SUSTAINABILITY PERFORMANCE

FOR THE BUILDING & CONSTRUCTION INDUSTRY

IN GREECE

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ΑΡΙΣΤΟΤΕΛΕΙΟ
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SBE16THESSALONIKI
17-19 October 2016
Sustainable Synergies from Buildings to the Urban Scale

Just a few facts about **GREECE**

Area	131,957 km^2
Coastline	13,676 km (11^{th} in the world!)
Population:	10,955,000 (2015 estimate)
GDP per capita	$17,901 (about 2/3 of the leading EU economies

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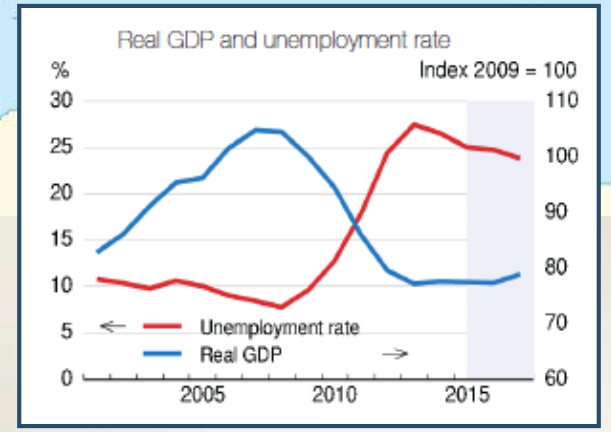
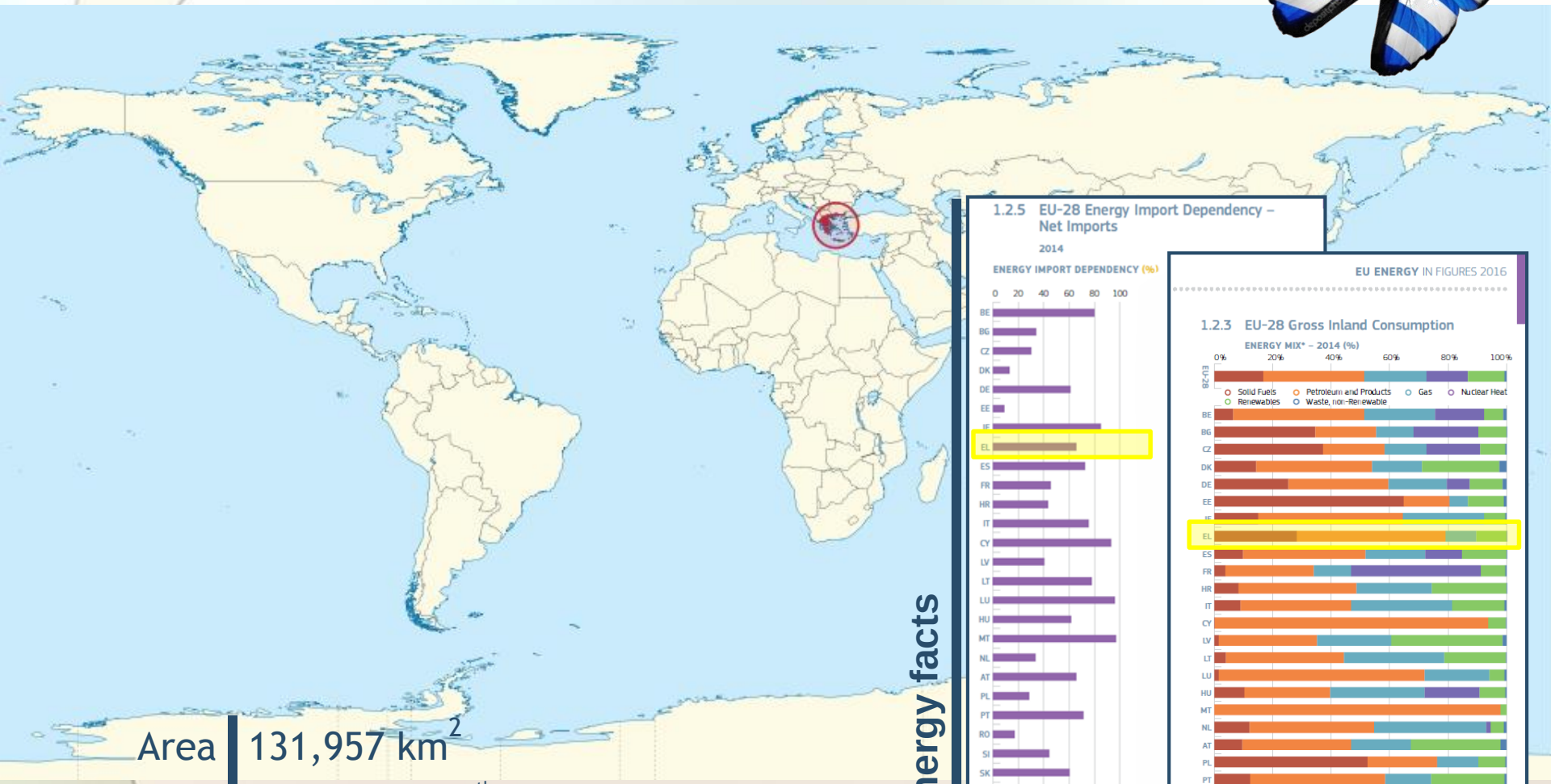
Economic conditions



OECD Economic Surveys Greece . OECD 2016

Just a few facts about GREECE



Energy facts

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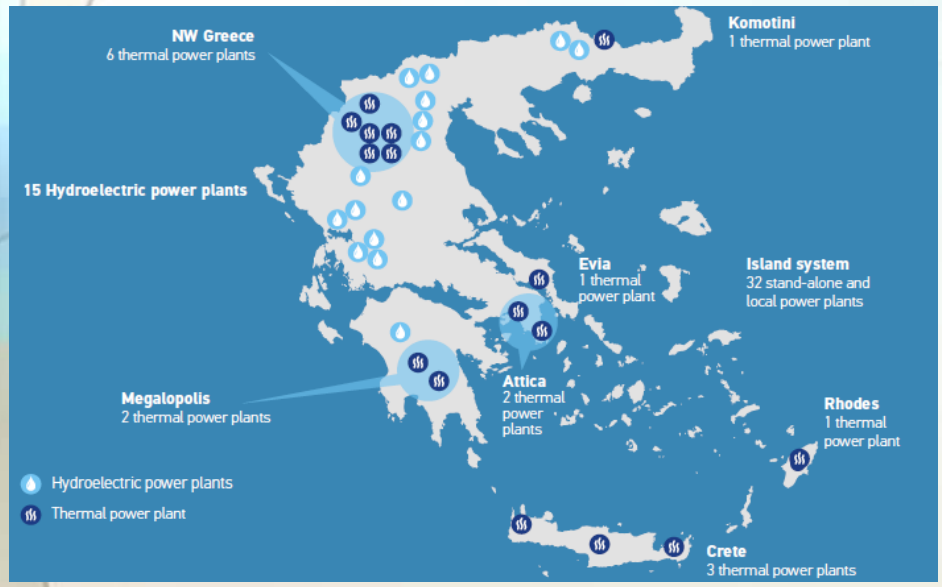
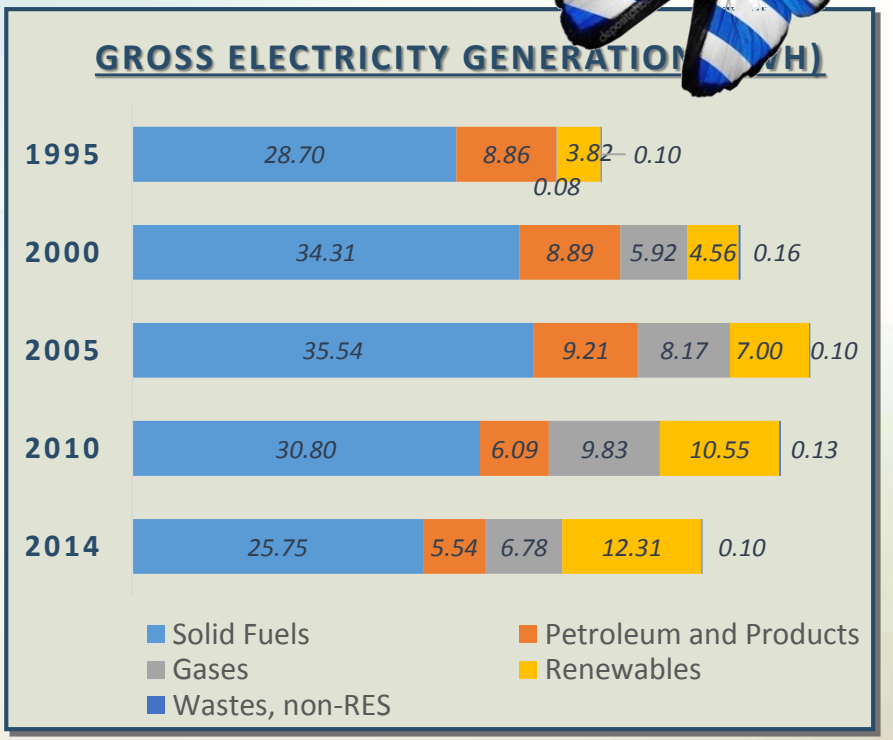
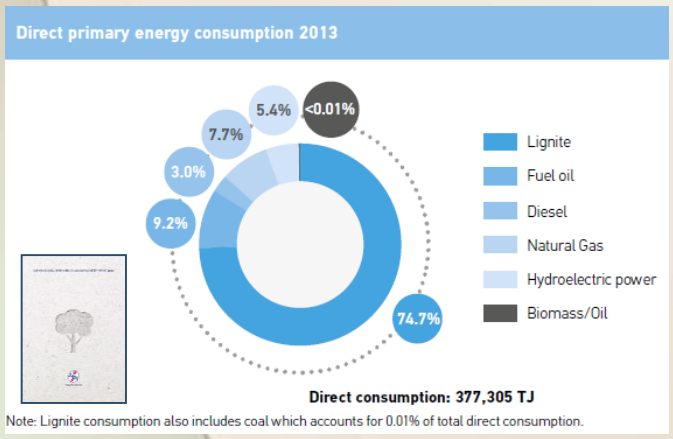
Electricity production

97,6% of electricity supplied is delivered by the Public Power Corporation



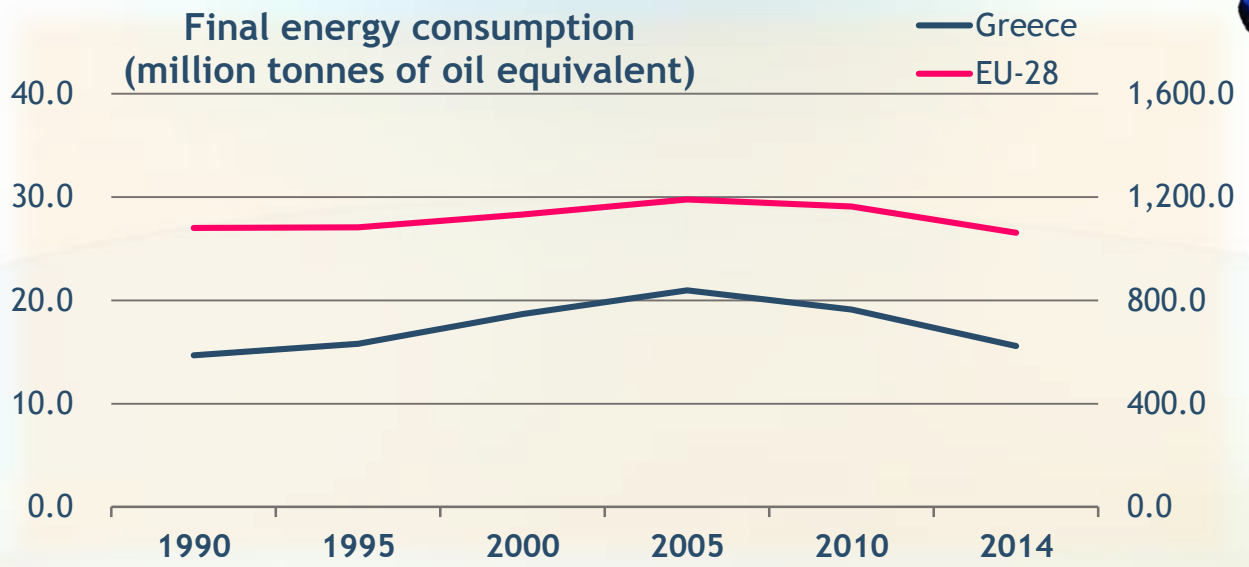




Measures

- Replacement of old power plants
- Improvement of existing thermal plants
- Development of RES, hydro and solar potential

Evolution of final energy consumption & GHG



Source: Eurostat (online data code: nrg_100a)

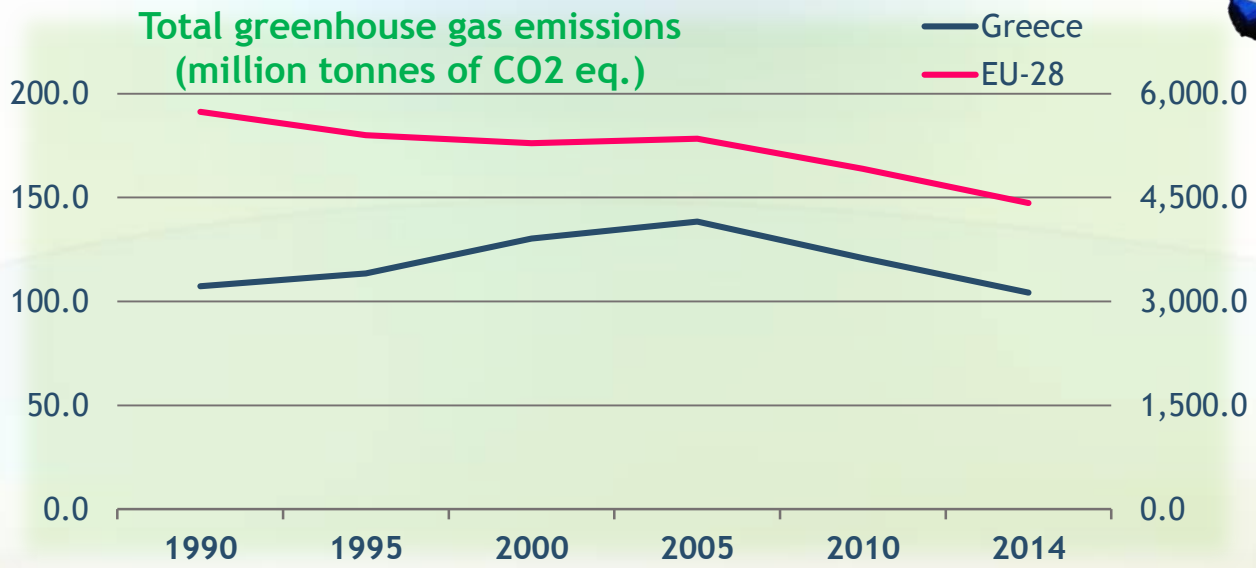
Energy trends

43% increase of energy consumption till 2005 due to economic development

26% decrease of energy consumption from 2005 to 2014 as a result of measures taken and the economic recession

6% more energy was consumed in 2014 than 1990.

Evolution of final energy consumption & GHG



Source: Eurostat (online data code: nrg_100a)

GR:
48% of the emissions are caused by the electricity production

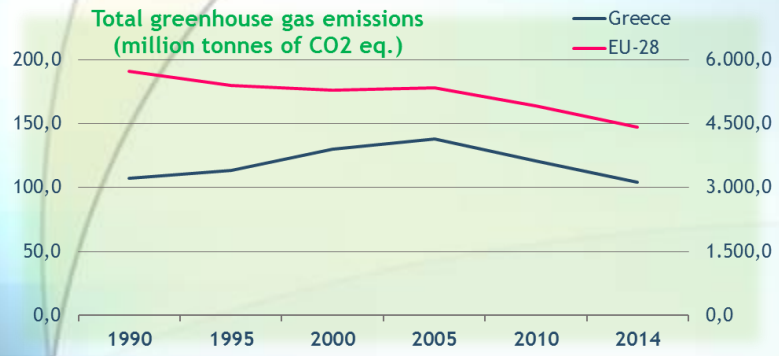
GHG trends

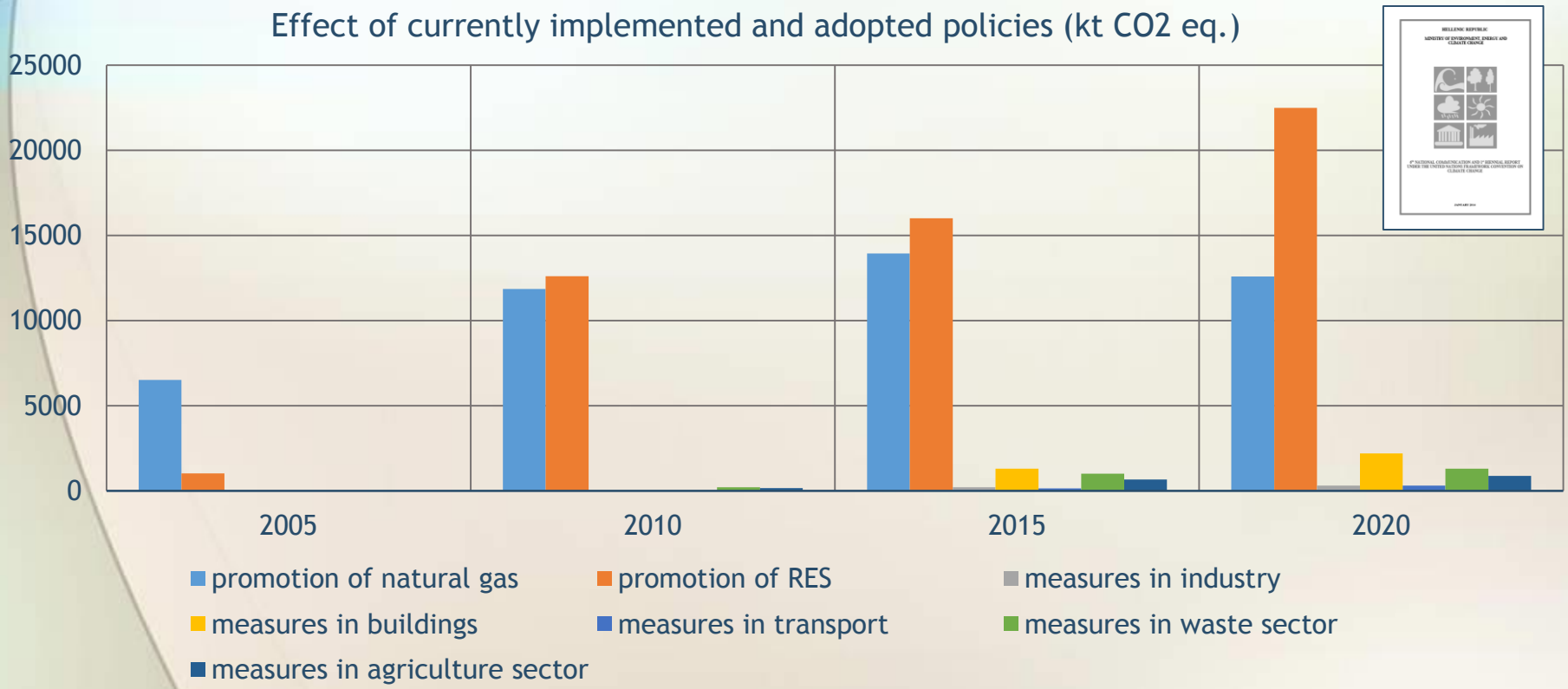
Reduction of CO2 since 2005

… but ≈10% increase of GHG since 1990 (base year)!

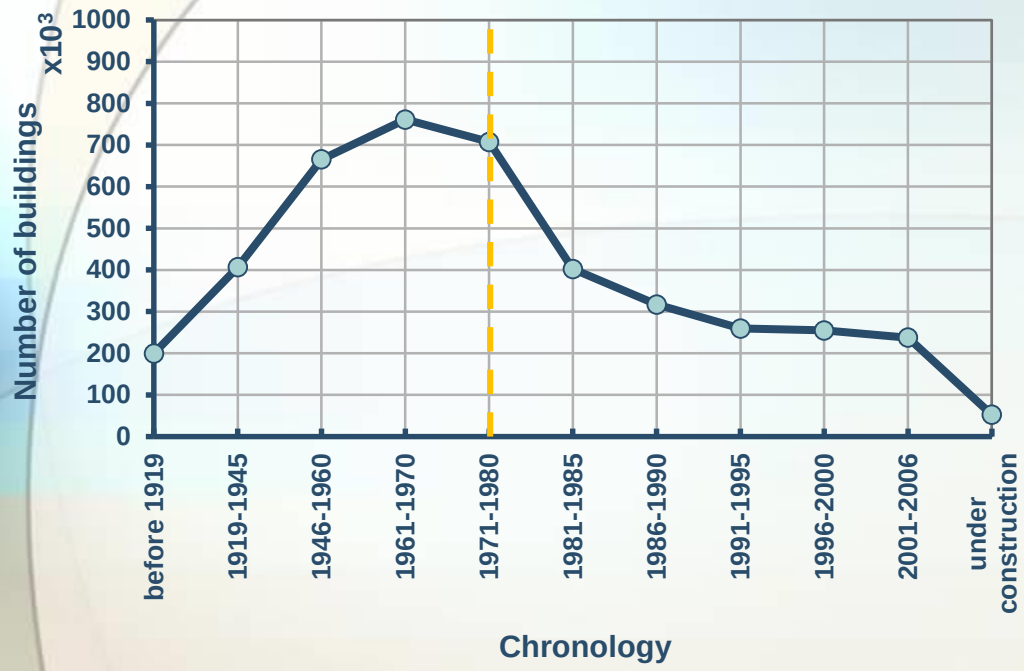
Increase is observed for CO2 and f-gases;
decrease is observed for methane and nitrous oxide emissions

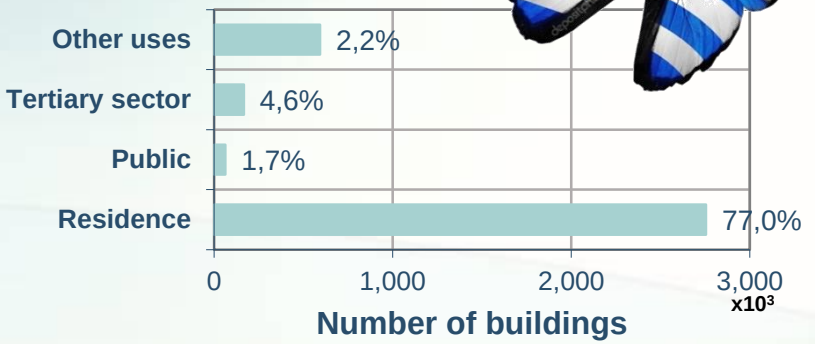
Effect of implemented & adopted measures



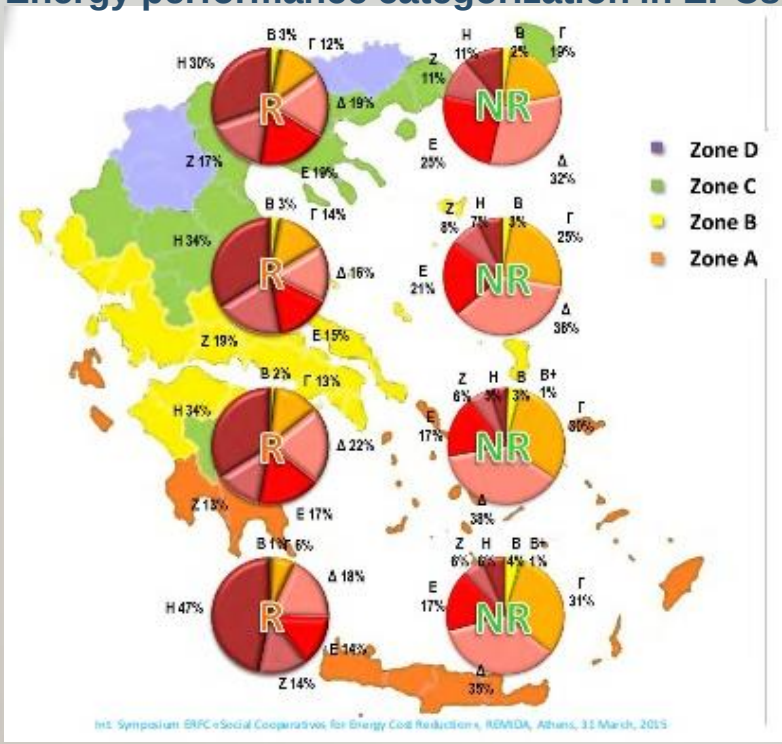


Building stock





Energy performance categorization in EPCs

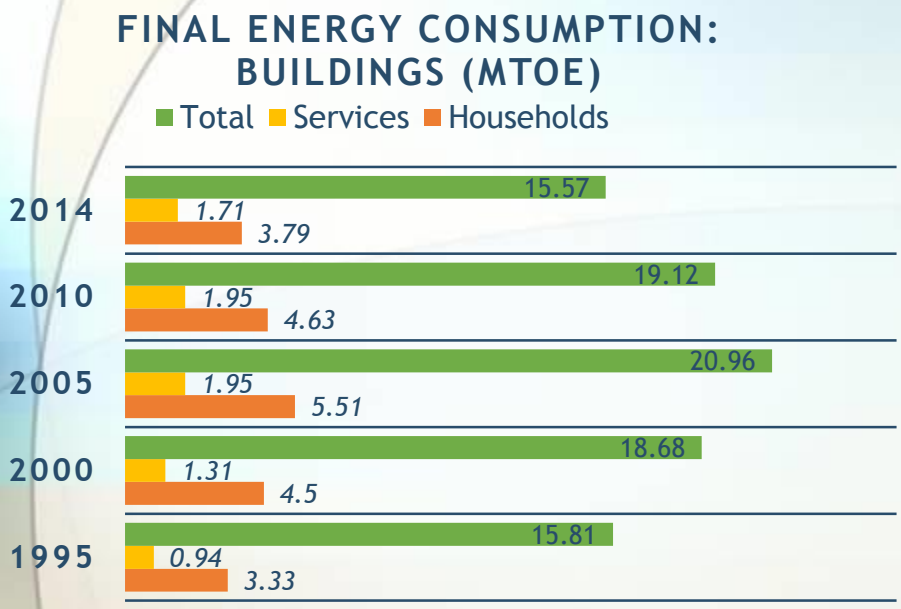


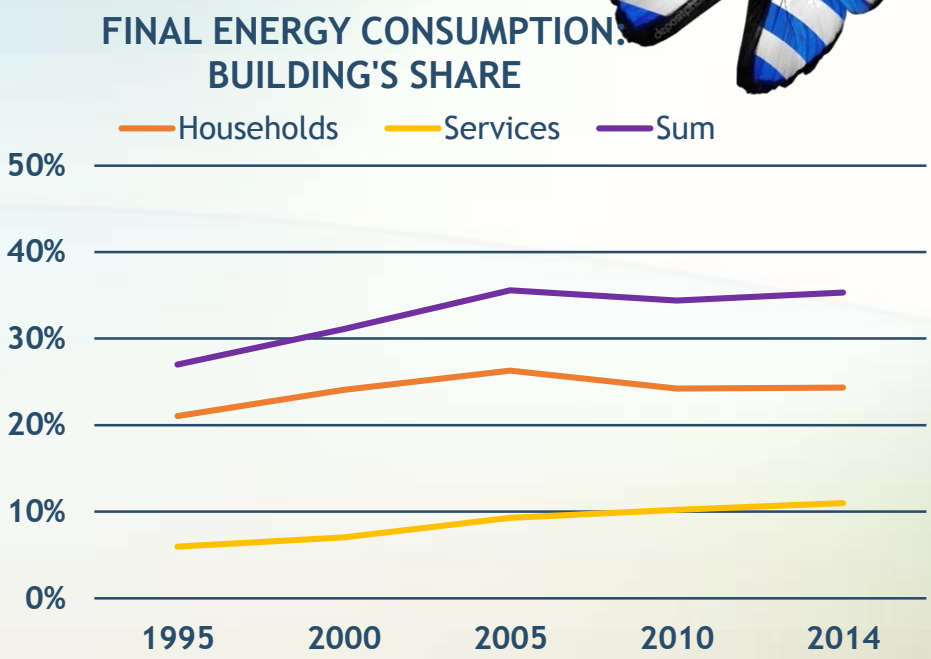
82.4% of total floor area is residences.

The majority was built before the introduction of any energy performance regulation;

The energy performance is low;
This is obvious is EPCs, especially for residential buildings.

BUILDINGS: energy & emissions



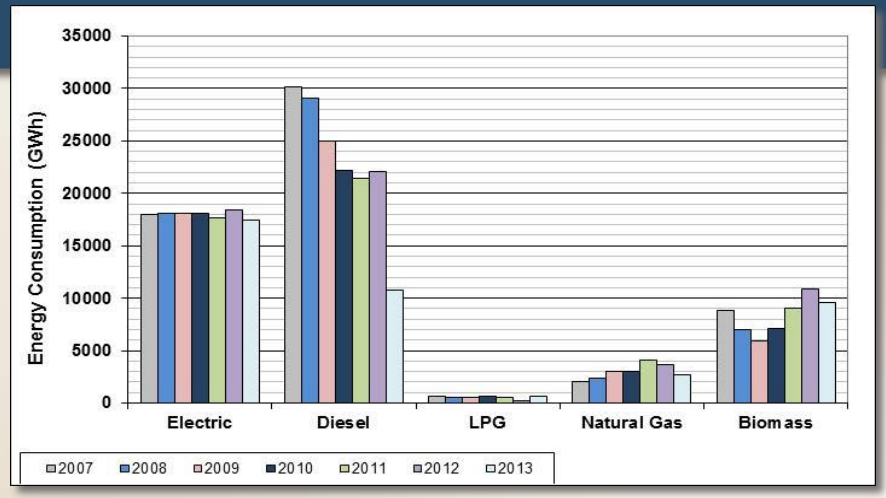


Energy trends in buildings' sector

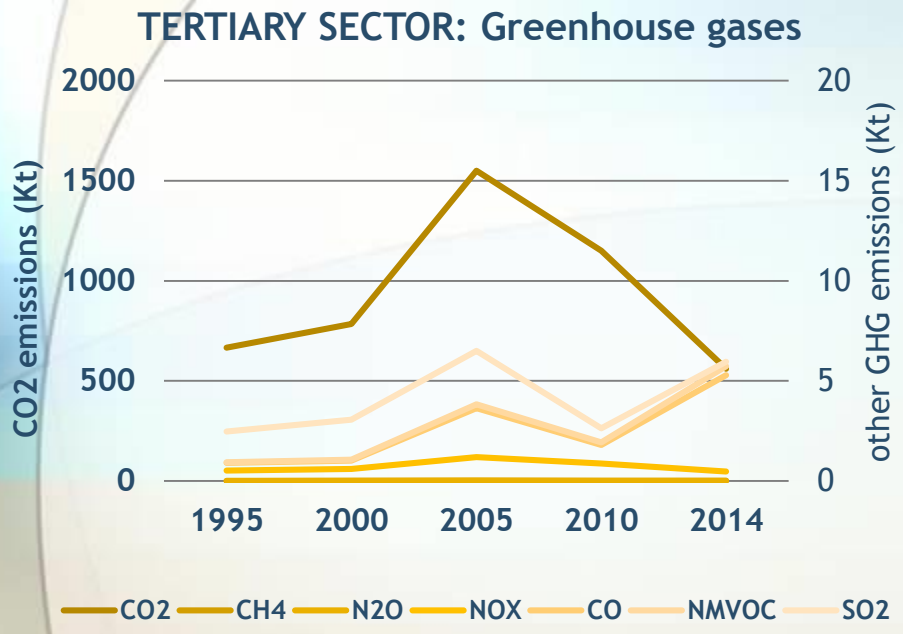
<u>Reduction</u> of building energy consumption (20% between 2014 and 2010!)

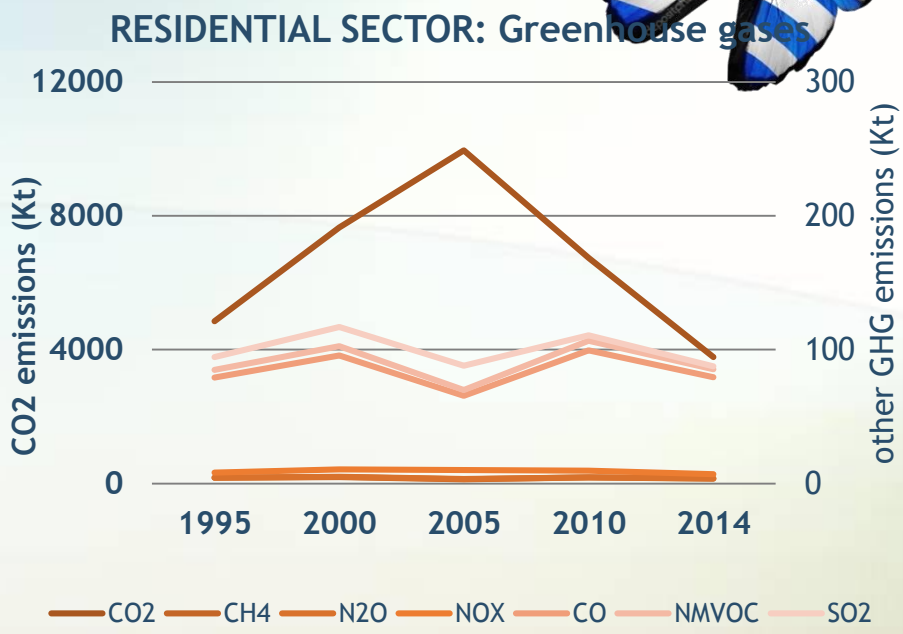
<u>Increase</u> of energy consumption for the tertiary sector (doubled from 1995)

<u>Strengthening</u> of the building's share on the total energy consumption



Buildings: energy & emissions





GHG trends in buildings' sector

<u>Reduction</u> of CO2 since 2005 (62%) AND 1990 (16%)!

BUT 8% INCREASE for the tertiary sector
and 19% DECREASE for households since 1990!

<u>Decrease</u> for CO2, methane and nitrous oxide emissions

Building sector: policies and regulations

Building energy performance

- Introduced in 2010.
- A recast is expected in the following days.
- Primary energy consumed for heating, cooling, HWP, lighting and ventilation (only for buildings of the tertiary sector) is calculated and compared to the relevant amount calculated for the reference building for energy categorization.
- A cost optimal analysis for energy efficient measures was conducted in 2016.

Nearly zero energy buildings

- nZEBs have not been defined in Greece yet, but the scheme is expected to be delivered by next March.

Sustainability in building codes

- No reference is made for embodied energy or environmental footprint of materials/buildings.
- The environmental assessment of buildings is mentioned in the New Building Code, where bonus are given for getting good scores.
- New urban planning regulations attempt to support buildings' sustainability.

Climate change: impacts and vulnerability

Temperature changes in Greece

1ºC in the last 500 years; 0,76ºC in the last 100 years!

The regional warming will be gradual, both of daytime and nighttime maximum, ranging from 1°C to 3°C in the near-future (2010–2039), to 3–5°C in the mid-century period (2040–2069) and 3.5–7°C by the end of the century (2070–2099).

Extreme weather events

Landslide and floods

See level rise; change in the coast's morphology; erosion

Climate change: impacts and vulnerability

Natural ecosystems and biodiversity: greatly affected; **Agriculture:** negative effects for southern Greece, positive for northern ones; **Forests:** suffer from reduced precipitation and increased temperatures, wildfires; **Fisheries:** decrease of fish production and available stocks; **Water resources:** decrease in aquifer infiltration and recharge; increased salinity, amplification of desertification phenomenon, etc; **Coastal zones:** coastline erosion; **Tourism; Human health care:** mortality due to temperature rise, infectious disease epidemics; **Energy:** hydropower will be affected; efficient of thermo-electric units will be reduced; increased loss on electricity distribution networks. Increased electricity demand in summer; **Transport;**

Climate change: mitigation and adaptation

United Nations
Framework Convention on
Climate Change

Greece has ratified
the Kyoto protocol
and **the Paris Agreement**

2015

The 1st National Strategy for Adapting to Climate Change was published and adopted by the law 4414/2016

2017

Regional plans for adopting to climate change were specified

Other actions

Covenant of Mayors
for Climate & Energy

SOUTH EAST EUROPE
Transnational Cooperation Programme

med
L'Europe en Méditerranée
Europe in the Mediterranean

INSPIRE Infrastructure for Spatial Information in Europe

INTERREG IVC
INNOVATION & ENVIRONMENT
REGIONS OF EUROPE SHARING SOLUTIONS

Climate-ADAPT-Sharing adaptation information across Europe
European Climate Adaptation Platform

MEDA Water

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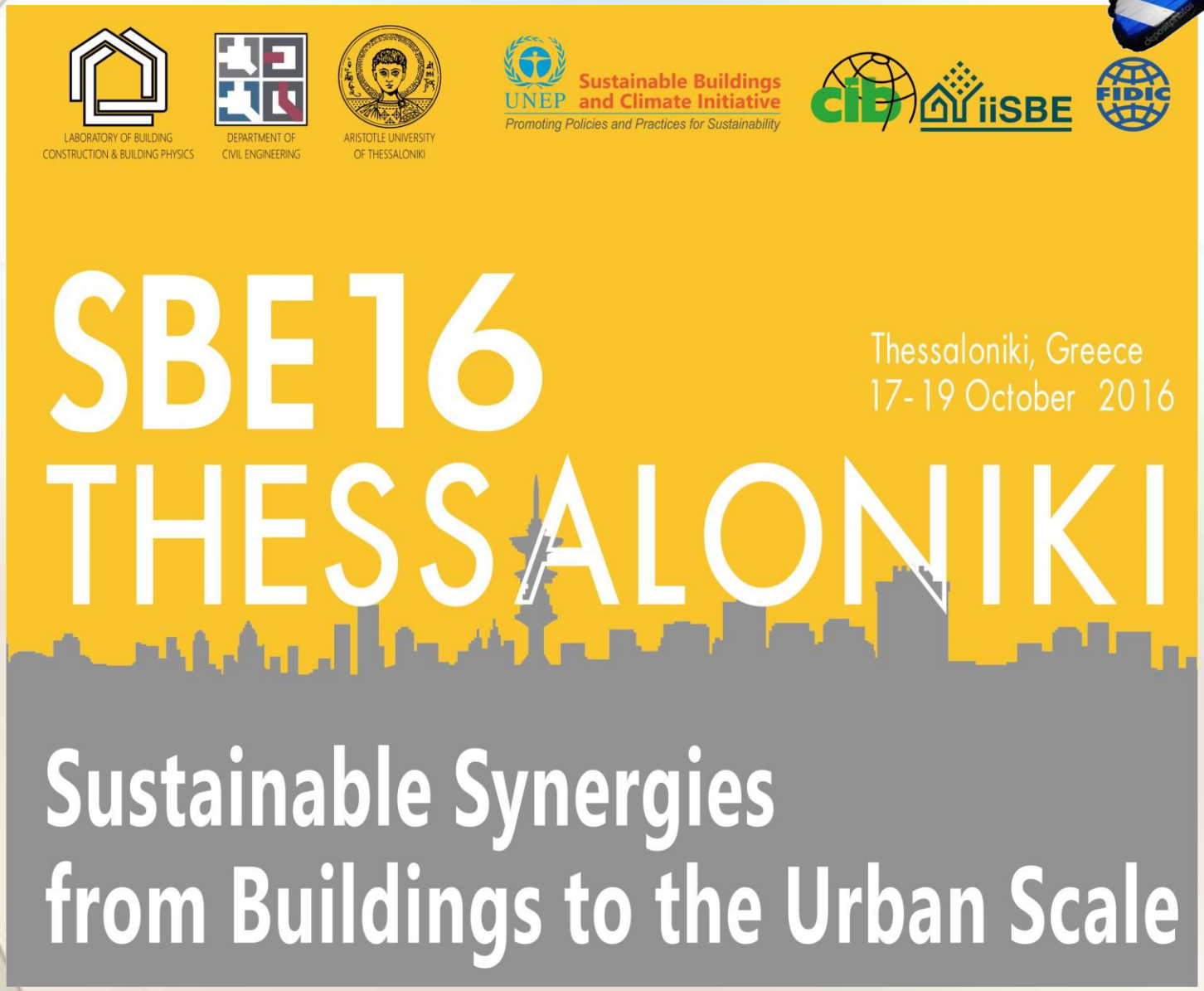

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