Generation of Electrical Energy from Solar Energy: Lessons of Experience from Slovenia Case

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Introduction

- There is need to increase the share of renewable energy in the total energy balance of the community.

- Renewable energy sources such as water energy, solar energy, wind energy, biomass, continue to set record levels for investment.

- This paper gives an overview of legislation development and constructed solar power plants in Slovenia.

- Described situation has some defectiveness, while conclusions could be applied in some countries where an increased economy level is about to start (for example Bosnia and Herzegovina).

Contents of presentation

1. Development of legislation for RES support
2. Directive 2009/28/EC
3. Slovenian case
4. Current situation in Bosnia and Herzegovina
5. Conclusions

Development of legislation

- In the recent years we have witnessed an extensive development of EU legislation for RES support.

- The EU possesses neither strategic reserves of oil and natural gas nor has a control over such reserves in the world.

- EU wants to have the leading role in the field of reduction of human impact on climate changes, i.e. the GHG emission reduction.

- 1997: 12 % of its overall energy consumption and 22.1 % of electricity consumption by RES till year 2010.

Development of legislation

- The EU expansion in 2004: 21 % of electricity should be produced from RES.

- On 23 April 2009 the new RES Directive 2009/28/EC on the promotion of the use of energy from renewable sources, was adopted.

- It requires the meeting of 20 % of the overall EU gross final energy consumption by RES till 2020 and for this purpose defines binding national targets that were set on the basis of different basic values for each of the EU Member States.

- On this basis the Member States adopted in 2010 their RES-AP.

Development of legislation

ANNEX I

National overall targets for the share of energy from renewable sources in gross final consumption of energy in 2020 (1)

A. *National overall targets*

	Share of energy from renewable sources in gross final consumption of energy, 2005 (S_{2005})	Target for share of energy from renewable sources in gross final consumption of energy, 2020 (S_{2020})
Belgium	2,2 %	13 %
Bulgaria	9,4 %	16 %
Portugal	20,5 %	31 %
Romania	17,8 %	24 %
Slovenia	16,0 %	25 %
Slovak Republic	6,7 %	14 %
Finland	28,5 %	38 %

Slovenian case

- In order to provide for better energy efficiency and environmental sustainability, the Government of RS in 2004 adopted the Resolution on the National Energy Programme (ReNEP).

- The National Energy Programme 2004-2010 (NEP-I) sets up the long-term development targets and orientations of energy systems and energy supply in the RS.

- The Renewable AP (2010) is an implementing act laying down the sectorial targets and measures to achieve the national target regarding the share of RES in the national gross final energy consumption in 2020.

Slovenian case

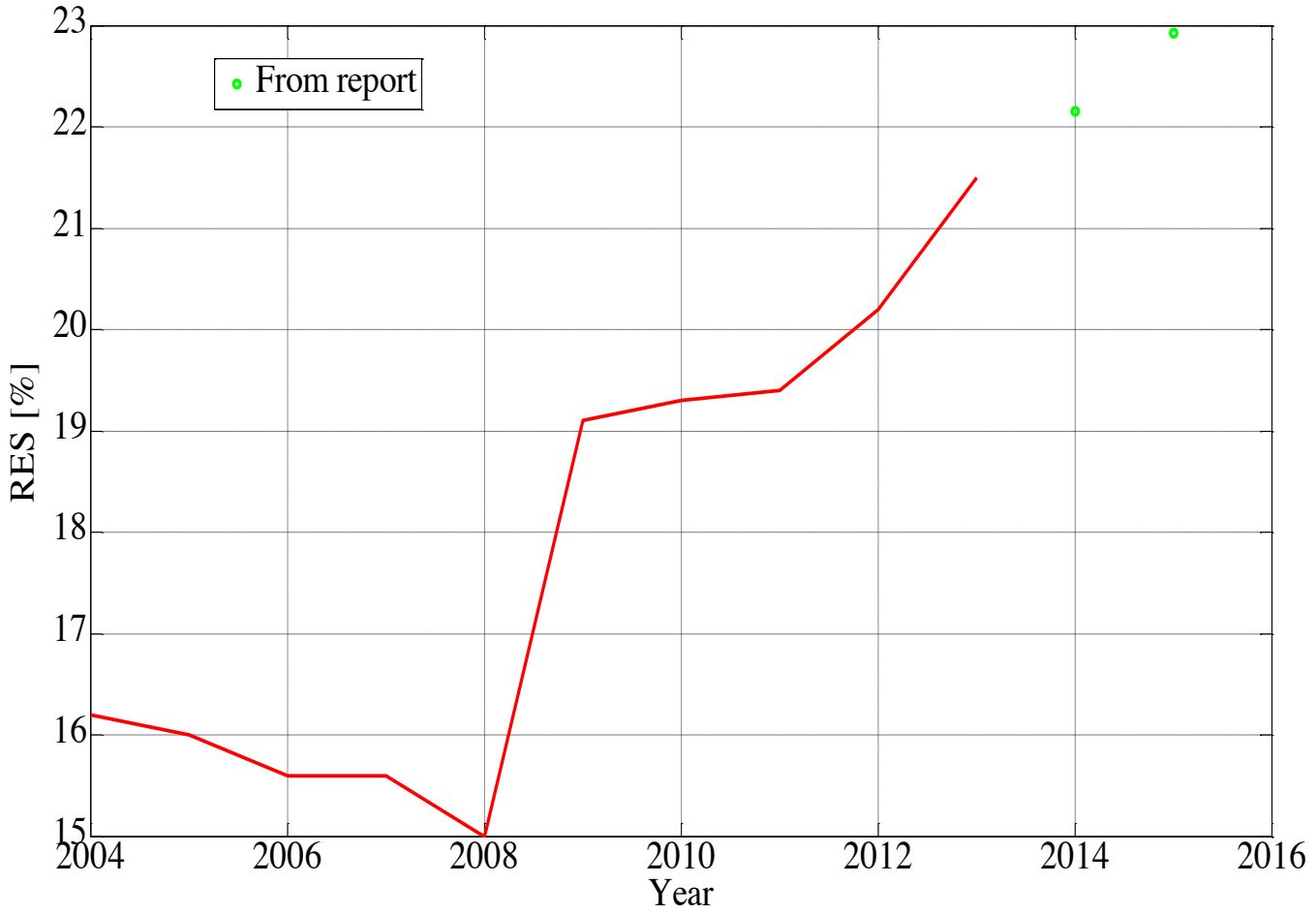
- The ministry responsible for energy stared the preparation of a new National Energy Programme (NEP-II) already in 2009 with the aim to replace the existing one (ReNEP 2004, NEP-I) in 2010 and to define the energy policy objectives until 2030…???

- The new Energy Act (EA-1) was adopted by the National Assembly of the Republic of Slovenia (2014).

- The Energy Concept of Slovenia (ECS) is the basic development document in the field of energy that on the basis of EA-1. The principal goals of ECS are reduction of energy related GHG emissions for at least 40 % until 2035 with regard to the level of 1990 and their further reduction for at least 80 % until 2055 with regard to the level of 1990.

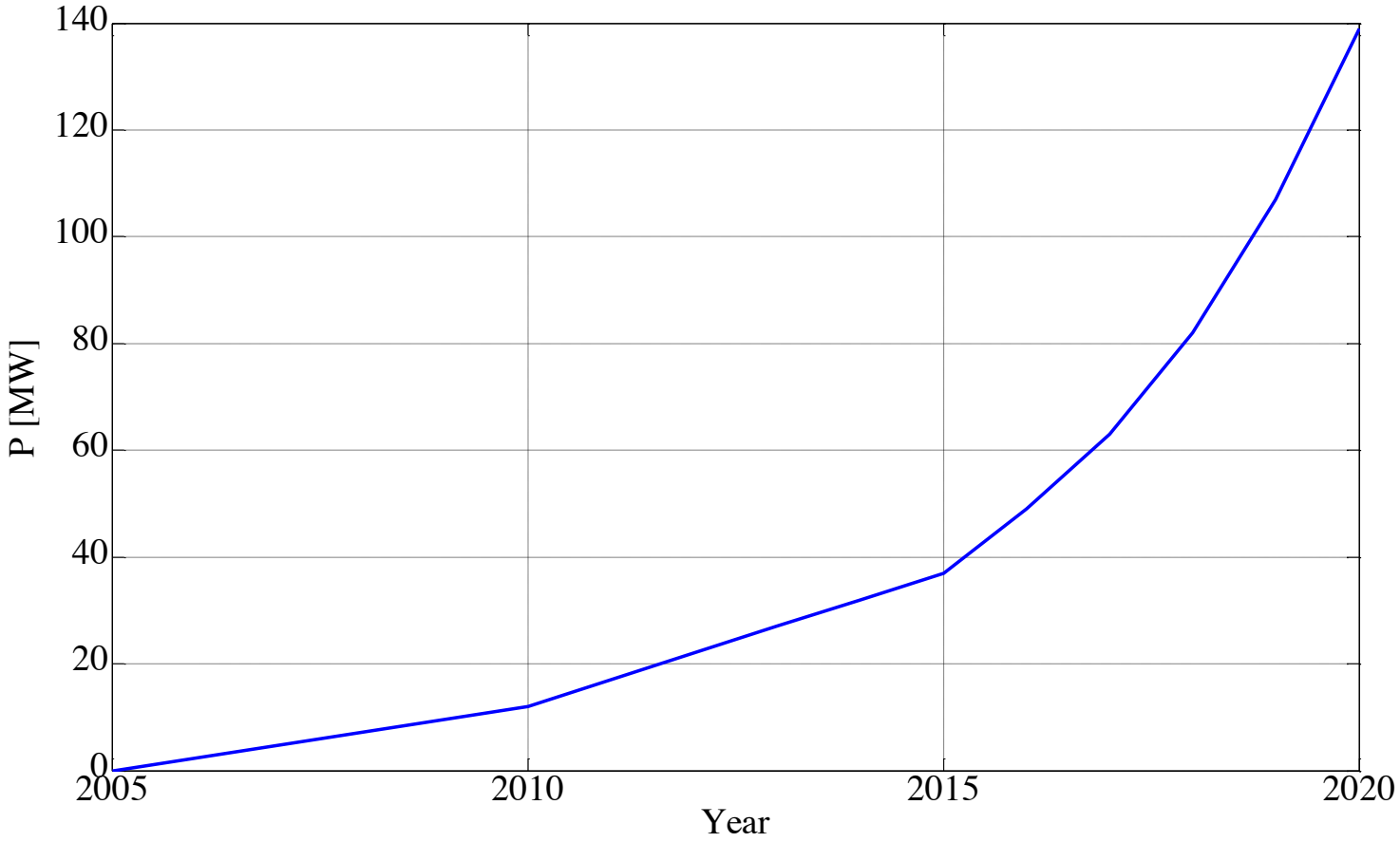
Slovenian case

The share of RES in the gross final energy consumption:



Slovenian case - SPP

Solar power plants & Slovenian renewable AP:



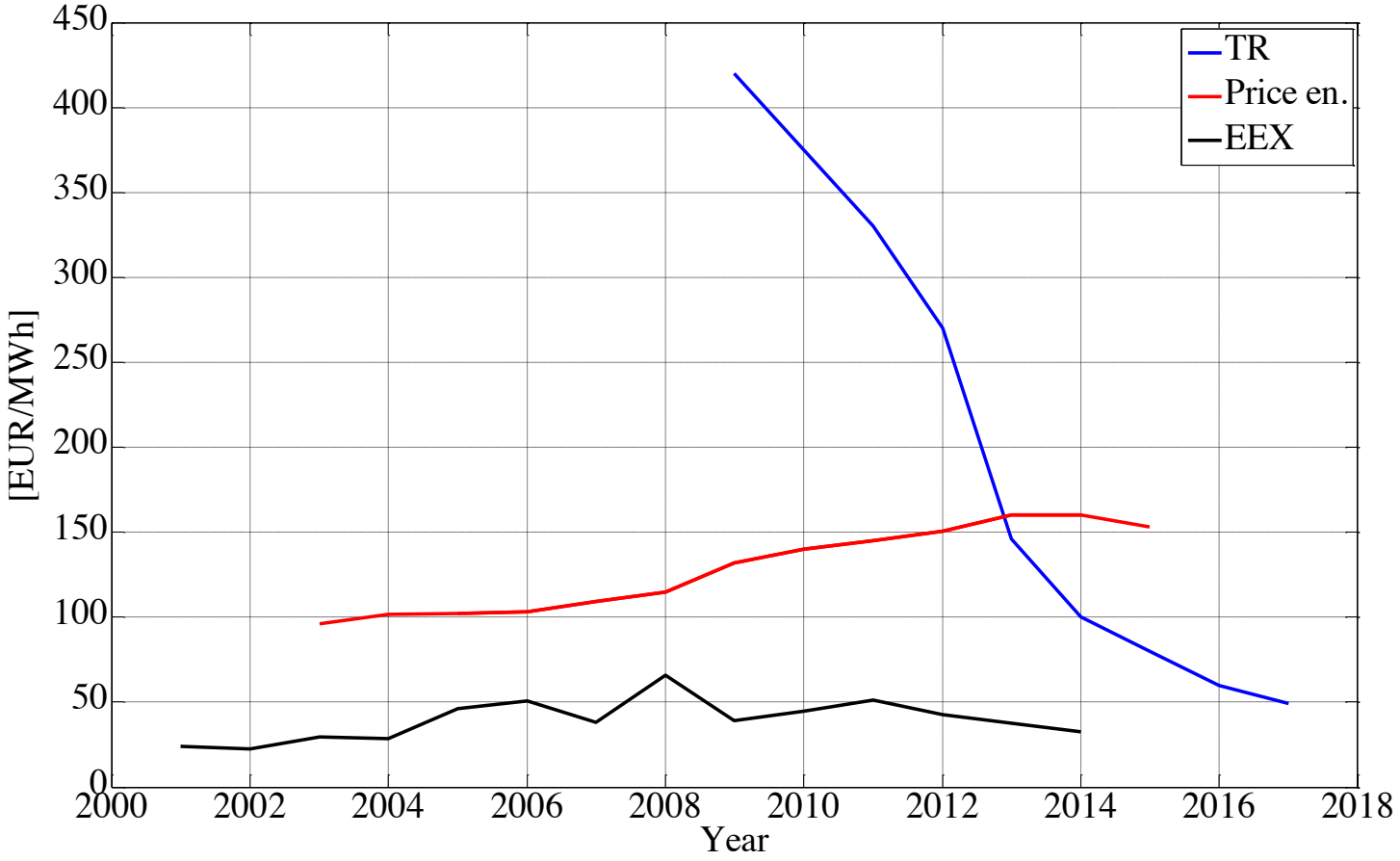
Slovenian case

- The most common support schemes for increasing the share of RES are various tariff systems that proved to be very effective not only in Europe but also in other parts of the world.

- Such tariff systems are in most cases either a feed-in tariff system with fixed purchasing price for electricity produced or a system that provides an additional premium to the market price that the producers achieve in the electricity market.

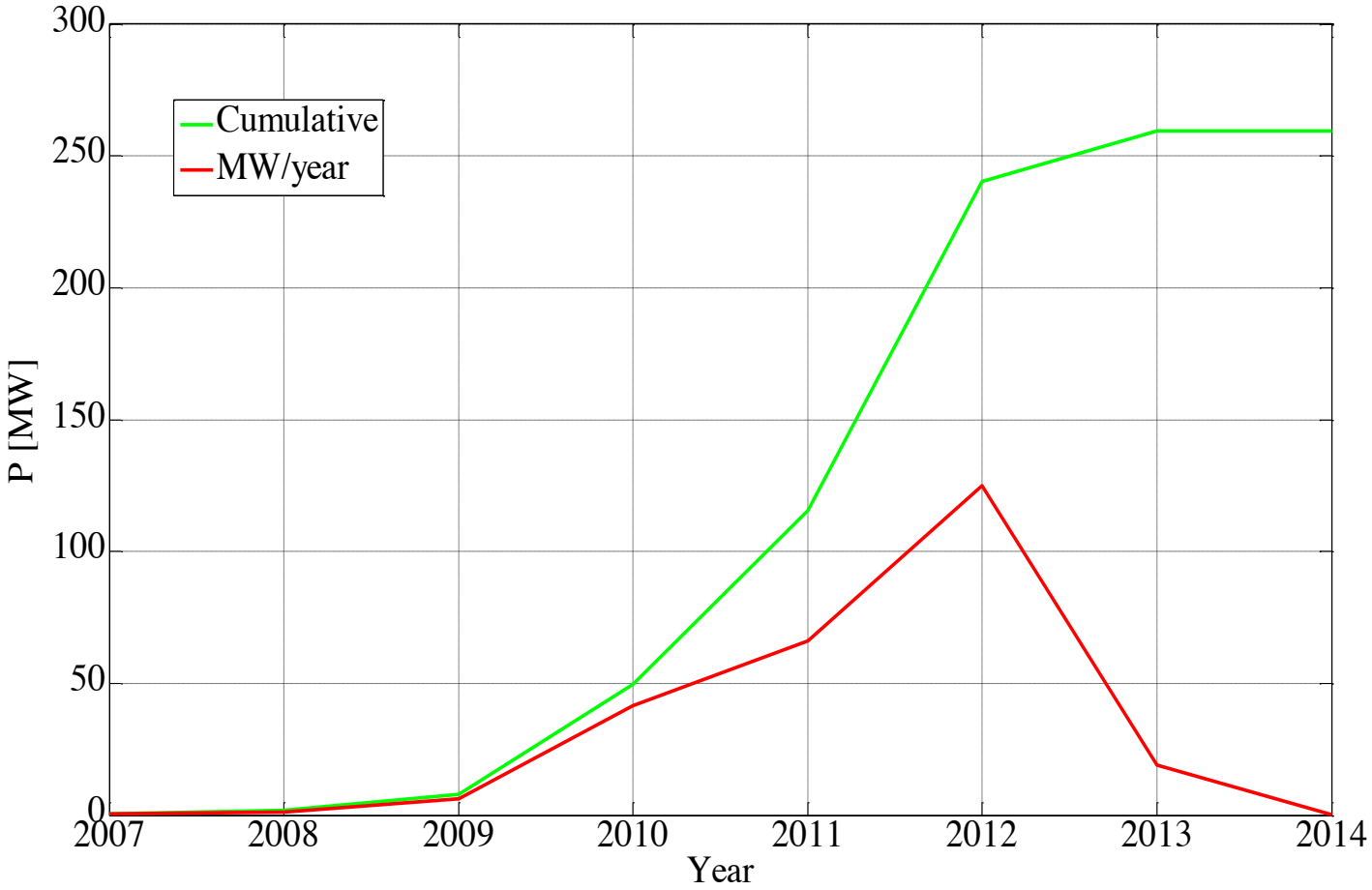
Slovenian case - SPP

Price of electricity including all associated duties for a typical household customer, EEX conditions and the TR:



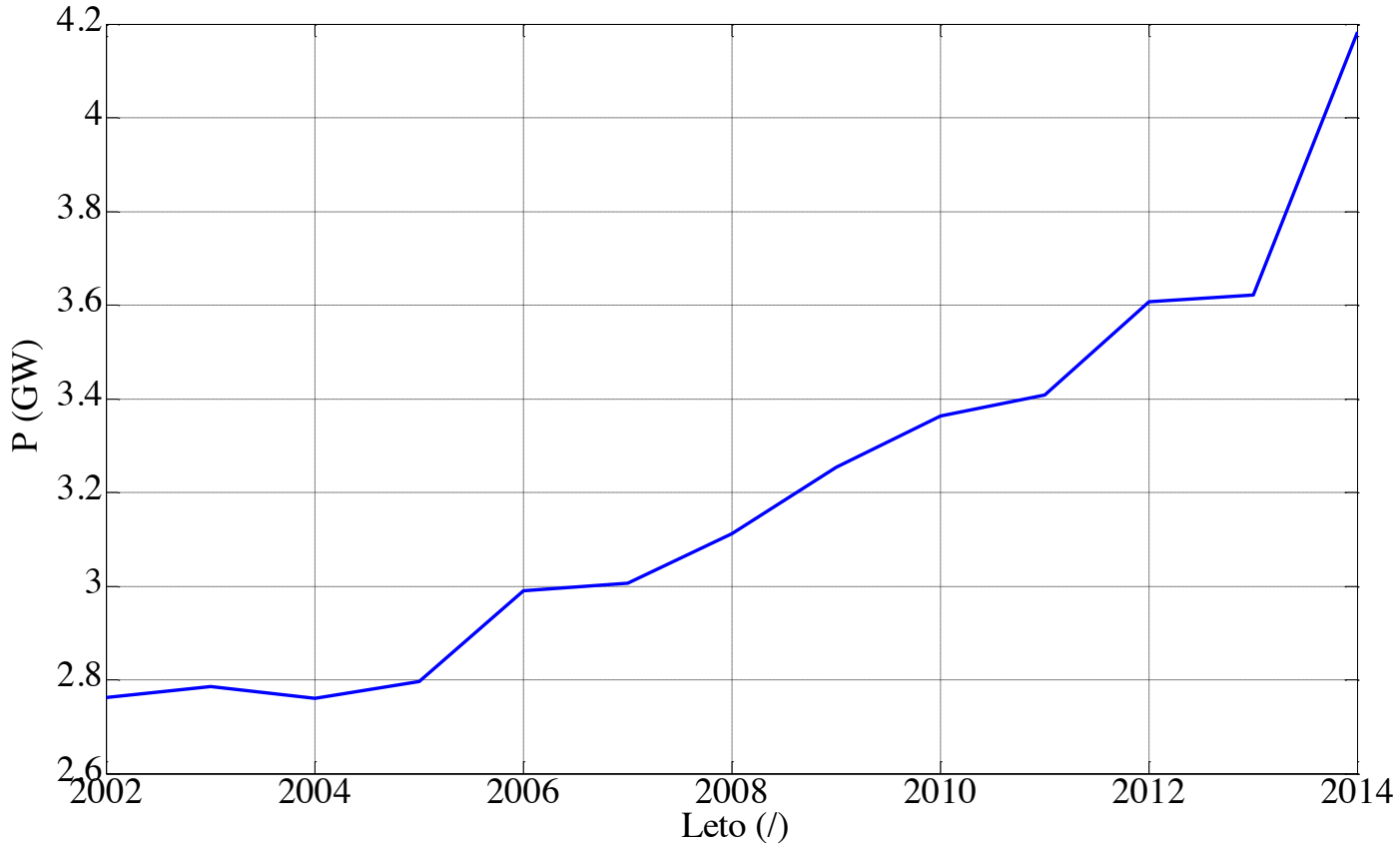
Slovenian case - SPP

Solar power plants (2007 – 2014):



Slovenian case - SPP

- Total (installed) power (2002 – 2014)
- SPP (6 – 7 %), SPPw (1 – 2 %)



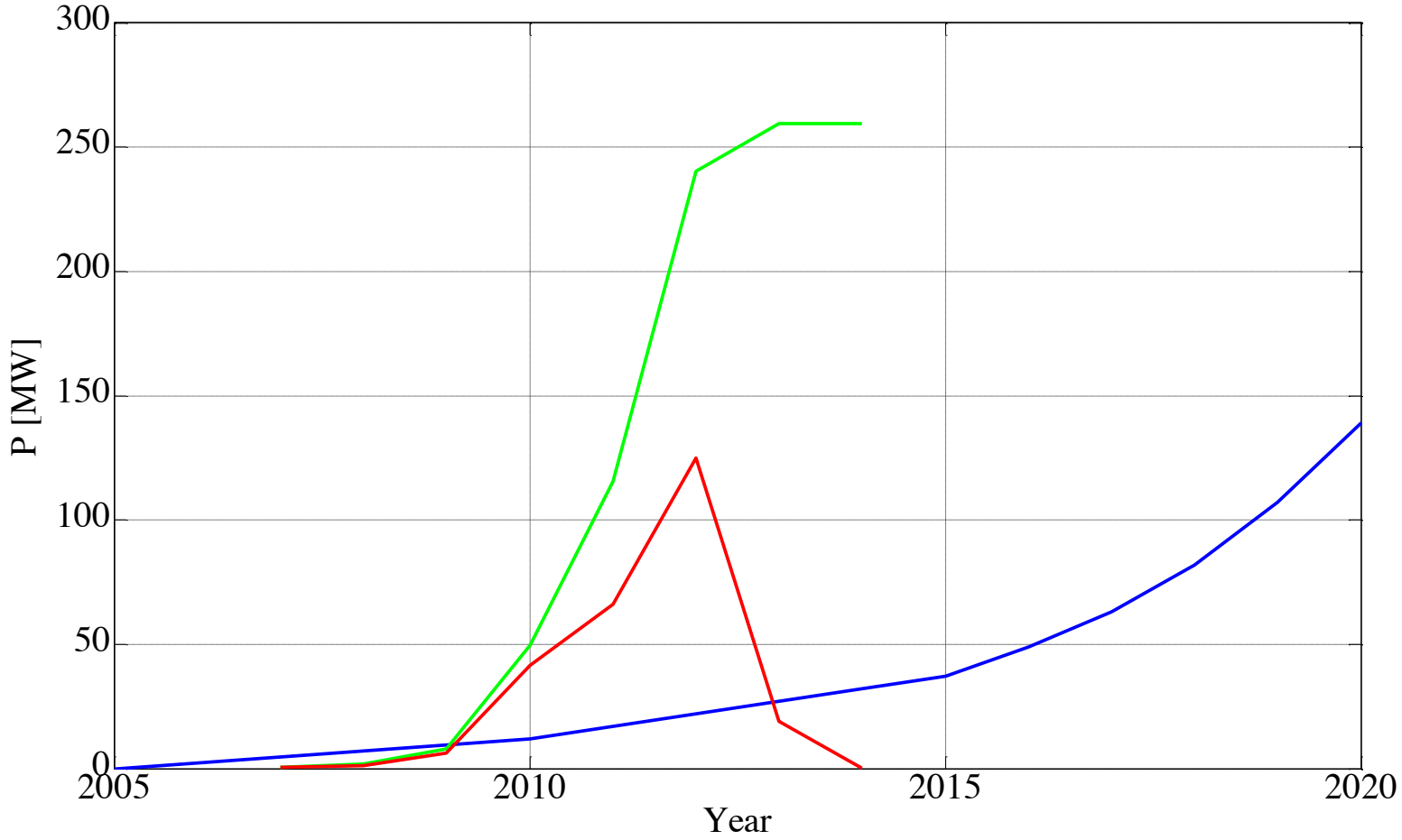
W_{2014}:
12.72 TWh

$W_{small,2014}$:
1.184 TWh

$P_{small,2014}$:
0.565 GW

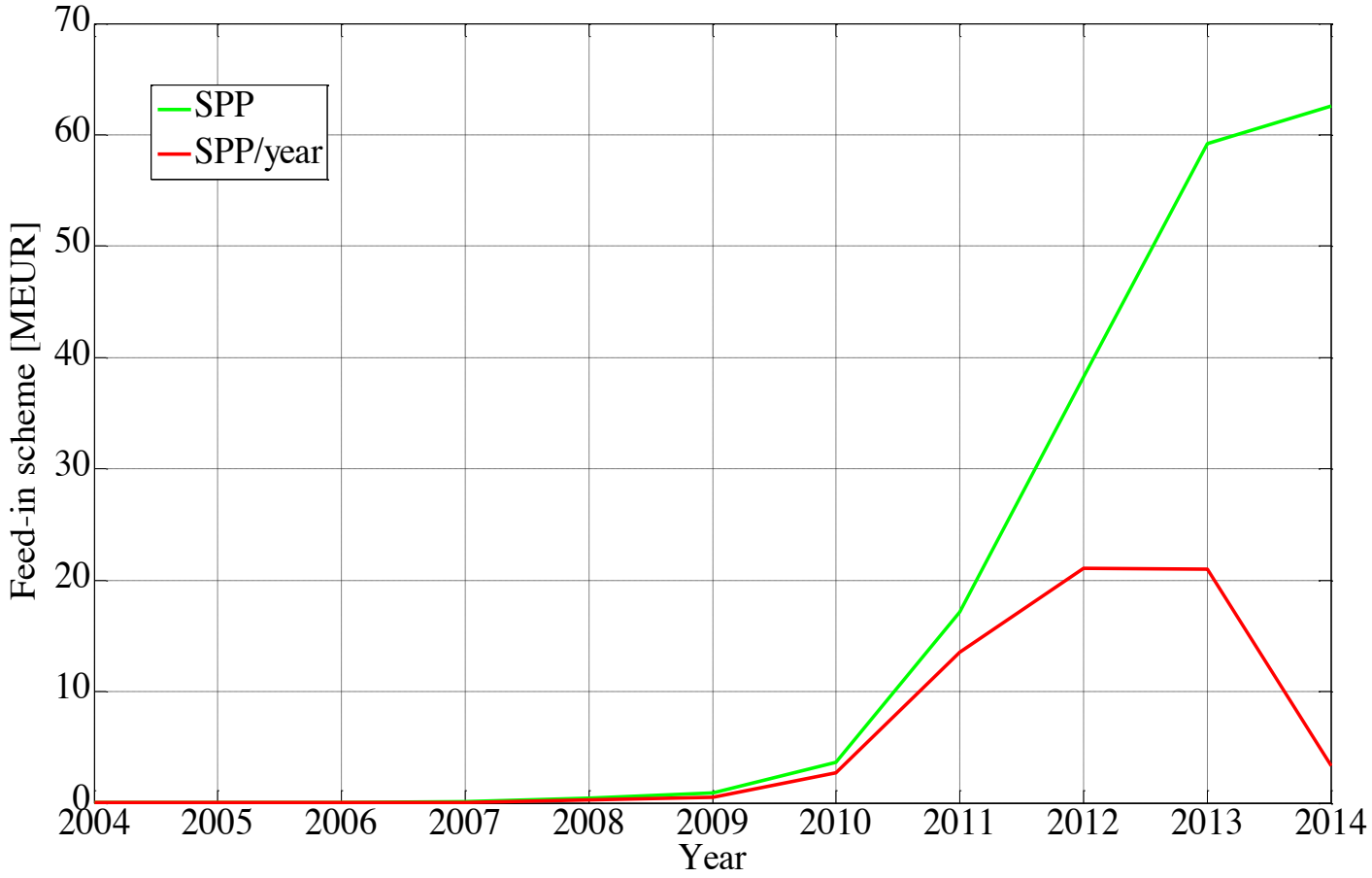
Slovenian case - SPP

Solar power plants (2007 – 2014) & AP:



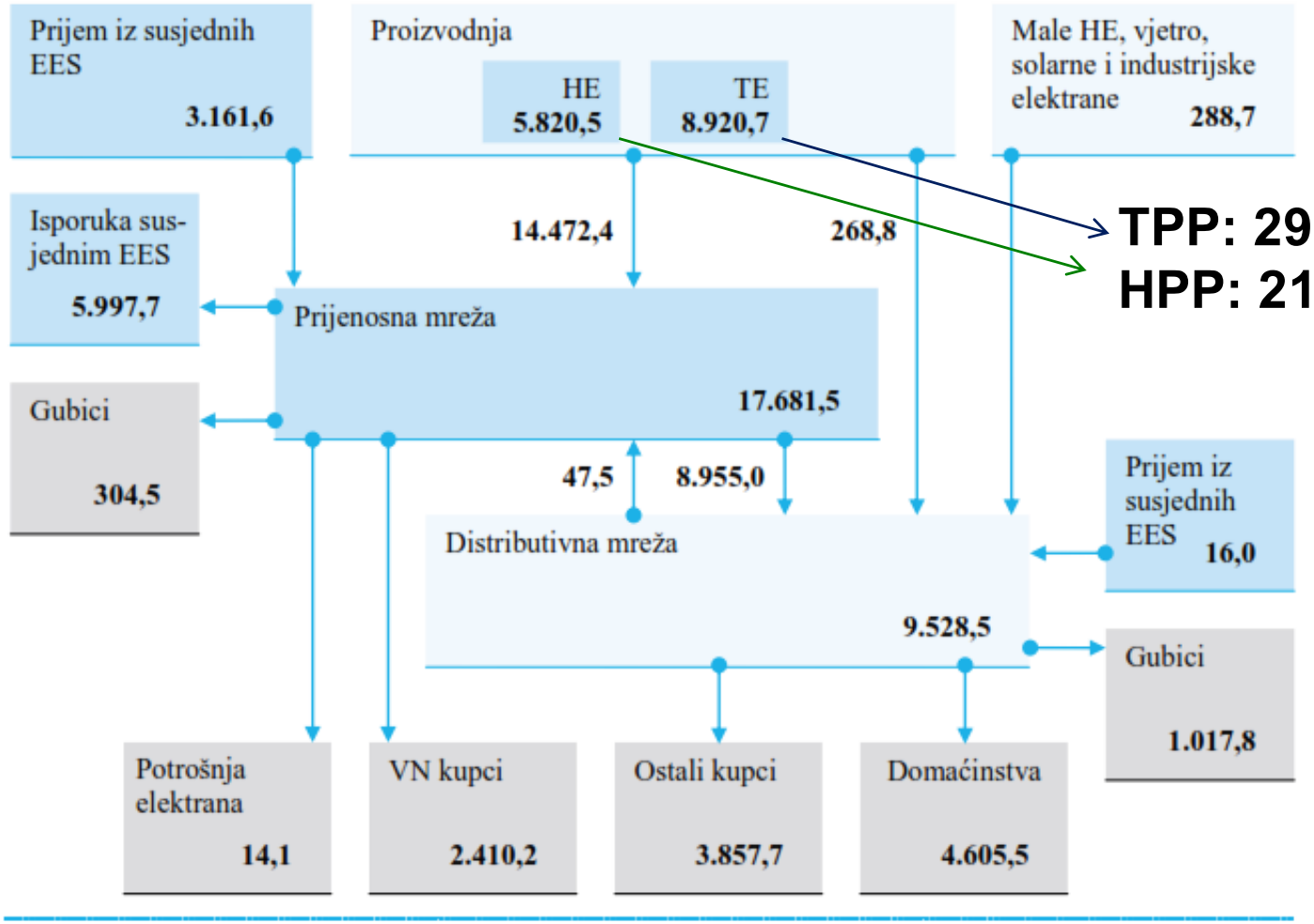
Slovenian case - SPP

Slovenia's electricity feed-in support scheme related to the SPP:



Situation in Bosnia and Herzegovina

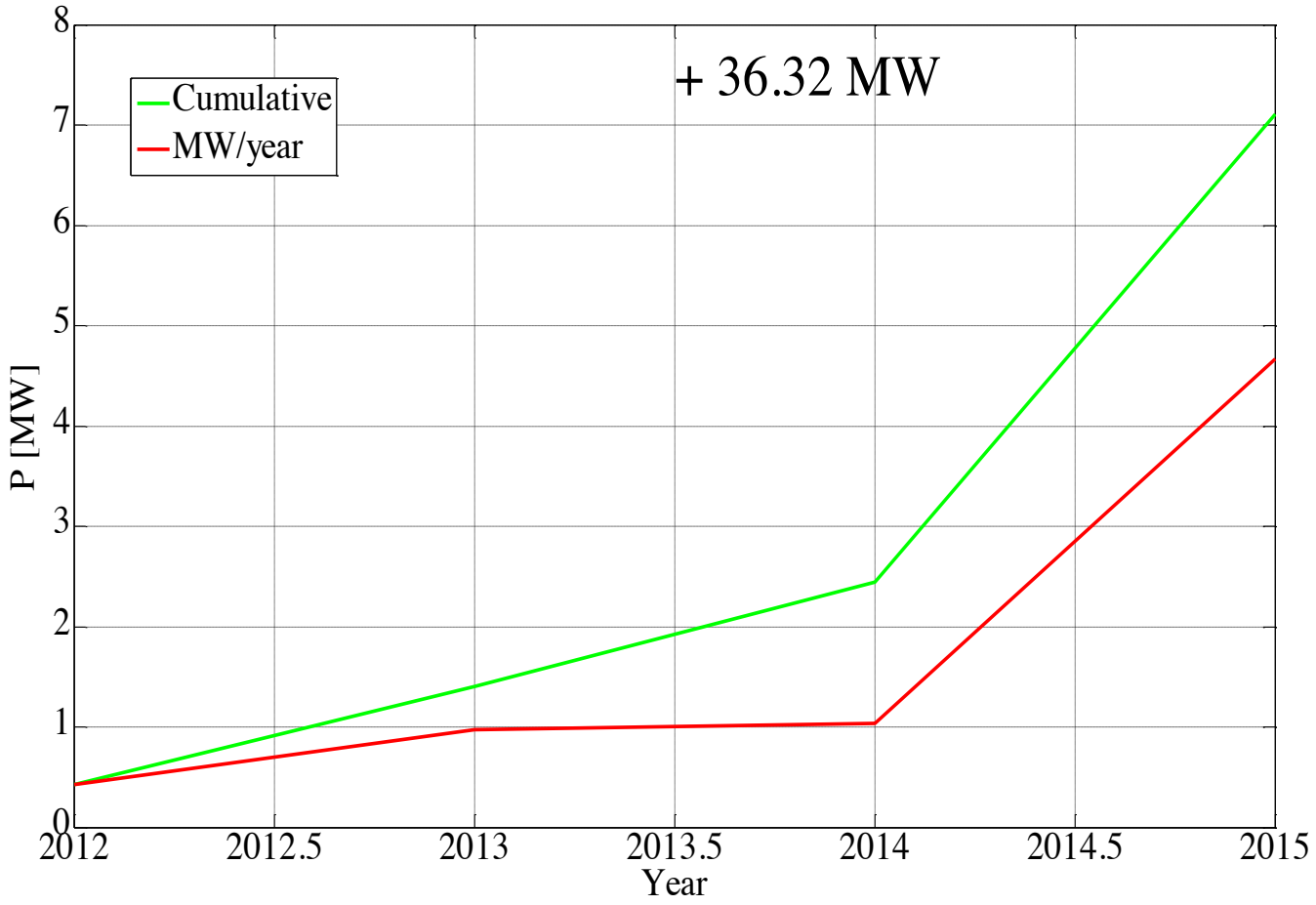
Slika 1. Ostvarene bilansne veličine u 2014. godini (GWh)



TPP: 2930 (2621) MW
HPP: 2156 MW

Situation in Bosnia and Herzegovina

Power of SPP in Bosnia and Herzegovina:



Situation in Bosnia and Herzegovina

Subsidies in recent years:

- The guaranteed price is obtained by multiplying of the reference price with the adequate tariff coefficient for a certain kind of RES production devices.

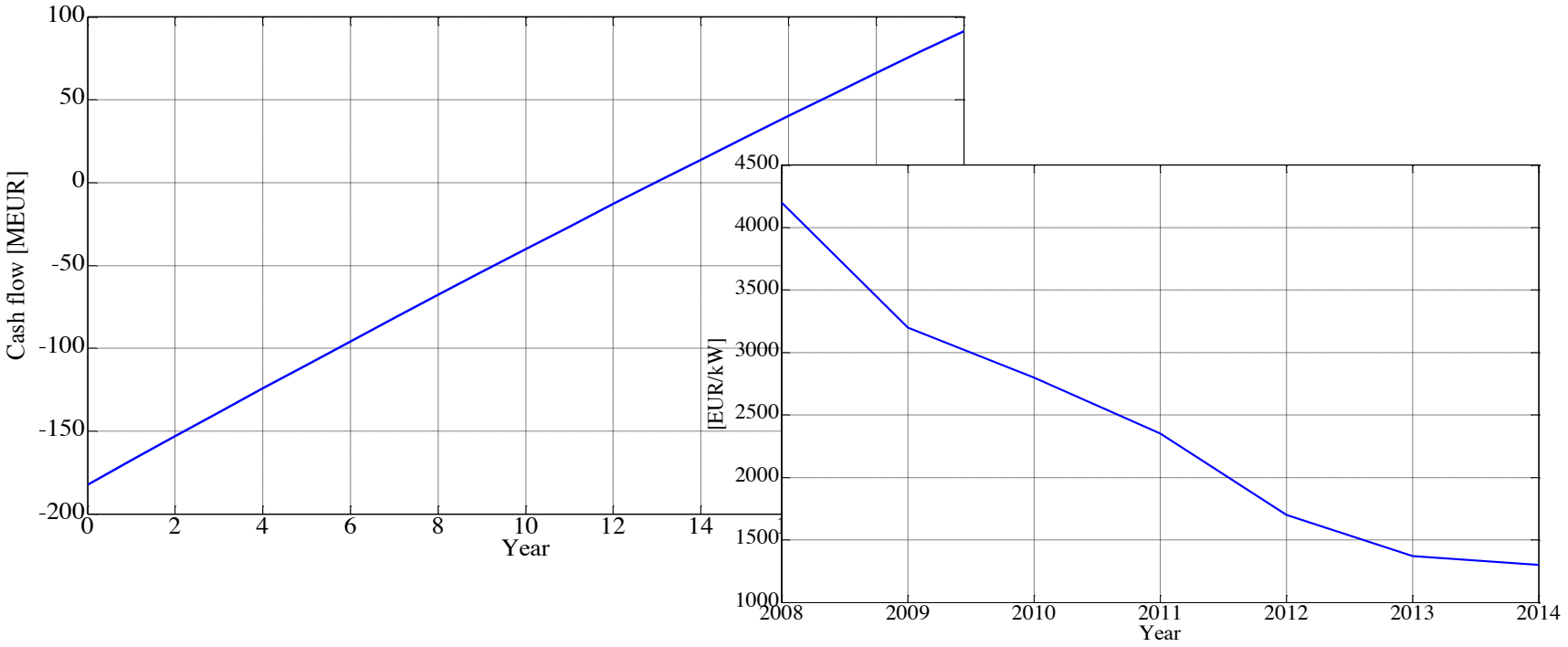
- According to the Decree on the use of RES and CHP, the guaranteed prices and tariff coefficients are determined individually for each energy source and capacity of the generator.

- The guaranteed prices in the period from 2014 to March 2016 are calculated on the basis of the reference price 54.0384 EUR/MWh.

Conclusions

- Presented negative consequences basically related to the high TR, especially at the beginning stage, are considered.

- With elimination of aforementioned negative reasons the time of cash flow crossing the value 0 MEUR could be significantly reduced.



Conclusions

- Electricity bill (21.33 EUR – 5.43 EUR)!

OBRAČUN PORABLJENE ELEKTRIČNE ENERGIJE

PRODUKT	OBDOBJE OD-DO	ŠT. DNI	PDP	KOLIČINA	ENOTA MERE	CENA	DDV%	ZNESEK BREZ DDV
Energija VT	01.12.2015-31.12.2015	31		47	kWh	0,06692	22,00	3,15
Energija MT	01.12.2015-31.12.2015	31		21	kWh	0,04237	22,00	0,89
Energija Skupaj								4,04
Obračunska moč	01.12.2015-31.12.2015	31		7	kW	0,77089	22,00	5,40
Omrežnina VT	01.12.2015-31.12.2015	31		47	kWh	0,04116	22,00	1,93
Omrežnina MT	01.12.2015-31.12.2015	31		21	kWh	0,03165	22,00	0,66
Dodatek za Agencijo	01.12.2015-31.12.2015	31		68	kWh	0,00017	22,00	0,01
Prispevek za delo. oper. trga	01.12.2015-31.12.2015	31		68	kWh	0,00013	22,00	0,01
Omrežnina Skupaj								8,01
Trošarina NEPOSLOVNA RABA	01.12.2015-31.12.2015	31		68	kWh	0,00305	22,00	0,21
Prispevek za en. učinkovitost	01.12.2015-31.12.2015	31		68	kWh	0,00068	22,00	0,05
Prispevek SPTE+OVE	01.12.2015-31.12.2015	31		7	kW	0,73896	22,00	5,17
Prispevki Skupaj								5,43
Skupaj obračunano brez DDV								17,48

Znesek omrežnine za gospodinjske odjemalce je razdeljen na omrežnino za distribucijsko omrežje 72,93%, prenosno omrežje 12,58% in elektronsko storitev

Thank you for your attention !

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