



PRIVREDNA KOMORA SRBIJE
CHAMBER OF COMMERCE AND INDUSTRY OF SERBIA

Renewable energy sources and energy efficiency

Current situation in RES in the Republic of Serbia – investment opportunities

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Belgrade, 23 September 2014



CONTENT

- Main characteristics of the energy sector
- Renewable energy sources – (potential and utilization)
- Legislation in the field of renewable energy sources
- Projects
- Examples of good practices in the Republic of Serbia
- About CCIS

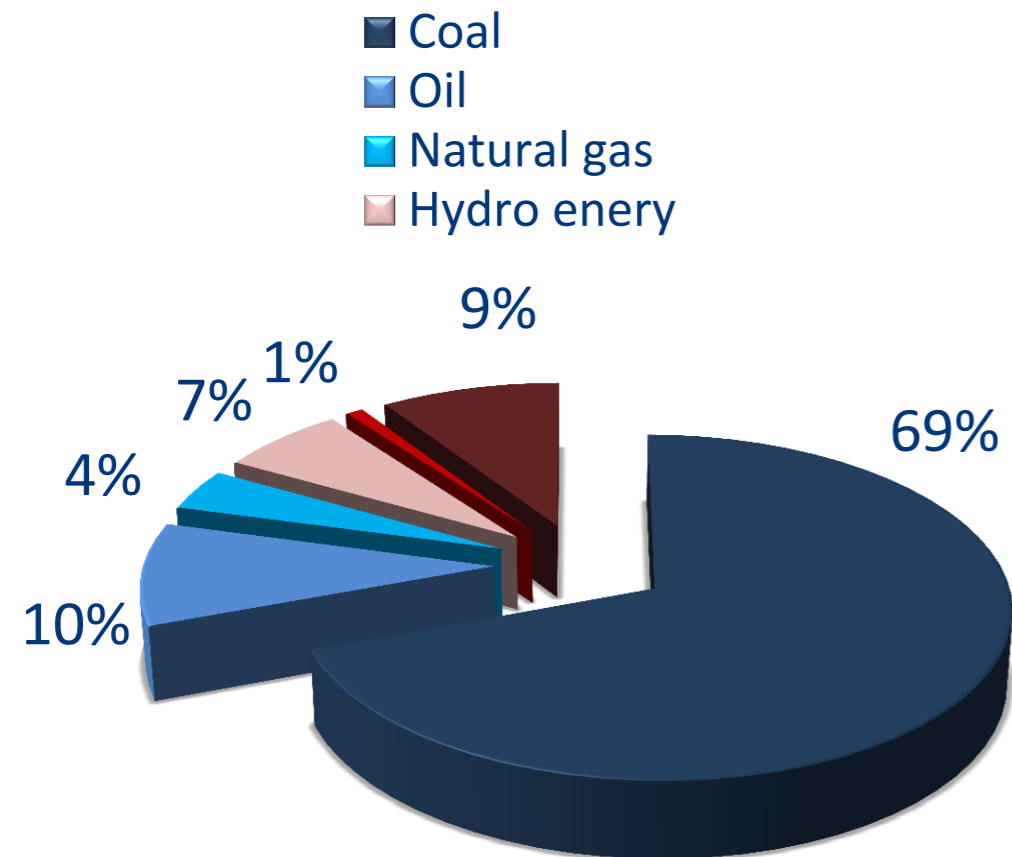
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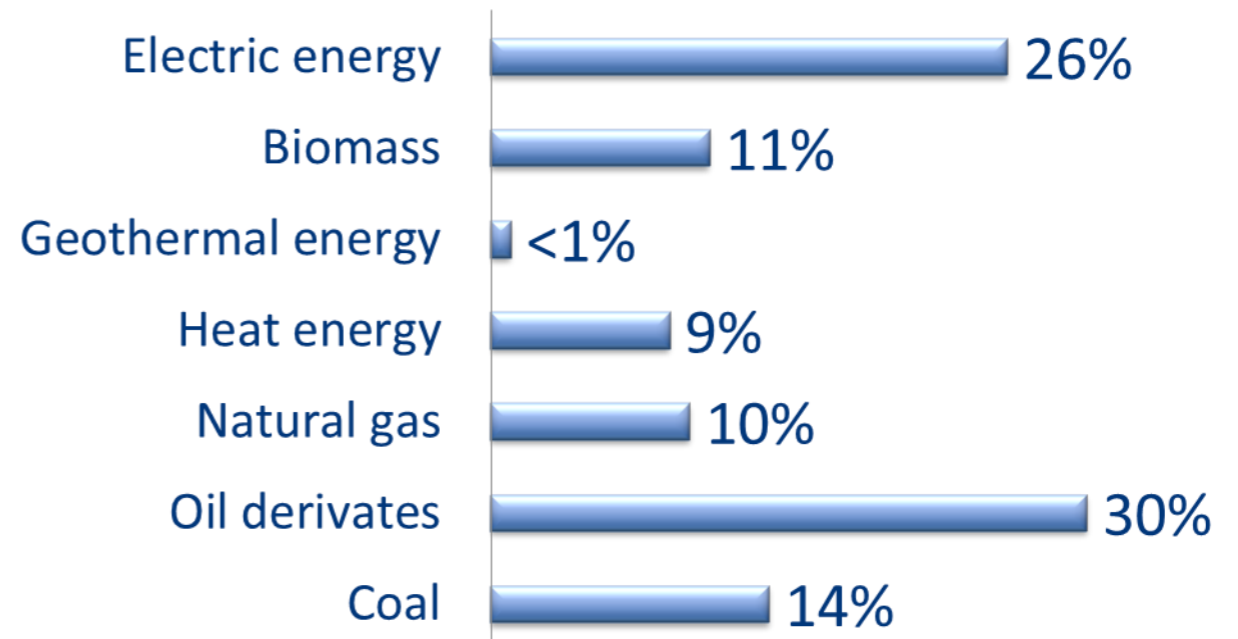


MAIN CHARACTERISTICS OF THE ENERGY SECTOR

Structure of Primary Energy of Production



Structure of Primary Energy of Production



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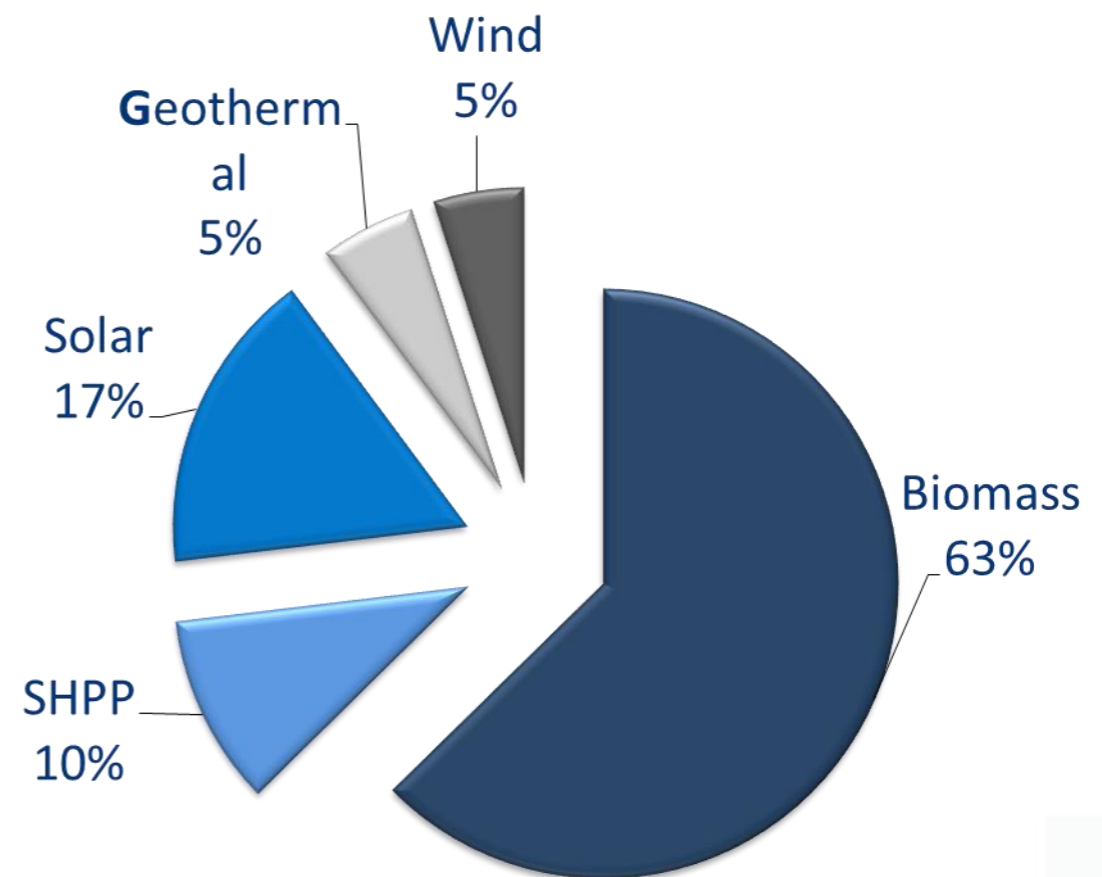


POTENTIAL OF RENEWABLE ENERGY SOURCES

Potential of renewable energy sources

There is substantial potential of RES for annual generation of around 5.6 million toe

Biomass	3.3 Mten
Total Hydro potential	1.7 Mten
Geothermal potential	0.2 Mten
Wind energy	0.2 Mten
Solar energy	0.6 Mten
Total potential:	5.6 Mten



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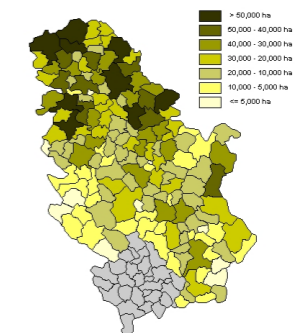
POTENTIAL OF RENEWABLE ENERGY SOURCES

Biomass

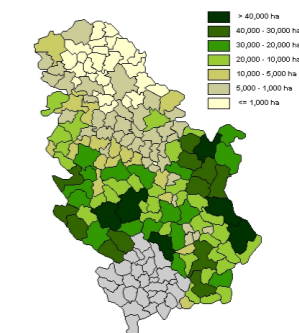
Biomass potential in the Republic of Serbia has been estimated at 3.3 Mtoe and consists of agricultural waste, forestry waste and wood processing industry waste, of which 2.3 Mtoe is untapped, while 1.1 Mtoe is already used.

Number of plants for biomass manufacturing

R.no.	Number of plants	Domestic	International	Total
1.	Briquette machine producers	6	3	9
2.	Pellete machine producers	15	8	13
3.	Boiler producers	14	5	19
4.	Stove producers	6	3	9
5.	Briquette producing plants	21	-	21
6.	Pellet producing plants	32	-	32
7.	Biogas pplants	6	-	6
8.	Biodiesel plants	8	-	8



Обрадиво земљиште у Србији



Површина под шумом у Србији

Obnovljivi izvori energije i energetska efikasnost

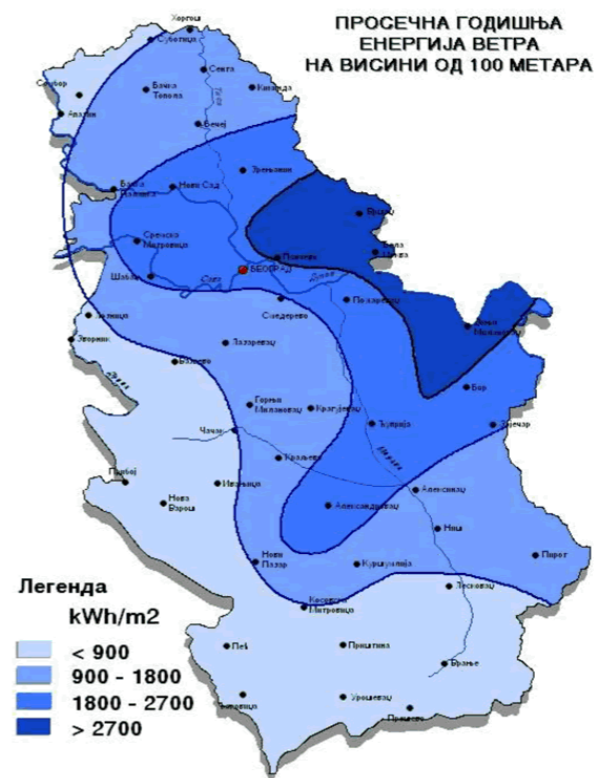




POTENTIAL OF RENEWABLE ENERGY SOURCES

Wind energy

- Technologically justified potential of around **0.2 Mtoe**
- Installed capacity 0.5 MW - 1 investor with the status of privileged electricity producer
- Projects in implementation – 2 investors with temporary with the status of privileged electricity producer for 6 locations with the total installed power of 34,950 MW
- Several private measures
- Officially available data only according to measuring of meteorological stations at altitude of 10m



MEAN WIND ENERGY
AT 100m ABOVE GROUND LEVEL
(ANNUAL)

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POTENTIAL OF RENEWABLE ENERGY SOURCES

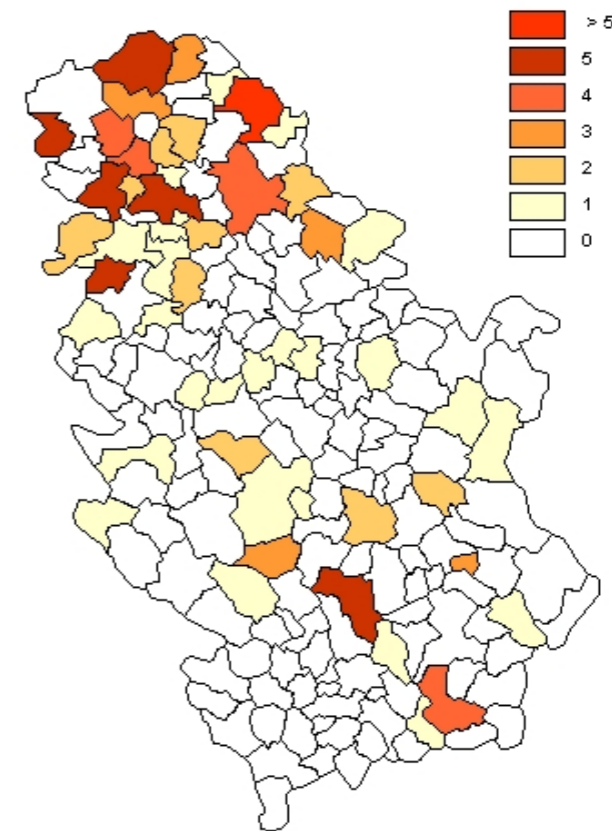
Geothermal springs

Potential of the existing wells (without usage of heat pump) 0.2 Mtoe

- relatively good reseraches
- over 50 sources of capacity >1MW
- Mainly low temperature (30-60° C, rarely up to 80° C)

Current usage

- Very low level and mainly in balneological and leisure purposes



Број геотермалних извора у општинама

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POTENTIAL OF RENEWABLE ENERGY SOURCES

Mini hydro power plants

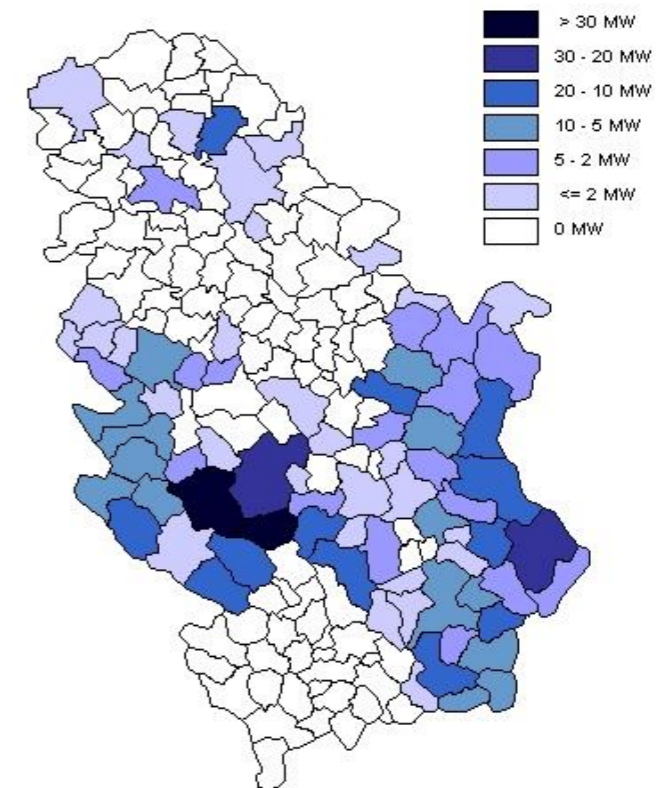
Potential 0.40 Mtoe

- source - MHE Cadastar
- defined locations of near 870

Constructed 42 MHE with the status of privileged electricity producer with the total power of 30,966 MW

Projects under implementation

- I announcement of the Ministry of Mining and Energy of the Republic of Serbia
- Tripartite Memorandum signed with 91 investors for 213 locations
- II announcement of the Ministry of Mining and Energy of the Republic of Serbia
- Tripartite Memorandum signed with 40 investors for 80 locations



Total MW from Small Hydro Power Plants

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POTENTIAL OF RENEWABLE ENERGY SOURCES

Solar energy

potential **0.6 Mtoe** annually

Current utilization

- 6 power plants with the privileged electricity producer with the total installed power of 4.129 KW
- 29 roof-mounted power plants with up to 30kW of the total power of 497kW
- 7 roof-mounted power plants with up to 30-500kW of the total power of 846

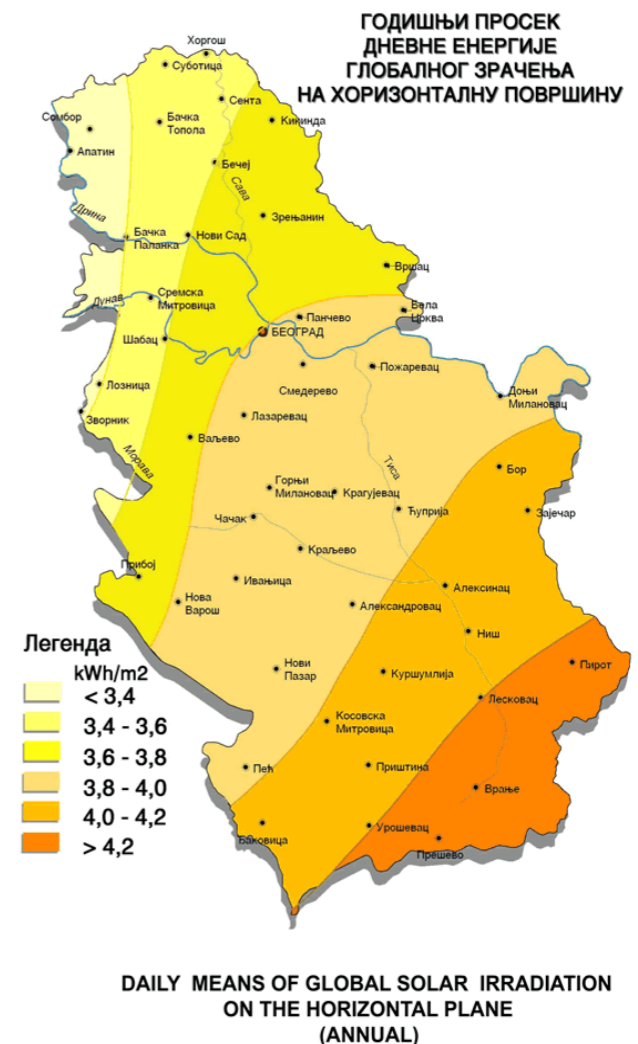
Projects under implementation

- 5 power plants with the privileged electricity producers with the total installed power of 1,871 KW
- 60 roof-mounted power plants with up to 30kW of total power 1,503kW
- 5 roof-mounted power plants with up to 30-500kW of total power of 1,154kW

Solar panels

- Individual

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INTERNATIONAL OBLIGATIONS

Signed Contract on establishing Energy Community - October 2005; Ratified by the Assembly of the Republic of Serbia – July 2006

- 2009/28/EC Directive on Renewable Energy Sources sets up binding national targets by which 20% share of RES in final energy consumption of the EU has to be achieved by 2020
- Decision by the Ministerial Council of the Energy Community as of 18 October 2012 (D/2012/04/MS-EC) - defined a binding target for the Republic of Serbia by 2020:**

27% RES in GFEC (with 21.2% in 2009)

10% RES in FEC in transport

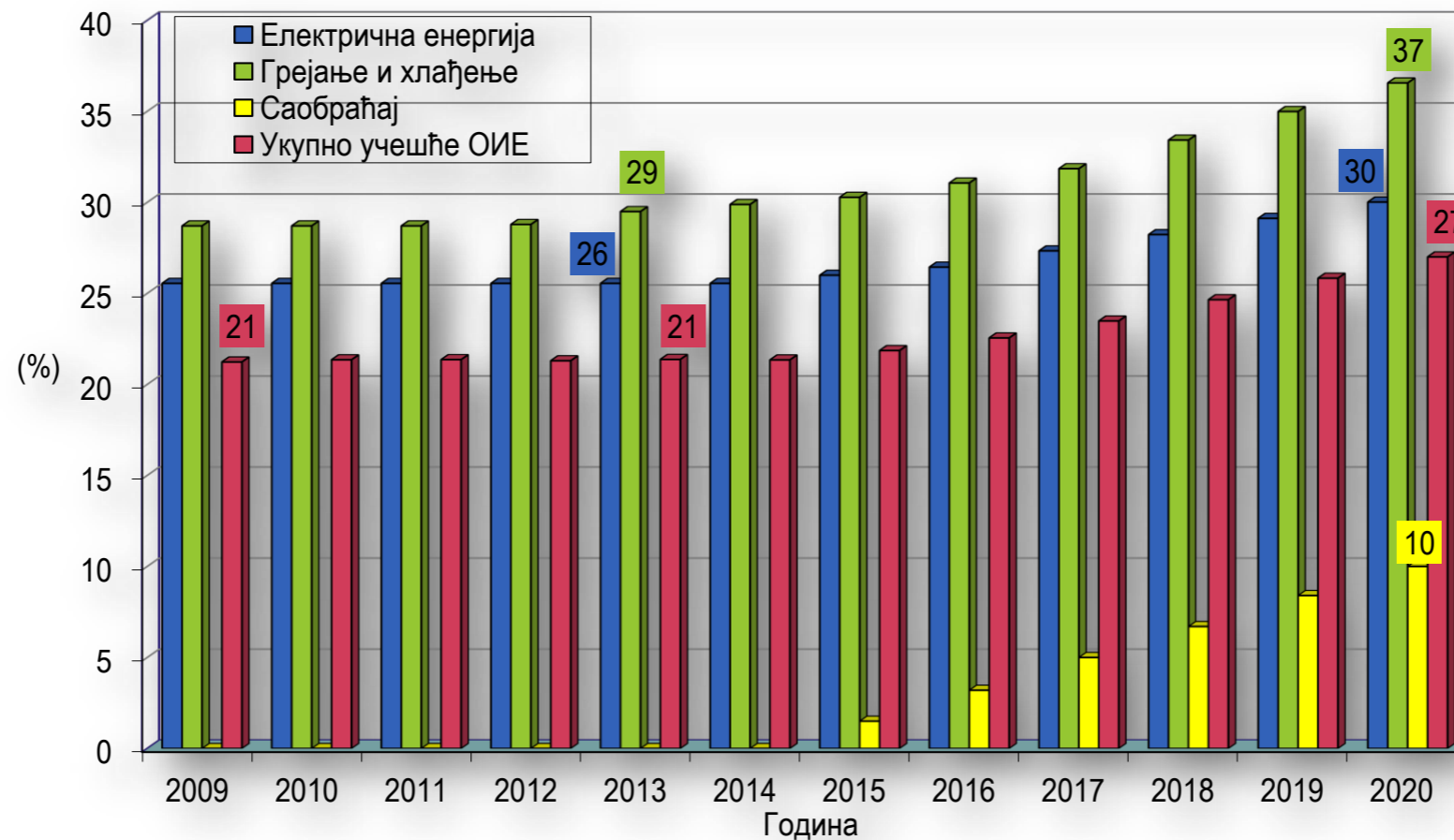
NAPRES of the Republic of Serbia was elaborated in accordance with the model stipulated by Directive 2009/28/EC (Decision 2009/548/EC) and shows basic policy of the Republic of Serbia as well as the goal and ways for implementing measures by sectors in the field of RES by 2020





DYNAMIC OF ACHIEVING THE GOALS BY 2020

By sectors: electricity, heating and cooling and transport



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ELECTRICITY GENERATION FROM RES NEW PLANTS UNTIL 2020

Estimated financial resources for each technology using RES in electricity generation for achieving the planned shares from new facilities until 2020 in the electric power sector

Types of RES	(MW)	(GWh)	Specific investment costs* (€/ kW)	Price as per planned installed capacity until 2020 (million €)
HPP (over 10 MW)	250	1108	1819	454.8
SHPP (up to 10 MW)	188	592	2795	525.5
Wind Power Plants	500	1000	1417	708.5
Solar Power Plants	10	13	2500	25.0
Biomass – CHP power plants	100	640	4522	452.2
Biomass (manure) – CHP power plants	30	225	4006	120.2
Geothermal Energy	1	7	4115	4.1
Waste	3	18	4147	12.4
Landfill gas	10	50	2000	20.0
TOTAL planned capacity	1092	3653	-	2,322.6



HEAT GENERATION FROM RES NEW PLANTS UNTIL 2020

Tabela 1b: Estimated financial resources for each technology using RES in heat production for achieving the planned energy shares from new capacities until 2020, in the heating and cooling sector

Types of RES	(ktoe)	Specific investment costs (€/kWt)	Investment costs (million €)
Biomass – heat from CHP plant	45	Included through costs in the electricity sector (Table 9a)	Included in investment costs in the electricity sector (Table 9a)
Biomass (DHS)	29	400*	37.52
Biogas (manure) – heat from CHP plant	10	Included through costs in the electricity sector (Table 9a)	Included in investment costs in the electricity sector (Table 9a)
Geothermal energy	10	1500*	29.08
Solar energy	5**	930***	43.6
Biomass in individual households	50	250*	44.87
TOTAL	149	-	155.0

*Source – Financing Renewable Energy in the European Energy Market, Page 14 (Ecofys 2011 by order of:European Commission, DG Energy)

**1,5 ktoe for the hot sanitary water in hospitals; 3,5 ktoe for heating consumable hot water in households.

***Price expresses per m² of solar collectors, Source – Financing Renewable Energy in the European Energy Market, Page 14 (Ecofys 2011 by order of:European Commission, DG Energy)



RES REGULATIONS

Bylaws

With the aim to stimulate investments in RES sector, Serbia has passed several bylaws relating to measures and ways of subsidizing RES electricity producers:

- Regulation on conditions and procedures for acquiring the status of privileged electricity producer
- Regulation on incentives for privileged electricity producer
- Rulebook on energy permits
- Contract models (RRA)
- Rulebook on origin guarantee
- Regulation on fees for RES (0.081 RSD/kWh)

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REGULATIONS STIPULATING HIGHER USAGE OF RES

Incentives for privileged electricity producers

A set of incentives for privileged electricity producers ensures:

- temporary status of privileged electricity producer for investors in solar and wind power plants,
- contract with public supplier for 12 years on purchasing electricity
- privileged price stipulated by Regulation
- exemption of balance responsibility
- obligatory repurchase of all produced electricity by public supplier
- Price adjustment on annual level for inflation value in euro
- Purchase of complete production after the expiry of subsidized period according to market terms

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INCENTIVES FOR PRIVILEGED ELECTRICITY PRODUCERS

Table: According to the Article 13 of the Decree on Incentives for Privileged Electricity Producers ("Official Gazette of the RS," No. 8/13) the "feed-in tariffs" amount to:

Item No.	Type of power plants	Installed power P (MW)	Feed-in tariff (c€/kWh)
1.	Hydro power plants		
1.1		up to 0.2	12.40
1.2		0.2 – 0.5	13.727-6.633* P
1.3		0.5 - 1	10.41
1.4		1 - 10	10.747-0.337* P
1.5		10 - 30	7.38
1.6	Using existing infrastructure	up to 30	5.9
2.	Biomass power plants		
2.1		up to 1	13.26
2.2		1 - 10	13.82 – 0.56*P
2.3		over 10	8.22



INCENTIVES FOR PRIVILEGED ELECTRICITY PRODUCERS

Item No.	Type of power plants	Installed power P (MW)	Feed-in tariff (c€/kWh)
3.	Biogas power plants		
3.1		up to 0.2	15.66
3.2		0.2 - 1	16.498 – 4.188*P
3.3		over 1	12.31
3.4	Plants fired by biogas from animal origin waste		12.31
4.	Landfill and sewage gas power plant		6.91
5.	Wind power plants		9.20
6.	Solar power plants		
6.1	roof-mounted	up to 0.03	20.66
6.2	roof-mounted	0.03 – 0.5	20.941 – 9.383*P
6.3	ground-mounted		16.25

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INCENTIVES FOR PRIVILEGED ELECTRICITY PRODUCERS (2)

Item No.	Type of power plants	Installed power P (MW)	Feed-in tariff (c€/kWh)
7.	Geothermal power plants		
7.1		up to 1	9.67
7.2		1 – 5	10.358-0.688*P
7.3		over 5	6.92
8.	Waste fuelled power plants		8.57
9.	Coal fired CHP power plants	up to 10	8.04
10.	Natural gas fired CHP power plants	up to 10	8.89

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TEMPORARY STATUS OF A PRIVILEGED ELECTRICITY PRODUCER

Energy Law passed in 2011

- For solar and wind power plants

Documents required

- Valid building permit
- Proof of the provided monetary deposit or a bank guarantee in the amount of 2% of the investment value
- A part of the technical documentation, which is an integral part of the decision on the building permit, including the economic and financial analysis of the project, i.e. investment value

With solar power plants, the price of the first 10 MW is guaranteed, as follows:

- Roof-mounted solar power plants, total power of up to 4 MW
- Ground-mounted solar power plants, total power of up to 6 MW

With wind power plants, the price is guaranteed for first 450 MW.

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OVERVIEW OF THE DECISIONS ISSUED TO PRIVILEGED ELECTRICITY PRODUCERS AND THOSE WITH A TEMPORARY STATUS

Status	Type	Installed capacities (kW)	Number of power plants
Privileged		50.806	95
	Biogas	4.862	5
	Co-generation	9.007	5
	MHEPP	30.966	42
	PV	4.129	6
	Roof-mounted PV up to 30 kW	497	29
	Roof-mounted PV 30 - 500 kW	846	7
	Wind	500	1

Status	Type	Installed capacities (kW)	Number of power plants
Temporary status of a privileged producer		39.979	74
	PV	1.871	5
	Roof-mounted PV up to 30 kW	1.503	60
	Roof-mounted PV 30 - 500 kW	1.154	5
	Wind	35.450	4

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PROCEDURE FOR BUILDING PLANTS AND PERFORMING ACTIVITY

For implementation of a project for building and operation of plants for production of electricity from renewable energy sources, an investor acquire the following rights:

- The right to build;
- The right to produce electrical/thermal energy

For acquiring the right to build and building a facility, it is necessary to obtain:

- Information on the location;
- Energy permit;
- Location permit;
- Building permit;
- Operating permit.

To acquire the right to produce electric/thermal energy, it is necessary to obtain the following:

- Acquire the right to exploit natural resources
- License for energy-related activity;
- Approval for the connection to the electricity network;
- Acquire the status of a privileged electricity producer;
- Power purchase agreement.





GUIDES FOR INVESTORS

The Guides specify all the complex procedures for building plants and performing the activity of electricity generation from specific RES, with reference to the relevant regulations and quoting the competent institutions.

The Guides are intended for investors and experts engaged in project development.

The Guides for:

- CONSTRUCTION OF PLANTS AND ELECTRICITY/HEAT GENERATION FROM BIOMASS
- CONSTRUCTION OF PLANTS AND ELECTRICITY GENERATION IN SMALL POWER PLANTS
- CONSTRUCTION OF PLANTS AND ELECTRICITY GENERATION IN WIND POWER PLANTS
- CONSTRUCTION OF PLANTS AND ELECTRICITY/HEAT GENERATION FROM GEO-THERMAL SPRINGS
- CONSTRUCTION OF PLANTS AND ELECTRICITY GENERATION IN SOLAR POWER PLANTS
- CONSTRUCTION OF SOLAR HEATING SYSTEMS

The Guides can be downloaded at <http://www.mre.gov.rs/cir/dokumenti-list/89/127>

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PROJECT: ELIMINATION OF BARRIERS FOR ACCELERATED BIOMASS DEVELOPMENT

Aim of the project: Increased share of renewable energy sources in electricity generation in Serbia

Budget: 2.845 mil US\$ GEF, 0.31 mil US\$ UNDP, 27.32 mil US\$ co-financing

Period: 4 years

Formal beginning of the project: October 2014

GEF/UNDP

Implementation partners:

- Ministry of Mining and Energy – Agreement on joint implementation of the project with UNDP
- Ministry of Agriculture and Environmental Protection

Institutions and organizations participating in the project

- Chamber of Commerce and Industry of Serbia
- Institute for Standardization
- Permanent Conference of Towns and Municipalities of Serbia
- Regional Development Agency Srem

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PROJECT: ELIMINATION OF BARRIERS FOR ACCELERATED BIOMASS DEVELOPMENT

Successfully funded, built and operated 6 plant on biomass

- Total value of grants: 1.6 mil US\$
- Number of projects: 6
- Types of projects: CHP plants up to 1 MWe for agricultural/forest biomass
- Grants allocated based on the public invitation to be announced by the Ministry of Mining and Energy
- Focus on private investors
- Individual grants up to 20% of the investment value.

At least another 12 projects supported through the technical support

- Technical support includes elaboration of studies and/or parts of technical documentation

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EXAMPLES OF GOOD PRACTICE IN THE REPUBLIC OF SERBIA

Victoria Group has created a system in which it has combined production of pesticides, seeds, fertilizers, then silos, kilning facilities, processing, finishing, all the way to end buyers and farms.

Current boiler plants in Victoria Group:

- Boiler plant on biomass in Victoria Oil Šid fueled by sunflower husk, capacity – 15 t/h (p=12 bar)
- Boiler plant in Sojaprotein Bečej fueled by straw, capacity – 15 t/h (p=13 bar)
- Boiler plant in Victoria Oil Šid fueled by sunflower husk, capacity – 25 t/h (p=13 bar)
- Boiler plant in Sojaprotein Bečej fueled by straw pellet, capacity – 25 t/h (p=47 bar)
- Boiler plant in Victoria Starch fueled by straw pellet, capacity – 2x25 t/h (p=14 bar)
- Plant for pellet production, capacity– 6-8 t/h raw materials: straw (cereals, soybean, maize stalks) Biodiesel factory, capacity – 100.000 t/y.
- Straw storage – Victoria Logistic

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EXAMPLES OF GOOD PRACTICE IN THE REPUBLIC OF SERBIA

Biogas plant owned by the company „Sava Kovačević“.

Plant in the total value 5.5 million EUR was funded by the company *Mirotin-Energo* from Vrbas, with the installed capacity of 1 MWe and 1 MWth, with the expected annual generation of d 8 GWh electricity and 8 GWh heat.

The plant started its operation in October 2012.

Biogas plant on the farm for milk production in Čurug (The Province of Vojvodina), which uses liquid manure and maize silages for generation of heat and electricity. The installation has the electric capacity of 635 kW, and the plant started its operations in January 2013.

The project was implemented by the company *Velvet Farm* which manages the farm, within the company for animal feed production *Global Seeds*.

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PRIVREDNA KOMORA SRBIJE
CHAMBER OF COMMERCE AND INDUSTRY OF SERBIA

ABOUT THE CHAMBER OF COMMERCE AND INDUSTRY OF SERBIA

Chamber of Commerce and Industry of Serbia is an independent, modern and responsible non-budgetary institution, a national association of all Serbian businesspeople, which serves the best interests of its members and the Serbian economy, owing to its tradition, experience and knowledge. Our key commitment is to make Serbia visible as a market economy country, with investment opportunities, open borders, and ready to join the European trends in a competitive way.

A century and a half of the Serbian chamber system tradition and the developed chamber network, Representative Offices abroad, are the guarantor of efficient implementation of the support mechanisms for the economy and businesspeople in their activities.

We have been and will remain your responsible partner and support to your business through:

- Representing interests of our members before the governmental bodies and institutions
- Exercising public powers by issuing various documents
- Upgrading international economic cooperation
- Promoting the economy in the country and abroad
- Disseminating business information to our members
- Consultancy services
- Business education
- Fostering good business practice and business ethics
- Work of Courts and Arbitration hosted by CCIS



Belgrade, 23 September 2014



PRIVREDNA KOMORA SRBIJE
CHAMBER OF COMMERCE AND INDUSTRY OF SERBIA

ABOUT THE CHAMBER OF COMMERCE AND INDUSTRY OF SERBIA

Group for renewable energy sources and energy efficiency within the CCIS Association of Energy and Energy Mining

It was established by the Decision of the Board of the Association of Energy and Energy Mining, No.15-124/50, of 12 December 2002

Work in the Group is carried out through the following Sections:

- Section for MHPP
- Section for wind energy
- Section for solar energy
- Section for geothermal energy
- Section for biomass and waste
- Section for energy efficiency
- Section of the producers of pellets and briquettes based on biomass and producers of thermal technical plants and equipment



Belgrade, 23 September 2014



PRIVREDNA KOMORA SRBIJE
CHAMBER OF COMMERCE AND INDUSTRY OF SERBIA

ABOUT THE CHAMBER OF COMMERCE AND INDUSTRY OF SERBIA

Members of the Group:

companies (registered for electricity and heat generation, equipment producers , project design organizations....)

Scientific institutions

Representatives of government agencies (line ministries, regulatory agencies)

Distinguished individuals in the area of RES

The group has 30-50 members per Section



Belgrade, 23 September 2014



PRIVREDNA KOMORA SRBIJE
CHAMBER OF COMMERCE AND INDUSTRY OF SERBIA

ABOUT THE CHAMBER OF COMMERCE AND INDUSTRY OF SERBIA

Group for RES and Energy Efficiency within the CCIS Association of Energy and Energy Mining

All these years, following the global trends and objectives of the energy policy of our country, CCIS (Group for RES and Energy Efficiency) has participated actively and organized a great number of seminars, lectures, training sessions, international gatherings and symposia , aimed at education of economic entities and individuals.

In addition, it organized international business – economic meetings and assisted in establishing business contacts, exchange of experiences in the areas relating to energy efficiency, RES and environmental protection, with the aim to promote and support the strategy for sustainable development.

CCIS has administrative and professional services, which cover a great number of industries, professional and scientific fields; the experts who cover these fields traditionally give a large contribution with their proposals. This is very important for investors, because at one place they can get legal advice , consulting service and operational assistance in the finalization of the planned investment.



Belgrade, 23 September 2014



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