

CODE2

Cogeneration Observatory and Dissemination Europe



Workshop Slovenia

*Deliverable D.4.2 – Workshop Report
07/05/2014*



Co-funded by the Intelligent Energy Europe
Programme of the European Union

1. Program and key information of the workshop:

Cogeneration Roadmap for Slovenia - expert workshop

8.30 Registration and coffee

1st SESSION: Status and perspectives of CHP in Slovenia and new Directive on energy efficiency

9.00 Introduction and presentation of CODE2 project – Stane Merše, JSI

9.10 CHP perspectives in Slovenia in focus of recent legislation review – Silvo Škornik, Ministry for Infrastructure and spatial planning RS

9.30 Implementation of Directive on energy efficiency – what brings for CHP? – Stane Merše, JSI

10.05 Discussion

10.30 Coffee break

2nd SESSION: CHP Roadmap for

11.00 Draft CHP Roadmap for Slovenia – Stane Merše, JSI

11.30 Evaluation of CHP support scheme and proposals for update - Damir Staničić, JSI

11.50 Discussion

12.30 Lunch

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3rd SESSION: Removal of barriers for CHP development

13.30 Work in two parallel thematic groups:

I. CHP in district heating and industry – moderator Damir Staničić, JSI

II: Micro and small scale CHP- moderator Stane Merše, JSI

14.20 Plenary discussion on group findings and final conclusions of the workshop

15:00 End of workshop

Date: 26. November, 2013

Location: Reaktorski center IJS, Brinje 40, Podgorica pri Ljubljani, Slovenia

Number of participants: 30 - list of participants in Annex

2. Introduction

The key goal of expert workshop was to enable quality expert discussion on the current and future development of cogeneration in Slovenia based on the drafted CHP roadmap for Slovenia prepared within CODE2 project.

Preparation of the workshop was based on the recommendations and concept prepared by Berlin Energy Agency (workshop Berlin, May 2013). We decided to invite limited number of relevant expert from different sectors and roles in the CHP framework in Slovenia (Ministry, Regulator, industry, services, district heating, electricity and natural gas suppliers, ESCOs, CHP equipment producers, CHP project providers, etc.) which will enable balanced discussion of all key important issues influencing the recent and future development of cogeneration in Slovenia.¹

Slovenia is in the dynamic transition period of CHP development as new support scheme introduced in 2010 triggered dynamic CHP investments but due to the restricted finance resources the Energy law is in updating procedure and is introducing the changed support environment which requires balanced approach and inclusion of all stakeholders so the workshop was excellent opportunity for this discussion and this was one of the key goal.

3. Main conclusions

Participant's feedback on the drafted Cogeneration Roadmap for Slovenia was very positive as key aspects and identified barriers were approved and further discussed and extended with more precise practical information during the workshop.

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Too fast recent growth of PV plants in Slovenia has caused significant burden for financing the RES and CHP electricity support scheme. Strong resistance of large industrial consumer to the necessary increase of fee for scheme financing resulted in issuing the amendment of Energy law with proposal for changing the current Feed-in support model to the limited tender support model. Key goals of new planned support model are:

- Better planning and optimization of costs for new entrants to the scheme at limited yearly available budget.
- Increase of support competitiveness and compliance by new state aid guidelines in preparation.
- Providing additional sources for financing the support scheme (Climate fund, supplement on fossil fuels, etc.)

Fast design and implementation of new support scheme is the key precondition for new CHP investments as current uncertain support situation completely stopped planning and implementation of new CHP investments as due to the current unfavourable energy market

¹ Considering our previous experiences and interest in CHP in Slovenia it would be easy to get more than 100 participants but this would not enable quality discussion and interaction between participants.

conditions, proper support level is key precondition for the economic operation and feasibility of all CHP plants.

Participants agreed that after four years of successful application, **support scheme would need deep evaluation to improve some perceived cost-effectiveness and to remove some noticed problems and inconsistencies:**

- Absence of the support for CHP plants older than 10 years is serious threat for stopping of the operation of several modern CHP plants and require proper solution on the EU level². Very limited and low operating support would enable further economic operation of several modern high efficiency CHP units, installed 10 years ago.
- Introduction of more smooth support level (curve) for the small scale CHP units would improve economic conditions of all sizes of CHP units as recent two level support favourites the units on the border of the two size classes (50 kWe and 1 MWe).
- Decrease of current support for medium size CHP units (above 1 MW) as investment costs of the recent implemented projects are lower than reference investment costs.
- As steam generation CHP units require higher investment costs, additional supplement for steam generation would enable additional development of CHP units in the process industry.
- More flexible approach in the support implementation would be welcome to solve some recent problems in the market: moving the equipment to new location in case of financial breakdown,
- Individual treatment of new CHP technologies is uncertain and request and time consuming additional administrative procedures. More simple instruments like bonus for emerging technologies would be appropriate solution. ORC and wood biomass gasification are already market proven technologies for wood biomass (small scale and micro) and could be introduced in the calculation of reference costs.
- Decrease of current 12% discount rate in methodology of the reference costs is necessary although the expected profitability expectations in industry are very high and only projects with short payback period (3-5 years maximum) are approved by the company management.

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Plant operator are aware of environmental aspects of CHP plants where equipment would enable operation at lower emission levels but plants are mainly fulfilling current legislation where upper level of emissions is still quite high (500 mgNOx/Nm³).

Micro and small scale CHP are the most promising cogeneration niche which boosted in the recent three years and will develop further in with the most typical plant size around 50 kWe. Decrease of connection costs and procedure simplification are one of the key aspect for faster

² Following current guidelines such support is allowed only for wood biomass CHP plants, if plant operation costs are higher than the electricity market prices.

progress of micro units where participant rise concern that planned tendering procedure is not the step in this direction (additional barrier) and that micro CHP plants should be excluded from tenders (keep the same support approach as they contribute almost negligible share of scheme costs (few %). Introduction of net metering support model is interesting approach also for cogeneration, as final electricity prices are growing due to introduction of additional taxes.

District heating (DH) CHP is the most developed cogeneration sector in Slovenia as CHP has been recently installed in almost all district heating systems and has more than 75% share in heat supply. Participants strongly support proposed setting the heating mode priorities on local and building level as it is crucial for the future development of DHC and cogeneration. As several DH CHP units are approaching the 10 years age the proper solution that would enable economic operation of these units also after the end of 10 years support period is crucial to preserve economic heat supply in DHC.

Industry CHP: in spite minimum recent development few very successful projects proved the huge economic potential in industry by recent support conditions. Current financial crises and very high profitability expectations are key barriers for new investments.

ESCO and CHP contracting (TPF) is getting predominant implementation model for CHP investments, with several new ESCOs providers. Financing the CHP investment by energy supply contracts is more and more used also by project developers and equipment suppliers.

As participants are not yet acquainted with EED details presentation on the workshop was very well accepted and participants supported prescribed activities and measures that should follow EED implementation, especially regulatory aspects (simplification of procedures) and comprehensive assessment of potentials and related energy policy measures for CHP.





4. Main lessons learnt

The workshop was very successful and highlighted next key issues:

- **Lack of information exchange and huge need for linking of CHP actors** – as in Slovenia there is no association or institution that would link all stakeholders and actors in the CHP market, workshop was excellent opportunity to share experiences and views to the actual problems and best practice, especially in the period of CHP support framework update. Participants expressed high interest in similar events also in the future.
- **Huge recent CHP market development** – proper incentive framework since 2010 triggered extensive market growth, especially in district heating and services. Establishing of Slovenian CHP unit packager, several new CHP project, equipment and service providers has very positive economic effects which are exceeding the input of public funds to the CHP support scheme.
- **CHP support scheme is prerequisite for further CHP development** – current energy market conditions request additional support instruments for CHP. Current support scheme was successful but needs proper updates – especially decrease of support of the medium size classes and smoother support level in micro and small scale classes and some other minor improvements. Participants are worried by new proposed tendering support model which should be carefully designed that will not limit or stop the recent growing CHP market.
- **CHP contracting and ESCO services** – is the most common implementation model in services and triggered fast development of contracting services which will have very positive influence on the developing of ESCOs services premature market in Slovenia very important for increasing energy efficiency and renewable energy sources measures implementation in all sectors.
- **CHP Roadmap for Slovenia was well accepted as document summaries and presents the key information on well developing CHP market in Slovenia with key necessary measures to sustain recent development and exploitation of huge existing economic potential for CHP in Slovenia and important contribution to energy, climate and economy targets of Slovenia.**

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With regard that all invited participants came from the CHP sector, all workshop time was devoted to presentations and live discussion with participants, **the visit of CHP site was postponed to later demonstration event** that will be focused to wider CHP interested audience.

5. Further steps planned after the workshop

Workshop proved the strong interest of CHP actors for participation in the CODE2 activities as they coincide with the reform of CHP support framework in Slovenia where CHP actors would like to be more actively involved and informed.

Next planned steps:

- Preparation of the final roadmap and circulation between workshop participants and other interest audience
- Presentations of the roadmap: articles, events,...
- Discussion of the roadmap with politicians and ministries;
- Considering further steps with the aim of setting up a permanent CHP working group.

For more details - workshop participants and all presentations please refer to the annexes to this report

Ljubljana 07.05.2014

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ANNEXES:

1. List of participants

2. PowerPoint presentations:

- 1. Introduction and presentation of CODE2 project – Stane Merše**
- 2. Implementation of Directive on energy efficiency – what brings for CHP? – Stane Merše**
- 3. Draft CHP Roadmap for Slovenia – Stane Merše**
- 4. Evaluation of CHP support scheme and proposals for update – Damir Staničić**
- 5. Discussion**

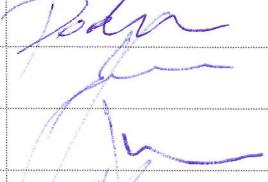
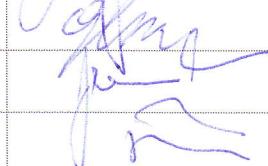
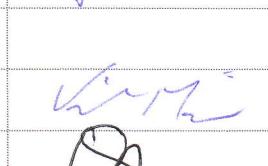
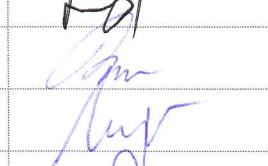
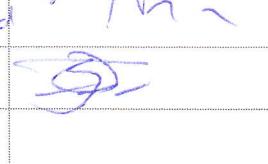
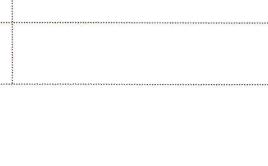
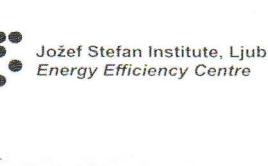
Načrt razvoja soproizvodnje v Sloveniji

"CHP Roadmap for Slovenia"

Strokovna delavnica

Reaktorski center IJS, Brinje 40, Podgorica pri Ljubljani
Torek, 26. november 2013

N	Priimek	Ime	Organizacija	Podpis
1	Šink	Luka	Domplan, d. d.	
2	Eržen	Matjaž	Gorenjske elektrarne, d. o. o.	
3	Martinčič	Vito	i-Tec, d. o. o.	
4	Čokl	Matevž	IMP Promont, d. o. o.	
5	Podlesek	Marko	GGE, d. o. o.	
6	Sevčnikar	Matej	INDOP, d. o. o.	
7	Stojanović	Slaviša	INDOP, d. o. o.	
8	Hegedič	Marko	Energetika Maribor, d. o. o.	
9	Rožman	Miran	Energetika Maribor, d. o. o.	
10	Kolman	Robert	Plinarna Maribor, d. o. o.	
11	Bašelj	Matej	KRKA, d. d. 	
12	Paternost	Andrej	KRKA, d. d. 	
13	Riedl	Tomaž	Megaenergija, d. o. o.	
14	Podgorelec	Andrej	Megaenergija, d. o. o.	
15	Tacer	Matija	ISKRA Sistemi, d. d.	
16	Jan	Aleks	Energen, d. o. o.	
17	Seršen	Marko	Energen, d. o. o.	
18	Žnidarič 	Borut	BORZEN, d. o. o.	
19	Gulič	Sandi	MITOL, d. d.	
20	Odar	Urban	GIZ DZP	

N	Primek	Ime	Organizacija	Podpis
21	Podešva	Branko	Adriaplin, d. o. o.	
22	Stropnik	Etbin	Viessmann, d. o. o.	
23	Vindišar	Jure	INEA, d. o. o.	
24	Glavina	Uroš	INEA, d. o. o.	
25	Šolinc	Hinko	MZIP-DE	
26	Škornik	Silvo	MZIP-DE	
27	Ravnak	Gašper	Butan plin, d. d.	
28	Vrhovnik	Mohor	Butan plin, d. d.	
29	Suhodolnik	Rok	Biomasa, d. o. o.	
30	Rodošek	Saša	TES, d. o. o.	
31	Vetrih	Marko	E3, d. o. o.	
32	D Vrabec	DARIJO	ELEKTRA TRIMORSKA dd	
33	AL-Mansour	Fouad	IJS-CEU	



Uvod delavnice in predstavitev projekta CODE2

Stane Merše

Center za energetsko učinkovitost, IJS Ljubljana, Slovenia

Strokovna delavnica CODE2 "Načrt razvoja soproizvodnje v Sloveniji"

ICJT, Reaktorski center IJS Podgorica, 26.11.2013



Co-funded by the Intelligent Energy Europe
Programme of the European Union

Institut "Jožef Stefan" Ljubljana, Slovenia
Center za energetsko učinkovitost

CODE2 - COGENERATION OBSERVATORY AND DISSEMINATION EUROPE



Projekt CODE2

Cogeneration Observatory and Dissemination Europe

Intelligent Energy Europe, 2012 – 2014

Nadaljevanje projekta CODE



COGENERATION OBSERVATORY
AND DISSEMINATION EUROPE

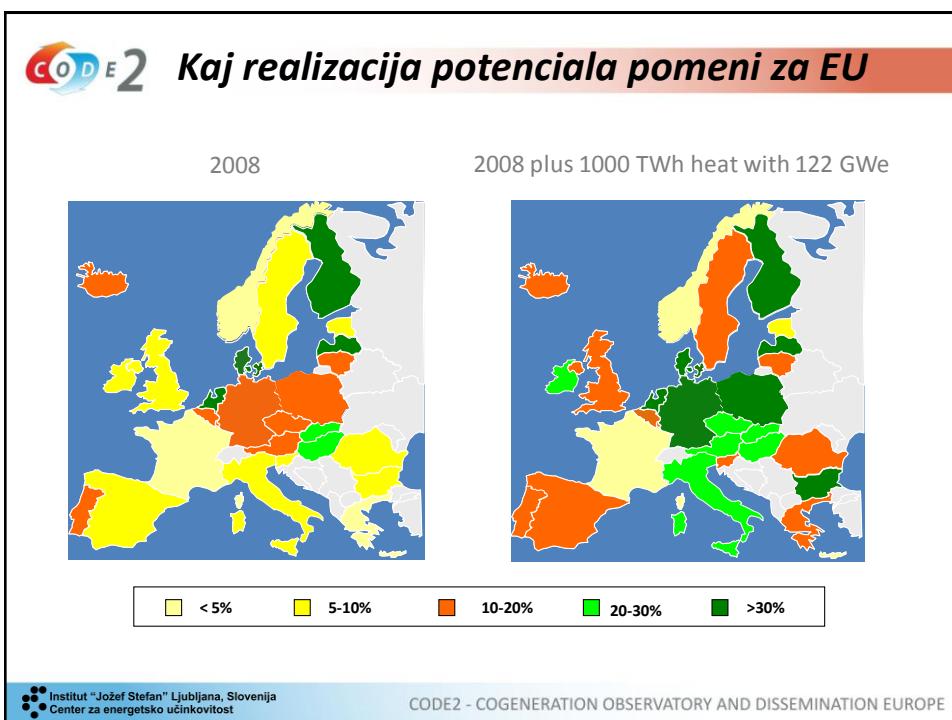
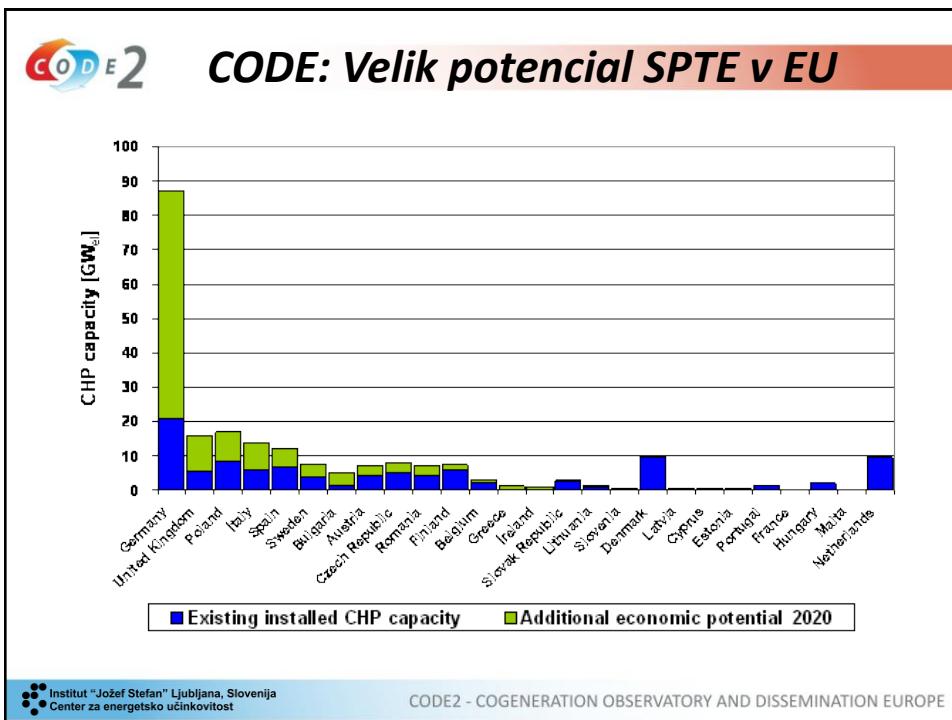
Partnerji projekta:

1. **COGEN Europe**, the European association for the promotion of cogeneration (Belgium)
2. **HACHP**, the Hellenic Association for Cogeneration of Heat & Power (Greece)
3. **Jožef Stefan Institute** (Slovenia)
4. **FAST**, Federazione delle Associazioni Scientifiche e Tecniche (Italy)
5. **COGEN Vlaanderen** (Belgium)
6. **Energy Matters** (Netherlands)
7. **Berlin Energy Agency** (Germany)
8. **KWK kommt** (Germany)

Več informacij najdete na spletni strani www.code2-project.eu oz. kontaktnem naslovu
info@code-project.eu

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Center za energetsko učinkovitost

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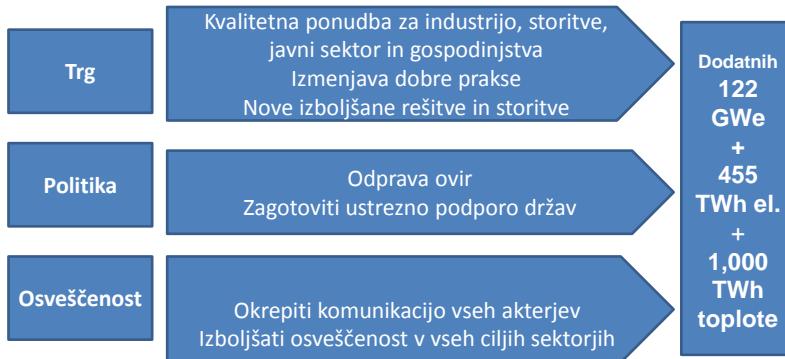




Načrt razvoja soproizvodnje za EU “CHP Roadmap for Europe”

2012

2030



Institut "Jožef Stefan" Ljubljana, Slovenija
Center za energetsko učinkovitost

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Načrti razvoja SPTE - “Roadmaps”

- Izdelava 27 nacionalnih in skupni EU načrt razvoja SPTE (“Roadmap”):
 - 7 podrobnejših načrtov razvoja SPTE za pilotne države:
 - Nemčija, Belgija, Irska, Italija, Grčija, Poljska in Slovenija
 - Strokovne dikusiske delavnice v pilotnih državah
 - 20 načrtov razvoja SPTE za ostale članice
 - Skupni načrt razvoja SPTE v EU
- Podpora pri prenosu nove Direktive o energetski učinkovitosti – kaj pomeni za SPTE?



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Center za energetsko učinkovitost

CODE2 - COGENERATION OBSERVATORY AND DISSEMINATION EUROPE

CODE 2

Ocena potenciala mikro SPTE v EU

Household systems ($\pm 1 \text{ kWe}$) Boiler replacement technology	SME & Collective systems ($\pm 40 \text{ kWe}$) Boiler add-on technology																										
BELGIJA																											
Present market (2013) Boiler stock: 2 200 000 units Boiler sales: 174 000 units/year	Present market (2013) Boiler stock: 450 000 units Boiler sales: 35 000 units/year																										
Potential estimation																											
<table border="1"> <thead> <tr> <th>Indicator</th> <th>Score</th> </tr> </thead> <tbody> <tr> <td>Market alternatives</td> <td>1</td> </tr> <tr> <td>Global CBA</td> <td>4</td> </tr> <tr> <td>Legislation/support</td> <td>2</td> </tr> <tr> <td>Awareness</td> <td>0</td> </tr> <tr> <td>Purchasing power</td> <td>2</td> </tr> <tr> <td>Total</td> <td>8 out of 12</td> </tr> </tbody> </table>	Indicator	Score	Market alternatives	1	Global CBA	4	Legislation/support	2	Awareness	0	Purchasing power	2	Total	8 out of 12	<table border="1"> <thead> <tr> <th>Indicator</th> <th>Score</th> </tr> </thead> <tbody> <tr> <td>Market alternatives</td> <td>1</td> </tr> <tr> <td>Global CBA</td> <td>4</td> </tr> <tr> <td>Legislation/support</td> <td>2</td> </tr> <tr> <td>Awareness</td> <td>1</td> </tr> <tr> <td>Total</td> <td>7 out of 9</td> </tr> </tbody> </table>	Indicator	Score	Market alternatives	1	Global CBA	4	Legislation/support	2	Awareness	1	Total	7 out of 9
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Total	7 out of 9																										
Expected final market share: 42% of boiler sales in Household sector	Expected final market share: 27% of boiler sales in SME & Coll. sector																										
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CODE 2

Ocena potenciala OVE SPTE v EU

Bioenergy CHP potential analysis

	2010	2020	2030
Heat demand from CHP and DH (PRIMES), ktoe	1.908	2.567	2.777
Heat demand from bio-energy CHP and DH, ktoe	160	686	722
Bio-energy penetration rate in CHP markets (2009, Eurostat)	6,4%	20,6%	20,0%
Availability of cost-efficient biomass for energy (Biomass Futures), ktoe		3.362	3.416

National frameworks for bio-energy CHP

Legislative environment	++ (3 of 3)
Suitability of heat market for switch to bio-energy CHP	+(2 of 3)
Share of Citizens served by DH (36%)	+(2 of 3)
National supply chain for biomass for energy, public acceptance	++ (3 of 3)
Awareness for DH and CHP	++ (3 of 3)

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ID DISSEMINATION EUROPE



Kratki vodnik o SPTE - "How to guide"

Efficient full heat CHP supply

The company Riedl is an internationally competitive provider of comprehensive and high-quality solutions in the field of mechanical treatment of complex products.



A 50 kW_e gas engine CHP on natural gas with heat storage, installed in 2011, is the heating source covering the entire heat demand for the company's industrial hall in Maribor. All produced electricity is entirely used on-site, grid electricity supplying the remaining demand.



The investment of 85.000 EUR will be recovered in 4 to 6 years, as the company is eligible for a feed-in premium on all produced electricity.

CHP in Warsteiner brewery

Energy Master 2010 awarded CHP plant in Warsteiner brewery provides economic benefits for company by reduction of expenses for energy as well as reducing CO₂ emissions.

2 CHP engine unit parameters:

Capacity: 2,3 MW_e, 2,3 MW_{th}
Yearly generation: 15 GWh_e, 15 GWh_{th}
Total investment costs: 3 million EUR

Data collection (heat and electricity demand)

Prefeasibility check (quick check – Smart CHP)

Feasibility study Sizing and selecting best CHP unit

Project design Project documentation, permits, licence, support, etc.

Financing model Loans, contracting – ESCO, etc.

Project implementation Construction & Commissioning

CHP Operation Management, maintenance

Check list for considering CHP:

- Stable and predictable heat or/and cooling demand for heating or process use on site of at least 4000 hours per year.
- Appropriate energy market conditions - higher electricity price compared to the fuel price (ratio of at least 2.1).
- Support mechanisms in place if energy market conditions request additional support: feed-in, certificates, tax relief, subsidies, etc.
- Availability of fuel on the location: natural gas, wood biomass, biogas, LPG etc.
- Proper place for installation of CHP unit: room, connections, chimney, etc.
- Financial resources: own, loans, energy contracting, subsidies, etc.



Orodje za hitro oceno izvedljivosti SPTE "Smart CHP – Spin your CHP unit"

CHP Smart - Spin your CHP unit!

Input cells Results cells

1. Set your energy demand:

Electricity	1.200 MWh/a	362	30 %
Heat	1.500 MWh/a	577	38 %

Thermal profile: 1. Offices, schools (daytime, 5d/7)

2. Set CHP energy variables:

CHP Price of fuel	55 €/MWh
CHP Electricity price	80 €/MWh _e

Value of CHP heat: 61 €/MWh_{th}

3. Set CHP support:

CHP Electricity support	80 €/MWh _e
Other support	0 000 €/a

Investment support	0 000 €
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Value of CHP electricity = CHP Electricity price + CHP Support: 160 €/MWh_e

4. Set economic variables:

Discount rate: 5%
Economic period: 10 years

Economic indicators:

Net investment	151.598 EUR
Profit	9.655 EUR/a
NPV	71.007 EUR

Simple pay back (years): 5,2 years

IRR (%): 14,2 %

Simple pay back (years): 5,2

IRR (%): 14

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Primeri dobre prakse

**Case study factsheet
EASTERN EUROPE**

CHP IN HC Hospital

Main CHP plant indicators	
Electrical capacity (total)	kW 150
Heat capacity (total)	kWm 230
Technology	Motor engine
No. of units	1
Manufacturer	Ener-G
Type of fuel	natural gas
Electricity yearly generation	MWh 600
Heat yearly generation	MWh 944
Year of construction	2011
Total investment costs	EUR -
Financing	Own funds
State support	Feed-in tariff
Location	Ubjane, Slovenia
Information	http://www.energ.si

Picture

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Center za energetsko učinkovitost**

**Case study factsheet
Northern REGION, Denmark**

**Skagen Varmevark
District heating**

Main CHP project indicators	
Electrical capacity (total)	kW 12,400
Electricity yearly total	kWh 12,800
Technology	Motor engine
No. of units	3
Manufacturer	Wartsila
Type of fuel	natural gas
Heat yearly generation	MWh 1000
Electricity yearly generation	MWh 600
Year of construction	1996
Total investment costs	EUR -
Financing	no specification
State support	no specification
Return of investment (payback period)	Years: no specification
Location	Ringkøbing, Denmark, corner Bent Jørgensens Vej, Wartsila, bent.joergensens@wartsila.com phone: +45-99-569949

General description of the case

The Skagen Varmevark is responsible for operating district heating for the town of Skagen, the most northern town in Jutland, with 4400 inhabitants. The Wartsila CHP plant (3 x W235G) is equipped with efficient heat recovery that reach total efficiencies of more than 90 %. The engines were upgraded a few years ago to give a better performance and efficiency.

In addition to its own production, a municipal waste incineration plant and a nearby industry are delivering heat to the common Skagen district heating network.

Success factors

The plant not only produces heat for the city and the distribution system operator, but also participates in the Danish electricity regulating and reserve/frequency balancing markets. To have simultaneous power and heat demand effective flexible operation, short-term use of engines, as well as of course operator alertness, are important. Besides the engines and in order to secure the power the plant is equipped with hot water boilers, open natural gas and prepared for the possible use of steam and fuel oil. The engines are connected optically with the control engines, and of course with storage or an accumulator. All these units allow flexible and environmentally friendly production.

Additional installations:

- 4x Gas hot water boiler 45 MWh
- Electrical hot water boiler 1.11 MWh
- Heat storage capacity/Hot water accumula 600 MWh

The plant operates very much on the day-ahead basis of the heat demand, and the regulating and n

Picture

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- Electrical hot water boiler 1.11 MWh
- Heat storage capacity/Hot water accumula 600 MWh

The plant operates very much on the day-ahead basis of the heat demand, and the regulating and n

**Case study factsheet
South Eastern Europe, GREECE**

CCHP UNIT IN A HI-TECH GREENHOUSE

Main CHP project indicators	
Heat capacity (total)	kW 6000
Electrical capacity (total)	kW 4800
Technology	Internal Combustion engines
No. of units	3
Manufacturer	CATERPILLAR
Type of fuel	Natural gas
Heat yearly generation	MWh 32000
Electricity yearly generation	MWh 25000
Year of construction	2007
Total investment costs	EUR 20,5 million
Financing	EU Competitive Programmes
State support	EU Competitive Programmes
Location	AGRITEK s.a. Agritek Agrofarms W. Macedonia, Greece www.agritek.gr

Success factors

The greenhouse is equipped with the necessary equipment for hydroponic cultivation, harvesting and pest.

- Energy Management Unit that includes a CHP unit of 4.8 MWth, two turbines of 3.8 MWth and an absorption chiller of 550 kWth.
- Processing Unit of 1.5 t CO₂ production/hour
- Organic cleaning, disinfection system and water recycling system
- Irrigation system for collecting and managing the wastewater
- 2100 m² packing machine sorting and packing of 90 percent with a machine of flow-pack
- Cool chamber of 216 m² and 3000 m² of storage space.

General description of the case

The investment was funded by the EU-funded CIP "Operational Programme-Competitiveness". The investment objective is purchased by the HTSO and supplies the national grid.

Due to the fact that CCHP units cover the heating and cooling needs of the greenhouse, the energy given by the State, as a bonus, for the process of CO₂, which is added to the specified F-T for cogeneration is given to the CCHP operation.

Conclusion

In general, this hi-tech greenhouse with the CHP unit, the absorption chiller and the processing unit of the exhausts from the engines, producing clean CO₂ for the indoor air, is a unique solution for agriculture and could be multiplied in Greece, especially in this period of economic crisis, where the local primary production should be significantly increased.

Media sources

The Greek electricity market is liberalized according to the Law, but there are many distortions that delay the full liberalization. In the area of CHP in Greece, due to numerous regulations, the investors face difficulties and the F-Ts to the cogenerators, creating serious financial problems in the cash flow of the enterprise. This has the negative effect on the CHP operation.

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Več o projektu na www.code2-project.eu

COGENERATION OBSERVATORY AND DISSEMINATION EUROPE

Realising Europe's identified potential for cogeneration

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About

The CODE2 project aims to realise Europe's identified potential for cogeneration by developing 27 National Cogeneration Roadmaps.

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The project has divided Europe in five Regions for which detailed cogeneration information is available.

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Find the latest developments here, such as project deliverables, press releases, event announcements and other news.

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Click on a country to find details on the national cogeneration situation

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Program delavnice

8.30 → Registracija udeležencev in kava

1. SEKCIJA: STANJE IN PERSPEKTIVE SOPROIZVODNJE TER DIREKTIVE O ENERGETSKI UČINKOVITOSTI

- 9.00 → Uvodni nagovor in predstavitev projekta CODE2—Stane Merše, IJS-CEU
- 9.10 → Perspektive soproizvodnje v Sloveniji v luči zakonodajnih sprememb—Silvo Škornik, Ministerstvo za infrastrukturo in prostor
- 9.30 → Implementacija Direktive o energetski učinkovitosti—kaj pomeni za soproizvodnjo?—Stane Merše, IJS-CEU
- 10.05 → Diskusija
- 10.30 → Odmor za kavo

2. SEKCIJA: NAČRT RAZVOJA SOPROIZVODNJE V SLOVENIJI

- 11.00 → Osnutek Načrta razvoja soproizvodnje v Sloveniji—Stane Merše, IJS-CEU
- 11.30 → Evaluacija podpornih shem in predlogov sprememb—Damir Staničić, IJS-CEU
- 11.50 → Diskusija
- 12.30 → Konsilo

3. SEKCIJA: ODPRAVA OVR-ZA RAZVOJ SOPROIZVODNJE

- 13.30 → Delovne diskusijske skupinah:
 - I. Soproizvodnja v daljinskem ogrevanju in industriji—moderator Damir Staničić, IJS-CEU
 - II. Mikro in mala soproizvodnja—moderator Stane Merše, IJS-CEU
- 14.20 → Skupna predstavitev ugotovitev in oblikovanje zaključkov delavnice
- 15.00 → Zaključek delavnice



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Implementacija Direktive o energetski učinkovitosti – kaj pomeni za soproizvodnjo?

Stane Merše

Center za energetsko učinkovitost, IJS Ljubljana, Slovenia

Strokovna delavnica CODE2 "Načrt razvoja soproizvodnje v Sloveniji"

ICJT, Reaktorski center IJS Podgorica, 6.11.2016a



Co-funded by the Intelligent Energy Europe
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Vsebina

1. Predstavitev Direktive (DEU)
2. Glavne vsebine povezane s SPTE
3. Podrobnejši pregled nekaterih zahtev
4. Zaključki

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Direktiva o energetski učinkovitosti



- ✓ **Soproizvodnja** vključena med tehnologije URE in v pripravo Nacionalnih akcijskih načrtov URE
- ✓ **Nacionalni okvirni cilji povečanja energetske učinkovitosti** na ravni primarne ali končne energije (absolutna poraba v letu 2020)
- Namesto zavezujočih ciljev **zavezujoči ukrepi**
- Izvajanje direktive v veliki meri odvisno od držav članic

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Učinkovitost oskrbe z energijo (14. in 15. člen)

Ključni cilj je spodbuditi odkrivanje in izkoriščanje stroškovno učinkovitega potenciala za učinkovito ogrevanje in hlajenje z uporabo:



Efficient heating and cooling' - measurably reduces the input of primary energy needed to supply one unit of delivered energy [...] in a cost effective way, taking into account the energy required for extraction, conversion, transport and distribution.

Člen 2(42)

Prihranki PE + Stroškovna učinkovitost = Koncept EED

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Učinkovito ogrevanje in hlajenja

Definicije Direktive:

‘SPTE z visokim izkoristkom’ – brez sprememb!

‘Učinkovito daljinsko ogrevanje in hlajenje (DOH)’ pomeni sistem, ki uporablja vsaj:

- 50 % energije iz OVE,
- 50 % odpadne toplote,
- 75 % toplote iz SPTE ali
- 50 % kombinacije takšne energije in toplotne



Obveznosti države glede SPTE

Celovita ocena možnosti za uporabo soproizvodnje z visokim izkoristkom ter učinkovito daljinsko ogrevanje in hlajenje

Priloga VIII (do 31. decembra 2015):

1. Ocena potenciala:

Stanje in 10 letna projekcija rabe toplotne in hladu, nacionalni zemljevid, idr....

➤ **Tehnični potencial za SPTE VI&DOH (tudi mikro SPTE)**

2. Analiza stroškov in korist – nacionalni nivo:

- Celovito energetsko načrtovanje, ki vključuje vse ekonomske tehnične rešitve, z ekonomsko analizo socio ekonomskih in okoljskih dejavnikov.
- Identifikacija in načrtovanje najbolj stroškovno učinkovitega načina ogrevanja in hlajenja na danem geografskem področju
- Podlaga/metodologija za odločanje

• **Ekonomski potencial za SPTE VI&DOH**

3. Sprejetje strategij in ukrepov za omogočanje razvoja ekonomskega potenciala

IZVIV ZA IZVEDBO !

CODE2 *Merila za energetska dovoljenja*

Analiza stroškov in koristi SPTE VI & DOH (od. 5. junija 2014): za pridobitev energetskega dovoljenja novih ali obnovljenih naprav z vhodno toplotno močjo >20 MW:

- **Termoelektrarne:**
Uporaba SPTE (Možna izključitev za JE, vršne enote, CCS)
- **Industrijske naprave**
Možnost SPTE ali priklopa na sistem DOH
- **Sistemi DOH**
Možnost uporabe SPTE, odpadne industrijske toplice, idr.

• Država mora zagotoviti učinkovita merila za izvedbo analize stroškov in koristi, primerne za posamezne naprave.
(projekcije cen goriv in energije, stroške, ekonomske kazalce uspešnosti, idr.)

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CODE2 *Obveznosti države glede SPTE*

- 1. Celovita ocena (CA)**
možnosti za uporabo soproizvodnje z visokim izkoristkom & DOH
(14. člen (1), PRILOGA VIII)
- 2. Analiza stroškov in koristi (CBA) - Nacionalna**
Identifikacija najboljših rešitev ogrevanja in hlajenja – gospodarne z viri in stroškovno učinkovite. (14. člen (3), PRILOGA IX)
- 3. Analiza stroškov in koristi (CBA) - Naprave**
14. člen (5), 2. del PRILOGA IX
- 4. Merila za energetska dovoljenja - Naprave**
14. člen (7)

31.12. 2015

5.6. 2014

Izjeme
31.12.2013

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CA (1): Description of heating and cooling demand

Description based on real (measured and verified) consumption information:

- National and energy statistics, national balances
- In **detailed sectoral and geographical break-down** (not less detailed than in relevant EU energy statistics): **Industry, services, agriculture and households**
- **Based on latest available data** – for year 2013? (deadline 31.12.2015)

Heat and cooling demand ≠ Statistical data

Do not wait for the 2013 data! Prepare the CA as quick as possible in order to provide guidelines for the regulation, new incentives, etc.



CA (2): Forecast of demand for next 10 years

Forecast should take into account the trends in the major sectors of the economy:

- **Industry:** analyse the likely evolution of heat demand, taking into account:
 - longer term structural trends (such as de-industrialisation or re-industrialisation or efficiency improvements and the impact of new production technologies)
 - as well as shorter term cyclical changes.
- **Buildings:** heat demand evolution in buildings should be given specific consideration, including analysis of the impact of energy efficiency improvements in buildings required by:
 - Energy Performance of Buildings Directive (2010/31/EU) and
 - EED

Very challenging task in current economic conditions and uncertain development.

Map of the national territory with main demand and supply points

Heating and cooling demand points:

- municipalities and conurbations with a **plot ratio of at least 0.3** (2,5MWh/m linear heat density)
- industrial zones with a total annual heating and cooling consumption of **more than 20 GWh**
- Existing and planned district heating and cooling infrastructures.
- Potential heating and supply points:
 - electricity generation installations with a total annual electricity production of **more than 20 GWh**
 - waste incineration plants
 - existing and planned cogeneration plants (by technologies Annex I)

Map data will be used also in the individual installation CBA (nearby heat demand/supply options)

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CA (4): Establishing technical potential for high efficiency CHP &DHC

Based on the identified heat demand and heat demand forecast, identification of those elements of the heat demand that technically could be satisfied by:

- high-efficiency cogeneration,
- micro-cogeneration and
- efficient district-heating and cooling.

This means establishing the maximum or technical potential.

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CA (5): Establishing economical potential for high efficiency CHP and DHC

Identification of those parts of the technical CHP & DHC potential that can economically be met:

- by high-efficiency cogeneration, including residential micro-cogeneration,
- by the refurbishment of existing and the construction of new generation and industrial installations,
- by other facilities generating waste heat, and
- by efficient district-heating and cooling infrastructures.

This is the economic potential whose benefits exceed the costs and it is the only potential that needs to be achieved.

Establishing the economic potential will not be possible without cost-benefit analysis (CBA).



CA (6): Strategies, policies and measures

MS will have to define strategies, policies and measures that may be adopted up to 2020 and up to 2030 for development of identified cost beneficial potential (efficient DHC infrastructure, high efficiency CHP, waste heat and renewable energy sources).

- **MS have no obligation to take measures if:**
 - a potential with cost-benefit surplus is not identified
 - when the cost-benefit surplus is not sufficient to cover the administrative costs of carrying out the CBA for an installation
- **Exemption for CBA - Article 14(5)** - may be applied to installations situated in those regions/territory where CA has not found cost-effective potential.



CBA: Steps and considerations

- 1. Identification of system and geographical boundary for given project or group of projects**
 - Region, city, project, etc.
- 2. Integrated approach to demand and supply options**
 - Identification of all heat and cooling supply and demand options within geographical boundary
- 3. Constructing a baseline (business-as usual scenario):**
 - Describe the existing situation: collection of all available data
- 4. Identify Alternative scenario:**
 - Consider all relevant realistic alternatives (technical, financial, time, law, etc.) **feasible for increasing heating and cooling efficiency:**
 - Cogeneration & DHC
 - Other efficient (individual) solutions



CBA: Steps and considerations (2)

- 5. Cost-benefit surplus assessment**
 - The total long-term cost and benefits assessment and comparison
 - Net present value (NPV) valuation criterion requested
 - Used prices shall reflect the true socio economic costs and benefits (include external costs – environmental and health effects, to the extent possible).
 - Forecasts of energy prices and other relevant variables for economic analysis,
 - Inventory of all relevant economic effects:
 - Benefits: value of output for consumer, external benefits, avoided costs & savings
 - Costs: Capital, O&M, energy, environment & health (plants, networks)
 - Sensitivity analysis

MS shall designate the competent authorities responsible for carrying out the CBA (local, regional, national, individual operators, etc.)



Druge pomembne naloge izvajanja EED

Zagotavljanje SPTE:

- **Prednostni/zagotovljen dostop do omrežja**
- **Prednost pri dispečiranju** (zagotavljanje stalne oskrbe s toploto)
- Možnost omogočanja **lažjega priklopa na omrežje za male enote SPTE**
 - “**Postavi in priglasi**” – preprosto obveščanje pri vgradnji mikro SPTE

Drugi instrumenti, pozitivni za SPTE:

- Obvezno zagotavljanje 1,5% prihranka dobaviteljev
- Spodbujanje energetskih storitev (pogodbeništvo)
- Obvezne meritve
- Spodbujanje EP (obveznost za velika podjetja)
- Dolgoročna strategija prenov stavb
- 3% letna prenova vladnih stavb



Zaključki

Nova direktiva:

- **Vpeljuje celovito načrtovanje pri oskrbi s toploto in hladom**
 - Učinkovite rešitve s povezovanjem SPTE & DOH & Industrije
- **Ocena potencialov – izzik za povezovanje obstoječih in novih podatkovnih zbirk** (register nepremičnin, baza energetskih izkaznic, baza kurilnih naprav, podatki dobaviteljev energije in goriv, idr.)
- **Ocena stroškov in koristi – na ravni področja in posameznih naprav – uporaba ustrezne metodologije in ocen glavnih vplivnih faktorjev ključna za končni rezultat**
- **Večja vloga SPTE pri zagotavljanju sistemskih storitev in poenostavitev pri vključevanju v omrežja.**
- **Učinki odvisni od končne izvedbe, ki ni enostavna!**



Načrt razvoja soproizvodnje v Sloveniji

“CHP Roadmap for Slovenia”

Stane Merše

Center za energetsko učinkovitost, IJS Ljubljana, Slovenia

Strokovna delavnica CODE2 “Načrt razvoja soproizvodnje v Sloveniji”

ICJT, Reaktorski center IJS Podgorica, 26.11.2013



Co-funded by the Intelligent Energy Europe
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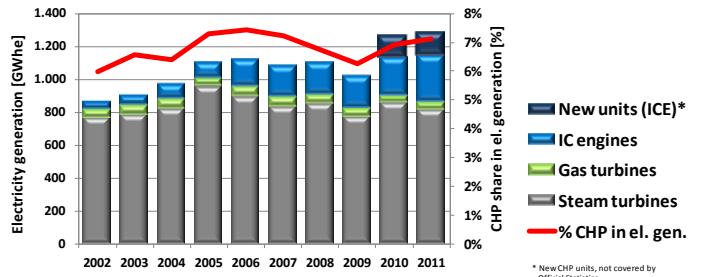
Vsebina

1. Kje smo s SPTE v Sloveniji
2. Aktualni razvoj SPTE
3. Ozaveščenost
4. Ekonomika SPTE
5. Potencial SPTE
6. Glavne ovire
7. Ukrepi za nadaljnji razvoj SPTE v Sloveniji
8. Pričakovani učinki izvedbe Načrta

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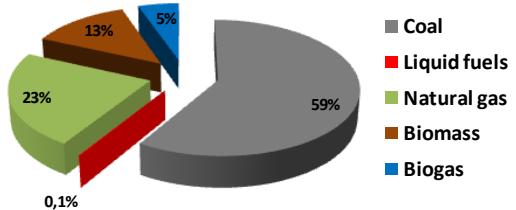
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Kje smo s SPTE?

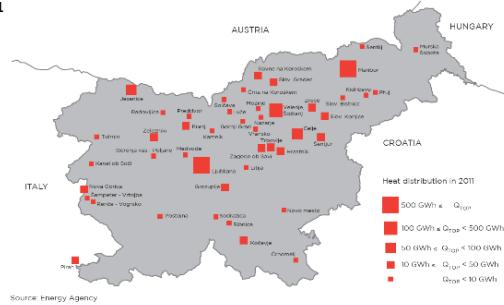
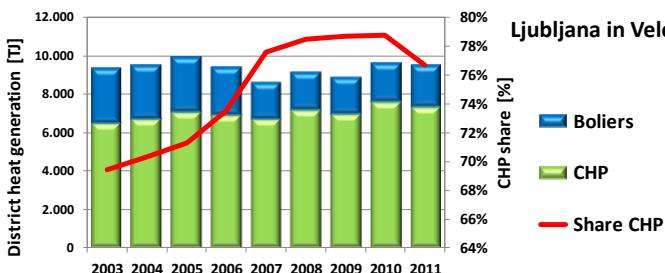


Statistika SPTE 2011:

- Instalirana moč: $350 \text{ MW}_{\text{el}}$
 - 20% samoproizvajalci (35% 2002)
- Proizvodnja:
 - $1,3 \text{ TWh}_{\text{el}}$
 - $3,1 \text{ TWh}_{\text{toplota}}$

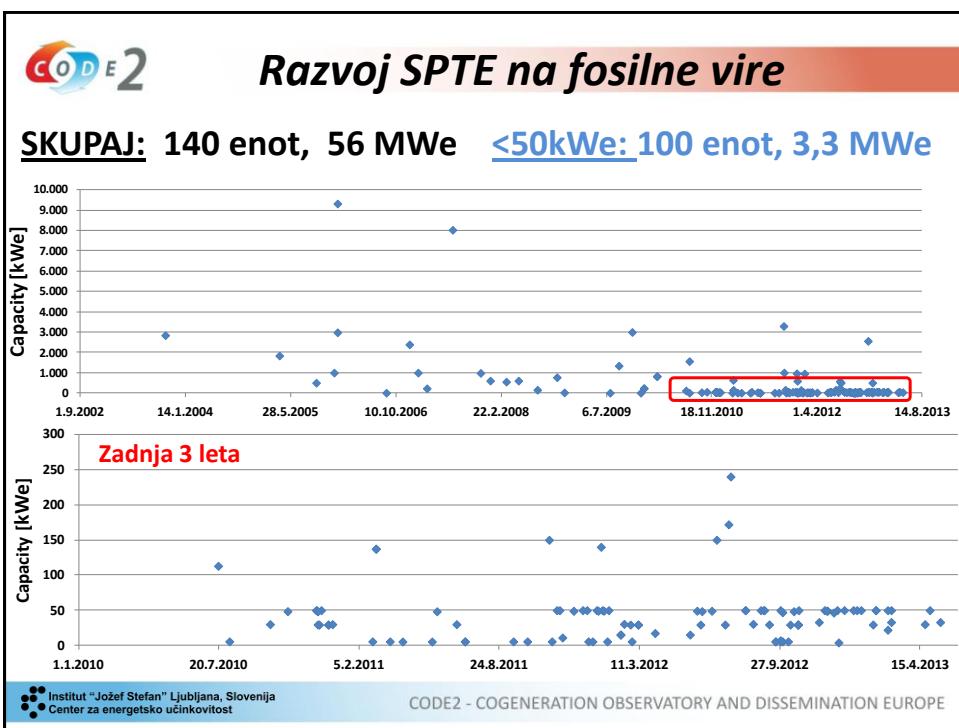
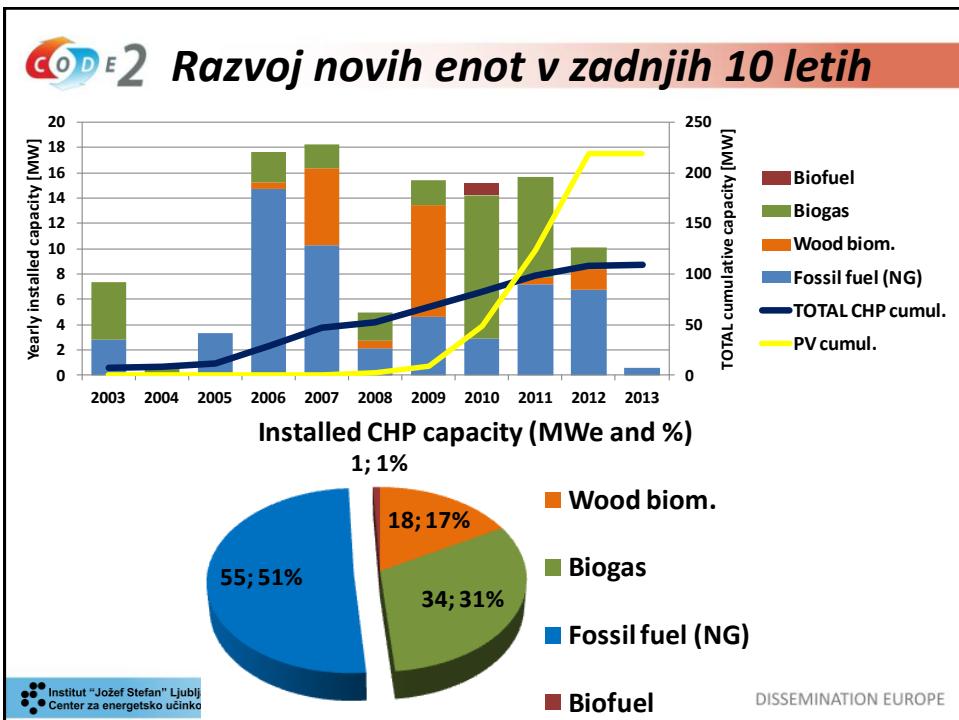


SPTE v daljinskem ogrevanju



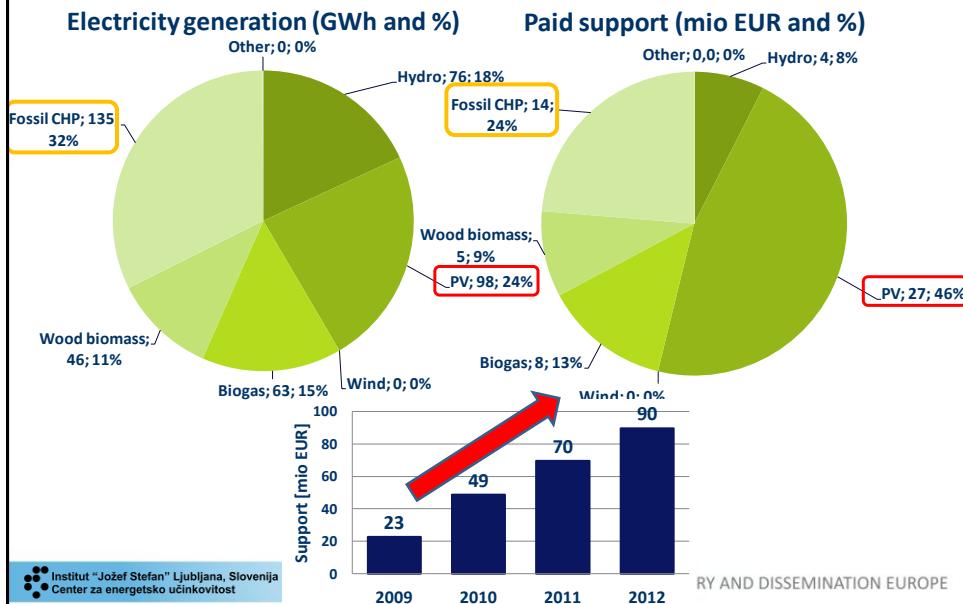
Statistika 2011:

- 49 občin (od 210)
 - 734 km omrežja DI
 - 1 km omrežja daljinskega hlajenja
- Struktura goriv:
 - 55% premog,
 - 33 % zemeljski plin,
 - 11% lesna biomsaa





Podpora shema OVE & SPTE – ½ leta 2013



Politika in cilji SPTE

- Energetski zakon:
 - Prenos SPTE direktive, [podpora shema!](#)
- Prvi cilji glede SPTE: ReNEP 2004:
 - Podvojitev proizvodnje el. Energije iz 800 na 1.600 GWh v obdobju 2000-2010 – doseženo le **1.135 GWh**
- Cilj do leta 2020 ni določen:
 - Osnutek NEP :
 - delež SPTE v bruto končni rabi električne energije: 18% v letu 2020 in 23% v letu 2030
 - Akcijski načrt OVE:
 - 80% delež OVE in SPTE do leta 2020 v sistemih DO
 - Akcijski načrt URE (2008-2016)
 - Cilj prihranki za SPTE izven ETS: 102GWh₂₀₁₆/ 9GWh prihranek v 2010
 - Predlog ANURE 2 (2011-2016):
 - 55MWe novih enot SPTE v vseh sektorjih (92 MWe do leta 2020)
 - OP-TGP do 2012:
 - Zmanjšanje emisij TGP za 313 kt CO₂ekv – v letu 2012 zaradi novih SPTE



Osveščenost glede SPTE v Sloveniji

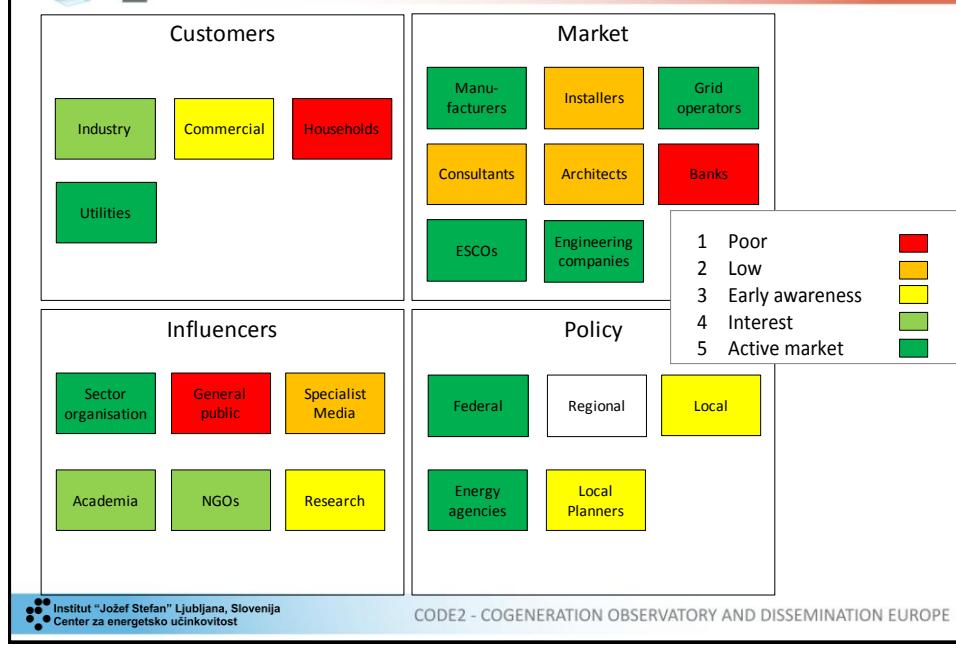
Sektorji	Osveščenost	Izvajanje projektov	Ključne ovire
Industrija	VISOKA	NIZKO	<ul style="list-style-type: none"> pomanjkanje denarja tveganja za pogodbeništvo
Storitve	NIZKA a raste	VISOKO	<ul style="list-style-type: none"> kompleksnost projektov
Gospodinjstva (bloki)	NIZKA	NIZKO	<ul style="list-style-type: none"> nizka osveščenost lastniška struktura drage tehnologije

Vpliv ključnih akterjev na potencialne investitorje:

Akterji	Industrija	Storitve	Gospodinjstva bloki
Ponudniki opreme	SREDNJI	VISOK	VISOK
Finančni sektor	NI	NI	NI
Izobraževanje	SREDNJI	NIZEK	NI
Raziskave	VISOK	NIZEK	NIZEK
Država	SREDNJI	SREDNJI	NIZEK
Interesne skupine	VISOK	VISOK	NIZEK
LEA	NIZEK	VISOK	SREDNJI



Osveščenost glede SPTE v Sloveniji (2)





Osveščenost glede SPTE v Sloveniji (3)

Splošna osveščenost je NIZKA – večina ljudi o SPTE še ni slišala, pogosto jo vidijo kot kompleksno in drago tehnologijo, ne vedno okolju prijazno (emisije, hrup, idr.).

Glede na vodilni državi glede razvoja SPTE v EU (Nemčija in Belgija) opažamo naslednje ključne razlike v osveščenosti:

- **Trdna podpora vlade in politike ter osveščenost glede prispevka SPTE k ciljem 2020 ni prisotna:**
 - kljub uspešni podporni shemi ter ustreznim obravnavi SPTE v akcijskih dokumentih, srednje in dolgoročne usmeritve niso jasno postavljene, kar vnaša negotovost, še posebej glede prihodnjega financiranja in izvajanja podporne sheme.
- **Pomanjanje ozaveščenosti bank in finančnih institucij – finančni sektor še zadržan glede SPTE:**
 - otežuje izvedbo projektov, še posebej v času finančne krize (SPTE obravnava še vedno kot zelo tvegane projekte, posledica tudi slabega poznavanja, precej slabše v primerjavi s PV, stanje izboljšuje?)
- **Ustrezno znanje ter osveščenost vseh akterjev odgovornih za uspešno izvedbo projektov SPTE:**
 - Izziv za vse vključene akterje, saj je kvaliteta storitev ključna v vseh sektorjih, še posebej v storitvah in gospodinjstvih

Promocija dobre prakse spodbujena s spodbudno podporno shemo je ključni dejavnik za dvig ozaveščenosti o SPTE v Sloveniji.



Ekonomika SPTE

Slovenia	Micro		Small & Medium		Large		
	up to 50kW		up to 10 MW		more than 10 MW		
	NG	RES	NG	RES	NG	Coal	RES
Industry	Green	Yellow				Red	Green
District heating	Grey	Grey					
Services	Green	Yellow			Grey	Grey	Grey
Households	Yellow	Red					Grey

Legend:

"normal"

CHP Investment has good economic benefits, return on investment for the investors, interest for new investment exists; there are no barriers for the implementation.

"modest"

CHP Investment has modest/limited economic benefits investment(?), limited interest for new investments.

"poor"

CHP Investment has poor or negative return on investment (?); due to other limitations, no interest/possibilities for new investments.

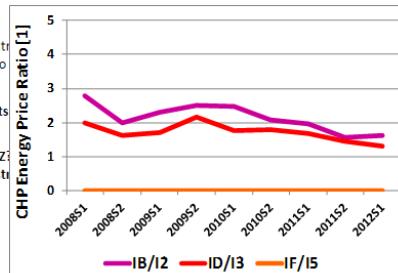
Not applicable for the sector

Natural Gas or appropriate fossil fuel

NG

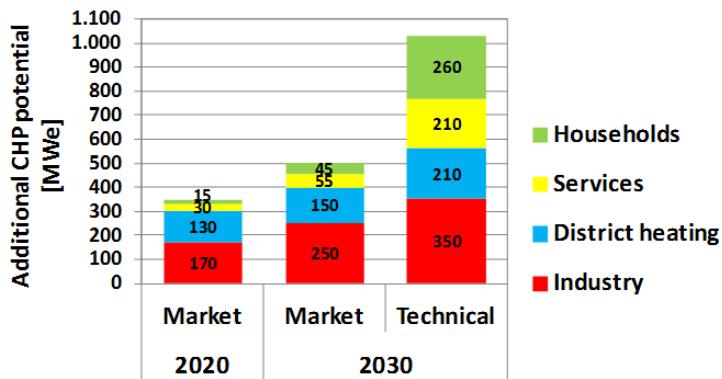
Renewable energy sources (wood biomass, biogas, etc.)

RES



Podpora shema zagotavlja dobre ekonomske pogoje za večino investicij SPTE, kar je nujno glede na trenutne zelo neugodne tržne razmere.

Potencial SPTE



Do leta 2030 bi lahko v Sloveniji pri sedanjih pogojih instalirali 500 MWe novih kapacitet SPTE s proizvodnjo 2,7 TWh električne energije in 2,5TWh topote. Ocenjeni tržni potencial predstavlja le 50% ocenjenega tehničnega potenciala, ki raste z razvojem tehnologij SPTE.

Ocena potenciala mikro SPTE - Storitve

SME & Collective systems ($\pm 40 \text{ kWe}$) Expected final market share: 15% of boiler sales in SME & Coll. sector

Boiler add-on technology

Present market (2013)

Boiler stock: 82 500 units
Boiler sales: 7 800 units/year

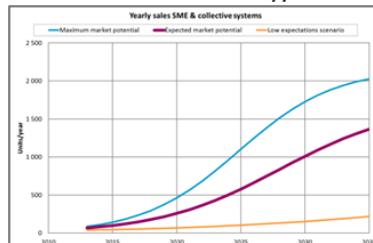
Potential estimation

Indicator	Score
Market alternatives	0
Global CBA	3
Legislation/support	3
Awareness	1
Total	7 out of 9

Yearly sales

Sales in 2020: 260 units/year*

Sales in 2030: 1 000 units/year*



Stock

Stock in 2020: 1 800 units*

Stock in 2030: 7 000 units*

Stock in 2040: 14 000 units*



Ocena potenciala mikro SPTE - Gospodinjstva

Household systems ($\pm 1 \text{ kWe}$)

Boiler replacement technology

Present market (2013)
Boiler stock: 262 000 units
Boiler sales: 25 000 units/year

Potential estimation

Indicator	Score
Market alternatives	0
Global CBA	0
Legislation/support	1
Awareness	0
Purchasing power	1
Total	2 out of 12

Expected final market share: 8% of boiler sales in Household sector

Yearly sales

Sales in 2020: 10 units/year*
Sales in 2030: 1 000 units/year*

Stock

Stock in 2020: 30 units*
Stock in 2030: 3 300 units*
Stock in 2040: 18 200 units*

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Ocena potenciala OVE SPTE

Bio-energy CHP potential analysis Slovenia

600
500
400
300
200
100
0

2010 2015 2020 2025 2030

ktOE

Final Heat Demand from CHP & DH (Primes, IEA)
National targets biomass for heating (NREAP)
Projected heat demand from bio-energy CHP
Projected heat demand from bio-energy CHP (after score card)
Biomass availability, share heating (sust., cost-eff.), final energy

1.336 GWh toploote v letu 2030
• 77% toploote v DO danes iz premoga!

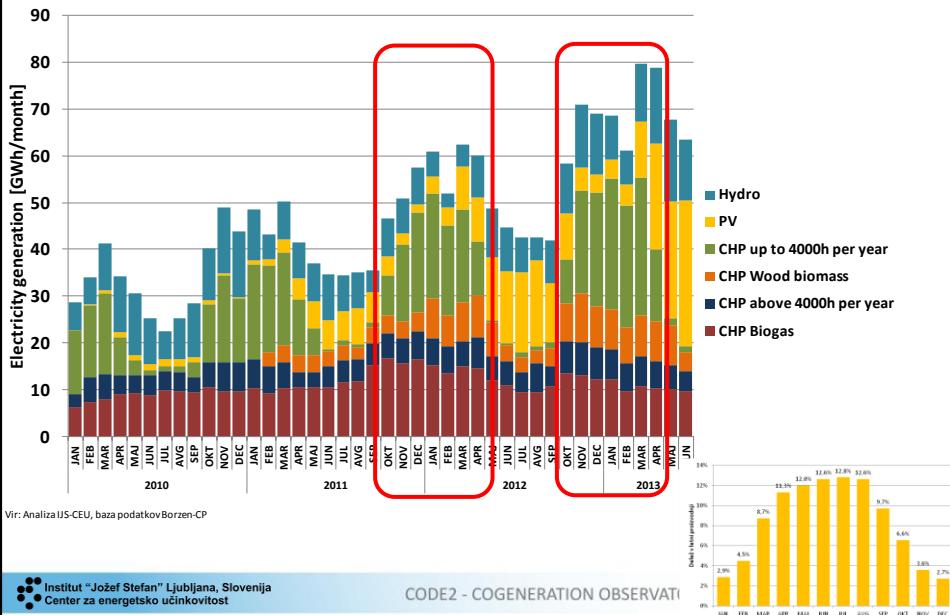
Framework Assessment (Score card)

	Score
Legislative environment	++ 3 (of 3)
Suitability of heat market for switch to bio-energy CHP	+ 2 (of 3)
Share of Citizens served by DH	+ 2 (of 3)

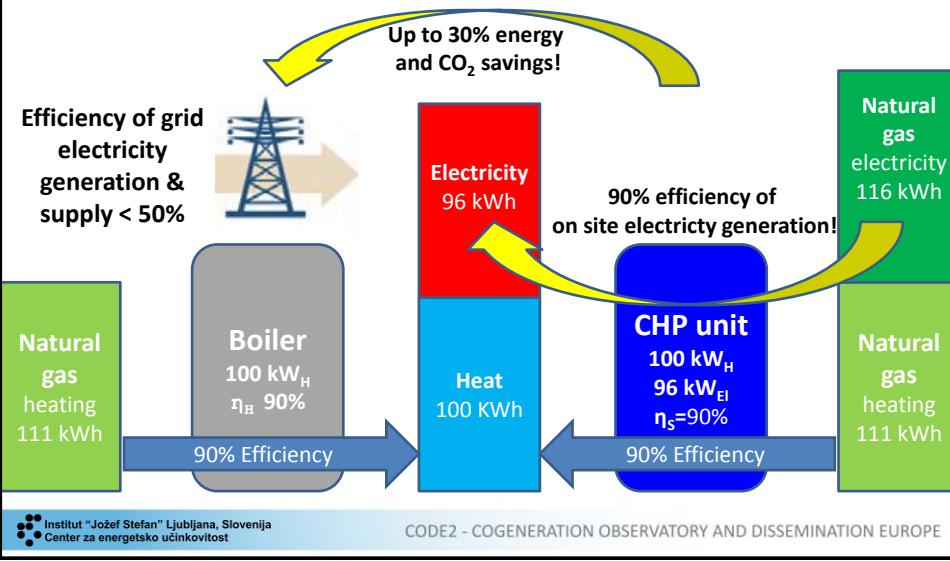
National supply chain for biomass for energy	++ 3 (of 3)
Awareness for DH and CHP	++ 3 (of 3)



SPTE – komplementarna proizvodnja z OVE

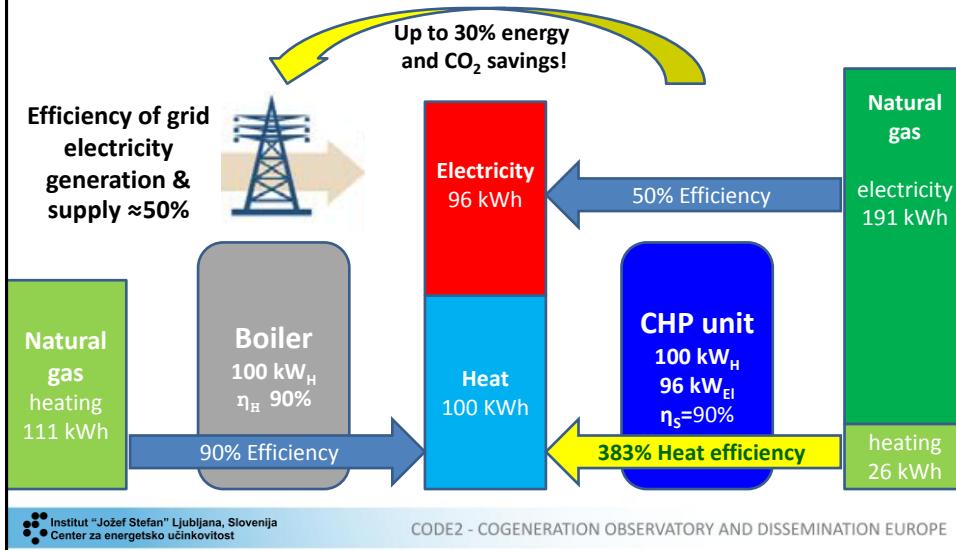


CHP – champion in electricity generation efficiency





CHP – champion in generation efficiency



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Glavne ovire pri SPTE

1. NEGOTOVA PODPORA:

Predlagane spremembe podporne sheme EZ-1, financiranje sheme
Podpora starejših enot SPTE (>10 let)

2. POMANKANJE FINANČNIH SREDSTEV:

Omejen dostop do finančnih sredstev, predvsem v industriji

3. OHLAPNA ENREGETSKA POLITIKA:

Odsotnost ciljev SPTE in prioritet pri načrtovanju ogrevanja

4. OZAVEŠČENOST:

Slaba splošna ozaveščenost ter ozaveščenost finančnega sektorja

5. ADMINISTRATIVNE OVIRE:

Predolgi in še vedno ne povsem jasni postopki, še posebej za najmanjše enote SPTE

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Strategija razvoja SPTE do leta 2030

**23% delež SPTE v
bruto končni rabi
električne energije
do leta 2030**

- Proizvodnja električne energije iz SPTE lahko zagotovi vsaj 23% delež bruto končne rabe električne energije v letu 2030 (18% do leta 2020)

**80% delež OVE in
SPTE toplotne v
sistemi DOH**

- 80% toplotne energije iz trajnostnih virov v sistemih daljinskega ogrevanja in hlajenja do leta 2020 : OVE, SPTE in odpadna toplota (100% za nove sisteme DOH)

**Trajnostna oskrba
s toplotno v
stavbah**

- Jasne prioritete načinov ogrevanja za nove in obnovljene stavbe: 1. Daljinsko ogrevanje, 2. OVE & odpadna toplota, 3. SPTE na fosilne vire

**Ustrezno podporno okolje in odprava ovir ključno za
doseganje zastavljenih ciljev!**



Stabilno podporno okolje za SPTE

1. Čim hitreje sprejeti EZ-1 in podzakonske akte ter zagotoviti predvidljivo in stabilno podporo za SPTE:

- Ohraniti sedanji uspešni "feed-in" sistem, ki ga je potrebno ustrezno modificirati in optimirati na podlagi evaluacije delovanja sheme v zadnjih letih.
- Za manjše enote ohraniti sedanj ureditev brez razpisov (lahko se določijo letne kvote)?
- Okrepiti institucije za izvajanje sheme (Agencija), za bolj učinkovito delovanje sheme (krajši roki postopkov, nadzor, idr.)

2. Zagotoviti redno spremljanje in optimizacijo sheme:

- Zagotoviti optimalno delovanje / finančno vzdržno
- Sproti odpravljati nepravilnosti in reševati aktualne probleme:
 - Podpora starih/rekonstruiranih enot SPTE
 - Določiti podporo za mikro enote na lesno biomaso
 - Poenostaviti podporo za tržno neuveljavljene tehnologije



Stabilno podporno okolje za SPTE (2)

3. Zagotoviti nove finančne vire za financiranje sheme:

- EZ-1: prispevki na vse energente , podnebni sklad
- Kohezijska sredstva:
 - Investicijska podpora za nove tržno neuveljavljene tehnologije?

4. Poenostaviti postopke in stroške priključevanja na omrežje:

- Nadaljevanje postopkov poenostavitev, še posebej za najmanjše enote :
 - Nižji in predvidljivi stroški
 - “Install and inform” – preprosta prijava projektov (DEU)
 - “Net metering”?



Stabilno podporno okolje za DOH

5. Pogoji za trajnostno in ekonomsko delovanje sistemov za DOH:

- Trajnostna in konkurenčna oskrba s toploto v sistemih DOH je ključni pogoj za nadaljni razvoj teh sistemov:
 - AN-OVE: 80% delež OVE & SPTE, EZ-1: 75% delež OVE, URE ali odpadne toplotne (DEU)
 - Ustreznega podprtja za vzpostavitev (podpora shema, kohezijska sredstva)

6. Jasne prioritete načinov ogrevanja za nove in obnovljene stavbe:

1. Daljinsko ogrevanje
2. OVE & odpadna toplota,
3. SPTE na fosilne vire



Večja ozaveščenost in promocija SPTE

7. Podpora razvoju novih finančnih & poslovnih modelov in nadaljni razvoj pogodbeništva za izvedbo projektov:

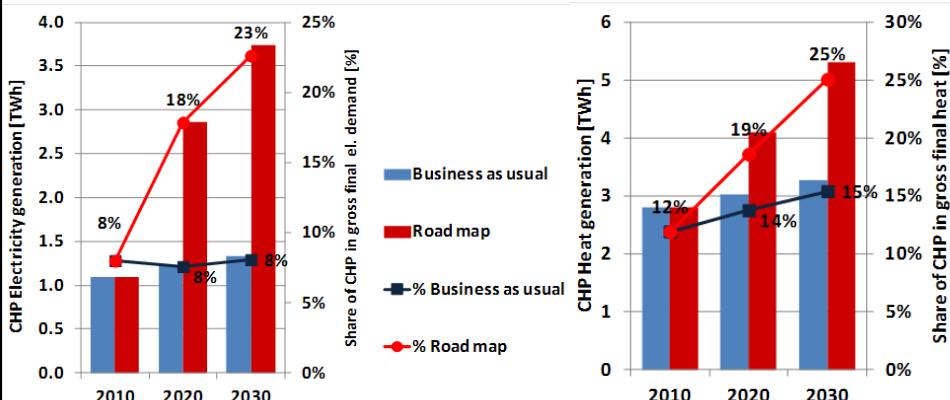
- Odprava nejasnosti in ovir
- Izdelava jasnih smernic in priročnika za izvedbo,
- Ustrezno vključevanje SPTE v zelena javna naročila
- Izvedba demonstracijskih projektov in pisarne za tehnično podporo

8. Širše promocijske aktivnosti za dvig ozaveščenosti o SPTE:

- Celovita kampanja pod vodstvom Direktorata za energijo ter vključevanjem lokalnih akterjev (LEA, ponudniki, idr.)
- Boljša vključenost SPTE v izobraževalne programe
- Povečanje mednarodnega sodelovanja in razvojne podpore domači proizvodnji opreme za SPTE



Pričakovani učinki izvedbe Načrta





Zaključki

Izvedba predstavljenega uravnoteženega Načrta razvoja SPTE v Sloveniji z izgradnjo 500 MWe novih kapacitet do leta 2030 prinaša številne koristi:

- Proizvodnjo 4 TWh električne energije (danes 1,1TWh) ali več kot 20% bruto končne rabe električne energije (danes 8%)
- Zagotavlja več kot 5 TWh ali $\frac{1}{4}$ of bruto končne rabe toplote (danes skoraj 3 TWh)
- Vsaj 20% deleže proizvodnje iz OVE
- Zmanjšanje emisij TGP za skoraj 1 miot CO₂
- Prispeva več kot 20% prispevka k izpolnjevanju ciljev do leta 2020:
 - URE - PPE 4,5TWh in
 - OVE električne energije 0,7 TWh
- Uravnotežen razvoj Slovenije z razvojem novih energetskih storitev, slovenske proizvodnje opreme za SPTE, nova delovna mesta, zmanjšanje uvoza energije in povečanje zanesljivosti oskrbe z energijo.



Evaluacija podporne sheme in predlogi sprememb

Damir Staničić, Stane Merše

Center za energetsko učinkovitost, IJS Ljubljana, Slovenia

Strokovna delavnica CODE2 "Načrt razvoja soproizvodnje v Sloveniji"

ICJT, Reaktorski center IJS Podgorica, 26.11. 2013



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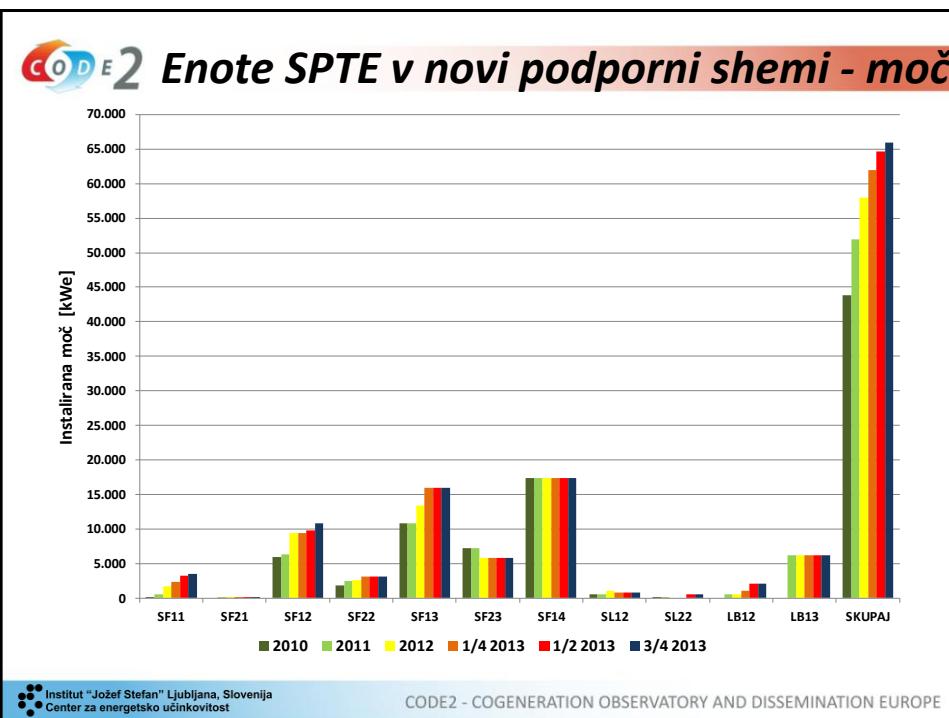
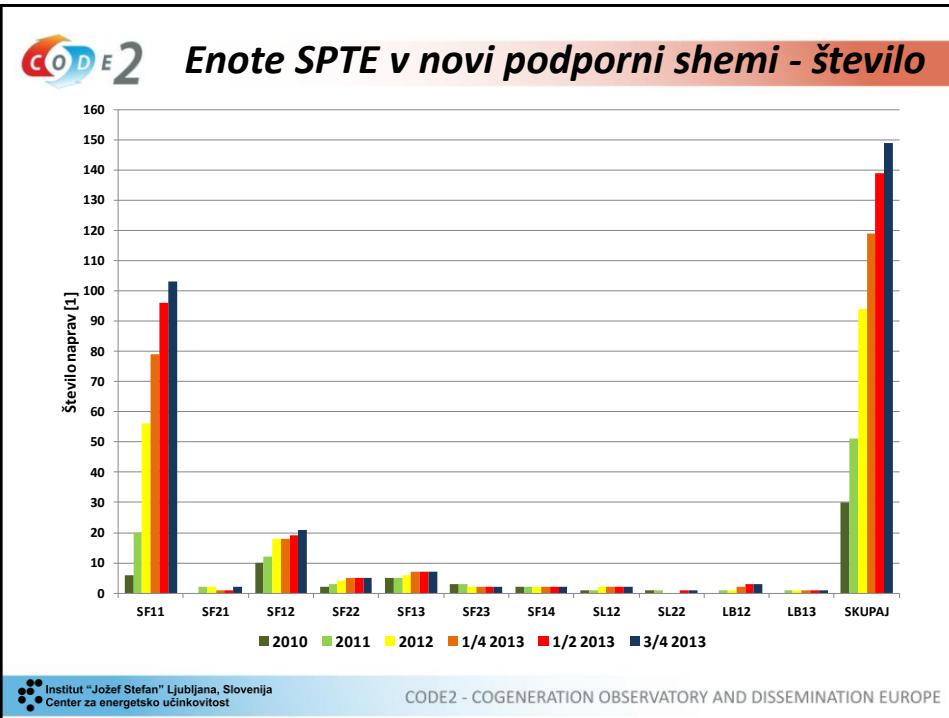


Vsebina

1. Evaluacija stanja
2. Analiza izboljšav in možnosti za optimizacijo
3. Zaključki in diskusija

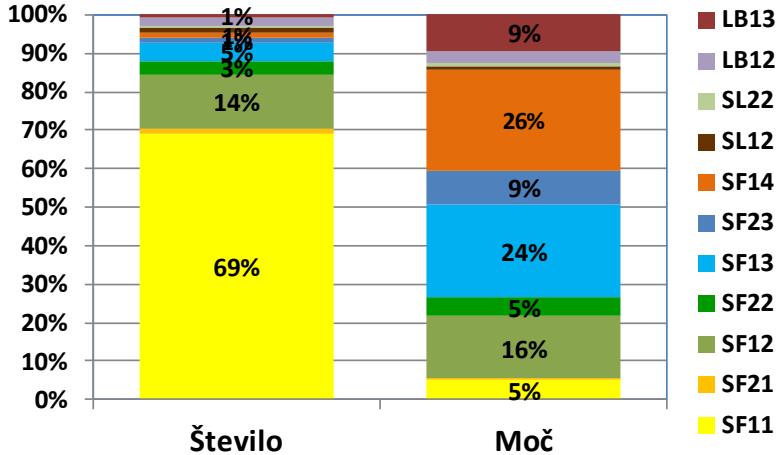
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Struktura naprav SPTE

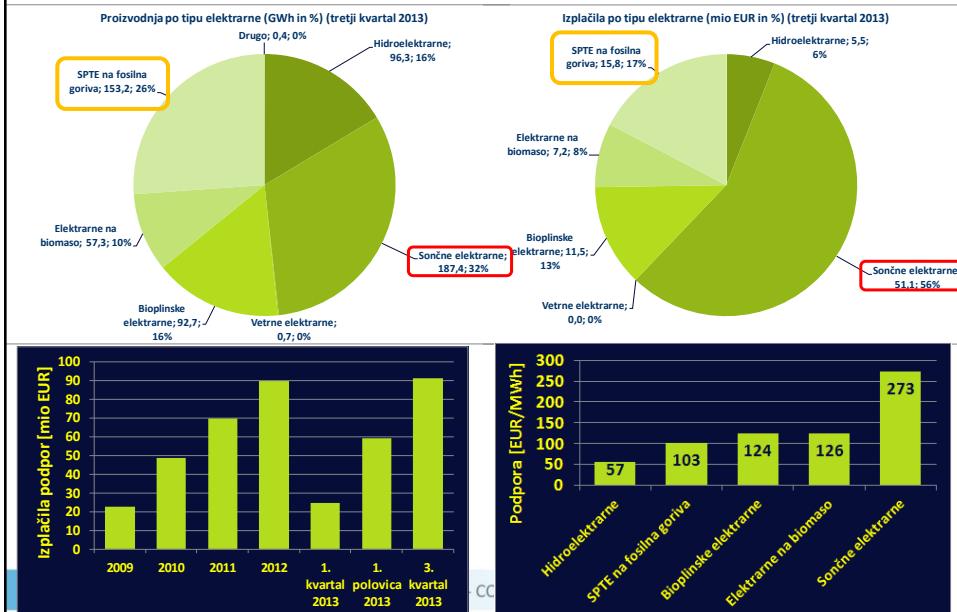


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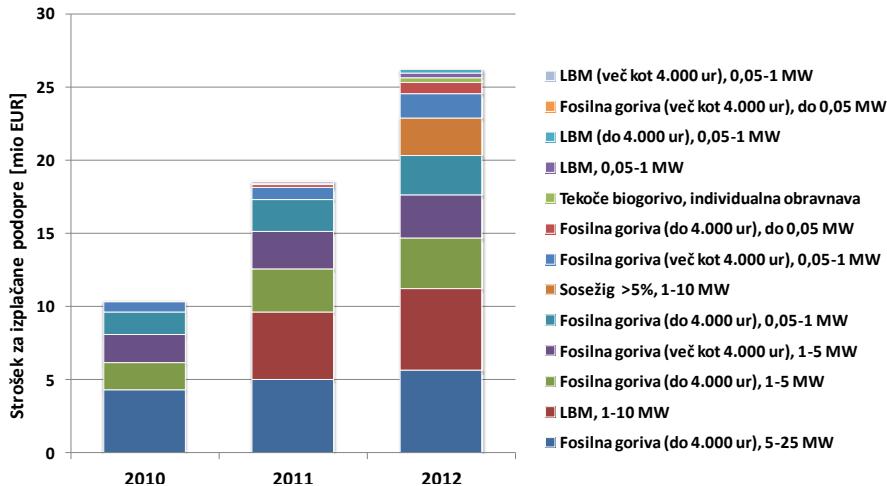


Podpora shema OVE & SPTE – ¾ leta 2013





Stroški podpor SPTE



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Razvoj SPTE in OVE v letu 2013

status	vrsta elektrarne	razred moči	01.01.2013-31.03.2013		01.04.2013-30.06.2013		01.07.2013-30.09.2013		Skupaj (leto 2013):	
			Št. Elektrarn	Moč (kVA)	Št. Elektrarn	Moč (kVA)	Št. Elektrarn	Moč (kVA)	Št. Elektrarn	Moč (kVA)
izdano SZP	SE	do 50 kVA	60	2.370	80	2.283	49	1.272	189	5.925
		50-1000 kVA	15	4.987	20	5.225	4	1.487	39	11.699
		več kot 1000 kVA	0	0	0	0	0	0	0	0
	HE	do 50 kVA	1	14	0	0	2	61	3	75
		50-1000 kVA	2	210	1	150	4	686	7	1.046
		več kot 1000 kVA	0	0	0	0	0	0	0	0
	VE	do 50 kVA	0	0	3	72	6	57	9	129
		50-1000 kVA	0	0	0	0	0	0	0	0
		več kot 1000 kVA	0	0	0	0	0	0	0	0
	SPTE	do 50 kVA	35	1.429	20	772	19	679	74	2.880
		50-1000 kVA	9	2.582	14	6.132	8	2.815	31	11.529
		več kot 1000 kVA	0	0	0	0	0	0	0	0
	SKUPAJ (izdano SZP):		122	11.592	138	14.634	92	7.057	352	33.282
priključeno	SE	do 50 kVA	36	1.467	35	1.020	46	1.355	117	3.842
		50-1000 kVA	13	7.028	12	4.043	3	937	28	12.008
		več kot 1000 kVA	0	0	0	0	0	0	0	0
	HE	do 50 kVA	0	0	2	34	0	0	2	34
		50-1000 kVA	0	0	0	0	2	742	2	742
		več kot 1000 kVA	0	0	0	0	0	0	0	0
	VE	do 50 kVA	1	50	0	0	2	100	3	150
		50-1000 kVA	0	0	0	0	0	0	0	0
		več kot 1000 kVA	0	0	0	0	0	0	0	0
	SPTE	do 50 kVA	10	414	8	322	21	783	39	1.519
		50-1000 kVA	0	0	3	942	6	4.994	9	5.936
		več kot 1000 kV	0	0	0	0	0	0	0	0
	SKUPAJ (priključeno):		60	8.959	60	6.361	80	8.911	200	24.231

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Usmeritve pri prenovi podporne sheme

- **Ustreznost metodologije RSEE**
- **Aktualizacija stroškov:**
 - Trenutne cene opreme
 - Pričakovani trendi zniževanja
- **Ustreznost referenc tržnih cen energije**
- **Skladnost z zastavljenimi cilji (AN-OVE, AN-URE)**
- **Skladnost podpor s smernicami za državne pomoči**
- **Optimizacija stroškov za vzdržno delovanje sheme**

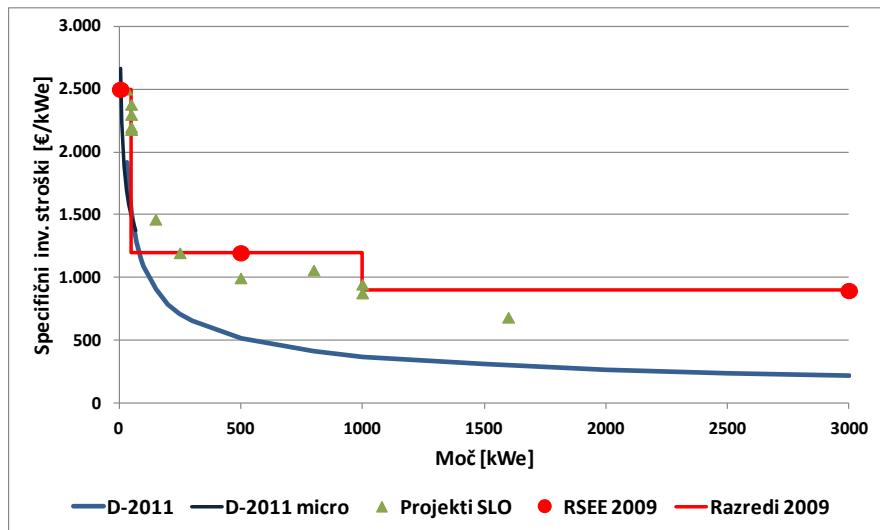


Metodologija RSEE

- **Ustrezna stroškovna podlaga**
- **Diskontna stopnja:**
 - 12% visoko za trenutne razmere?



Investicijski stroški SPTE

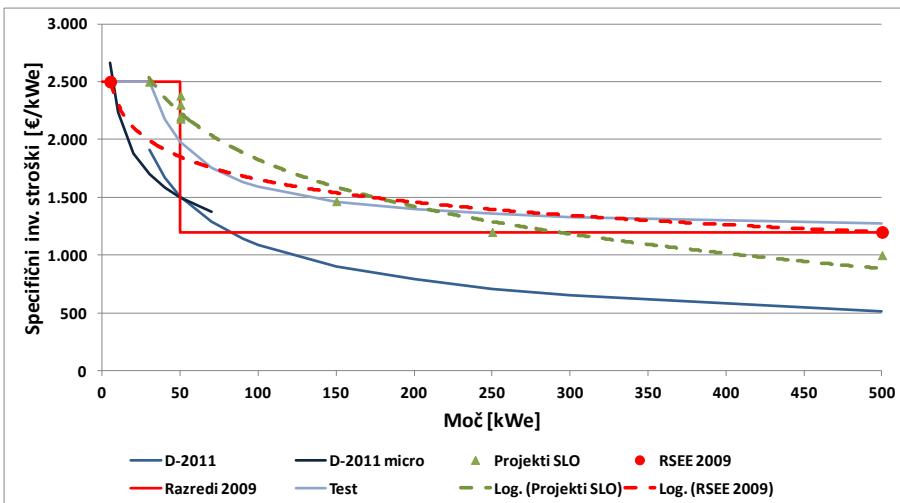


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Investicijski stroški SPTE – krivulja RSEE



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Stroški pogodbenega vzdrževanja

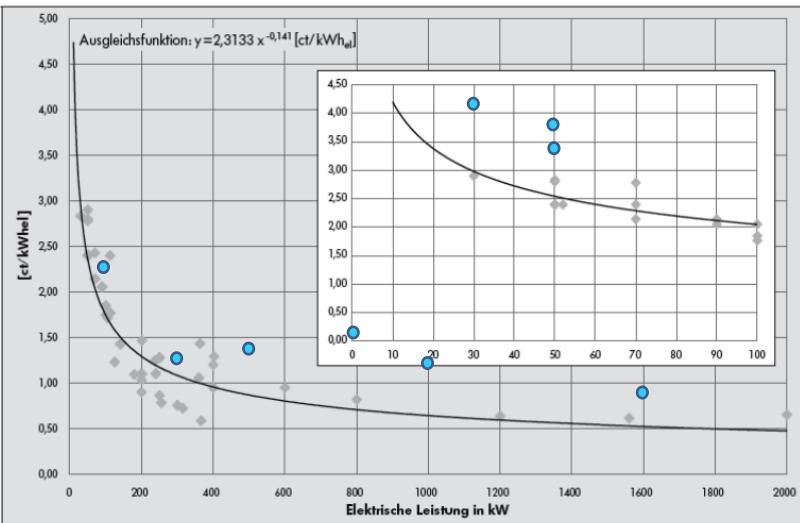


Abb. 3-12: Spezifische Kosten von Instandhaltungsverträgen für Erdgas-BHKW
(Basis: 61 Angebote)

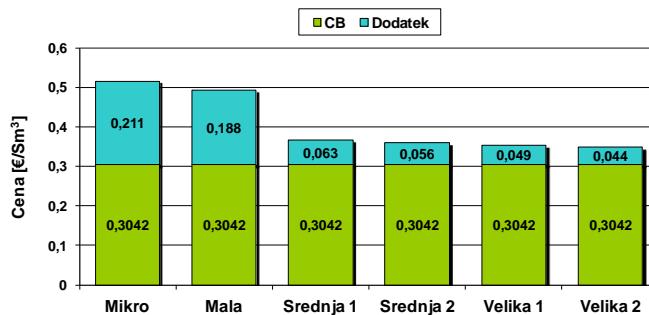


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Referenčne cene zemeljskega plina



Velikostni razred	Variabilna cena	Fiksni del		Omrežina		Kuponi CO ₂	Dajatev CO ₂	Prispevek URE	DODATEK skupaj	SKUPAJ	
		C _B	Fdi	Opi	ODI					€/Sm ³	€/MWh
1 Mikro	do 50 kW	0,3042	0,072			0,112	0	0,0274	0,005	0,211	54,5
2 Mala	od 50 do 1000 kW	0,3042	0,059			0,101	0	0,0274	0,005	0,188	49,2
3 Srednja 1	od 1 do 5 MW	0,3042	0,040	0,023	0	0	0	0		0,063	38,8
4 Srednja 2	od 5 do 25 MW	0,3042	0,035	0,021	0	0	0	0		0,056	38,0
5 Velika 1	do 50 MW	0,3042	0,030	0,019	0	0	0	0		0,049	37,4
6 Velika 2	do 200 MW	0,3042	0,025	0,019	0	0	0	0		0,044	36,8



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Referenčne cene električne energije

- Trenutno stanje na trgu – ali je referenca ustrezná?
 - 2013: 50,66 €/MWh
 - 2014: 43,31 €/MWh
- **Končne cene odjemalcev (ZZS):**
 - 2013: VT 63€/MWh, MT 42 €/MWh (**53,8€/MWh**)
 - 2014/15: VT 63€/MWh, MT 42 €/MWh (**42,5€/MWh**)

Velikostni razred	Faktor B		Tržna cena (EUR/MWh)	
	Obratovalne ure < 4000 ur	Obratovalne ure > 4000 ur	Obratovalne ure < 4000 ur	Obratovalne ure > 4000 ur
Mikro, manjše od 50 kW	0,85	0,90	36,81	38,98
Male, manjše od 1MW	0,88	0,92	38,11	39,85
Srednje – nižje, do vključno 5 MW	0,93	0,94	40,28	40,71
Srednje – višje, do vključno 25 MW	0,93	0,94	40,28	40,71
Velike- nižje, do vključno 50 MW	0,96	0,97	41,58	42,01
Velike- višje, do 200MW	0,96	0,97	41,58	42,01



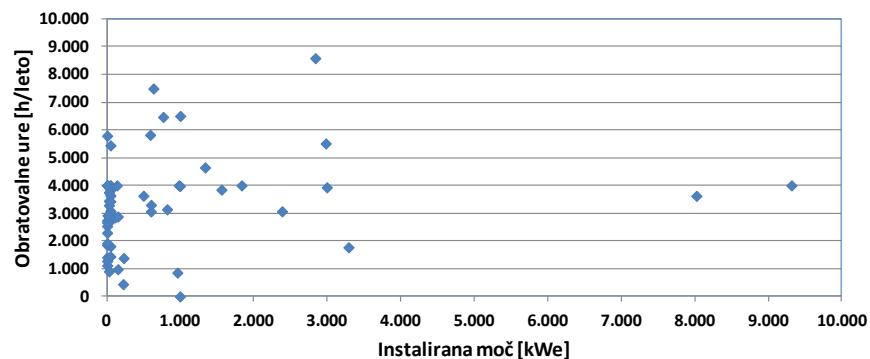
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Obratovalne ure

- **Preračun RSEE pri višjih obratovalnih urah:**
 - 4.000 in 6.500 ur (sedaj 3.500 in 5.500)
- **Omejitev izplačil navzgor tudi nad 6.500 ur?**



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Podpora starim/obnovljenim SPTE

- **Kako zagotoviti ekonomiko obratovanja naprav starejših od 10 let?**
 - Nove smernice ne dajejo možnosti?
- **Kvalitetna obnova:**
 - Zahteve glede izkoristkov?



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Individualna obravnava za nove tehnologije

- **Ohraniti?**
- **Dodatni bonus na podporo**
- **Investicijska subvencija**
- **Katere tehnologije spodbujati?**
 - Stirlingov motor
 - Gorivne celice
 - ORC



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Zaključki

Kakšni so vaši predlogi in mnenje?



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Odprava ovir za razvoj SPTE

Diskusija v dveh skupinah:

1. *Daljinsko ogrevanje in industrija*
2. *Mikro in mala SPTE*

Damir Staničić, Stane Merše

Center za energetsko učinkovitost, IJS Ljubljana, Slovenia

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Vsebina

1. Katere ključne izzive vidite za nadaljnji razvoj SPTE v Sloveniji v naslednjih 2 letih?
2. Katere ovire je potrebno odpraviti?
3. Konkretni predlogi!
4. Vloga SPTE v energetski politiki, kaj lahko prinese DEU?
5. Zaključki in diskusija

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