The state of solar energy in the Republic of Croatia

Croatian Professional Association for Solar Energy
Zvonimir Radovečki, B.Sc.
President: Ljubomir Majdandžić, Ph.D.

Croatia and the SE European Energy Bridge

Westin Hotel, Zagreb, October 10th, 2014

Republic of Croatia imports more than 50% of primary energy

- Importing 34% (42%) of electricity
- Imports about 40% of gas
- Imports over 90% of oil and petroleum products
- 100% imported coal

Croatia has a great potential in the use of renewable energy sources (solar irradiation energy)!?

Energy Law (Official Gazette No. 68/01, 177/04, 76/07, 152/08, 127/10 and 113/12)
"The use of renewable energy sources and cogeneration in the interest of the Croatian Republic"

Law on Energy Efficiency in the final consumption (OG. No. 152/08 and 55/12)

Distribution of renewable energy in Europe

Usage of renewable energy with regard to specific regions

Croatia and the SE European Energy Bridge

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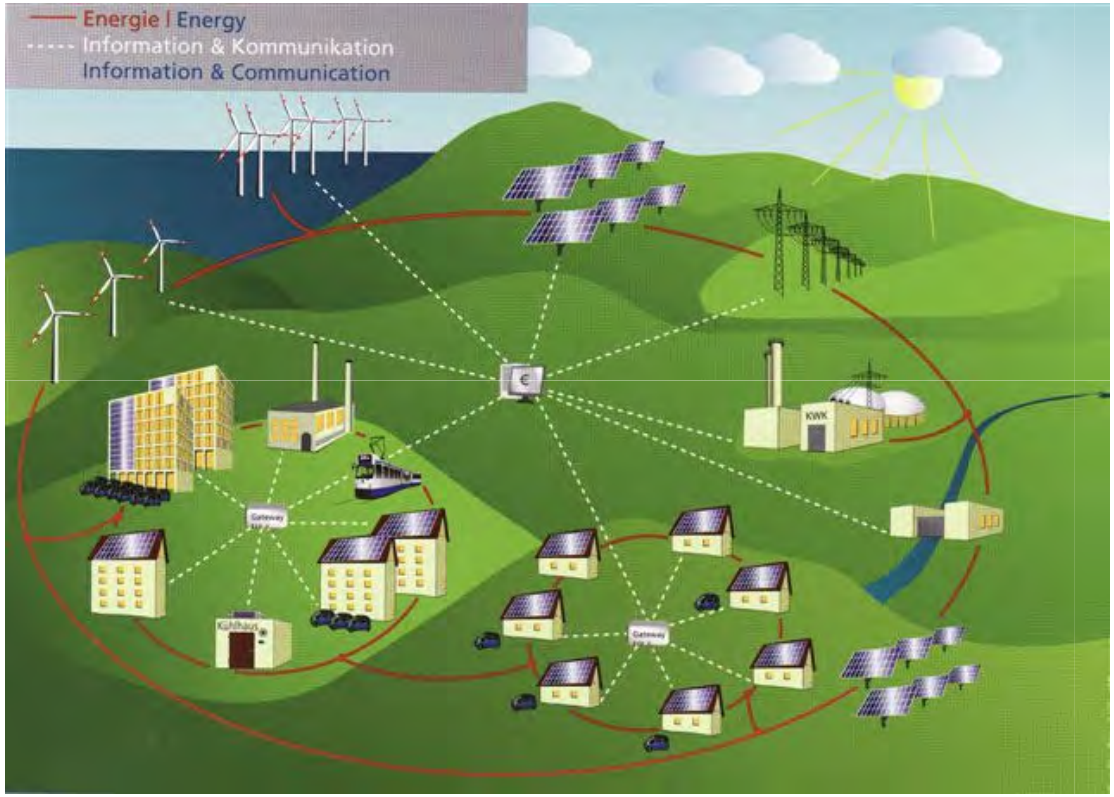

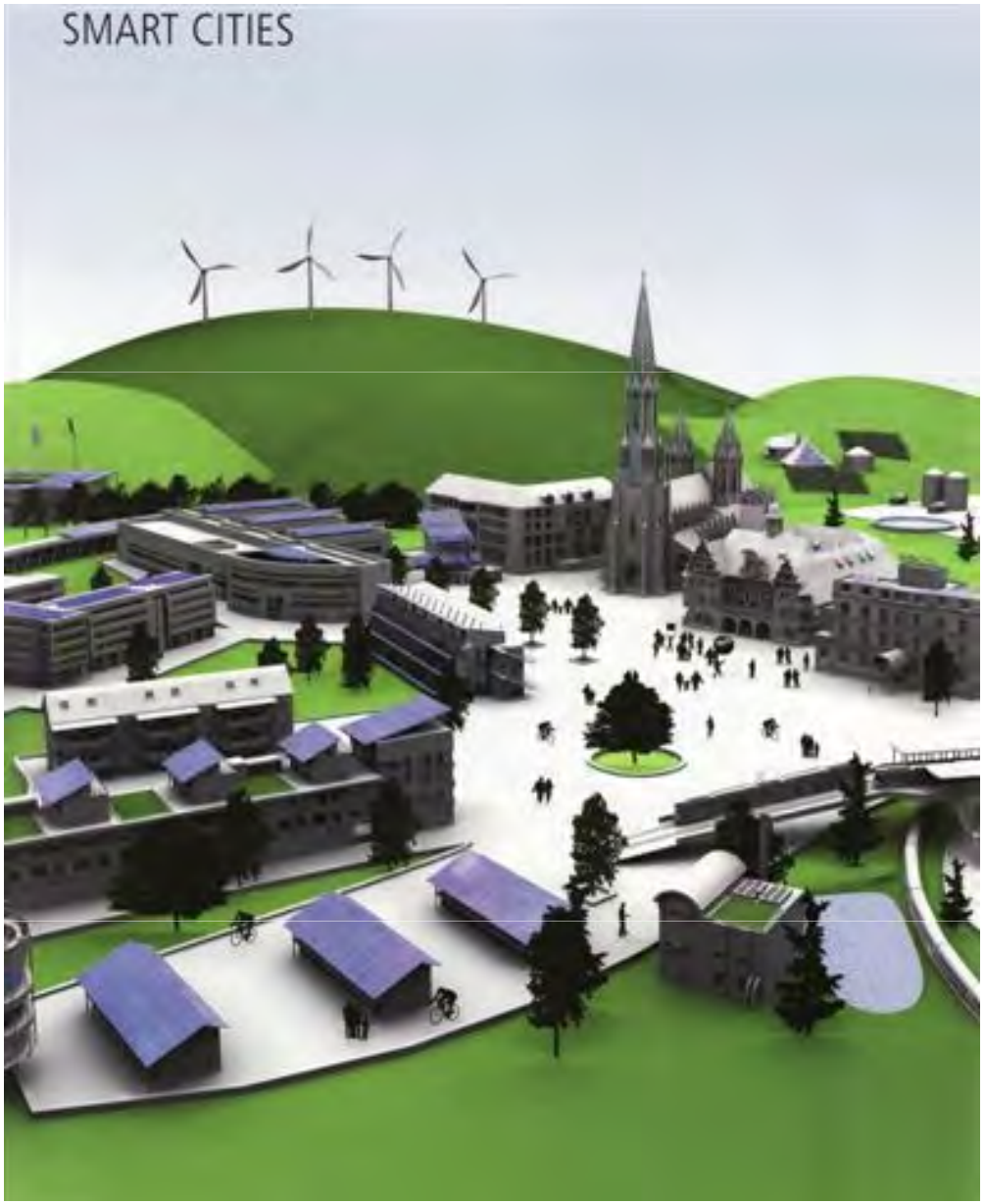

Energetics of 21st century

Smart city

Smart Grids

Satellite monitoring

Weather forecast

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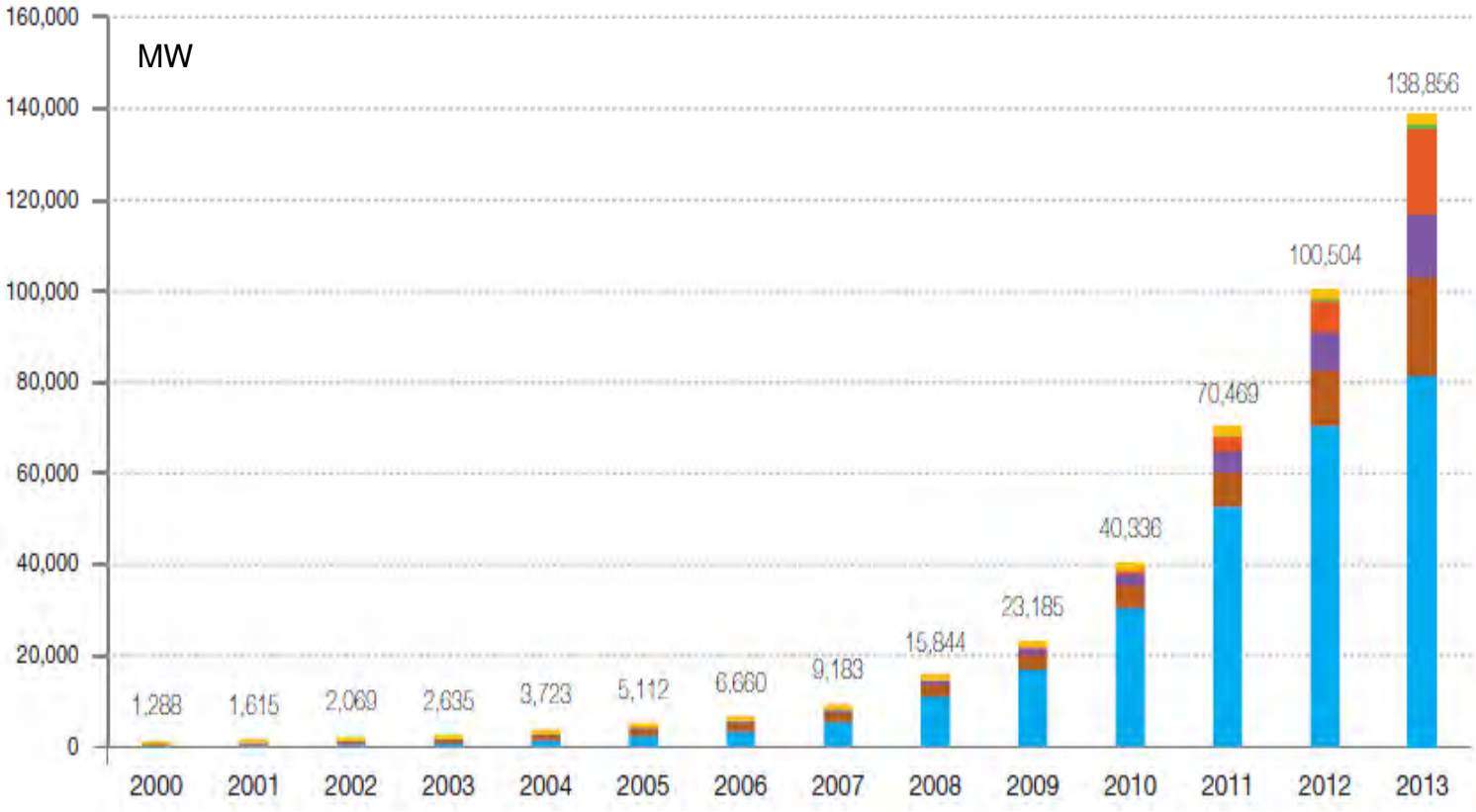
By the end of 2013, the power of installed PV systems reached 138.9 GW. A leader in installing is Europe with 81.5 GW (covering about 59% of the installed systems worldwide).
China 18.6 GW
USA 13.7 GW
Asia Pacific 22 GW

EPIA (*European Photovoltaic Industry Association*) gives an outlook on PV systems until 2016 and forecasts into 2020 and 2040 year .

The total installed power of PV systems in the world

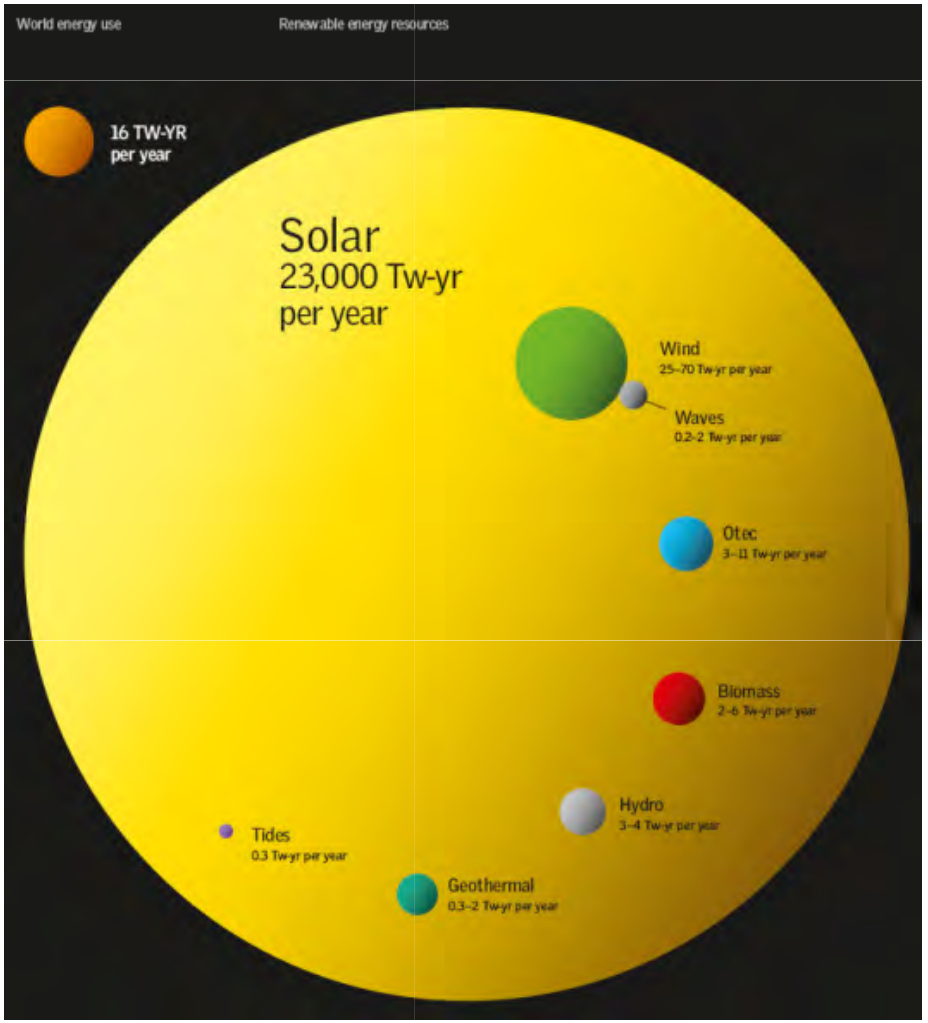


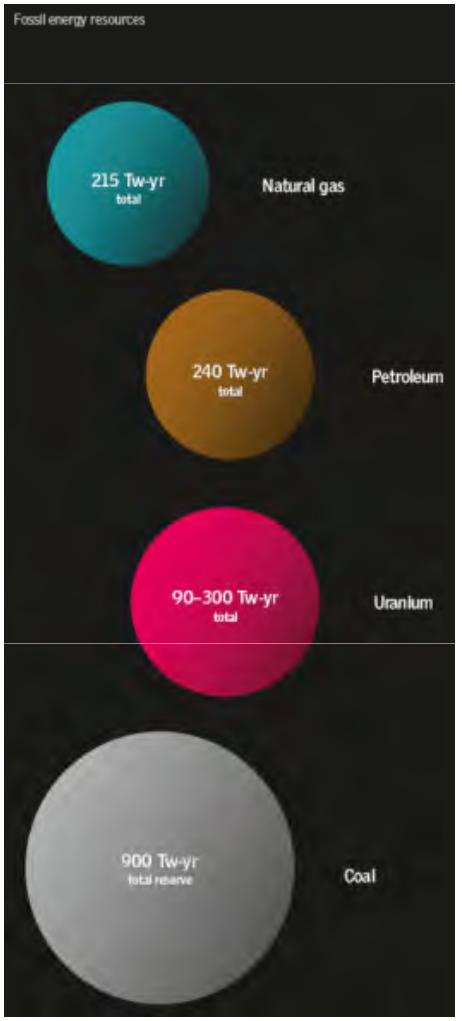
EPIA predicts solar photovoltaic technology to cover 12% of EU energy consumption by 2020 , and by the 2040, as many as 28%.

Sun, in just one second, releases more energy than our civilization has consumed throughout its history and development.
In 10 billion years the Sun decreases its mass by only one part of a thousand.
(SUN - unlimited, clean and reliable energy source)

Natural potential energy of solar radiation is 50 times larger than all the stock of fossil and nuclear fuels.

Technical potential of solar radiation energy is still higher than the world's total energy consumption.





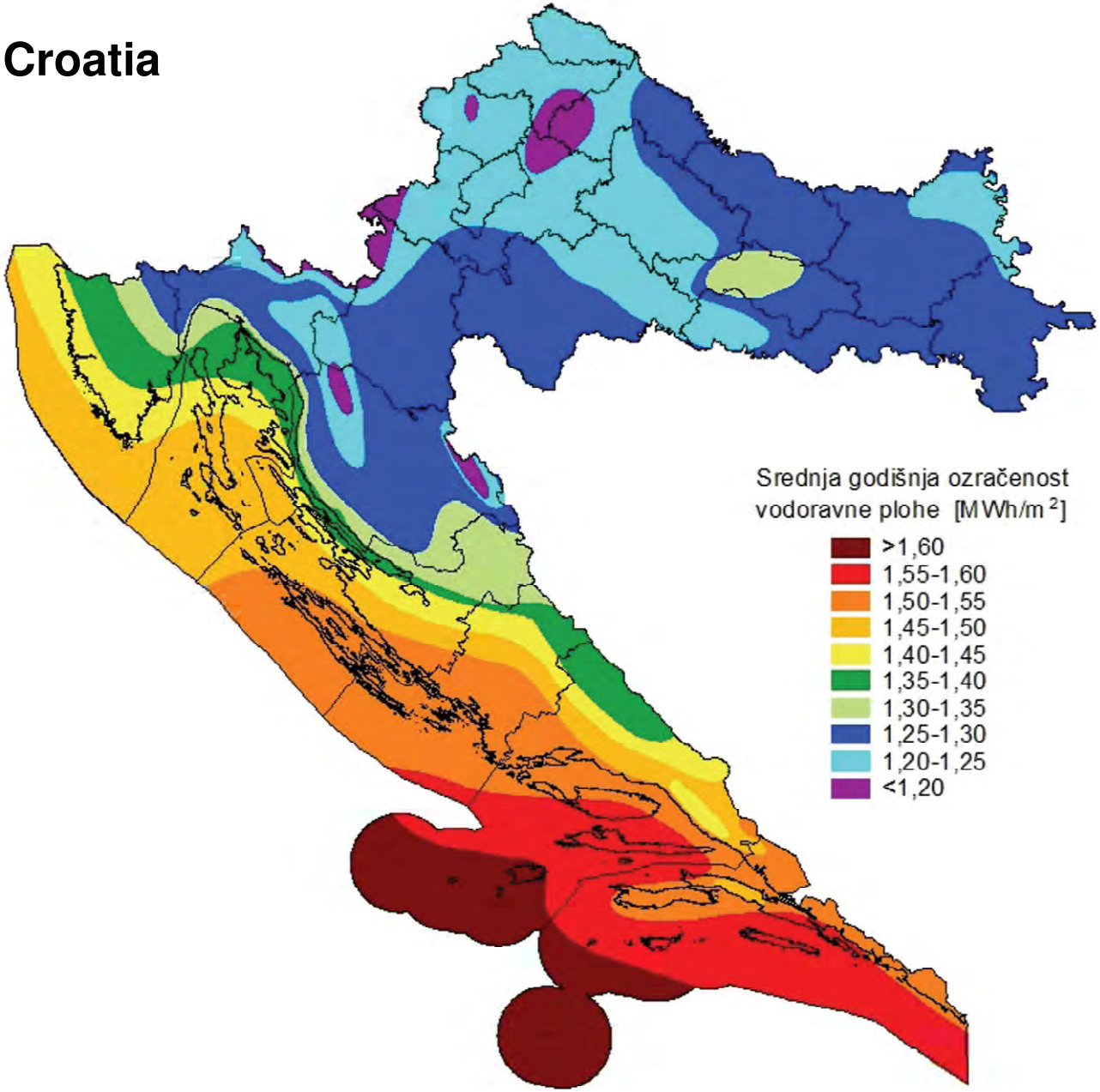
Average annual total irradiation horizontal surface solar radiation

The potential of solar energy in Croatia

In Croatia, there are between 1800 (Zagreb) and 2800 (the island of Hvar) hours of sunlight per year.

Irradiation is more than 1600 kWh per m^2.

Production of heat (space heating and hot water), cooling and electricity is possible.



The energy output from the PV system power rating 10 kWp installed in several cities in the Republic of Croatia

City	*Input energy solar radiation on inclined modules* E_Z, kWh/m^2	*The energy output of solar modules* E_{FN}, kWh	*The energy output from the PV system*, E_{st}, kWh	*Specific annual electricity produced*, kWh/kW$_p$
Zagreb	1 370	14 248	11 398	1 140
Zadar	1 660	17 264	13 811	1 381
Varaždin	1 330	13 832	11 066	1 107
Split	1 720	17 888	14 310	1 431
Sisak	1 350	14 040	11 232	1 123
Rijeka	1 470	15 288	12 230	1 223
Pula	1 580	16 432	13 146	1 315
Osijek	1 370	14 248	11 398	1 140
Hvar	1 780	18 512	14 810	1 481
Dubrovnik	1 720	17 888	14 310	1 431

Croatia: 1st July 2007

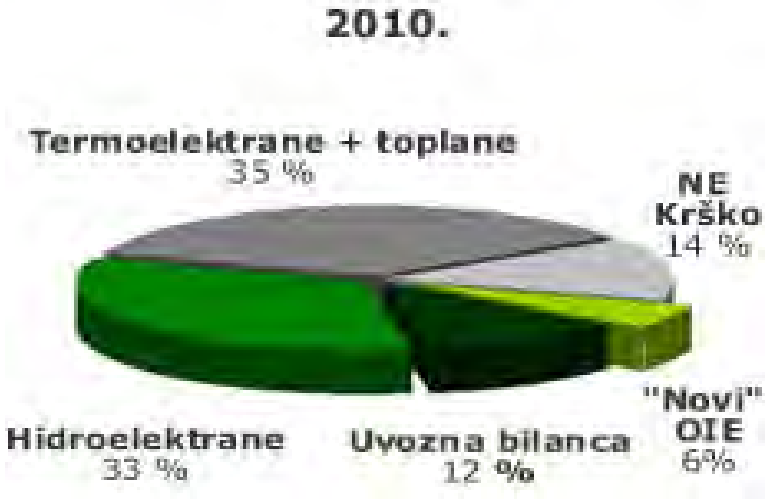
Regulations on the use of renewable energy sources and cogeneration(*NN, br. 67/07 i br. 88/12*)

Regulations on acquiring the status of preferential electricity producers (*NN, br. 67/07, 35/11, 88/12 i 132/13)*

Tariff system for the production of electricity from renewable energy sources and cogeneration (*NN, br. 33/07, 63/12, 121/12, 144/12, 133/13, 151/13 i 20/14*)

Decree on fees for encouraging production of electricity from renewable energy sources and cogeneration (*NN, br. 33/07, 133/07, 155/08, 155/09, 08/11, 144/11 i 128/13*)

Decree on the minimum share of electric energy produced from renewable energy sources and cogeneration whose production is encouraged (*NN, br. 33/07 i 8/11*) **(13.6% by 2020)**



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Total electricity consumption in Croatia in 2013 amounted to cca.19,000 GWh.

The EU average of electricity obtained from Photovoltaic is 3% and in Croatia it is 0.12%.

For Croatia to reach that average, by now it should have 500 MW of installed PV systems.

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Examples of completed projects of PV systems in Croatia

Pisarovina, 10 kW

Špansko, ZG 10 kW

Posedarje, Zadar 10 kW

Samobor, 10 kW

Sesvete, ZG 10 kW

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Education is of great importance

Through this project, during the last 10 years my house had more than 5000 visitors

- Students
- Governmental and non-governmental organizations
- Planners and investors

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Thank you very much for your attention

www.hsuse.hr

hsuse@hsuse.hr

ljubomir.majdandzic@zg.t-com.hr

zvonimir.radovecki@zg.t-com.hr