

“An Outlook of Renewable Energy Sources in SE Europe ”

9th SE Europe Energy Dialogue

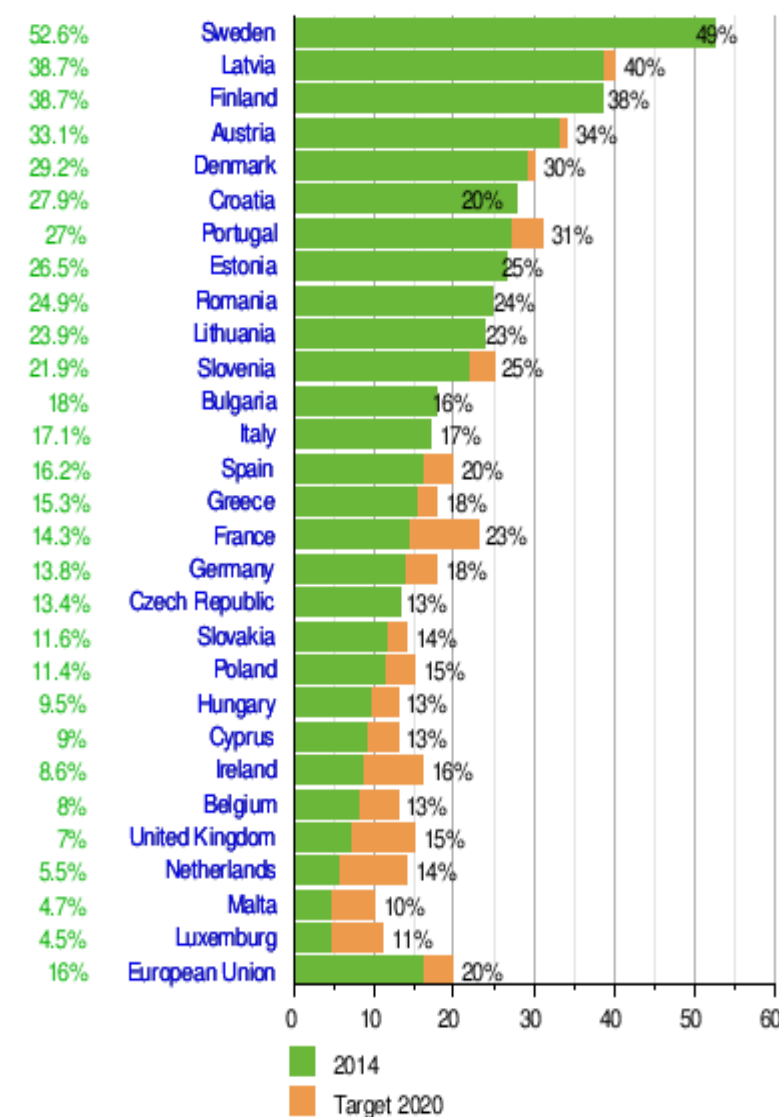
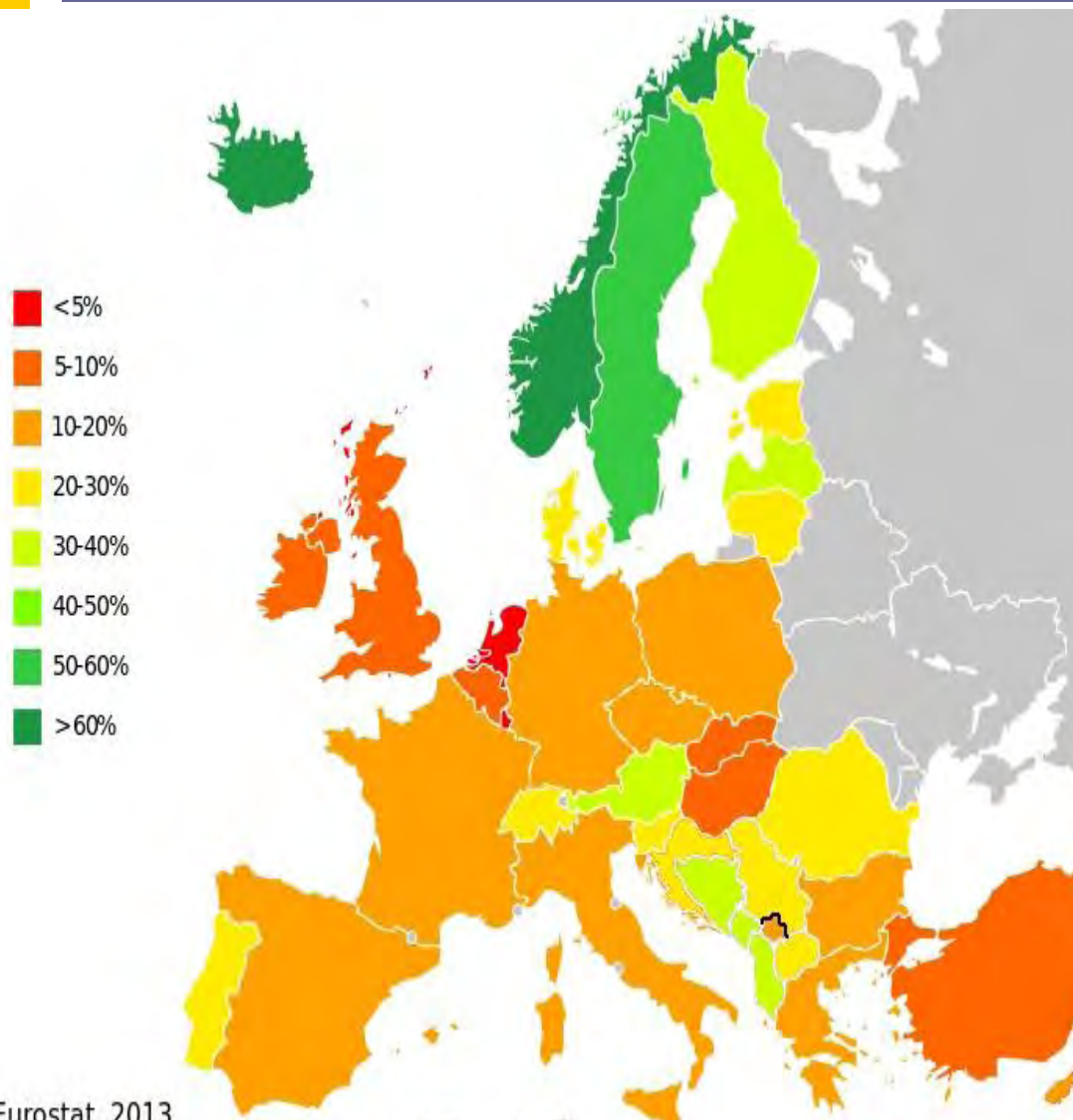
29 - 30 June 2014

Thessaloniki

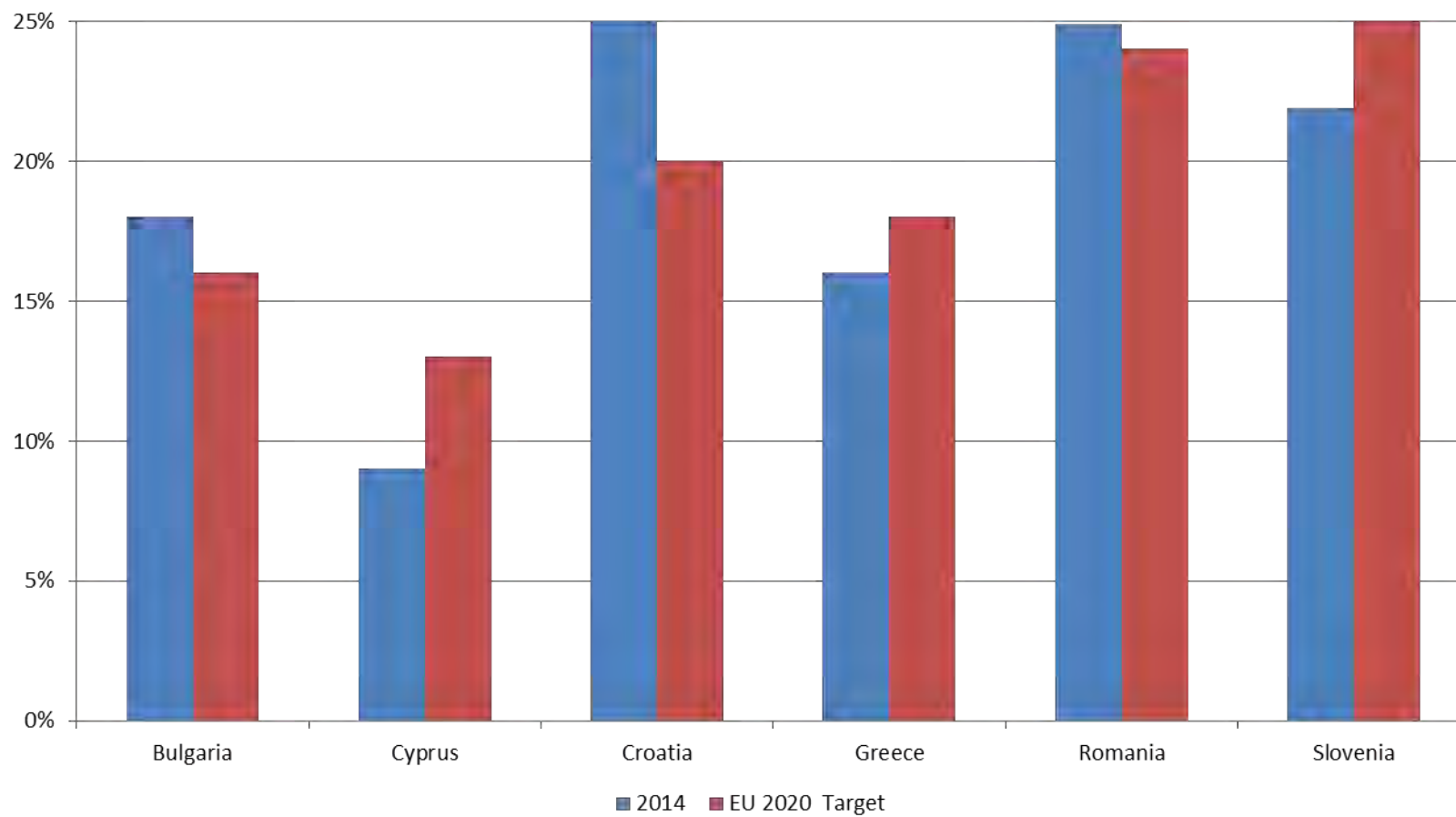
A Presentation by
Nicholas Sofianos, Msc (Economic Development, Glasgow University)
Research Projects Coordinator

Institute of Energy for S.E. Europe (IENE), Athens

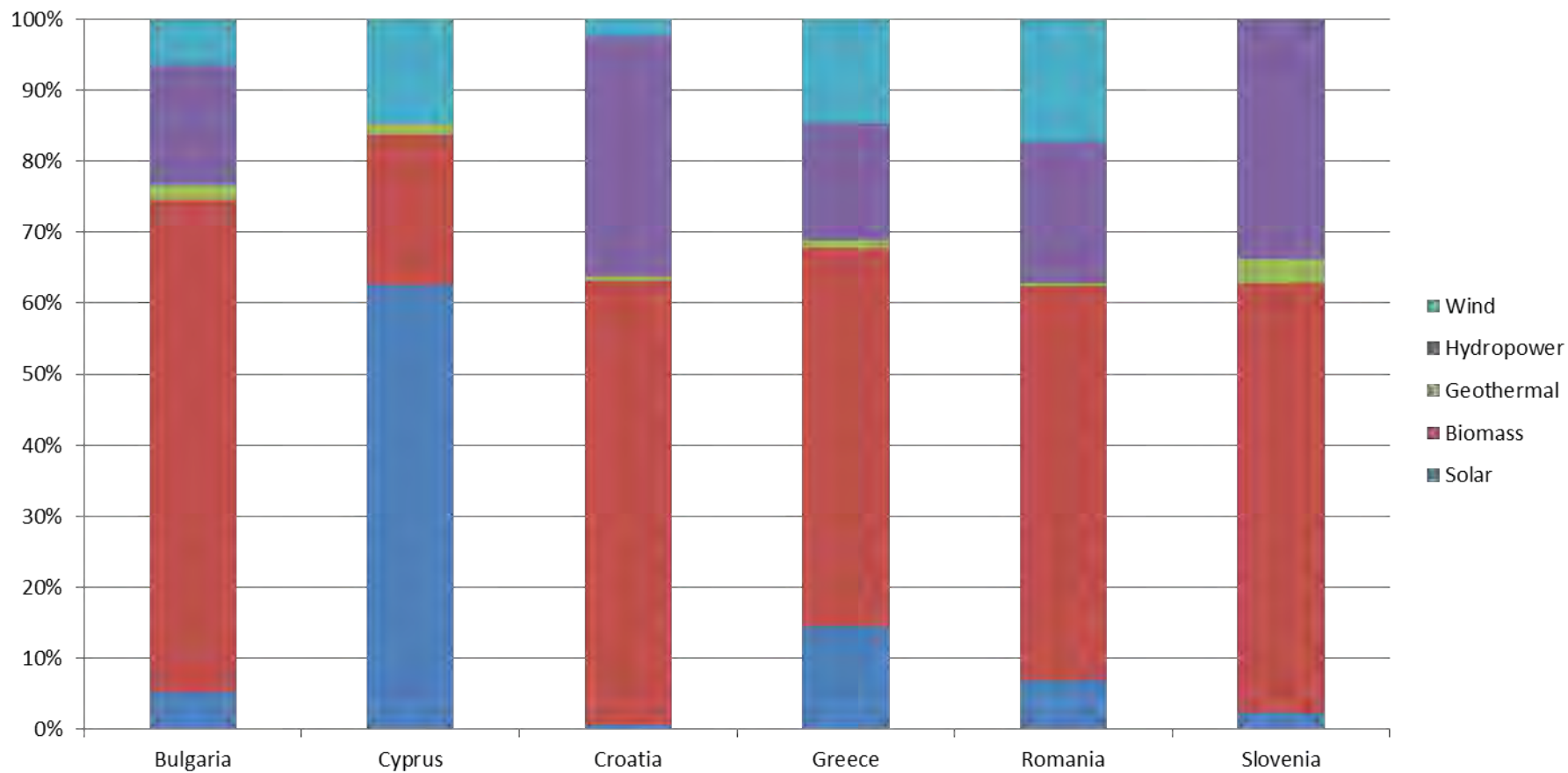
Renewable Energy Share in Gross Final Energy Consumption in EU28 (2013 – 2014)



Share of Energy from RES (in % of gross final energy consumption)



Share of Energy from RES by type (2014)



RES Targets for Energy Community Countries

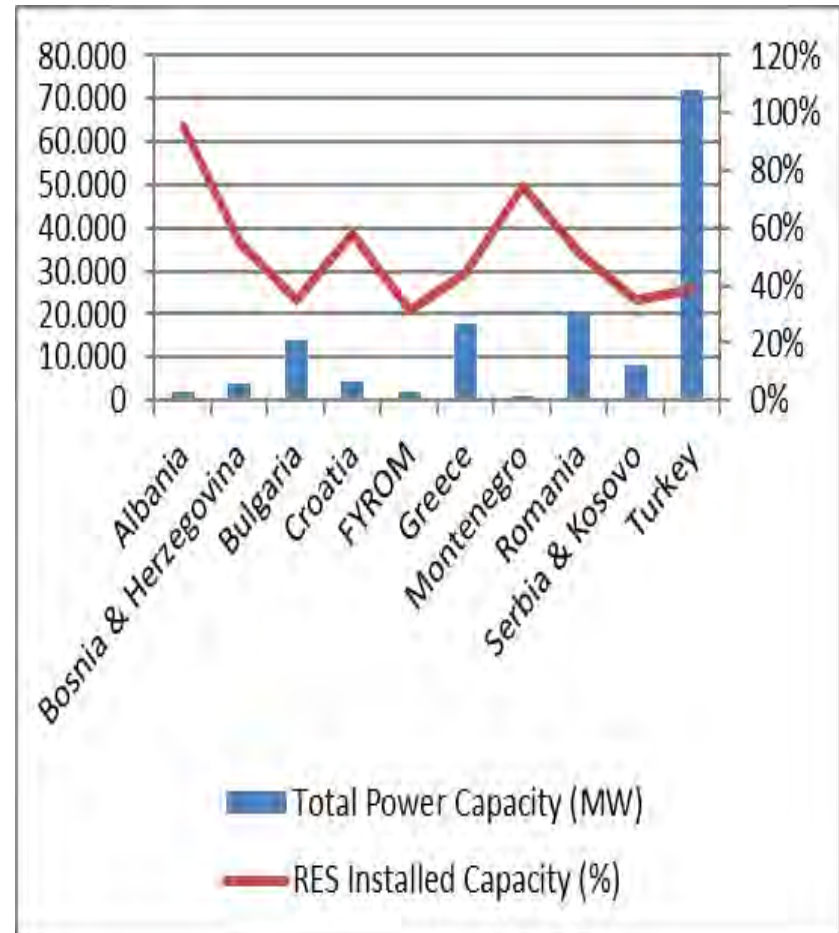
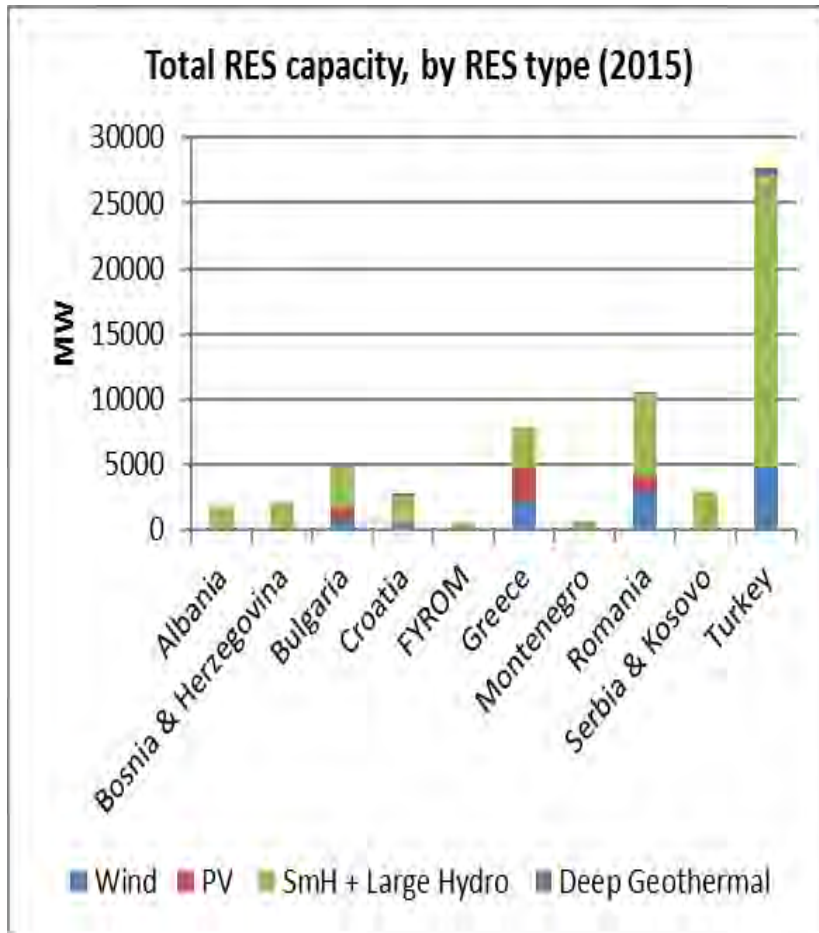
- **The Contracting Parties of the Energy Community, Albania, Bosnia and Herzegovina, Kosovo, FYROMacedonia, Moldova, Montenegro, Serbia and Ukraine implement the Directive 2009/28/EC since September 2012. The shares for the Contracting Parties were calculated based on the EU methodology and reflect an equal level of ambition as the targets fixed for EU Member States. The targets for the share of renewable energy in Contracting Parties in 2020 are the following: Albania 38%, Bosnia and Herzegovina 40%, Kosovo 25%, FYRO Macedonia 28%, Moldova 17%, Montenegro 33%, Serbia 27% and Ukraine 11%. The deadline for transposing the Directive 2009/28/EC and the adoption of the National Renewable Energy Action Plan (NREAP) was set for 1 January 2014.**
- **With the Decision 2012/03/MC-EnC and the acceptance of binding targets Contracting Parties can participate in all cooperation mechanisms. This means in particular that statistical transfers of renewable energy for the purposes of target achievement will be possible independently from physical flow of electricity. In addition, the decision lays down a number of adaptations to the rules for statistical transfers and joint support schemes between the Contracting Parties and EU Member States to ensure the original objectives of the RES Directive are preserved.**



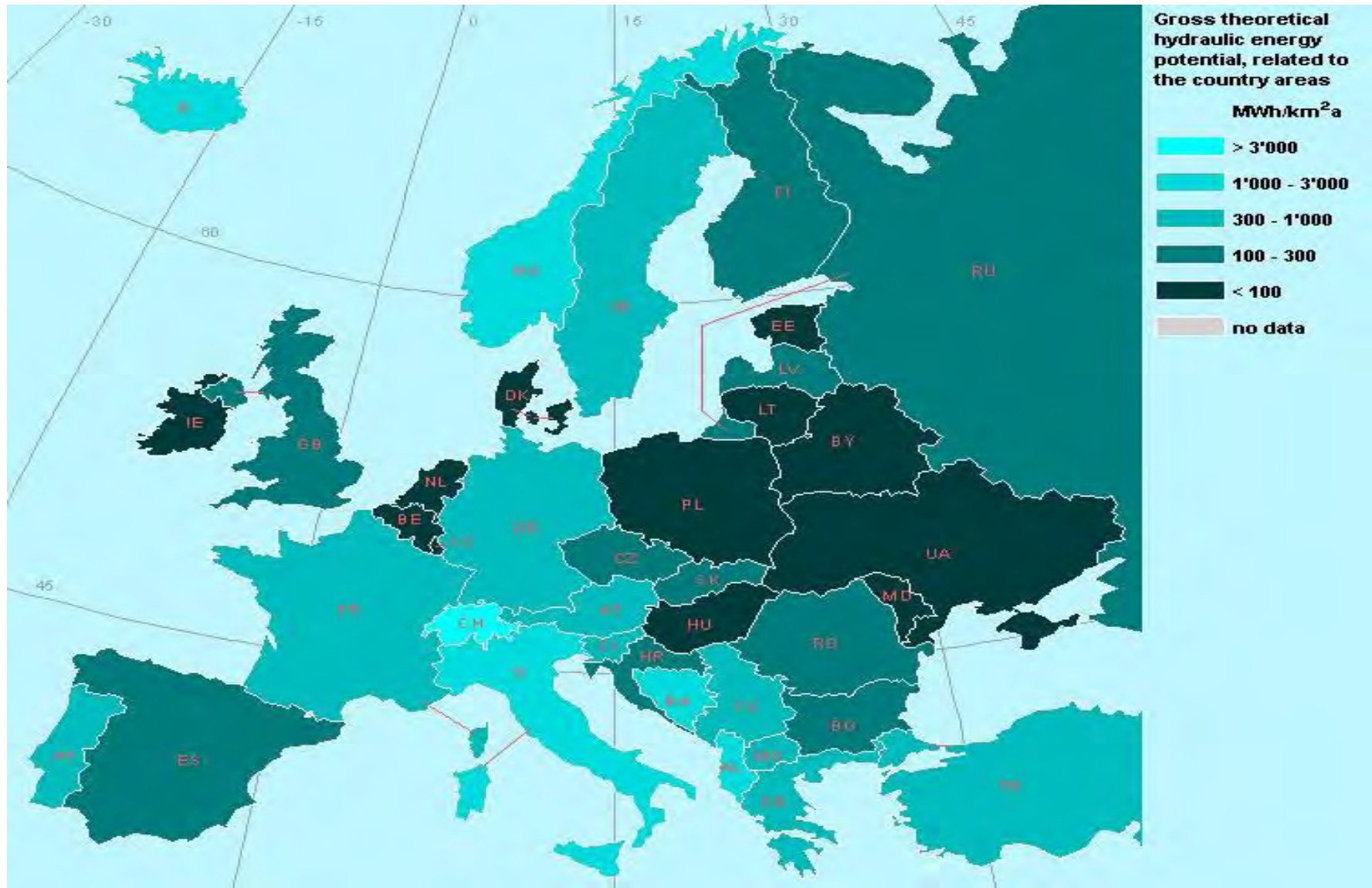
Installed Electricity Capacity in SE Europe, and the share of RES in electricity generation (MW, 2013 - 2014)

Countries	Wind	PV	SmH + Large Hydro	Deep Geothermal	Total RES	Total Power Capacity	RES Installed Capacity (%)
Albania	0	0	1.800	0	1.800	1.878	96%
Bosnia & Herzegovina	0	0	2.058	0	2.058	3.710	55%
Bulgaria	691	1.020	3.129	0	4.840	13.921	35%
Croatia	423	8	2.187	10	2.617	4.516	58%
FYROM	37	0	581	0	618	1.953	32%
Greece	2.150	2.600	3.173	0	7.923	17.762	45%
Montenegro	0	0	660	0	660	886	74%
Romania	2.976	1.158	6.232	0,05	10.366	20.082	52%
Serbia & Kosovo	10	5	2.910	0	2.925	8.360	35%
Turkey	4.718	100	22.289	600	27.707	72.050	38%
Total	10.487	4.891	44.990	610,05	61.514	145.118	42%

Total RES Installed Capacity in SE Europe



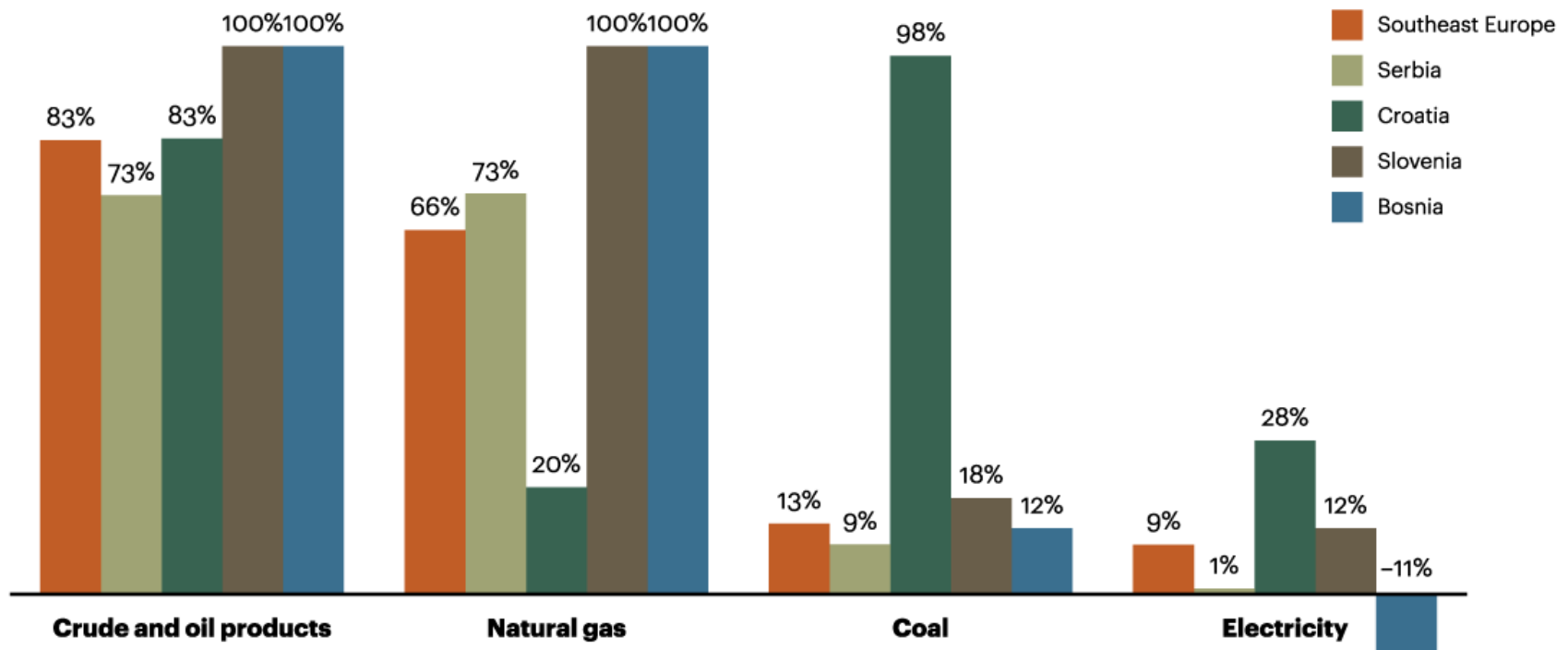
Hydro Potential in Europe



Dependence on Energy Imports

Net imports as % of energy supply

(Southeast Europe and the region's four biggest countries by energy requirements, 2011–2012¹)



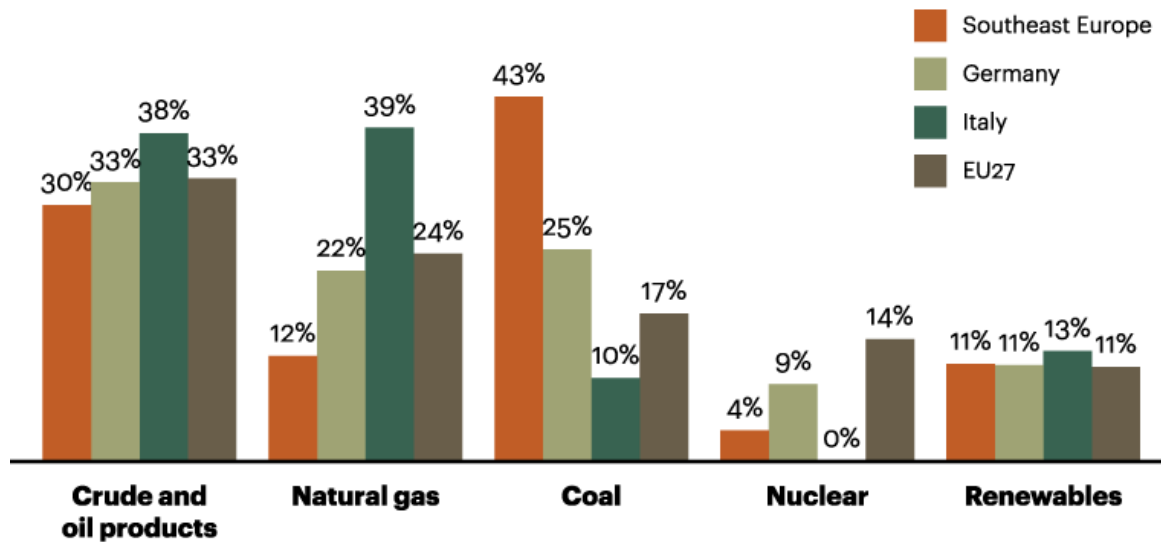
¹ Depending on data availability

Use of Energy in EU and SE Europe and Carbon Intensity



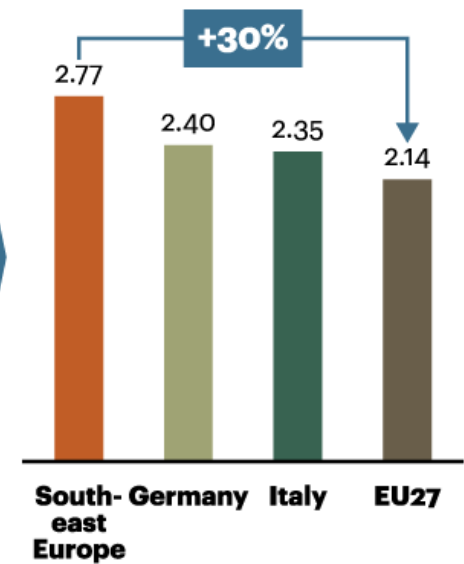
Energy types in TPES

(%, 2011)



Carbon intensity

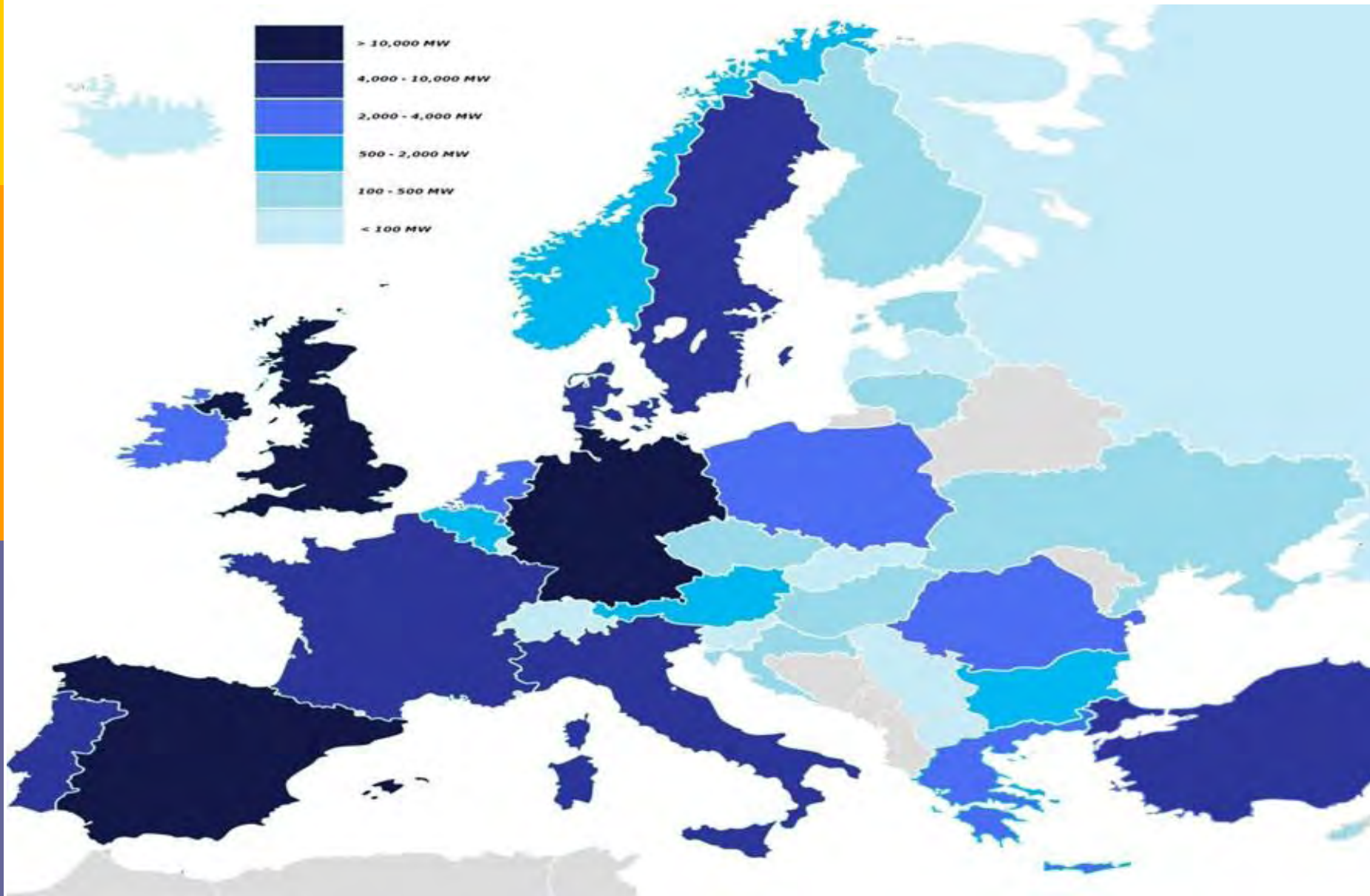
(tons CO₂ per ToE of TPES, 2011)



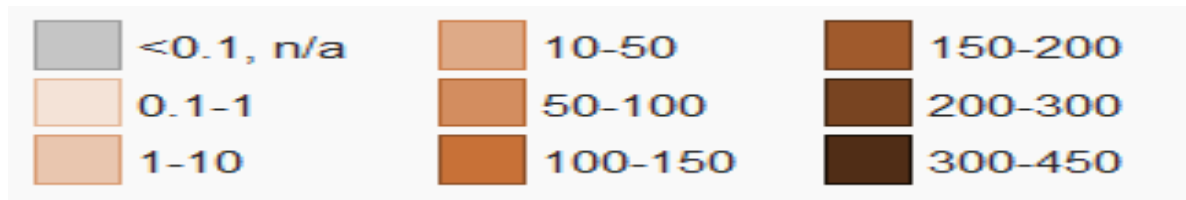
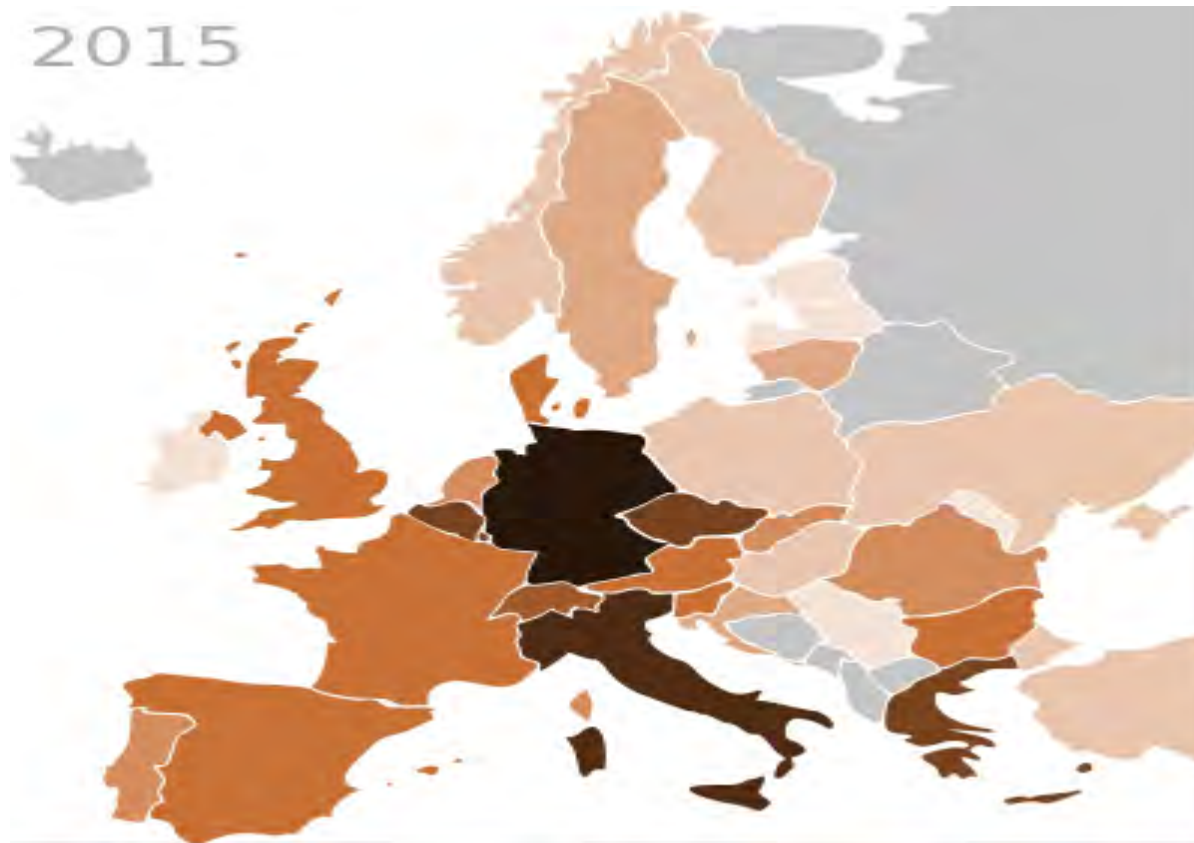
Notes: ToE is tons of oil equivalent on a net calorific basis; TPES is total primary energy supply.

Sources: International Energy Agency; A.T. Kearney analysis

Wind Energy Installed Capacity in EU and SE Europe



PV Installed Capacity in EU in Watts per capita (2014)

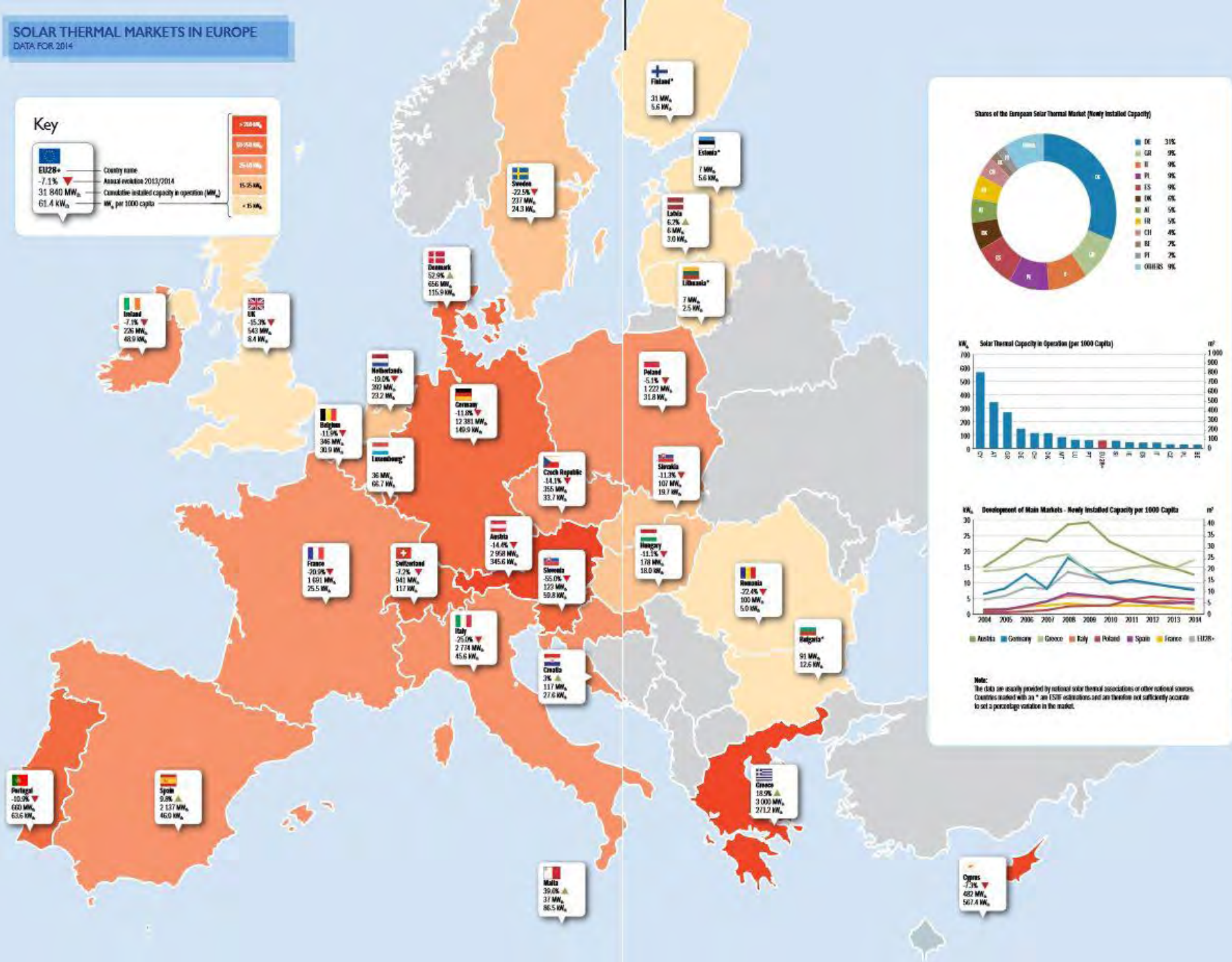


SOLAR THERMAL MARKETS IN EUROPE

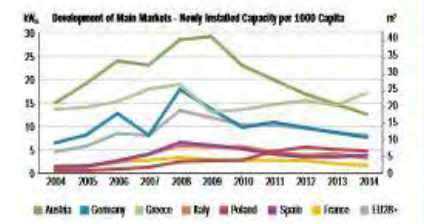
DATA FOR 2014

Key

EU28+
 -7.1% Annual evolution 2013/2014
 31 840 MW_t Cumulative installed capacity in operation (MW_t)
 61.4 kW_t MW_t per 1000 capita



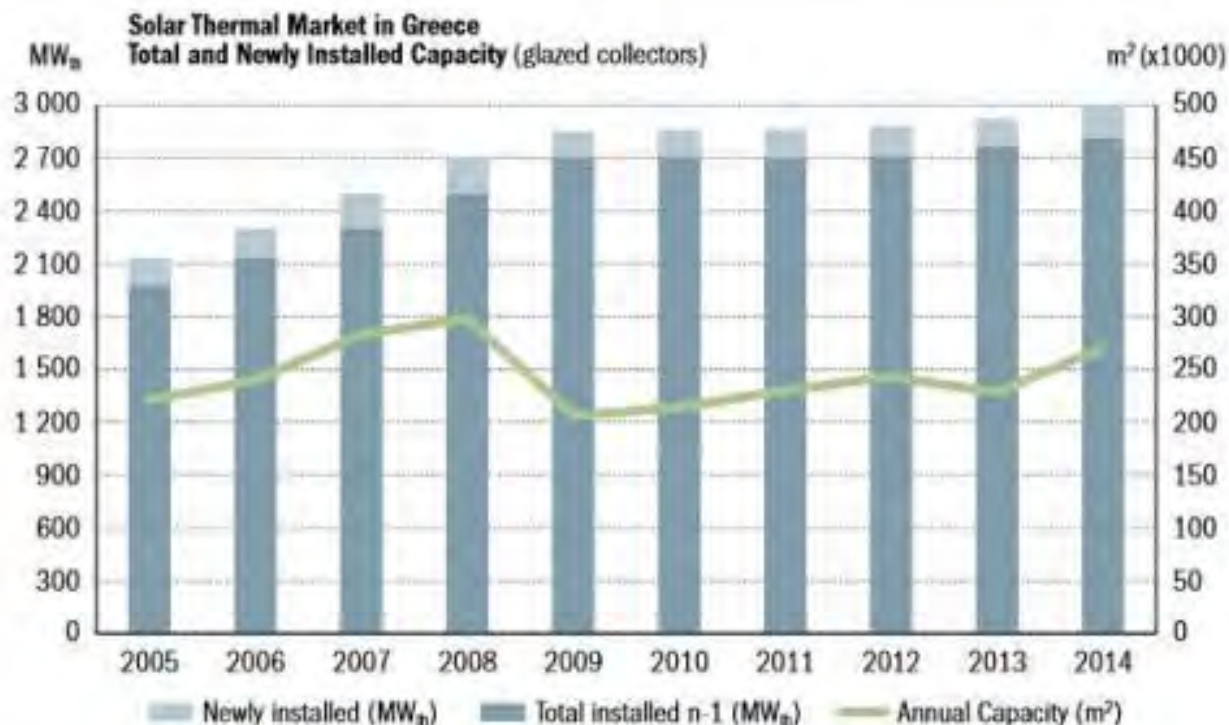
Shares of the European Solar Thermal Market (Newly Installed Capacity)



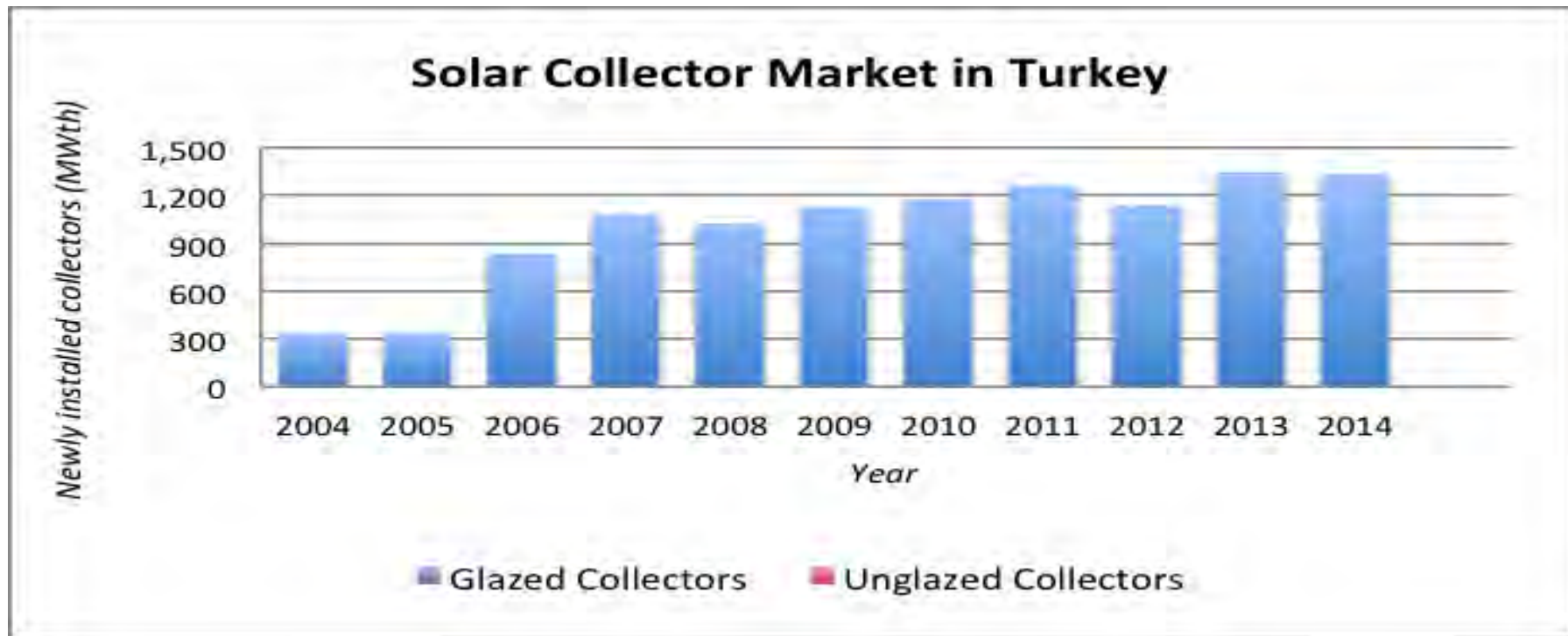
Note: The data are directly provided by national solar thermal associations or other national sources. Countries marked with * are ISTAT indications and are therefore not sufficiently accurate to set a percentage variation in the market.

Solar Thermal in Greece

- **Greece:** Solar Thermal is booming in Greece. The Greek market is developing particularly well: in 2013 the solar market increased by almost 19%. This corresponds to a newly installed collector area of approximately 270,000 m². One probable reason for this is the fact that the price of oil in Greece has increased in the last few years, in contrast to many other EU countries. As part of the severe austerity policies, subsidies for oil and gas were eliminated, and this increased the competitiveness of solar thermal even further.



Solar Thermal in Turkey



- **Turkey:** Turkey is located geographically in a region called the “solar band,” which has the greatest utilization potential for solar energy. With nearly 1.9 million m² of collector area newly installed in 2014 (1.33 GWth), Turkey was again the second-largest solar thermal market after China. The share of vacuum tube collectors had increased significantly over the years, but stagnated in 2014 at 44 % of total market volume. According to the latest market surveys on solar thermal industry trends (9); multi-family houses were considered as the fastest-growing segment in Turkey’s solar thermal market, as stated by 52% of the survey participants. Another 17% considered single-family houses to be the most important segment, 14% opted for the tourism sector, 10% for the public sector and 7% for industrial process heat.

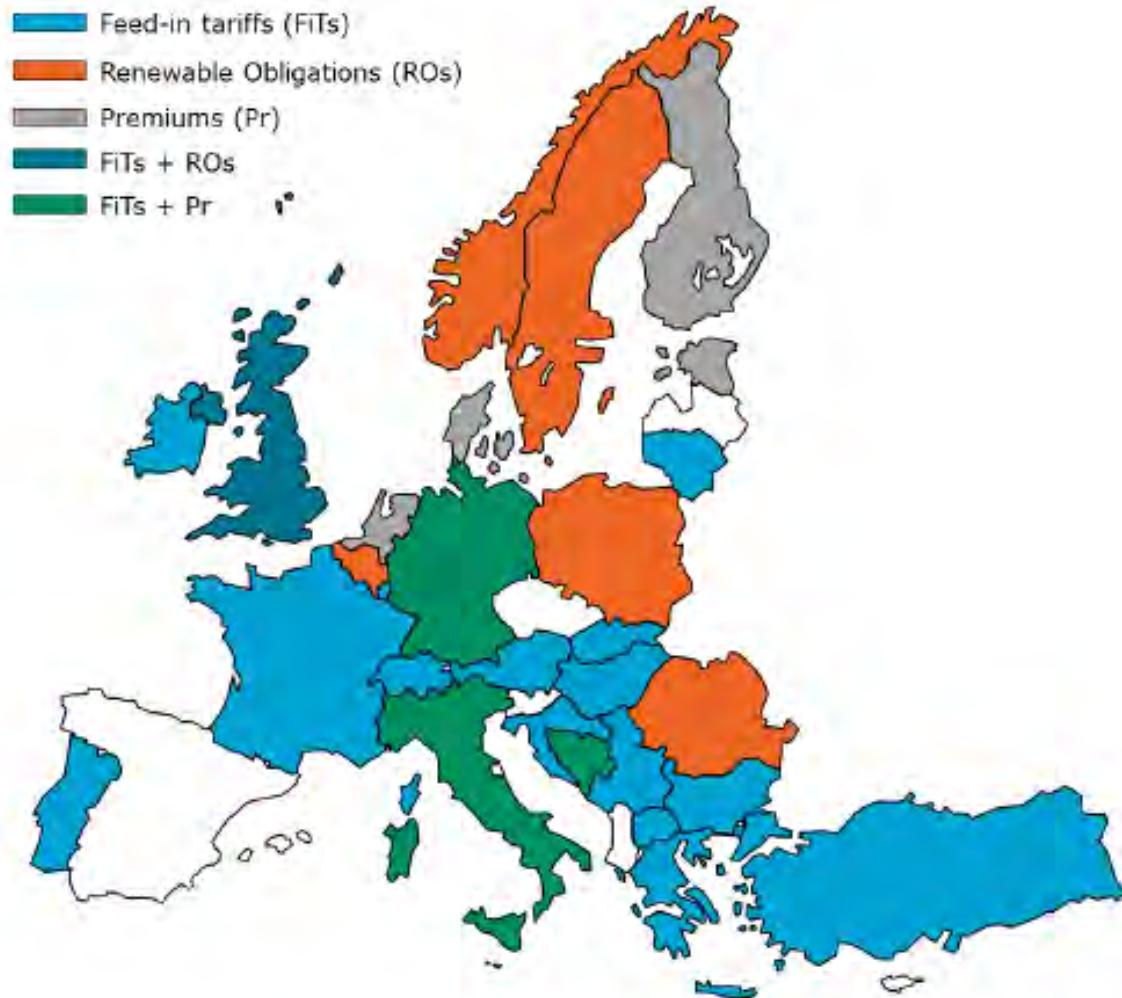
Solar Thermal in Bulgaria, Romania and Serbia

- **Bulgaria:** According to data the installed solar collector area in 2013 was 53,000 m².

Year	Cumulated collector area at year's end [m ²] Source: NSI	Newly installed collector area [m ²] Source: NSI	Increase in newly installed collector area
2010	194,000		
2011	230,000	36,000	18 %
2012	256,000	26,000	11 %
2013	309,000	53,000	104 %

- **Serbia:** Solar thermal market in Serbia has grown noticeably over the last two years. According to the Serbian solar thermal association estimates that more than 10,000 m² of solar collector area have been installed in Serbia over the last five years, most of them (roughly 3,500 collectors) in the northern province of Vojvodina. According to estimations by the Energy Efficiency Agency of Serbia, more heating and energy efficiency in the industry could reduce the energy consumption in Serbia by more than 50%.
- **Romania:** Big decrease in solar thermal installations (-22%). Lack of policies to develop maintenance services, as well as bad national resource efficiency policies led to notable failures among installed systems.

Renewable Energy Funding Mechanism in Europe

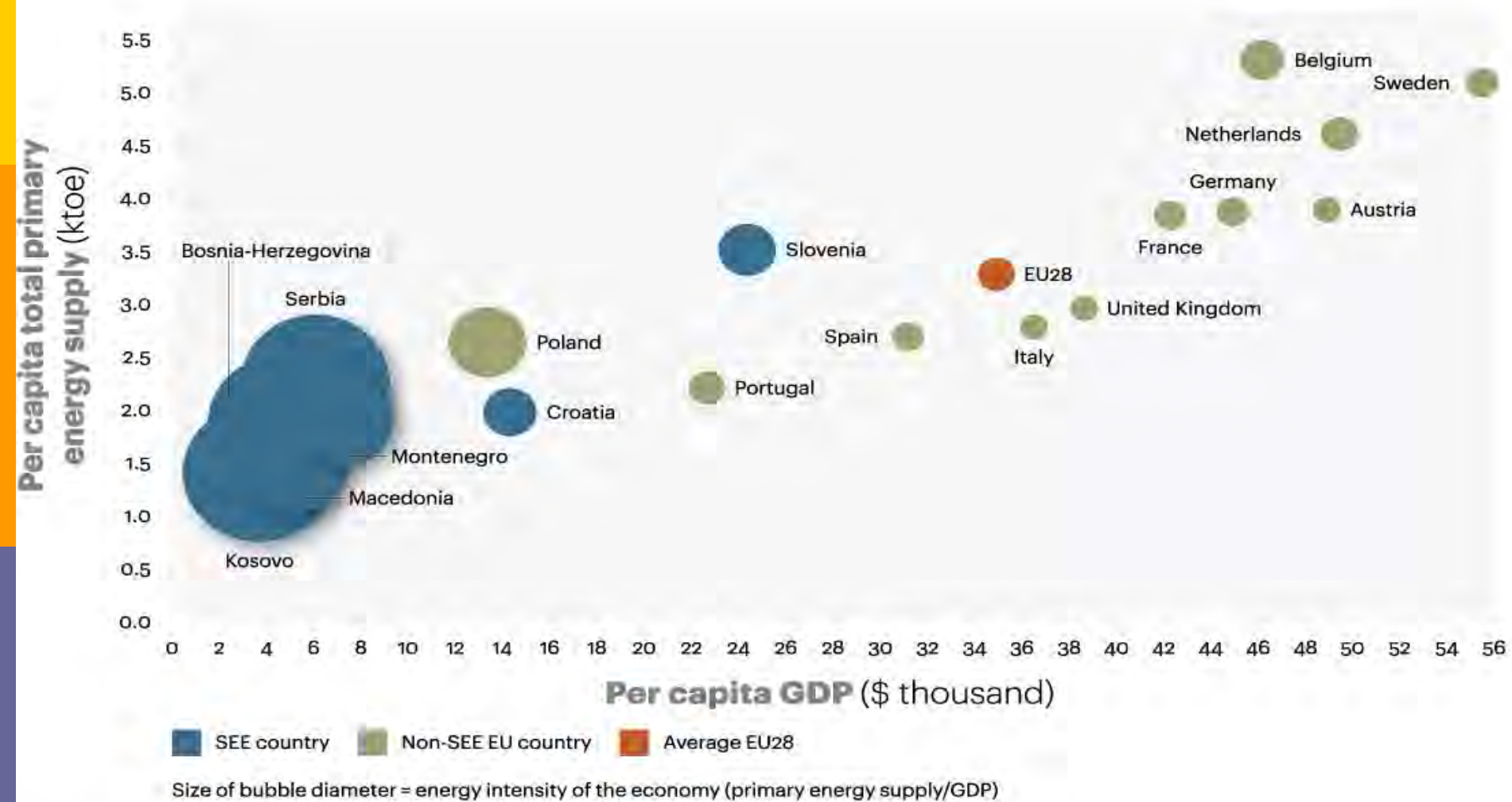




Renewable Energy Funding Mechanism in Europe

- ❑ **In Europe 20 countries have adopted Feed-in Tariffs to support the electricity generation from RES**
- ❑ **In four countries (Denmark, Estonia, Finland and Netherlands), Independent Power Producers (IPPs) are supported through premiums, that are paid out of top of the market price to offset the difference with wholesale electricity**
- ❑ **Three countries (Bosnia, Germany and Italy) give IPPs the opportunity to choose between Feed-in Tariffs and premiums**
- ❑ **Green certificates schemes have been implemented in another six countries (Belgium, Poland, Romania, Sweden, Norway and the UK (combined with Feed-in Tariffs))**

(Primary Energy Supply / per capita GDP)



Notes: SEE is Southeast Europe; EU is European Union; ktoe is kiloton of oil equivalent on a net calorific basis.
 Sources: International Energy Agency 2011 data for total primary energy supply, International Monetary Fund 2011 World Economic Outlook database for GDP; A.T. Kearney analysis

A snapshot of the RES development in SE Europe (I)

- ❑ **Greece: New Legislation regarding electricity production from RES and cogeneration**
- ❑ **Turkey: Government targets 27.5 GW of non-hydro RES capacity by 2023. Turkey is currently considered as a hot market for RES. New funding schemes and mechanisms(New YEKDEM)**
- ❑ **Bulgaria: Renewable energy production down in 2014, but still above 2020 targets. After a period of strong growth, helped by generous feed in tariffs offered by the government, Bulgaria has attempted to slow down the growth of RES**
- ❑ **Romania: Renewable energy capacity reached 5.163 MW at end-March (2016) RES sector has attracted investments of over 7 billion Euros in the past 4 years. The Government cut the incentives in order to block electricity prices from spiraling out of control**

A snapshot of the RES development in SE Europe (II)

- ❑ **Croatia:** New bill on RES adopted on September 2015. Launch of a new renewable scheme from January 1st, 2017. The signals the Croatian Government has been sending over the past three years were somewhat conflicting. 365.5 MW installed capacity
- ❑ **Serbia:** New secondary legislation Package adopted this month (June 2016). Will provide more favorable investment conditions in RES, will improve bankability of local RES projects and bring the Serbian legal framework in line with the EU 3rd Energy Package
- ❑ **Cyprus:** The objective as per Cyprus' Action Plan, is to reach a minimum consumption of energy from RES of 13% of total gross energy consumption. Significant investment is expected in solar PV projects in the next 5 years
- ❑ **B&H:** Bosnia and Herzegovina moves closer to become a wind energy producer. A Wind Energy booming is expected the years to come.



**Thank you for
your attention**

nsofianos@iene.gr