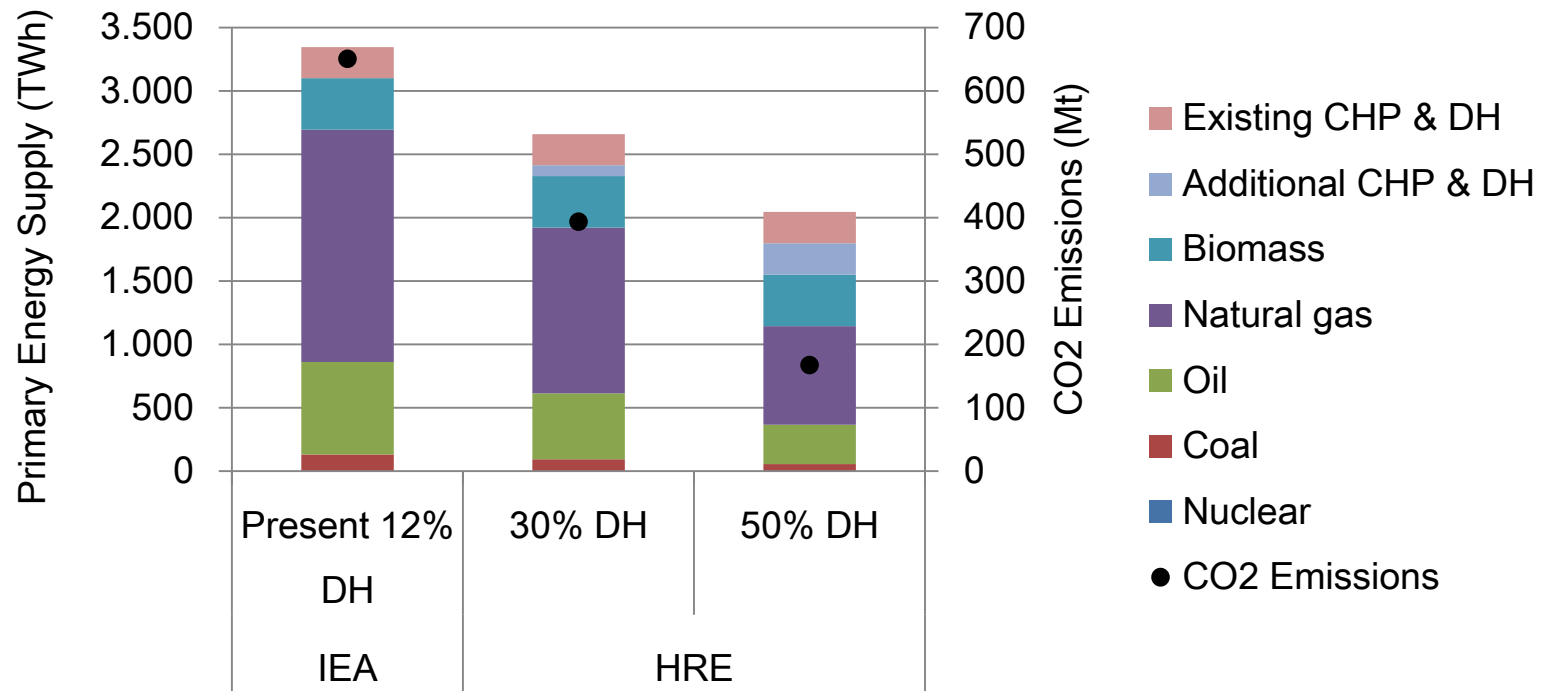
- Increasing DH to 30% then 50%;
- Increasing CHP;
- Using Oil/Natural gas in CC-CHP;

Step 2: (Utilise waste and RE sources)

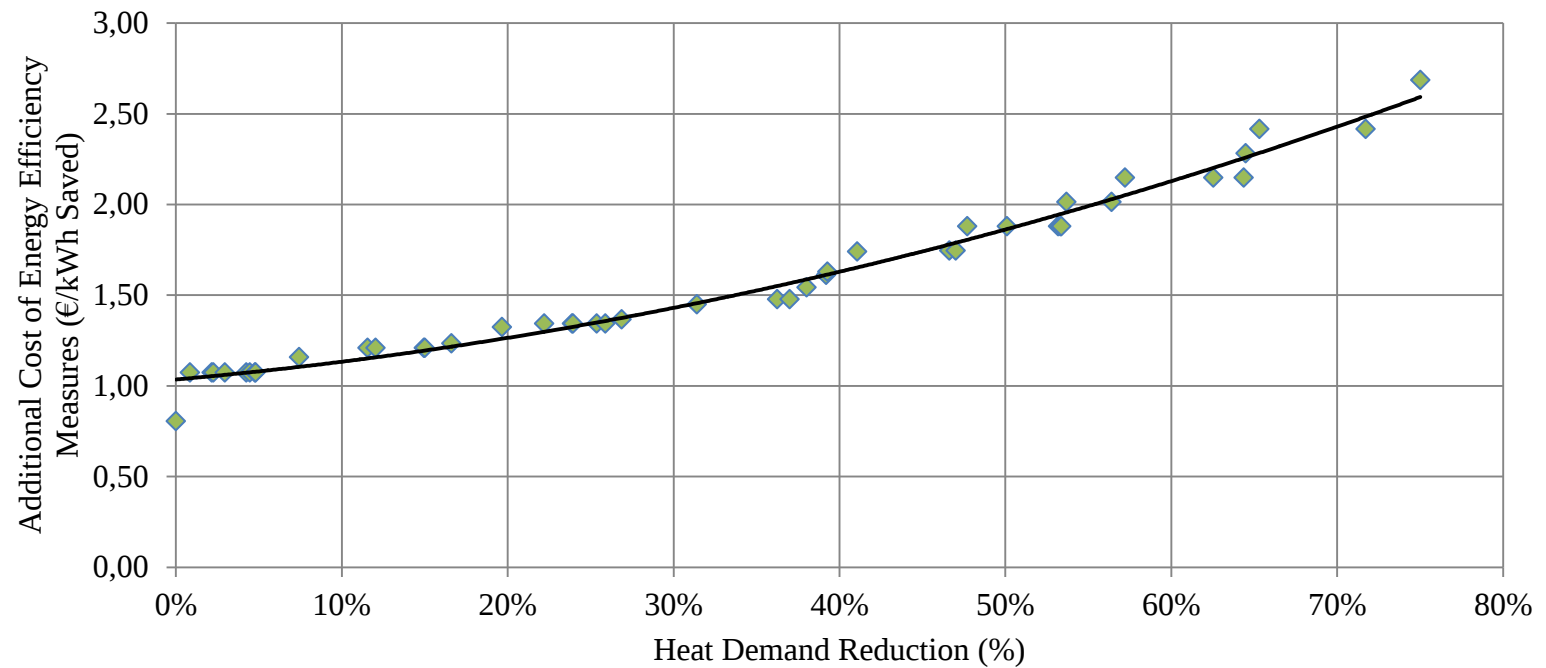
- Industrial waste heat;
- Waste incineration;
- Geothermal heat;
- Large-scale Solar Thermal.

HEAT ROADMAP EUROPE

EU27 Primary Energy Supply and CO₂ for Heating Buildings
in 2010 at Different DH Penetrations



HEAT ROADMAP EUROPE



Key technologies for the new heat supply in HRE-EE 2050

- total heat demand in buildings reduced by 34% between 2010 and 2050.
- **expansion of DH** from the present level of 12% to 50% in 2050.
- **CHP increase from 41 GWe in 2010 to 205 GWe in 2050**
- Large-Scale Heat Pumps: 0 GWe in 2010 to 40 GWe in 2050
- Thermal Storage: 160 GWh in 2010 and 750 GWh in 2050
- Centralised Boilers: 132 - 532 GWth in 2050 (mostly Biomass)
- Heat from Waste Incineration: 50 TWh in 2010 and 200 TWh in 2050
- Large-Scale Solar Thermal: 0 TWh in 2010 and 100 TWh in 2050

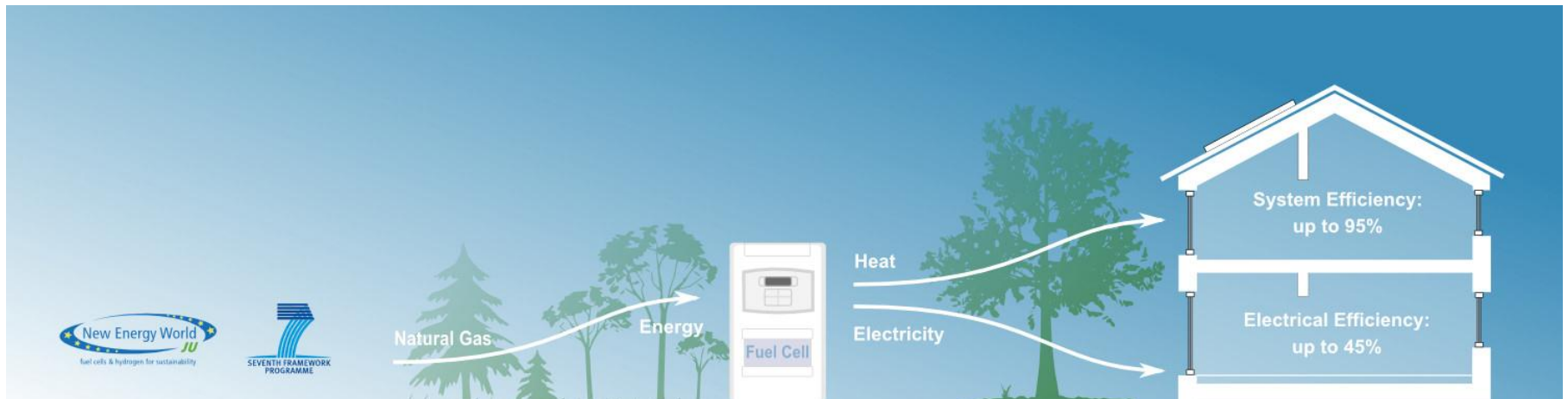
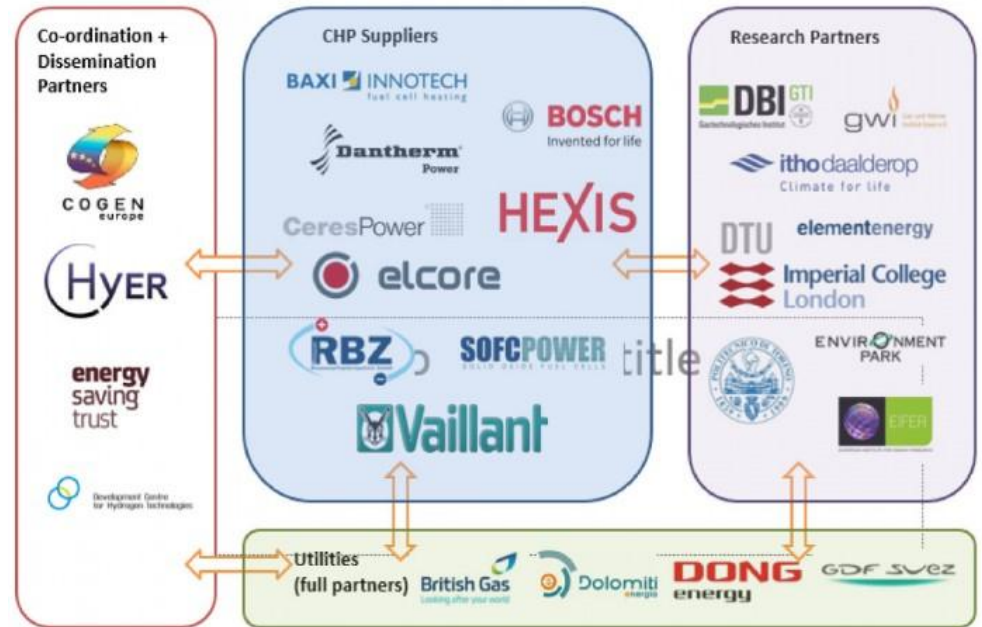
Key technologies for the new heat supply in HRE-EE 2050 ...

- ...
- Individual Solar Thermal: 22.5 TWh in 2010 and 130 TWh in 2050
- Industrial Excess Heat: 7 TWh in 2010 and 105 TWh in 2050
- Geothermal Heat: 2 TWh in 2010 and 100 TWh in 2050
- Individual Heat Pumps: 40 GWe in 2010 and 175 GWe in 2050
- Wind Power: 150 TWh in 2010 and 1490 TWh in 2050

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enefield.eu



FC in ENEFIELD

Table 3: Main FC mCHP systems currently developed or under development (systems not displayed to scale)²

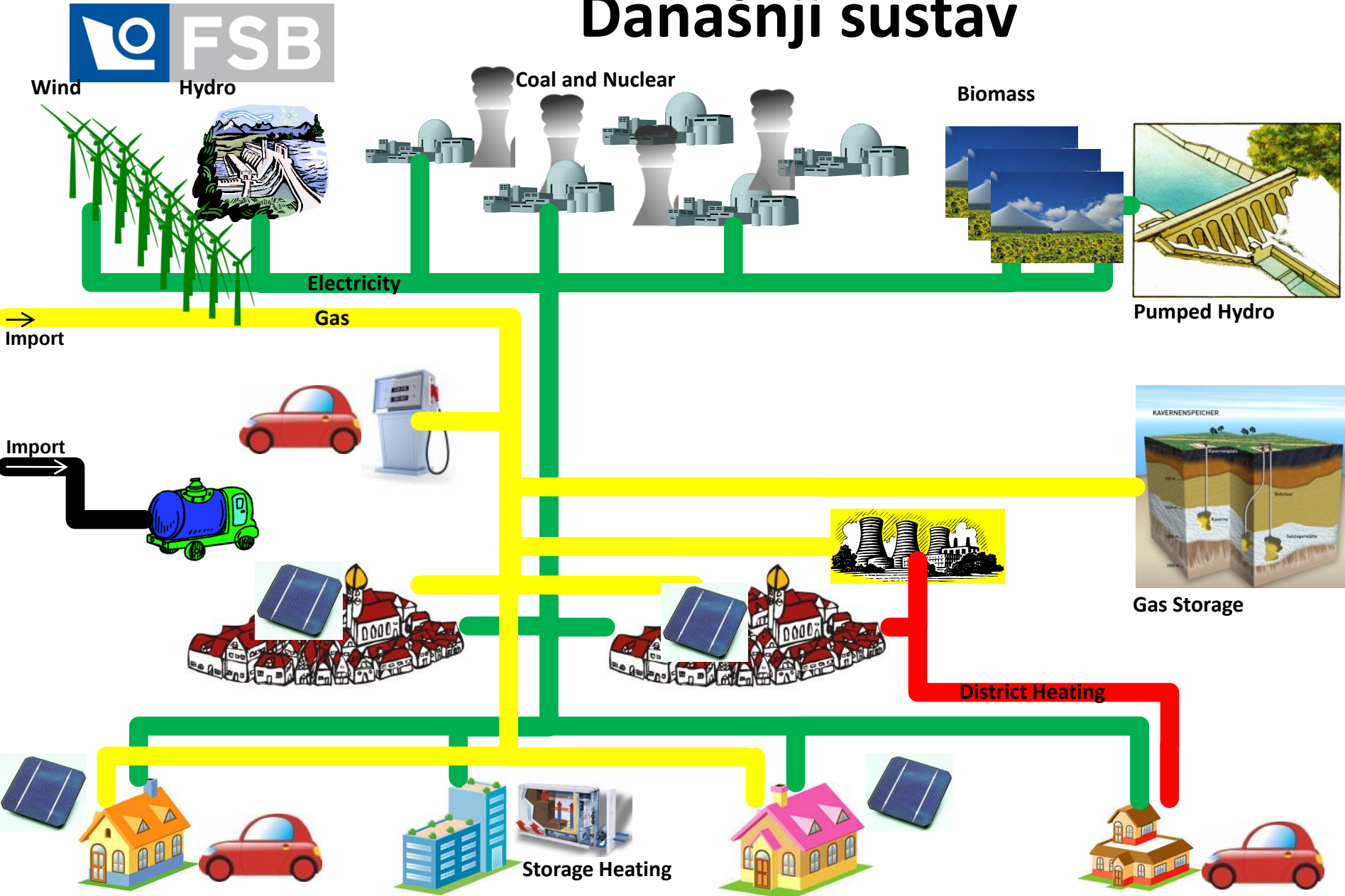
					
<i>Baxi Innotech (LT PEMFC)</i>	<i>Dantherm Power (LT PEMFC)</i>	<i>Hexis (SOFC)</i>	<i>SOFCPower (IT SOFC)</i>	<i>IRD (PEM)</i>	<i>Viessman / Panasonic (PEMFC)</i>
					N/A
<i>Elcore (HT PEMFC)</i>	<i>RBZ (LT PEMFC)</i>	<i>Bosch Thermotechnik (SOFC)</i>	<i>Vaillant (SOFC)</i>	<i>CFCL (SOFC)</i>	<i>IE-CHP (PEM)</i>

² Source: ene.field project, <http://panasonic.co.jp/corp/news/official.data/data.dir/2013/09/en130910-4/en130910-4.html>, <http://www.bluegen.info>, <http://www.treehugger.com/clean-technology/hydrogen-community-lolland-the-future-is-here.html>

Potencijal primjene u ZG

- potrošnja u zgradarstvu 58 % ukupne finalne potrošnje u ZG;
- za grijanje, pripremu potrošne tople vode i kondicioniranje zraka otpada 80-90% potrošene energije u zgradarstvu ;
- svega 16 % od potrošnje u zgradarstvu predstavlja toplinska energija iz toplana (uglavnom kogeneracijska);
- emisije CO₂ nastale u sektora zgradarstva predstavljaju 54 % ukupnih emisija CO₂ u Gradu Zagrebu;
- nesrazmjer u broju priključaka na toplinsku i plinsku mrežu:
 - HEP toplinarstvo 106.000;
 - GPZ preko 240.000 potrošača;
- nakon primijene građevinskih mjera energetske učinkovitosti ostat će potreba za podmirivanjem toplinskih potreba

Današnji sustav



Budući sustav?

