6. MEĐUNARODNA ENERGETSKA KONFERENCIJA O BIOMASI I OBNOVLJIVIM IZVORIMA ENERGIJE

6th International Energy Conference for Biomass and RES

2.12.2015., Zagreb Hotel Westin

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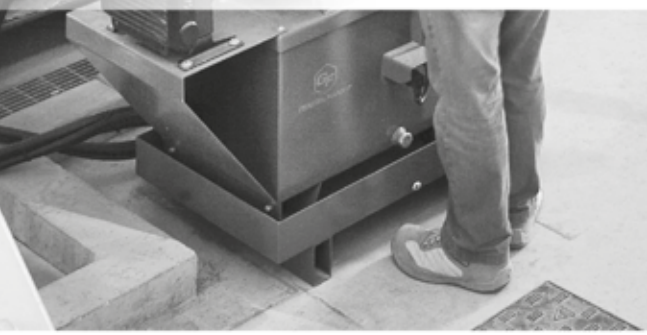

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UVODNE RIJEČI

Marijan Kavran
Direktor
Hrvatski drvni klaster

Sve održivo je u modi, ali rijetki sektori imaju temelj za održivost

Naš sektor je relativno heterogen, jer uključuje ulagače iz različitih dijelova gospodarstva, iz zemlje i inozemstva, iako u Hrvatskoj okosnicu sektora čine drvoprerađivačke tvrtke koje koriste drvni ostatak iz prethodnih faza prerade, što je u skladu s kaskadnim sustavom za koji se zalažu neki krugovi u EU. S druge strane, na razini EU radi se o vrlo konjunkturnom sektoru koji i dalje raste dvoznamenkastim stopama.

Održivo gospodarenje šumama je sastavni dio zelene ekonomije, a šume su izvorište sirovine za energetski sektor koji se bazira na drvu. Ovaj je tjedan održana važna rasprava u Europskom parlamentu koju je potaknula austrijska zastupnica Elisabeth Köstinger uz prisustvo Phila Hogana, povjerenika za poljoprivredu i ruralni razvoj. Hogan je istaknuo da se Komisija zalaže za ulaganje u šumarstvo kroz programe ruralnog razvoja i razvoj bioekonomije, naglašavajući važnost inovativnih programa i projekata koji ostvaruju dodanu vrijednost prirodnih resursa, uz važan doprinos koji se ostvaruje kroz mnogobrojna radna mjesta.

Povjerenik Hogan je istom prilikom istaknuo da je danas moderno govoriti o održivosti, jer to dobro zvuči i svi žele slušati o tome. Mi ćemo se pridružiti takvim razmišljanjima i podvući da je održivo šumarstvo stvarnost u ovom dijelu Europe i da mi zaista imamo šanse za uspostavu kružne ekonomije, jer na šumskoj sirovini razvijamo cijeli lanac dodane vrijednosti. Uporabom biomase u lokalnim zajednicama potičemo i multicipliramo lokalni rast i dajemo doprinos europskim energetskim ciljevima. Stoga veseli činjenica da je čak 37 tvrtki ispunilo uvjete za kupnju drvne sirovine na 14 godina za kogeneracije i proizvodnju struje iz drva.

Mi smo zapravo tek otkrili biomasu, jer smo prethodnih godina i desetljeća, dok je Europa izdašno koristila EU fondove, tek stidljivo pokušavali uhodati ovu vrstu proizvodnje. Sada kada smo u tome relativno uspjeli, posebice oko motiviranja ulagača i stvaranje poticajnog zakonskog okvira ne možemo odjednom nadoknaditi sve propušteno. Stoga predviđamo da ćemo još dugo, još mnogo naših Konferencija posvećivati ovakvim temama, budući da postoji zanimanje gospodarstva i relativna podrška nadležnih institucija.

UVODNE RIJEČI

Raoul Cvečić Bole
Predsjednik
Hrvatska udruga proizvođača peleta,
briketa, biomase i pripadajućih tehnologija

Imamo veliku priliku i veliku odgovornost!

Poštovani sudionici 6. Međunarodne energetske konferencije,

Ispred nacionalne udruge biomase i proizvodnje peleta trebamo izraziti zadovoljstvo razvojem tržišta obnovljivih izvora u Hrvatskoj. Daleko je to od željenih europskih razina i očekivanja iz europskih dokumenata u udjelu OIE, ali uzmemo li u obzir naše prilike pred nekih 4-5 godina uočit ćemo veliki napredak, pa stoga treba priznati da su se stvari promijenile na bolje.

Jedan od važnih koraka je i naše ovogodišnje članstvo u AEBIOM, europskoj udruzi za biomasu, koja nas konkretno podržava u našim aktivnostima, ali i učestalo opskrbljuje važnim sektorskim informacijama. Upravo smo jučer od AEBIOM-a saznali da su u Bruxellesu otvorene konzultacije oko revizije i usvajanja dvije važne direktive: revidiraju se teme energetska učinkovitost i obnovljiva energija, a proces je pokrenula Europska komisija.

Na taj način, udruženi u europsku asocijaciju imamo priliku sudjelovati u procesu donošenja EU zakonske regulative, ali imamo i odgovornost predložiti najbolja rješenja, kako za Europu, za našu regiju, tako i za Hrvatsku. Na kraju, treba biti otvoren i reći da to radimo i u interesu naših tvrtki iz ovog sektora, jer ako će one biti uspješne, onda će se i razvijati zelena i cirkularna ekonomija i postići ambiciozni EU ciljevi postavljeni do 2030. godine.

Na nama je velika odgovornost da u Hrvatskoj potaknemo i ubrzamo proces zamjene fosilnih energija onim obnovljivima, jer klasična energija bazirana na fosilnim gorivima proizvodi preko 60 posto svih globalnih štetnih emisija stakleničkih plinova, a to se snažno odražava i na klimatske promjene. Naš sektor, naša biomasa, pelet i briket imaju veliki potencijal u ublažavanju svjetskih klimatskih izazova na vrlo održiv, raznolik i troškovno učinkovit i prihvatljiv način.

Iz tog razloga nam je vrlo drago da će se COP 21 - klimatska konferencija UN-a u Parizu baviti i pronalaskom novih energetskih rješenja, koja će naglasiti važnost obnovljivih izvora. Pažnju svjetske javnosti treba usmjeriti prema potencijalima drvne biomase koja je najbrži, najčišći, najpouzdaniji i ekološki najučinkovitiji model promjene teškog stanja uzrokovanog primjenom fosilnih goriva, a čini nam se da se ta činjenica u medijima još uvijek ne prepoznaje dovoljno.

Mi se u Hrvatskoj nećemo miriti s neznanjem administracije i javnih naručitelja ili s komforom projektanata, kojima je najlakše u javne objekte ugraditi sustav na fosilna goriva. Takve ćemo slučajeve mijenjati i uvoditi OIE, kako bi se naša vrijedna ekološka goriva na bazi drva utrošila u Hrvatskoj, a ne u drugim zemljama čime se poboljšava njihova CO2 bilanca.

S druge strane treba istaknuti da ova konferencija, svojim kontinuitetom, kvalitetom tema i izbalansiranom strukturom sudionika daje pregled dosad učinjenog, te sve nas, koji se nalazimo u vodstvu sektora ohrabruje da nastavimo s promocijom biomase, peleta i drugih obnovljivih izvora energije. Bioenergija treba biti u središtu politike u Hrvatskoj kao i na EU razini.

UVODNE RIJEČI

Sven Müller
Direktor
Fond za zaštitu okoliša i
energetsku učinkovitost

Hrvatska svoj gospodarski rast temelji na načelima održivog razvoja, pa je ulaganje u obnovljive izvore energije neizostavni segment takvog razvitka. Naš zemljopisno-klimatski položaj osigurava nam neiscrpno korištenje energije sunca i vjetra, a bogatstvo šumskog prostora daje nam ogromne količine drvne biomase koju možemo koristiti za podmirenje domaćih potreba na energetski efikasniji način. Stvoreni viškovi drvne biomase mogu kroz preradu u pelete i drvne sječke služiti kako energent ne samo u industriji nego i u kućanstvima. Na žalost, drvna biomasa još uvijek nije dovoljno prepoznata od strane potrošača pa je i ova konferencija odlična prilika da se takva vrsta energenta što više popularizira radi daljnjeg korištenja.

Istina, situacija je bolja nego prijašnjih godina, no još uvijek nedovoljno dobra s obzirom na razvojne mogućnosti drvne biomase kako u energetskom, ali isto tako i u gospodarskom smislu.

Fond je kroz svoje programe prepoznao te mogućnosti pa jedinicama lokalne samouprave, tvrtkama, ali sve više i građanima sufinanciramo instaliranje sustava obnovljivih izvora energije koji koriste pelete i drvnu sječku, a također ulažemo i u pogone za proizvodnju biomase. Do sada smo sufinancirali 84 takva projekta ukupno vrijedna 259 milijuna kuna, od kojih je Fond odobrio 48 milijuna kuna poticaja. U okviru programa energetske obnove kuća odobreno samo u 2015. godini građanima smo s 9 milijuna kuna sufinancirali 484 kotla na biomasu.

Fond će i u sljedećim godinama nastaviti ovakva ulaganja, a osim nacionalnih sredstava, investicije u drvo-prerađivačku industriju treba uključiti i u programe korištenja europskih fondova. Da bi naše gospodarstvo bilo konkurentno svi zajedno trebamo propagirati korištenje resursa koje imamo jer su oni itekako dobra domaća alternativa sve skupljim svjetskim energentima.

Dr. Heinz Kopetz
World Bioenergy Association, Stockholm

Wind Energy and Bioenergy – pillars of a 100% renewable energy world

Content

- The need for CO2 reduction
- 2000 – 2014: Bioenergy, Wind energy
- 2015 – 2035: Bioenergy, wind energy within a climate mitigation strategy
- Conclusions

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Climate mitigation

- Global warming is getting more and more the most serious problem. IPPC warns in the last reports about the dire consequences of climate change such as:
  - Considerable risk for the future food supply, for forests, for oceans etc.
  - damage to public health,
  - displacement of people and mass migration,
  - death or injuries on massive scale.

The climate of tomorrow depends on the CO2 emissions today!
What does this mean for the energy system?

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Consequnces for the energy system

- CO2 - the main cause of climate change.
- Fossil fuels: the main source of CO2 emissions!
- Coal, oil, gas should remain in the earth crust after 2050!
- Their use should be halved by 2035 – not 460EJ but 230EJ!

The only alternative to a climate desaster:

Reducing fossil fuels and replace them by better efficiency and renewable energies

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IPCC on C02 emissions

IPCC defined a carbon budget for this century in line with the 2° C target. According to this budget the emissions from 2012 to 2100 should not exceed **1,6 ton C02/capita** and year (range 0,8 – 2,4 ton)!

- **EU emissions 2011: 7,6 ton C02/capita**
- **Global emissions 2011: 4,5 ton C02/capita**
- **Mitigation pathway: 1,6 ton C02/capita** (range 0,8 – 2,4ton)

The EU emits at present 3 -4 times more C02 than foreseen in the global carbon budget as calculated by IPCC!!

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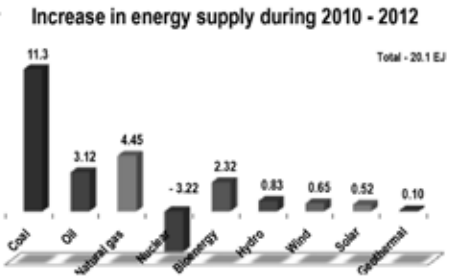
Increase in energy supply during 2010 – 2012

2 year changes:
+ 18,9 EJ fossil
+ 4,4 EJ RES
- 3,2 EJ nuclear
20,1EJ total



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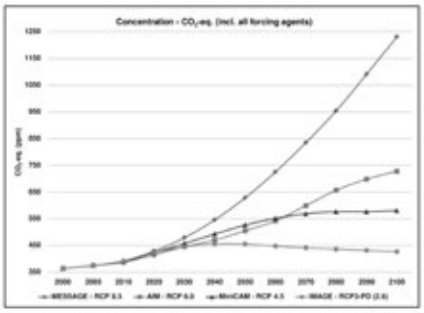
Global developments of bioenergy: how to follow the green line?

The world is moving along the red line. To follow the greenline the C02 emisson should be a third of the present level!



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The development of windenergy 2004 - 2014

- *In the new energy world wind energy will play an extraordinary role.*
- *Over the last ten year wind energy achieved an annual growth of 22,8%,*
- *the installed capacity by 2014 reached 371 GW.*
- *If the annual growth rate over the next 21 years could be managed with 15% wind capacity by 2035 would attain almost 7 000 GW corresponding to 57 EJ (Exajoule) electricity as compared to 3EJ by 2014.*

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The development of windenergy 2004 - 2014

- Wind energy grows at an impressive speed!
- Over the last 12 years wind energy achieved an annual growth of 27%.
- Over the last five years the growth rate was 18%, the installed capacity by 2014 reached 370 GW.
- In 2012 the generation was 521 TWh based on 283 GW installed capacity.

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2012: three countries generate 50% of wind electricity

In 2012, three countries – China, USA, Germany- generated 50% of the Global wind electricity!

In Europe and Americas, mainly USA, wind generation is several times higher Than the world average. Asian and African countries are lagging behind, with the exception of China, the biggest wind producer!

continent	TWh	Share in %	kWh/1000capita
Africa	3	1	**3**
Americas	164	30	**172**
Asia	138	27	**35**
Europe	208	40	**252**
Oceania	8	2	**285**
TOTAL	521	100	**74**

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Global bioenergy 2000 - 2012

- *Biomass is a traditional energy source. In 2012 bioenergy contributed 48,5 EJ as final energy. (wind 1,9 EJ).*
- *The relative growth rate 2000 – 2012 was 2,4% annually; the total growth over 12 years was 13,1EJ.*
- *As compared to wind with a growth rate of 26% and a total growth of 1,5 EJ.*
- *Also the repartition among continents is completely different. Asia and Africa are leading in the use of biomass*

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Biomass on the continents

Asia is leading in the use of biomass, followed by Africa and the Americas!

Asia: 25,1EJ
Africa: 14,7 EJ
Americas: 9,7 EJ
Europe: 6,5 EJ
Oceania: 0,2 EJ
TOTAL: **56,2 EJ** (equals 3 120 million tons dry matter of biomass)

In Africa biomass covers 50% of the primary energy consumption; biomass is mainly used for cooking!

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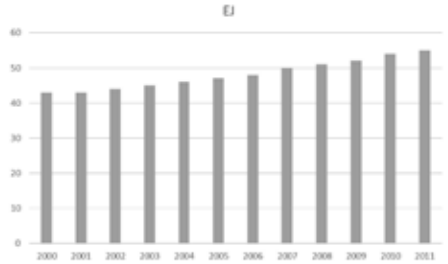
World Bioenergy Association (WBA)

- **The global development of biomass as primary energy source** (source: IEA, world energy outlook)

In 11 years from 43 to 55 EJ, an increase of 28%!



Not only these global figures are of importance but also where it comes form, how we use the biomass, how efficiently we convert it to final energy!

World Bioenergy Association (WBA) – the global voice of bioenergy – join WBA: www., worldbioenergy.org

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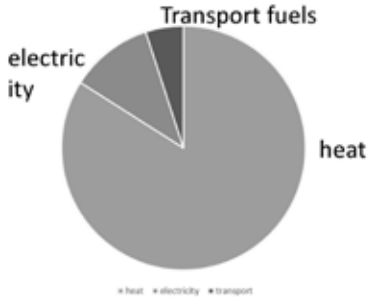
Global developments of bioenergy: heat market dominating

- Global Utilization of primary biomass, 2011:
  84% heat, 11% electricity, 5% transport fuels



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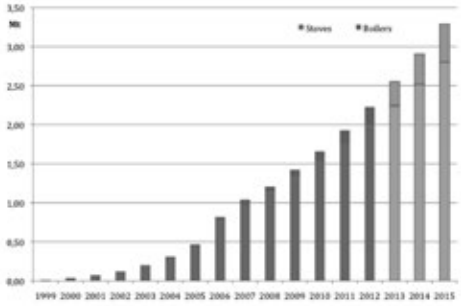
Italy: the most dynamic European pellets market

Reference: A. Paniz and L. Pau, AIEL, presentation Jan. 2014 bioenergy Graz

Consumption 2012: 2.2 million tons,
annual growth 200 – 300.000 tons, 90% stoves, 10% boilers
Annual growth rate 2003 -2013: 29%



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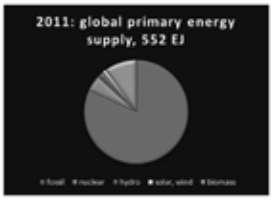
Basics of the global energy system

- *The global energy system is dominated by fossil fuels – more than 80%.*



- *The gap between primary energy and final energy - heat, electricity and transport fuels. The difference **is 218 EJ** (560EJ primary energy and 342EJ final energy)*
- *Main reason: wasted heat in fossil power generation.*
- *To compare: all RES deliver 63EJ final energy!*

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The consequences for the energy system

- *The use of fossil fuels (460 EJ in 2012) became the main source of climate change*
- *A reduction of fossil power generation by 10 000 TWh would save 135 – 150 EJ fossil fuels*
- ***Power generation by wind and solar technologies should become the main strategy to reduce the use of fossil fuels***

Some additional information:

Almost half of fossil fuels (estimated 200 – 220 EJ) goes to power generation, 100 EJ to transport and the rest to industry and heat in buildings. 2012 fossil fuels delivered 15 400 TWh electricity (SSEJ)

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2012, global composition of final energy EJ

Final energy in 202 was 342 EJ. The table informs About the use of fossil fuels and the role of renewables. .

EJ	2012
Final fossil	**271**
Hereof as electricity	55
as transport	100
as heat	116
nuclear	**8**
Renewables	**63**
TOTAL	**342**

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2012, global composition of RES for final energy

Bioenergy deliverd 48,5 EJ final energy, most was heat, electricity with 1,6EJ was smaller than wind electricity with 1,9EJ!

EJ	2012
Biomass	**48,5**
As electricity	1,6
As transport	2,7
As heat	44,2
Hydro	**11,2**
Wind	**1,9**
Others	**1,4**
TOTAL	**63,0**

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What would be a climate mitigation scenario 2035?

- *Fossil fuels as primary energy should be halved*
- *The final demand for energy will grow (economic growth, population growth), whereas the primary demand could decline.*
- *This is possible if the global system gets much more efficient and uses much more renewables.*
- *Wind electricity should play a key role as well as biomass.*

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Bioenergy: potential by 2035 as seen by the IPCC

Supply of biomass as primary energy, EJ (source 2010 IPCC)
Additional 80 EJ until 2035!

EJ prim. energy	2010	2035
Forestry	47.2	Medium increase
Agriculture	5.4	Strong increase
Waste	1.6	Strong increase
total	54.2	125 - 150

Biomass could deliver 100 – 120 EJ final energy by 2015!
What could be the contribution of wind energy?

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What could be Wind based electricity by 2035?

Different approaches to answer this question such as:

a) global capacity 2035 reaches level of leading countries 2012

b) the growth rate 2015 – 2035 is half of the growth between the years 2004 - 2014

c) the needed contribution of wind energy by 2035,

if demand grows by 10 000 TWh and fossil generation declines by 10 000 TWh – the difference to be covered by wind, pv, hydro, biomass and new technologies.

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Wind energy: contribution 2035

If all countries by 2035 would have the same wind installation per capita Germany today wind energy would deliver 28EJ electricity based on 3 750 GW Installed capacity.
With an annual growth of 13,6% the capacity would be 4 360 GW and 35 EJ electricity could be generated

Approach	GW 2035	TWh	EJ
a) Germany 2014 as benchmark 2035	3 750	7875	**28**
b) Annual growth 12%	3 470	7285	**26**
c) Needed to replace enough fossil electricity	4 630	9720	**35**

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2035, global composition of RES for final energy

The result would be: More final energy, much more electricity thanin 2014 and a reduction in the use of fossil fuels as primary energy Of more than 200 EJ – the world would move towards the climate targets!

	2012	2035
Biomass	48,5	**104**
As electricity	1,6	2 - 5
As transport	2,7	5 - 20
As heat	44,2	80 - 97
Hydro	11,2	**16**
Wind	1,9	**35**
Others (pv, geotherm. o)	1,4	**45**
TOTAL	63,0	**200**

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2012, global composition of final energy EJ

	2012	2035
Final fossil	271	186
Hereof as electricity	55	18
as transport	100	90
as heat	116	78
nuclear	8	4
Renewables	63	200
TOTAL	342	390

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The storage of energy – synergies between wind and biomass

Biomass is stored solar energy,
The cost to build a storage space for biomass are low!

It is expensive to store electricity.

At least on the northern hemisphere more than 50% of the energy is needed as heat. In Europe 84%, in the USA and Japan more than 90% of this heat comes from fossil sources.

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The cost of energy storage

- *How to store energy and what are the investment cost?*
  - *as electricity?*
  - *as hot water?*
  - *in chemical stored energy in biomass?*

Integrated systems using biomass, water storage and electricity for heating can sole part of the storage problem very cheap.

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Table: cost of storage on 1kWh energy, Euro/kWh

The cost of energy storage

Type of storage	Form of energy	Investment cost per one kWh storage capacity in Euro
		Euro
Plumb battery	electricity	500 - 1 500
Hot water storage tank	Heat as hot water	20
Storage room for pellets	Chemical stored energy in wood	0,25

Biomass is by far the cheapest choice for seasonal storage from summer to winter!
Biomass in winter for heat and for CHP solutions!

WORLD BIOENERGY ASSOCIATION www.worldbioenergy.org Official Sponsors: ANDRITZ

Conclusions: the way towards 100% RES

2035 can be an intermediate target.

Wind:

Now we need a strong growth of wind electricity in all parts of the world, in all countries. The growth should be 10-15% in the coming 20 years! Together with pv electricity a big share of fossil power generation should be shut down in the next two decades. This is the best strategy to reduce CO2 emission and to fight against climate change.

Biomass:

Should grow even more than in wind, mainly in the heating market and in the transport sector. Also cogeneration especialla in winter time should grow.

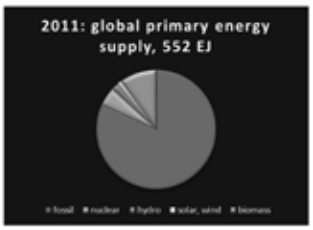
Within a few decades 100% RES is reachable!

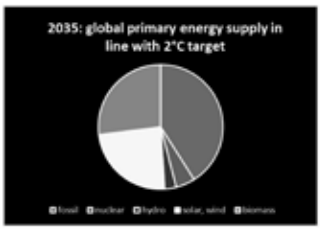
WORLD BIOENERGY ASSOCIATION World Bioenergy Association (WBA) – join the global voice of bioenergy! – www.worldbioenergy.org

Global developments of bioenergy

2 ½ fold incrase of bioenergy, 8 fold increase of other RES (solar, wind)

The needed change in the composition of the energy supply until 2 to comply with the mitigation pathway!





WORLD BIOENERGY ASSOCIATION World Bioenergy Association (WBA) – join the global voice of bioenergy! – www.worldbioenergy.org

ANDRITZ

I thank our official sponsor ANDRITZ and our silver sponsors:

KWB pellet boilers, Viking heat machines, AGRANA ethanol producer for their support!

WBA AT A GLANCE

About WBA

The World Bioenergy Association (WBA) is the global organization dedicated to supporting and representing the wide range of actors in the bioenergy sector. Our members include national and regional bioenergy organizations, institutions, companies and individuals. The purpose of WBA is to promote the increasing utilization of bioenergy globally in an efficient and sustainable way and to support the business environment for the bioenergy. Since its foundation in 2008, WBA has been working to address a number of pressing issues including certification, sustainability criteria, standardization, bioenergy promotion, and the debates about bioenergy's impact on food, land-use and water supply.

WBA Activities

- Improving the global bioenergy statistics
- Publication of factsheets on bioenergy sectors – advanced biofuels, biomass gasification, potential of biomass etc.
- Lobbying at regional and global level in favour of bioenergy
- Assisting in development of standardization criteria for bioenergy
- Aiding the formation of new bioenergy associations globally
- Organizing and participating in workshops, side events and conferences worldwide
- Providing technical expertise in developing bioenergy action plans
- Collaborating with international organizations – REN Alliance, IRENA, REN21, UNFCCC etc.

WBA Member network

As of August 2015, WBA has a total of 178 members from 50 countries – Africa (22), Americas (20), Asia (30), Oceania (6), and Europe (100). Through our member network, WBA informs a larger estimated audience of more than 50 000 individuals working in the sector of bioenergy.

WBA Board

- **Heinz Kopetz**: President, World Bioenergy Association, Sweden
- **Douglas R. Bradley**: President, Climate Change Solutions, Canada
- **Andrew Lang**: Chairman, SMARTimbers Cooperative, Australia
- **Sribas C. Bhattacharya**: President, International Energy Initiative, India
- **Laercio Couto**: President, The Brazilian Network of Biomass for Energy, Brazil
- **Michael J McAdams**: President, Advanced Biofuels Association, USA
- **Wan Asma Bt Ibrahim**: Head of Bioenergy Program, Forest Products Division, Forest Research Institute, Malaysia
- **Benard Muok**: Director of Program, ACTS, Kenya
- **Tanay Sidki Uyar**: President, EUROSOLAR, Turkey
- **Hisashi Kajiyama**: President, Bioenergy Research and Investment (BERI) Inc., Japan
- **Hong Hao**: Chairman of Board, Great Resources (Ji Lin) Co. Ltd., China
- **Jean Marc Jossart**: Secretary General, European Biomass Association, Belgium
- **Kai Johan Jiang**: Chairman and CEO, Dragon Power Group & Chairman, National Bio Energy Group, China
- **Philip Peck**: Assoc. Prof., International Institute for Industrial Environmental Economics, Lund University, Sweden
- **Albert Binger**: Energy Science Advisor, Caribbean Community Climate Change Centre, Jamaica
- **Hazir Farouk**: Assistant Prof., School of Mechanical Engineering, Sudan University of Science & Technology, Sudan
- **Jörgen Sandström**: Executive Officer, Business Development and External Relations, Addax Bioenergy, Switzerland
- **William Strauss**: President, FutureMetrics, USA
- **Kes McCormick**: Assistant Prof., International Institute for Industrial Environmental Economics, LUND University, Sweden

WBA staff

- Heinz Kopetz, President, Austria (hg.kopetz@netway.at)
- Karin Haara, Executive Director, Sweden (karin.haara@worldbioenergy.org)
- Bharadwaj Kummamuru, Project Officer, India (bharadwaj.v.kummamuru@worldbioenergy.org)

WBA AT A GLANCE

WBA supporters

Official: ANDRITZ Group

Silver: AGRANA Group

WBA members

Full members: Spanish Bioenergy Association, Swedish Bioenergy Association, European Biomass Association, Canadian Bioenergy Association, proPellets, Zambian Bioenergy Association, The Wood Energy Group, Energigården - Senter för Bioenergi, CZ Biom - Czech Bioenergy Association, Climate Change Network Nigeria, Eurosolar Turkey, German BioEnergy Association, SSS-National Institute of Renewable Energy, African Bioenergy Association, Austrian Biomass Association, Norsk Bioenergiföreningen, Fachverband Biogas e.V, Bioenergy Association of New Zealand, New World Hope, Advanced Biofuels Association, Bioenergy Association of Turkey, Lithuanian Biomass Energy Association

Associated members: First Bioenergy, Elmia AB, EFO AB, Silvex Energy AB, Bandit Industries, INC, United Loggers Ltd, AKATA Commodity Trading ApS, MHG Systems Oy Ltd, Scandinavvian Forestry & Engineering, COVAERSA s.a.u. (Briec), SIBCONGO, Firefly AB, CPM, Groupe Anderson Inc., C.F. Nielsen A/S, W.Kunz Dry Tec AG (Swiss Combi), Viking Heat Engines AS, FM BioEnergy, Jeffrey Rader Corporation, B&W Mechanical Handling Ltd/Samson, Energy commission of Nigeria, Andritz Group AG, Chemec Oy, Vermeer Corporation, KWB, Ekman & Co AB, Bronswerk Heat Transfer BV, National Center for Biotechnology, Valliluoto Group, Herz Energietechnik GmbH, Energie Steiermark, Agrana, EUROTEC WTT s.r.l, Promill Stolz SAS, Pilum AB, Ingenieurbüro Riebenbauer, Forstbetrieb Regnier-Helenkow, Addax Bioenergy Management S.A, BDI - BioEnergy International AG, Konrad Forsttechnik GmbH, Scheuch GmbH, Sveaskog Förvaltnings AB, ÖkoFEN Forschungs- und EntwicklungsgesmbH, Lund University Biofuels, Westtech Maschinenbau, Bioenergi Wärmeservice, Södra Skogsägarna, Probstdorfer Saatzucht, Nahvärme Holding include 6 companies, Anaerobe Systems, Meva Energy, MAB Powertec Oy

(Indivduals are not listed)

Membership fees

Form of membership	Characteristics of the member	Euro/year
Full membership	Large international bioenergy associations	5 000
	Medium sized international bioenergy associations Large national bioenergy associations	3 000
	National bioenergy associations	1 200
	Bioenergy associations at the begining of their work	300
Associated membership	Large global companies	5 000
	Medium sized companies	3 000
	Energy agencies, research institutes, think tanks in general and organizations in relation to agriculture and forestry	2 000
	Small companies	1 200
	Energy agencies, research institutes, think tanks in developing countries Consultants, startups, companies with less than 50 employees	300
Individual membership	Individual persons interested in bioenergy	50

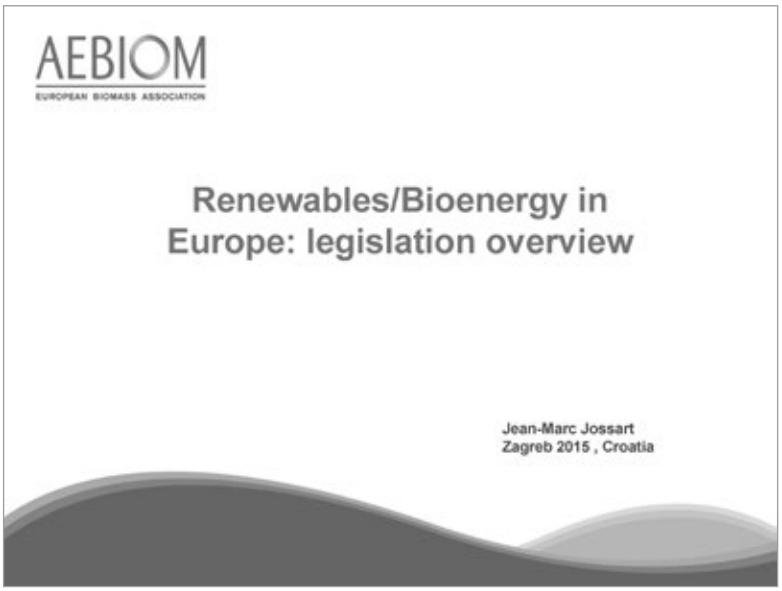
BECOME A WBA MEMBER

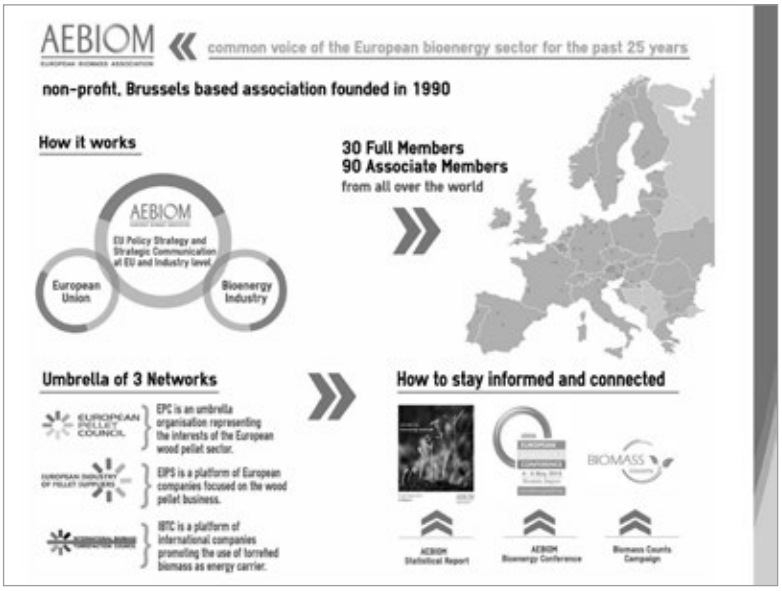
Visit: www.worldbioenergy.org/content/wba-membership

Contact: info@worldbioenergy.org

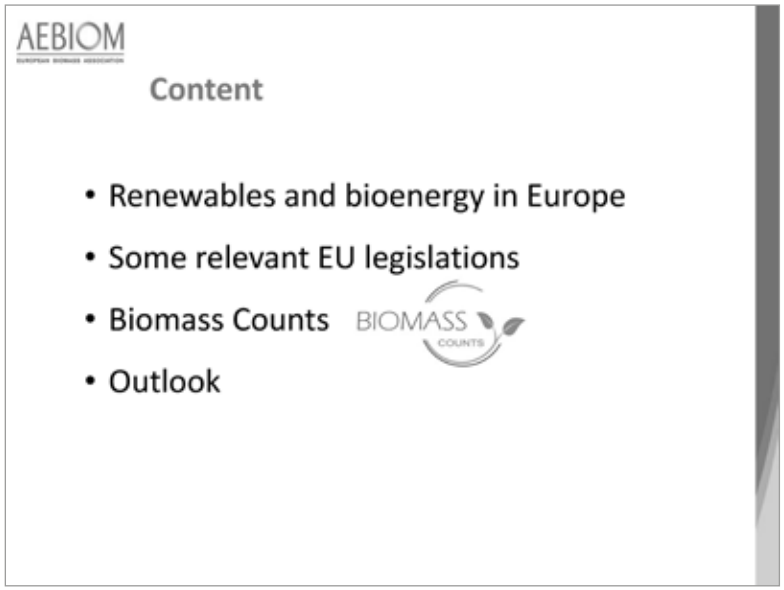
Jean-Marc Jossart
AEBIOM, European Biomass Association

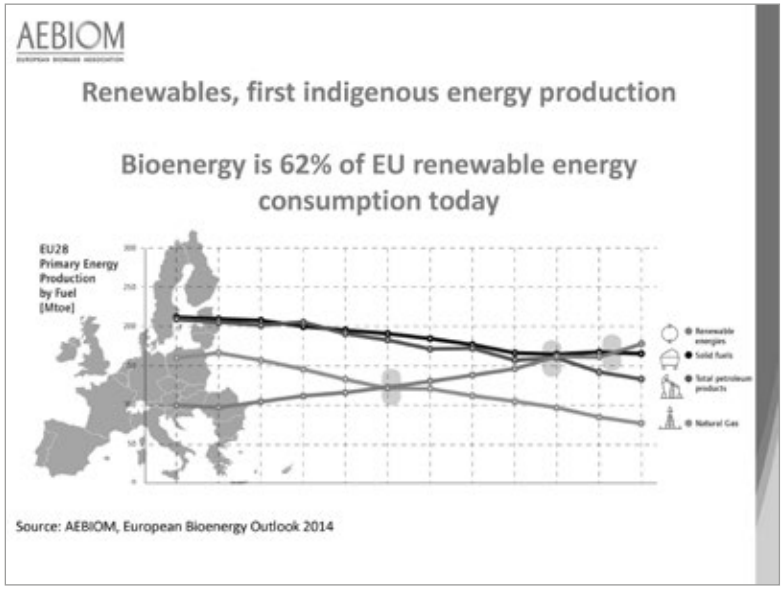
RENEWABLES/BIOENERGY IN EUROPE: LEGISLATION OVERVIEW

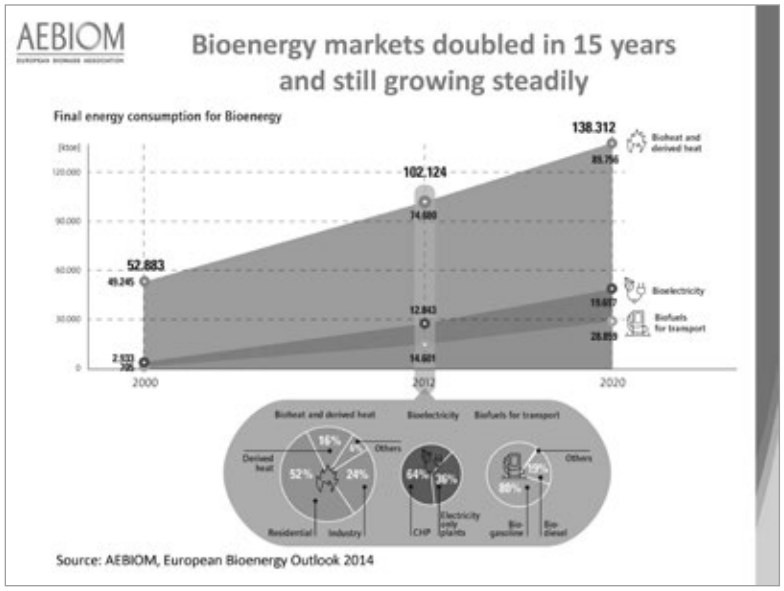


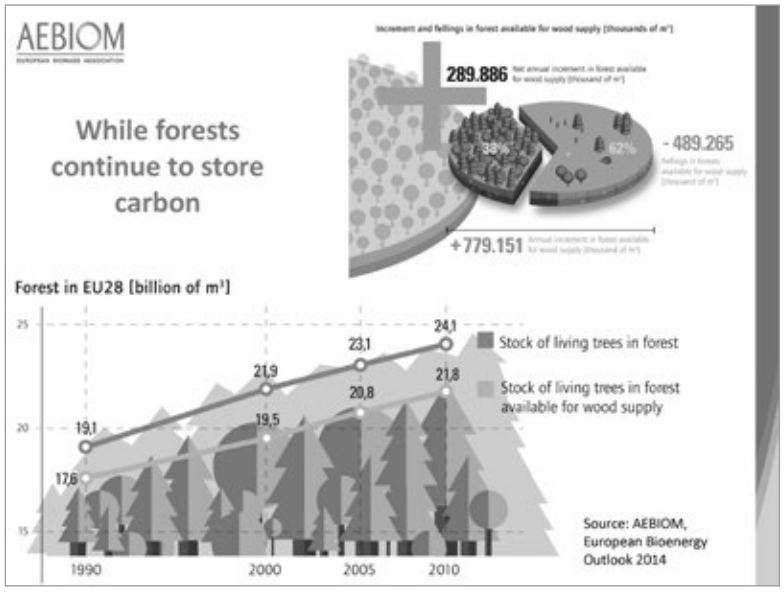


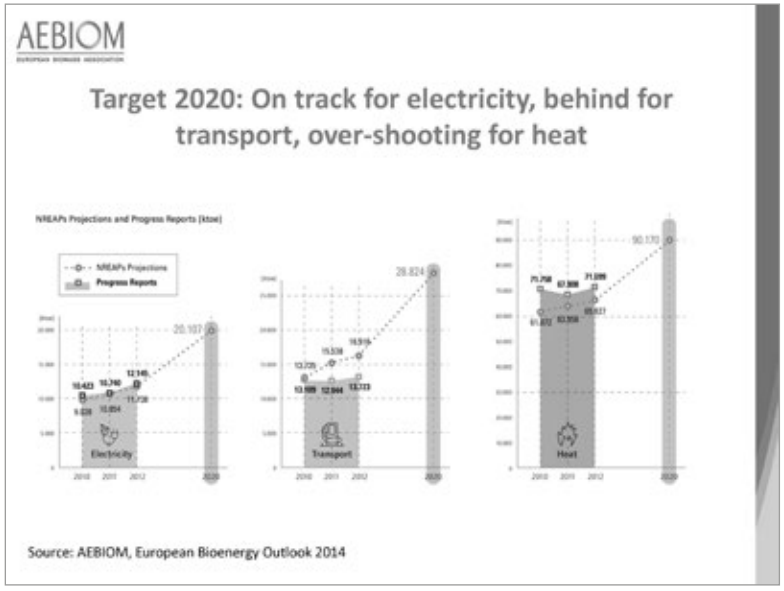

AEBIOM
AEBIOM MEMBERS
Full Members
Associate Members


AEBIOM
Content
• Renewables and bioenergy in Europe
• Some relevant EU legislations
• Biomass Counts
BIOMASS COUNTS
• Outlook


AEBIOM
Renewables, first indigenous energy production
Bioenergy is 62% of EU renewable energy consumption today
EU28 Primary Energy Production by Fuel [Mtoe]
Renewable energies
Solid fuels
Total petroleum products
Natural Gas
Source: AEBIOM, European Bioenergy Outlook 2014


AEBIOM
Bioenergy markets doubled in 15 years and still growing steadily
Final energy consumption for Bioenergy
138.312
102.124
52.883
2000
2012
2020
Bioheat and derived heat
Bioelectricity
Biofuels for transport
Source: AEBIOM, European Bioenergy Outlook 2014


AEBIOM
While forests continue to store carbon
289.886
- 489.265
+779.151
Forest in EU28 [billion of m³]
Stock of living trees in forest
Stock of living trees in forest available for wood supply
1990
2000
2005
2010
Source: AEBIOM, European Bioenergy Outlook 2014


AEBIOM
Target 2020: On track for electricity, behind for transport, over-shooting for heat
Source: AEBIOM, European Bioenergy Outlook 2014

AEBIOM

A sector generating a lot of local jobs.

EU28 Job Distribution in the Bioenergy Sector in 2012 [%]

- Solid biomass 58%
- Biofuels 23%
- Biogas 14%
- Waste 5%

489.880 jobs

Source: AEBIOM, European Bioenergy Outlook 2014

AEBIOM

Release 20 October 2015

AEBIOM

Recent policy developments currently at EU level

- 2030 Climate and Energy Framework
- Energy Union
- Sustainability criteria for solid/gaseous biomass
- Indirect Land Use Change - ILUC

AEBIOM

2030 Climate and Energy Framework

- Member States position 23 October 2014 (European Council)
  - 27% RES target EU binding - BUT not nationally binding
  - 40% GHG emissions reduction: ETS and non ETS sectors
  - 27% reduction of energy consumption - indicative objective
- This approach must now be accompanied by a robust and reliable **governance system** for reaching renewables and energy efficiency targets

*An **improved biomass policy** will also be necessary to maximise the **resource efficient use** of biomass in order to deliver **robust and verifiable greenhouse gas savings** and to allow for **fair competition** between the various uses of biomass resources in the construction sector, paper and pulp industries and biochemical and energy production. This should also encompass the **sustainable use of land**, the **sustainable management of forests** in line with the EU's forest strategy and address **indirect land use** effects as with biofuels.*

AEBIOM

Energy Union

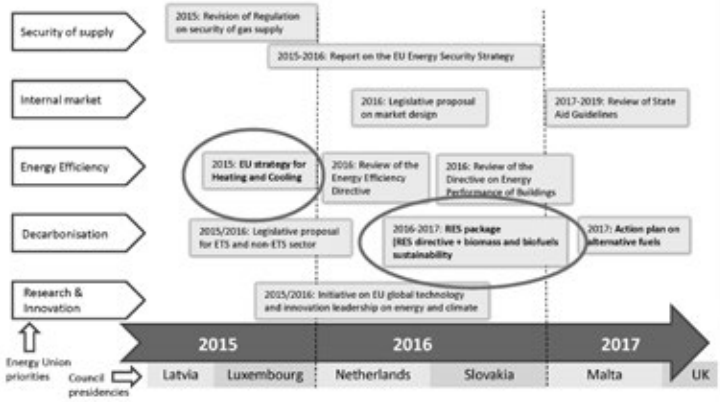
"A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy" – 25 February 2015

5 Dimensions:
- Energy security
- Internal market
- Energy efficiency
- Decarbonisation of economy
- RD&I

*The Commission will propose a new Renewable Energy Package in 2016-2017. This will include a **new policy for sustainable biomass and biofuels***

AEBIOM

Energy Union



AEBIOM

Sustainability

- The Commission has started to work (again) on sustainability policy – Planning: 2016
- Will be based on existing frameworks but format?
- AEBIOM currently defining its detailed position

Reference documents:

- Communication on sustainability requirements for the use of solid and gaseous biomass sources in electricity, heating and cooling (2010)
- SWD State of play on sustainability for solid and gaseous biomass used for electricity, H&C (2014)
- EU Forest Strategy (SFM)

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Sustainability
Ongoing Studies (non exhaustive list)

Study	Who	Objective
RECEbio	DG ENVI	Resource efficiency impact of future EU bioenergy demand (Indufor, IEEP - final report end 2015)
Carbon Impacts of biomass produced in the EU	DG ENER	qualitative and quantitative assessment of direct and indirect GHG emissions associated with different types of solid and gaseous biomass used in electricity and heating/cooling – (PwC - final report 2015 (delay))
Optimized cascading use of wood	DG GROW	define the cascading use of wood and assess its environmental and socio-economic impacts (IEEP)
Imports from North America	DG ENVI	Study on environmental impacts of growing biomass imports from North America (COWI + Pinchot Institute)
CCA of EU legislation on F-bi	DG GROW	Identify direct and indirect costs of the most financially burdensome EU legislation (Technopolis – final report February 2016)

Study	Who	Objective
Forest biomass for energy: current trends, carbon balance and sustainable potential	Birdlife, EEB, T&E	Clarify possibilities and implications of woody bioenergy supply for natural environment and climate by 2020 and 2030 (published)
Potential and Implications of using biomass for energy in the EU	Birdlife, EEB, T&E	Analysis of how much and what kind of biomass could be produced and used in the EU for energy in a sustainable way by 2020 and 2030 (launch postponed)
Pitfalls and potentials. The role of bioenergy in the EU climate and energy policy post 2020	Birdlife, WWF, Greenpeace, etc...	Four safeguards: 1- the introduction of a cap to limit the use of biomass, 2- the strengthening of the principle of cascading use of biomass, 3- a correct carbon accounting for biomass and finally 4- the introduction of comprehensive binding sustainability criteria (published).

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ILUC

- Amendments to Fuel Quality Directive et RES Directive
- Max. 7% biofuels from crops
- Reporting on ILUC
- RES electricity in transport multiplied by 2,5 – 5 times
- Reference target of 0,5% of advanced biofuels → national targets and plan
- Some feedstocks (advanced biofuels) multiplied by 2

Biomass - An ongoing debate

BIOMASS COUNTS

www.biomasscounts.eu

- 5 networking events in 2015
- Factsheets
- Social media
- Statistics
- Etc.

Join Us

BIOMASS COUNTS

BIOENERGY

- Fueling Europe with jobs and innovations

Date: **20 October 2015**
Conference: **16:00 – 18:15**
Cocktail reception: **18:30 – 20:00**
Venue: **European Parliament**

Event Co-hosted by:

Miapetra Kumpula-Natri - MEP, Chair of Bioeconomy Working Group, Member of ITRE Committee, S&D Group

Benedek Jávor - MEP, Vice-Chair of the Committee on the Environment, Public Health and Food Safety, Greens/EFA Group

AEBIOM

Outlook

- Energy security is a key concern and bioenergy is gaining market shares.
- Many policies decided in Brussels impacting the bioenergy business.
- Time to communicate to maintain credibility of bioenergy.

ENplus

Quality Certification Scheme For Wood Pellets

ENplus Handbook

For countries not managed by any national licenser/supporter

Part 1: General

Version 3.0, August 2015

Publisher and responsible Licenser:

European Pellet Council (EPC)
c/o AEBIOM - European Biomass Association
Place du Champ de Mars 2
1050 Brussels, Belgium

Email: enplus@pelletcouncil.eu
Website: www.enplus-pellets.eu

This Handbook is only valid for countries not managed by any National Licenser/supporter.

The European Pellet Council (EPC) is responsible for the implementation of EN*plus* and can grant *Certified Companies* the right to use the ENplus certification seals for all the countries that are not covered by any national pellet association. A list of these national pellet associations, either managing EN*plus* (National Licenser) or supporting the development of EN*plus* (National supporting association) in their respective countries, are listed on www.enplus-pellets.eu.

PREFACE

Wood pellets are a renewable fuel produced mainly from saw mill residues. Wood pellets are used as a fuel for residential heating systems as well as for industrial burners. They are a refined fuel that can be damaged during handling. Hence, quality management should cover the whole supply chain from the choice of raw material to their final delivery to the end-user.

EN*plus* was originally designed in 2010 by Deutsches Pelletinstitut GmbH (DEPI) as a quality certification scheme for wood pellets in the heating market. The aim was to achieve a supply of consistent product quality. The main target groups were producers of wood pellets and pellet traders with deliveries to end-users.

The pellet market has developed rapidly, experiencing a huge increase in international trade. The industrial and residential pellet markets became linked based on the quality class A1. Regional pellet supply chains have been completed with a global commodity market for wood pellets. The bagging of pellets has been partly separated from the production process with this step now being undertaken by pellet traders or independent service providers. This development brings with it quality risks arising due to wider raw material bases, new logistical processes and new market actors with little experience in wood pellet handling. In order to address these issues it was necessary to modify the scheme.

The 3rd major revision of the EN*plus*-Handbook further develops the quality certification scheme that combines product certification, chain of custody certification and quality management certification. Aspects of environmental sustainability are integrated by monitoring sustainability indicators such as the carbon footprint of pellet production.

With the publication of handbook version 3.0, EN*plus* provides for the first time the concept of service provider certification. A dedicated certification has been created for companies offering services in the pellet sector such as transport, storage, bagging, and customer deliveries of certified pellets for other parties.

Another important change in the certification scheme is related to the pellet quality classes. The standard EN 14961-2 has become obsolete and has been replaced by ISO 17225-2. The quality classes EN*plus* A1, EN*plus* A2 and EN*plus* B are based on this new standard, but the EN*plus* product requirements exceed the ISO 17225-2 standard for some pellet properties. Each quality class will have a dedicated quality seal that shall be displayed on pellet bags.

The certification scheme covers the following essential points based on the reference standards in brackets:

- Requirements on raw materials and product properties (ISO 17225-2)
- Requirements on quality management in wood pellet production and handling (ISO 9001, EN 15234-2)
- Requirements on control, tracking and declaration, from the raw material to the end product delivered to the customer

Specifications for internal quality control guarantee that the product requirements are maintained permanently. Requirements on the performance of the technical equipment,

operational procedures and documentation are defined, which should lead to a rapid tracking and solving of problems. Requirements on labelling and complaint management assure a high customer satisfaction. Scheme monitoring will lead to increasing operation standards and thereby will improve the overall performance of the *Certified Companies*.

In this document the requirements for *Certified Companies* are defined, as well as the processes related to certification (e.g. application procedure, surveillance inspections). All aspects concerning the relation between the EN*plus Board*, *International Licenser, National Licensers* as well as *Certification, Inspection* and *Testing Bodies* are defined in a separate document, part 5 of the EN*plus Handbook*, version 3 –"Scheme Organisation". Other related documents, such as documentation templates and guidelines, will be published separately.

This document is part of the EN*plus Handbook, Version 3* defining the rules for the EN*plus* Quality Certification Scheme for Wood Pellets. The different parts of the *Handbook* are:

- Part 1: General
- Part 2: Certification Procedure
- Part 3: Pellet Quality Requirements
- Part 4: Sustainability Requirements
- Part 5: Scheme Organisation
- Part 6: Schedule of Fees

The current versions of these parts are published on the international website of EN*plus* [www.enplus-pellets.eu].

This document, part 1 (version 3.0) of the EN*plus Handbook*, contains information about the following topics:

- General information and overview
- Scope of the ENplus Certification Scheme
- Definitions of terms
- Normative References

National Licensers will define specific national regulations in the national versions of the *Handbook* in order to implement general rules regarding trader equipment and acceptance of complaints. The national regulations will be clearly marked.

Certified companies have to follow the rules of the *Handbook* issued by the *Competent Management*.

In case of any dispute about the regulation defined in the *Handbook*, the regulation of the Master-Handbook applies (exception: national regulation).

Terms written in italic characters are defined in the section "Definitions of terms".

CONTENT

DEFINITIONS OF TERMS

Affiliated Companies

Affiliated Companies are companies that are fully or partly owned by the legal entity that is the *Certified Company*. This legal entity shall be entitled to enforce the *Affiliated Company* to obey both the provisions of the *Handbook* and the requests from the *Competent Management*.

Bagged Pellets

Pellet bags are a packaging unit for the retail market. *Bagged Pellets* may contain up to 30 kg of pellets of the quality classes EN*plus* A1 or EN*plus* A2.

Big Bags

Big Bags (aka. big bulk bags) are bags made from plastic mesh containing a batch of pellets with a weight from 30 to 1.500 kg.

Board of ENplus

The *Board of ENplus* consists of one representative from each *National Licenser*. It decides on the provisions of the certification scheme and on the acceptance or exclusion of a National License. Furthermore, the board serves as the objection committee, authorises amendments to the *Handbook*, and decides on exceptions from the provisions of the *Handbook*.

Certification Seal

Every *Certified Producer* and every *Certified Trader* has a unique *Certification Seal* consisting of the *ENplus Logo* and a unique *ENplus ID*.

Certification Body

A *Certification Body* evaluates the conformity of a company with the EN*plus* requirements based on an *Inspection Report* and issues the results of the evaluation in a *Conformity Report*. Additionally the *Certification Body* organises the inspections of traders and service providers (equivalent to the *Inspection Body's* role for producers). *Certification Bodies* being active within the EN*plus* scheme shall be listed by the *International Management* of EN*plus*.

Certified Company

A company that holds a valid certificate (issued by a *Certification Body*), has signed and meets the terms of the respective EN*plus* license contract with the *International Licenser*. All *Certified Companies* (producers, traders and service providers) are listed on the international EN*plus* website [www.enplus-pellets.eu] as well as on the respective national website.

Certified Producer

A company producing wood pellets and being a *Certified Company* within the EN*plus* scheme.

Certified Service Provider

A company offering services related to the handling of wood pellets (transport, delivery, storage or bagging) and being a *Certified Company* within the EN*plus* scheme. A service provider is not the owner of the pellets that are handled.

Certified Trader

A company trading wood pellets and being a *Certified Company* within the EN*plus* scheme.

Competent Certification Body

The *Competent Certification Body* is the *Certification Body* responsible for the certification of a company in a specific area. This will be a *Certification Body* which is listed for being active in countries without a *National Certification Body*.

Conformity Report

The *Conformity Report* is a document to inform the *International Management* about the findings of inspection and certification. The *Conformity Report* is issued by a *Certification Body* and provides the *Certified Company*, the *Inspection Body* and the *International Management* with the results of the conformity evaluation.

ENplus ID

Every *Certified Producer* and every *Certified Trader* is assigned a unique *ENplus ID*. The *ENplus ID* has five characters. The first two characters indicate the country where the company is located. The three characters after the country code provide the number of the *Certified Company* in their country.

ENplus Logo

The *ENplus Logo* is a registered trademark and is part of the *Certification Seal* along with the *ENplus ID*.

Full Load Delivery

Full Load Delivery is the delivery of a complete truck load to one end-user. The load shall be a minimum of 20 metric tonnes.

Handbook

The EN*plus* handbook, referred to as *Handbook*, consists of several parts and defines the rights, responsibilities and obligations of *Certified Companies*, listed *Certification Bodies*, listed *Inspection Bodies*, listed *Testing Bodies*, *National Licensers* and the *International Licenser*.
The different parts of the *Handbook* are:

- Part 1: General
- Part 2: Certification Procedure
- Part 3: Pellet Quality Requirements
- Part 4: Sustainability Requirements
- Part 5: Scheme Organisation
- Part 6: Schedule of Fees

Every *National Licenser* will publish a national version of the *Handbook* which is based on the EN*plus* master-handbook. The national versions may differ in the regulation related to complaint management and end-user delivery.

Inspection Body

The *Inspection Body* is the organisation charged with inspecting the facilities of a certified pellet producer or a producer applying to become certified. The *Inspection Body* checks if the requirements defined in the EN*plus Handbook* are met and reports the results of the inspection to the *Certification Body*. *Inspection Bodies* active within the EN*plus* scheme shall be listed by the *International Management* of EN*plus*.

Inspection Report

The *Listed Inspector* performing the inspection of an applicant or an already *Certified Company* documents the results of the inspection in an *Inspection Report*. Based on the information stated in the *Inspection Report* the *Competent Certification Body* decides on the conformity of the company with the requirements of EN*plus*.

International Licenser

The *International Licenser* is the organisation representing the interests of the pellet sector at the international level. This organisation is allowed to grant *Certified Companies* the right to use the *Certification Seal* in countries without a *National Licenser*. Currently, the European Pellet Council is the *International Licenser*.

International Management

The *International Management* of EN*plus* is the organisation responsible for the certification of companies in countries in which there is no *National Licenser* in place. It is also responsible for the listing of *Testing, Inspection and Certification Bodies* as well as for the listing of all *Certified Companies* on the website www.enplus-pellets.eu. Furthermore the *International Management* publishes amendments to the *Handbook*, organises training and workshops at an international level and provides support materials.

Licensee

The European Biomass Association AEBIOM has received the licensing rights for the EN*plus* registered mark from the developer (German Pellet Institute, DEPI) of the certification scheme.

Listed Inspector

Person performing on-site inspections for listed *Certification Bodies* or *Inspection Bodies*. This person shall be listed by name by the *International Management* on the international EN*plus* website [www.enplus-pellets.eu]. Only *Listed Inspectors* may perform inspections related to EN*plus*.

National Licenser

National Licensers are the associations representing the interests of the pellet sector in their respective countries and have signed a contract with the *Licensee*. This contract enables them to grant *Certified Companies* the right to use the *Certification Seal* in their respective country/area.

Part Load Delivery

Part Load Delivery is a delivery of bulk pellets to more than one end-user along a single route (aka. multi-drop).

Quality Seal

Combination of *Certification Seal* and the quality logo of one of the quality classes.

Service Provider Registration Number

Every *Certified Service Provider* is assigned a unique registration number. The *Service Provider Registration Number* has seven characters. The first two characters indicate the country where the company is located. The three characters after the country code provide the number of the *Certified Company* in that country. Furthermore the letters "SP" are attached.

Service Sign

Every *Certified Service Provider* has a unique *Service Sign* including a unique *registration number*. The *Certified Company* is granted the right to use the *Service Sign* for advertising purposes.

Storage Guidelines

The *Storage Guidelines* define the requirements for end-users' stores. The construction of the store has a significant influence on the quality of the pellets. The construction of stores according to the guidance of the *Storage Guidelines* is a precondition for the acceptance of end-user complaints.

Every *National Licenser* publishes its own version of the *Storage Guidelines*.

Sublicense Contract

Sublicensed traders may sell certified pellets in bulk if a *Certified Trader* grants them the right to use their *ENplus Seal.* The precondition for sublicensing is that the physical handling of the pellets is performed only by the *Certified Company*. The *Sublicense Contract* shall be signed by the sublicensed trader and the *Certified Company*. The *International Licenser shall* be informed about such arrangements within 2 weeks of the contract being made.

Testing Body

A *Testing Body* is a company operating a laboratory carrying out fuel analyses according to the relevant testing standards. *Testing Bodies* being active within the EN*plus* scheme shall be listed by the *International Management*.

NORMATIVE REFERENCES

CEN/TC 15370-1: Solid biofuels - Method for the determination of ash melting behaviour - Part 1: Characteristic temperatures method

EN 14778: Solid biofuels - Sampling

EN 14961-2: Solid biofuels – Fuel specification and classes – Part 2: Wood pellets for non-industrial use

EN 15234-2: Solid biofuels - Fuel quality assurance - Part 2: Wood pellets for non-industrial use

ISO 3166: Codes for the representation of names of countries and their subdivisions

ISO 16948: Solid biofuels - Determination of total content of carbon, hydrogen and nitrogen contents

ISO 16968: Solid biofuels - Determination of minor elements

ISO 16994: Solid biofuels - Determination of total content of sulphur and chlorine

ISO 17225-1: Solid biofuels - Fuel specifications and classes - Part 1: General requirements

ISO 17225-2: Solid biofuels - Fuel specifications and classes - Part 2: Graded wood pellets

ISO 17828: Solid biofuels - Determination of bulk density

ISO 17829: Solid Biofuels - Determination of length and diameter of pellets

ISO 17831-1: Solid biofuels - Determination of mechanical durability of pellets and briquettes - Part 1: Pellets

ISO 18122: Solid biofuels - Determination of ash content

ISO 18125: Solid biofuels - Determination of calorific value

ISO 18134: Solid biofuels - Determination of moisture content -

ISO 18846: Solid biofuels - Determination of fines content in quantities of pellets

ISO 9001: Quality Management Systems – Requirements

ISO/IEC 17020: Conformity assessment - Requirements for the operation of various types of bodies performing inspection

ISO/IEC 17025: General requirements for the competence of testing and calibration laboratories

ISO/IEC 17065: Conformity assessment - Requirements for bodies certifying products, processes and services

Note: Until the referenced ISO analysis standards are published, analyses shall be performed according to the related CEN standard.

1 COMING INTO FORCE

This document, Part 1 of the EN*plus Handbook*, version 3.0, will come into force with its publication on 1st of August 2015.

Information about the coming into force of the regulation of the certification scheme can be found in the specific parts.

2 SCOPE OF THE CERTIFICATION SCHEME

The aim of the EN*plus* certification scheme for wood pellets is to secure the supply of wood pellets for heating and CHP in residential, commercial and public buildings with a clearly defined and constant quality.

EN*plus* is a quality certification scheme that covers the entire supply chain of wood pellets: from the production and delivery chain of wood pellets all the way to the end user's store. The essential components of the certification scheme are:

- Definition of quality classes and specification of pellet properties
- Provisions on the quality management of pellet producers, traders and service providers
- Requirements on product declaration and use of the *Certification Seal*
- Listing of bodies, licensing and revoking, training, (these aspects will be handled in a separate document, part 5 of the EN*plus Handbook*, version 3).
- Inspection and conformity evaluation of products, processes and documents within the relevant standards and the provisions of this handbook.

The rights, responsibilities and obligations for *Certified Companies* and applicants are defined in this *Handbook*. The *Handbook* will be revised regularly by an editorial group authorised by the *Board of ENplus*. The *International Management* of EN*plus* may publish amendments to the *Handbook* as well as clarifications and may publish specific rules regarding end-user delivery.

3 SETUP OF THE CERTIFICATION SCHEME

The *Licensee* has received the licensing rights for the registered trademark EN*plus* (*ENplus Logo*), from the developer and license owner of the EN*plus* certification scheme, Deutsches Pelletinstitut GmbH (DEPI). The *Licensee* is allowed to grant the licensing rights to an association member of the European Pellet Council (EPC) that represents the wood pellet industry in its respective country or region. The license to use the EN*plus* trademark is always issued by the *International Licenser* or a *National Licenser*.

Pellet associations that have received the licensing rights for their country serve as *National Licenser* and organise the *management* of EN*plus* in their country. The *National Licenser* contracts one or more *National Certification Bodies* for the conformity evaluation of companies in its country[1].

In countries without a *National Licenser*, EN*plus* certification will be coordinated by the *International Management*.

The independence of the certification scheme is guaranteed through the involvement of independent accredited bodies for certification[2], inspection and testing. All *Testing, Inspection and Certification Bodies* who verify that companies comply with the provisions of the EN*plus* Handbook shall be accepted and listed with the *International Management* and who publishes them on the international EN*plus* website (www.enplus-pellets.eu).

An up-to-date list of all *National Licensers* is published on the international EN*plus* website.

The *International Licenser* will grant the license to use the *Certification Seal* consisting of the *ENplus Logo* and the respective *ENplus ID* to companies who fulfil the obligations under the provisions of the *Handbook* and enter into a contract with the *International Licenser*.

If a *National Licenser* is terminated or loses their EN*plus* licensing rights, license users from this country will receive their established license directly from the *Licensee* without further delay.

National Licensers will define specific national regulation in order to implement general rules regarding trader equipment and acceptance of complaints. This national regulation will be clearly marked.

[1] Due to historical reasons Austria has two *National Certification Bodies*. Applicants may choose the one responsible for the certification of their company.

[2] Due to historical reasons the German implementation of EN*plus* is organised as an ISO 9001 group certification with DEPI as system support organisation that serves as *National Licenser* and *National Certification Body* without being accredited. The independency is guaranteed by an ISO 9001 certificate of the accredited *Certification Body*.

4 FLOW OF INFORMATION AND CONFIDENTIALITY

The *International Management* and the *Listed Bodies* are committed to the non-disclosure of all business-related information received through contact with the *Certified Company* in the course of or before certification, if this information is not publicly available. The *International Management* of EN*plus* will not disclose business-related information of *Certified Companies* to the members of EPC or those of national pellet associations. Disclosure is only possible if the *Certified Company* releases the *International Management* and the listed bodies from their non-disclosure obligation or if the *International Management* and the listed bodies are obliged by law to disclose specific information.

The *Listed Bodies*, and the *International Management* form a confidentiality chain. Listed bodies are obliged to provide the *International Management* with all necessary information about a *Certified Company* according to the provisions of this *Handbook*. This includes the information provided in the laboratory report, *Inspection Report*, *Conformity Report* and *the certificate* as well as any information needed for complaint management.

The International management may use information taken from conformity and testing report for fast tracking quality issues or for preparing publication about the scheme. Information will only be published in a way that guarantees that no conclusions can be drawn on a particular *Certified Company*.

Where a *Certified Company* has *Affiliated Companies* in other countries, an exchange of information between the concerned *National Managements* may be necessary.

5 OVERVIEW ABOUT THE TYPES OF CERTIFICATION

For a load of bulk pellets to be sold as EN*plus* certified, all companies which are involved in the supply chain and which have physical contact with the pellets should be certified.

The following figures show the activities that need to be certified and which activities can request a voluntary certification.

All processes, except pellet production, may be performed by an external service provider.

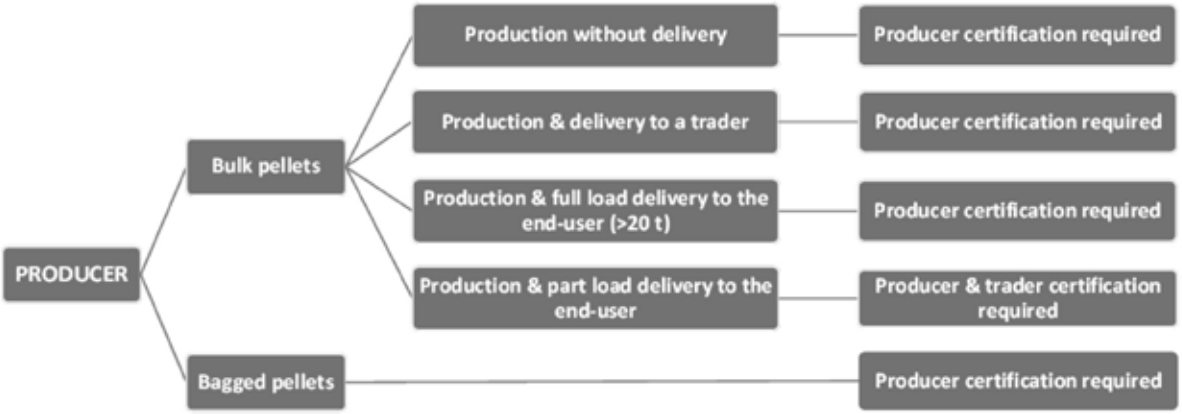


Figure 1: *The certification required by Producers depending on different business activities*

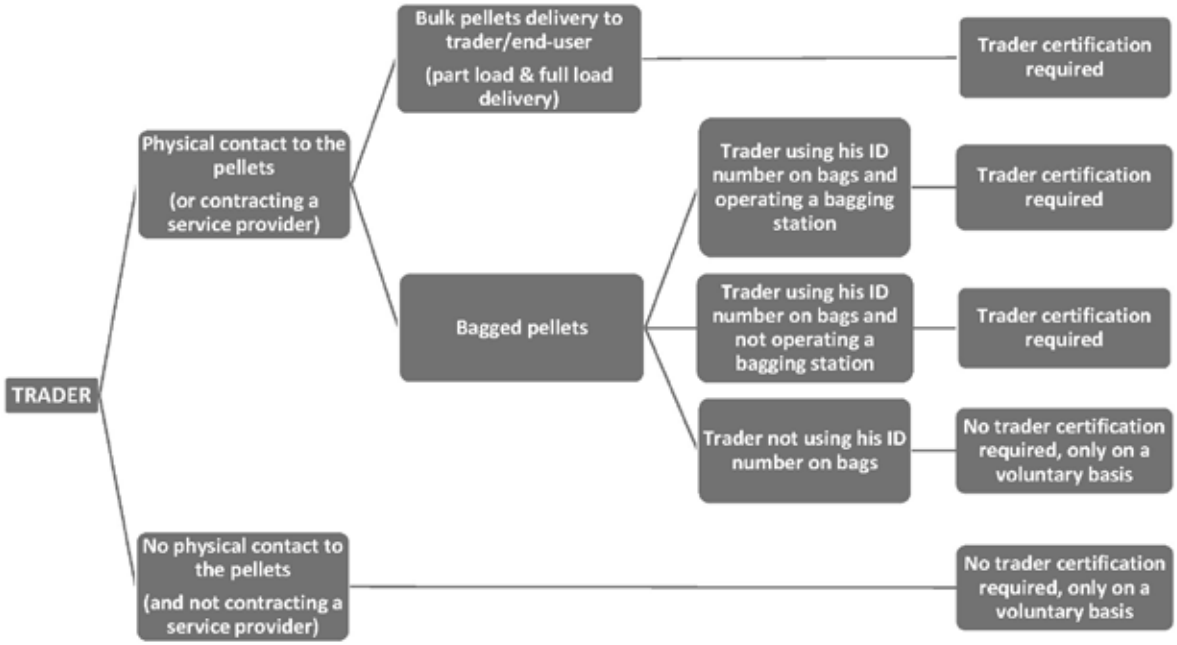


Figure 2: *The certification required by Traders depending on different business activities*

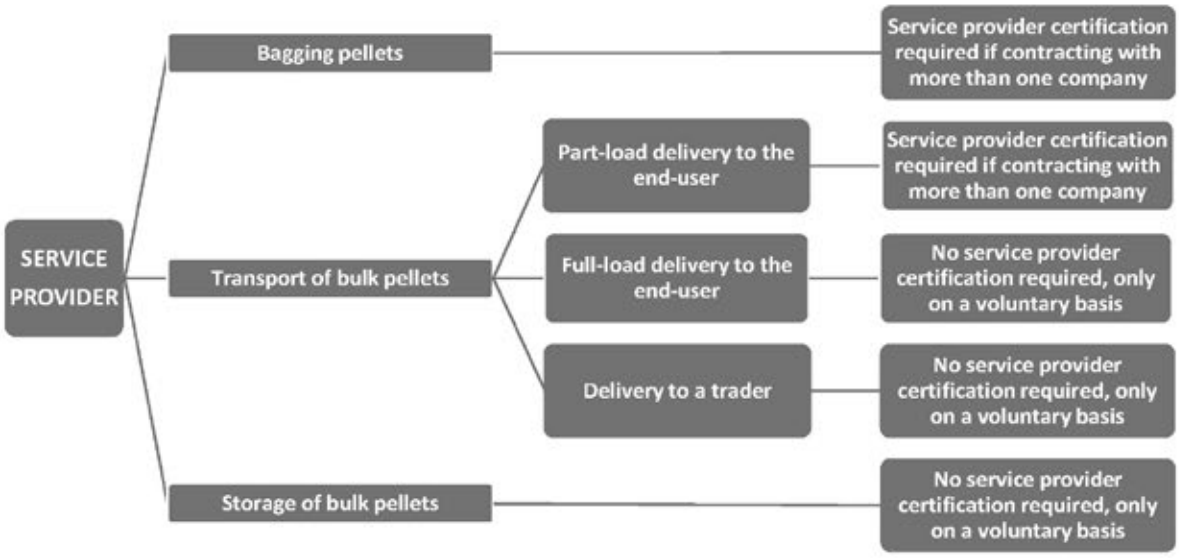
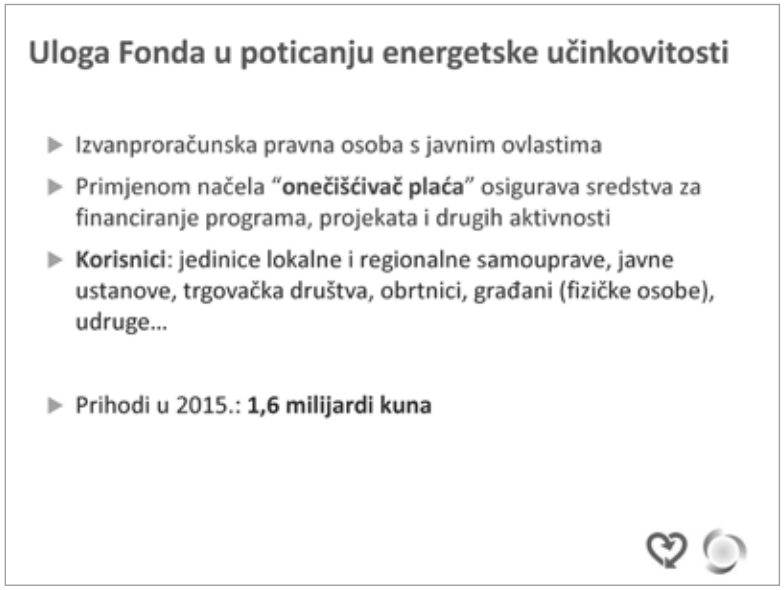


Figure 3: *The certification required by Service Providers depending on different business activities*

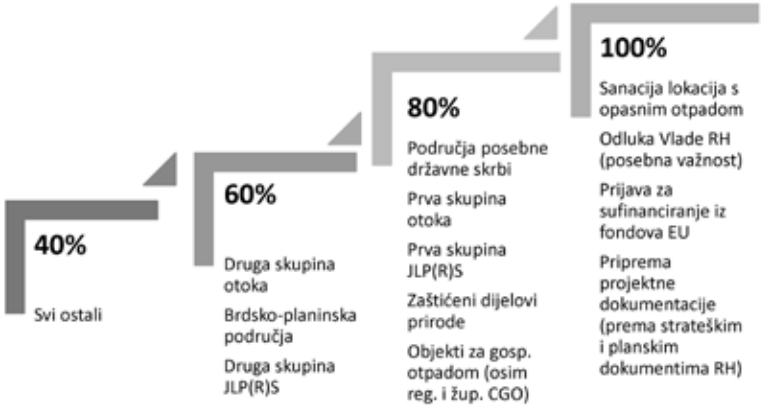
Mario Klobučar, dipl. ing.
Fond za zaštitu okoliša i energetsku učinkovitost

MOGUĆNOSTI SUFINANCIRANJA PROJEKATA PROIZVODNJE I KORIŠTENJA BIOMASE



JAVNI POZIVI I NATJEČAJI 2015.

Sufinanciranje Fonda



Korištenje obnovljivih izvora energije (OIE)

Sufinanciraju se troškovi nabave, ugradnje, mjerenja, ispitivanja, podešavanja i puštanja u pogon sustava za proizvodnju:

- električne energije iz energije sunca, vjetra, vode
- toplinske energije za grijanje vode
- grijanje i hlađenje prostora s toplinskim sunčanim kolektorima, kotlovima na biogoriva, dizalicama topline energetske klase A i geotermalnim izmjenjivačima topline
- čvrstih biogoriva

2014. odobreno **21 milijun kuna za 54 projekata**

2015. odobreno **46 milijuna kuna za 67 projekata +**

13 milijuna kuna za projekte OIE u turizmu

OIE u turističkim objektima

- Moguće je dobiti 40,60 ili 80% sufinanciranja u obliku **donacije**, **subvencije** ili **zajma**, ovisno o statusu prijavitelja i lokaciji
- **TKO SE MOŽE PRIJAVITI?**

  trgovačka društva, zadruge, trgovci pojedinci, fizičke osobe - obrtnici, obiteljska poljoprivredna gospodarstva (OPG) za subvenciju ili zajam, te fizičke osobe - građani za donaciju
- ***PREDUVJET*:**

  Korisnici moraju imati pravo korištenja ili biti vlasnici hotela, kampova i drugih vrsta ugostiteljskih i turističkih objekata namijenjenih smještaju , za koje posjeduju Rješenje o razvrstavanju i kategorizaciji ili Rješenje o odobrenju za pružanje ugostiteljskih usluga.

OIE u turističkim objektima

- **IZNOSI SUFINANCIRANJA**
  - subvencije do **1,4 milijuna kuna**
  - zajmovi do maksimalno **7 milijuna kuna**
  - donacije – ovisno o lokaciji:
    - 80% ili **do 24.750 kn** za projekt na području posebne državne skrbi, prvoj skupini otoka ili u zaštićenim dijelovima prirode.
    - 60% ili **do 19.500 kn** za projekt na drugoj skupini otoka ili u brdsko-planinskom području, a
    - 40% odnosno **do 15.000 kuna** za sva ostala područja Hrvatske.

Do sada - odobreno **8,4 milijuna kuna za 51 projekt**
Osigurano je **ukupno 13 milijuna kuna poticaja**.

Biomasa kao obnovljivi izvor energije

- Biomasa = obnovljivi izvor energije
- Više od **44%** površine Hrvatske prekriveno šumama
- **30%** kućanstava koristi ogrjevno drvo, a sve više se u sustavima grijanja koriste peleti i drvna sječka
- Fond sufinancira **sustave koji koriste biomasu**, ali i **pogone za proizvodnju biomase** – u sklopu javnog natječaja za sustave za korištenje obnovljivih izvora energije te javnih poziva i natječaja za energetsku obnovu

Sufinanciranje projekata

- Do ove godine sufinancirana **84 projekta** vrijedna 259 mil. kn – Fond odobrio **48 mil. kn poticaja**
- Najviše sredstava odobreno projektima na području Vukovarsko-srijemske (6,6 mil. kn) te Primorsko-goranske županije (5,3 mil.kn.)
- Samo u 2015. godini u okviru programa energetske obnove kuća odobreno sufinanciranje **484** kotla na biomasu – **8,9 mil. kn**

Izgradnja pogona za proizvodnju peleta u Perušiću

- Tvrtka Viševica-Komp d.o.o. u Perušiću proizvodi okovan i prirodno sušen bukov željeznički prag te druge proizvode od drvne sirovine. Na istoj lokaciji, tvrtka je investirala u novu liniju za proizvodnju peleta.
- U proizvodnom pogonu, službeno otvorenom 2008. g. se proizvodi 3 tone peleta po satu, odnosno 72 t dnevno. Godišnje se proizvede **20.000 tona peleta** ogrjevne vrijednosti od oko 4.500 kcal/kg sa sadržajem vlage od 10 %. Pepeo kao nusprodukt proizvodnje se koristi kao korisno bio gnojivo.
- **UKUPNA VRIJEDNOST INVESTICIJE**: 25.759.615 kn
- **ISPLAĆENA SREDSTVA FONDA**: Subvencija kamate na kredit - 720.000 kn

Korištenje OIE u Domu za starije i nemoćne Slakovec

- stari plinski kotlovi u domu su zamijenjeni pirolitičkim kotlom na drvene cjepanice snage 60 kW, a na južnom krovu je ugrađeno 6 pločastih solarnih kolektora za zagrijavanje potrošne tople vode, ukupne površine 13,92 m^2
- **UKUPNA VRIJEDNOST INVESTICIJE**: 299.658 kn
- **SREDSTVA FONDA**: 106.687 kn
- **GODIŠNJE UŠTEDE:**

  Provedbom projekta ostvarene su godišnje uštede energije od **141.769 kWh** odnosno **42.531 kuna** te su smanjene emisije CO_2 za **31 tonu.**

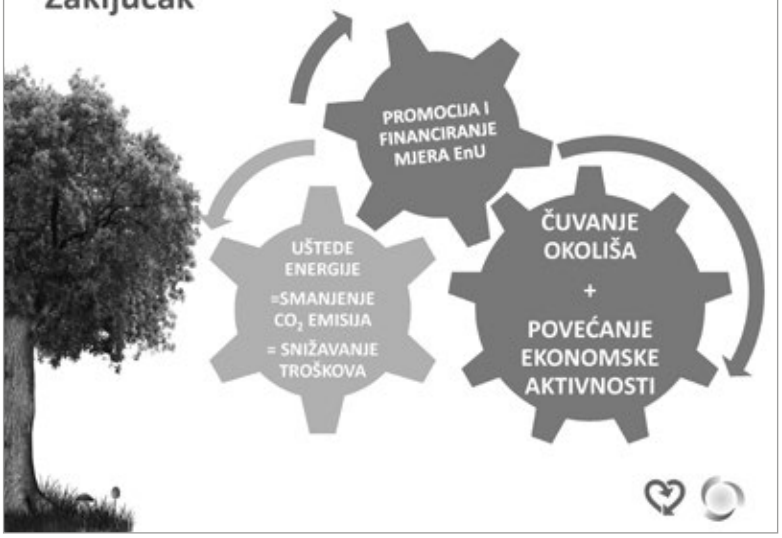
Izgradnja kogeneracijskog postrojenja BE TO1

- Na prostoru stare glinske pamučne industrije površine 24.000 m² je sagrađeno prvo kogeneracijsko postrojenje na drvnu biomasu za istovremenu proizvodnju električne i toplinske energije snage 1,25 MW električne energije i 4,5 MW toplinske energije.
- **UKUPNA VRIJEDNOST INVESTICIJE**: 53.212.500 kn
- **SREDSTVA FONDA**: 1.563.750 kn
- Proizvedena el. energija će se prodavati u mrežu, dok se dio toplinske energije planira iskoristiti za grijanje grada. Ugovor o opskrbi topli. energijom je već potpisan s Kaznionicom u Glini, a u sljedećoj fazi bi im se trebali pridružiti i drugi, veći potrošači gradskih i županijskih ustanova.

Izgradnja sustava područnog grijanja na biomasu

- Općina Pokupsko je ove godine započela s izgradnjom sustava područnog grijanja na biomasu.
- **UKUPNA VRIJEDNOST INVESTICIJE**: oko 9.000.000 kn
- **SREDSTVA FONDA**: za radove vrijednosti 1.729.300 kn odobreno sufinanciranje u iznosu 80% - **1.383.440 kn**

Zaključak

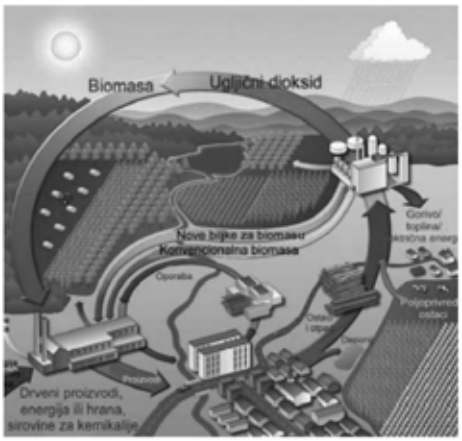


dr. sc. Branimir Šafran
Prof. dr. sc. Stjepan Risović

ANALIZA PROIZVODNJE GORIVIH PELETA

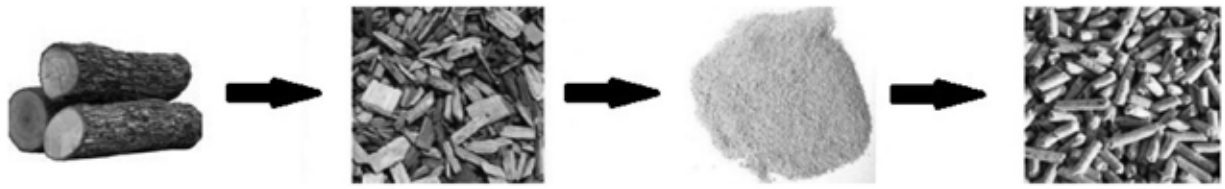
1. UVOD

Zbog velike svjetske potrošnje energije, biomasa postaje značajan izvor u svjetskim energetskim bilancama. Energija iz biomase ima prednosti pred drugim izvorima energije zbog svojeg prirodnog porijekla i minimalnog utjecaja na okoliš. Ona je CO_2 neutralan energent jer se njezinim izgaranjem ne povećava emisija stakleničkih plinova. CO_2 oslobođen tijekom izgaranja biomase reciklira se kao dio ugljikova ciklusa (**Slika 1.**). Sve navedene pretpostavke valjane su u uvjetima podjednake ili manje potrošnje od proizvodnje biomase.



Slika 1. Ugljikov ciklus u prirodi

RH ima velik energetski potencijal u biomasi. Biomasa se može podijeliti na šumsku i poljoprivrednu. Šumska biomasa, prema podacima Hrvatskih šuma ima drvnu zalihu preko 550 mil. m^3, sa godišnjim prirastom od 11 mil. m^3 i sječivim etatom 8 mil. m^3. Poljoprivredni potencijal također je značajan, a tu se ubrajaju ostaci jednogodišnjih kultura (slame, kukuruzovina, oklasak, trave, ljuske, koštice) ostaci iz voćarstva, vinogradarstva i povrtlarstva. Spaljivanje biomase u automatiziranim sustavima moguće je samo ako je ona usitnjena. Rastresita usitnjena biomasa ima nisku gustoću koja se kod poljoprivredne kreće u rasponu 40 – 150 kg / m^3 i kod drvne 150 - 200 kg / m^3. Zbog često velikih udaljenosti od mjesta sakupljanja do mjesta prerade ili spaljivanja biomase, javljaju se visoki transportni troškovi. Oni se mogu umanjiti prešanjem (ugušćivanjem) biomase u gorive pelete (**Slika 2.**). Gorivi peleti su geometrijski pravilni komadići prešane usitnjene drvne ili poljoprivredne sirovine, valjkastog oblika, gustoće 1200 - 1400 kg / m^3, nasipne gustoće do 700 kg / m^3 i niskog sadržaja vode 8 – 10 %.

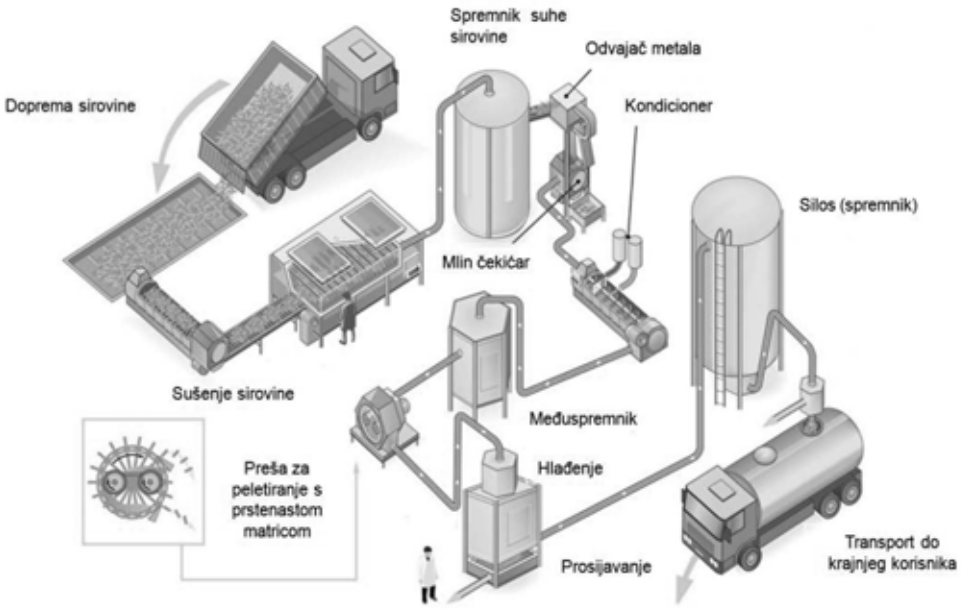


Slika 2. Pretvorba sirovine u gorivi pelet

2. PROIZVODNJA PELETA (Slika 3.)

Ciljevi u proizvodnji peleta vezani uz odabir karakteristika preše su:

- najviša kvaliteta peleta
- optimalan kapacitet
- jednostavnost operacije
- jednostavno uključenje u pogon
- smanjena mogućnost začepljenja
- što je moguće duži vijek matrice i valjaka



Slika 3. Shematski prikaz tehnološkog postupka proizvodnje drvnih peleta

Proces proizvodnje peleta vrlo je složen i ovisi o mnogim karakteristikama sustava koje se mogu podijeliti na konstrukcijske i tehnološke.

Konstrukcijske karakteristike odnose se na izvedbu, oblik i dimenzije ključnih elemenata sustava koje su sljedeće:

- konstrukcijska izvedba preše
- oblik i dimenzije valjaka koji tlače materijal
- kvaliteta i način obrade (površina valjaka i matrice)
- duljina kanala matrice
- broj, raspored i oblik otvora matrice

Tehnološke karakteristike koje se odnose na proces prešanja su sljedeće:

- proizvodni parametri (obodna brzina valjaka na matrici, razmak između valjaka i matrice, pritisna sila na valjcima, temperatura prešanja...)
- kvaliteta i struktura ulaznog materijala (vrsta sirovine, sadržaj vode, granulacija...)

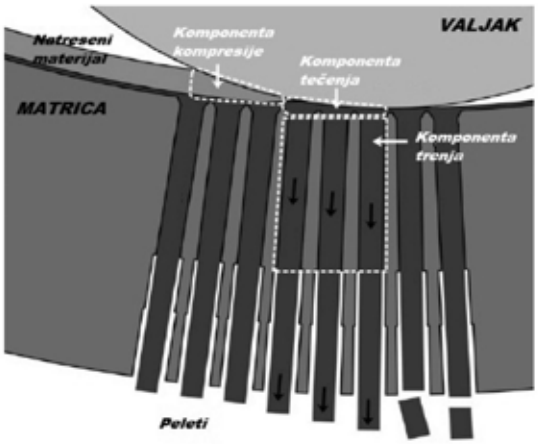
3. ANALIZA PROCESA PELETIRANJA

U industrijskim uvjetima teško je kontrolirati proizvodne parametre, tj. teško je ili nemoguće mjeriti tlak i temperaturu u kanalima matrice prilikom prešanja. Kako bi se analizirao proces peletiranja, peleti se moraju proizvesti u strogo kontroliranim laboratorijskim uvjetima.

Proces peletiranja sastoji se od ***komponente kompresije i ekstruzije*** (**Slika 4.**), a komponentu ekstruzije možemo podijeliti na:

a) Komponentu ekstruzijske deformacije koja je nazvana ***komponentom tečenja materijala*** (*flow*) i ona se odvija u upuštenju prilikom ulaska materijala s površine matrice u upusni kanal,

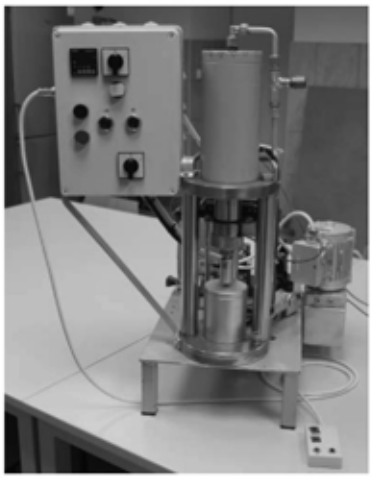
b) ***Komponenta trenja*** nastaje u kanalu matrice i prisutna je sve do izlaska gotovog peleta u rasterećenje matrice ili do izlaska iz matrice.



Slika 4. Tri karakteristične komponente peletiranja materijala: kompresija, tečenje i trenje materijala

Za određeni materijal koji se analizira, mjeri se specifični rad peletiranja. Specifični rad peletiranja je zbroj energija potrebnih za obavljanje pojedinih faza peletiranja. Proces peletiranja promatra se kao rad potreban za kompresiju sloja materijala na površini matrice, pomak materijala do koničnog upuštenja, ulazak u upuštenje, sekundarno komprimiranje u upuštenju te tečenje u otvor matrice i konačno, rad potreban za savladavanje trenja u otvoru matrice. Analiza procesa peletiranja vrši se na laboratorijskoj preši za pelet (**Slika 5.**). Ona je u osnovi hidraulična preša s automatiziranim pomakom opremljena klipom, matricom i zatvaračem, grijačem i temperaturnim kontrolerom za regulaciju temperature matrice, mjernim dinamometrom za mjerenje sile prešanja i isprešanja, davačem pomaka koji mjeri pomak i položaj klipa te softverom za prikupljanje podataka mjerenja.

Korištenjem laboratorijske preše za pelet moguće je konstruirati krivulju tlak prešanja – kompresijski omjer (P_x – c) (**Slika 6.**). Kompresijski omjer predstavlja odnos duljine i promjera kanala matrice ($c = L / d_h$). Laboratorijska preša za pelet koristi se za provođenje testova peletiranja pri malim kompresijskim omjerima (2 – 3 mjerenja u linearnom području ($c < 1$) i 2 – 3 mjerenja u srednjem području ($c \leq 4$) pri čemu se mjeri tlak prešanja P_x, a ovisnost tlaka prešanja (P_x) i kompresijskog omjera (c) prikazana je izrazom (1).

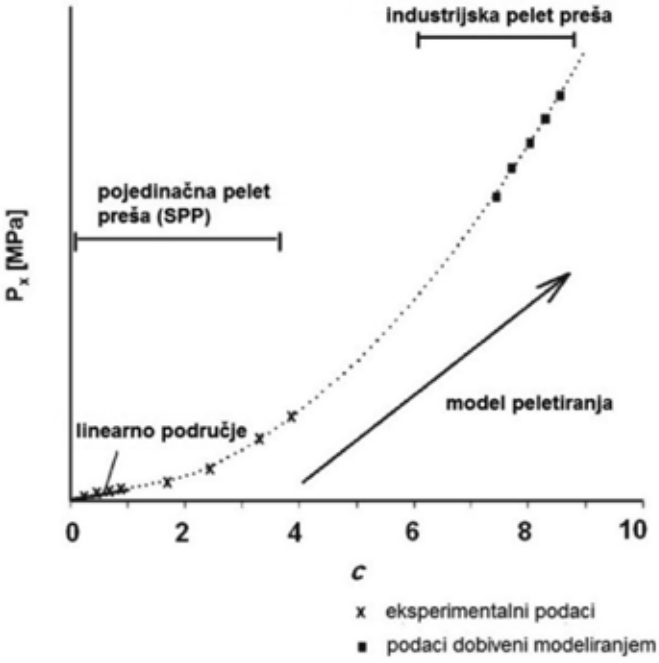


Slika 5. Laboratorijska preša za pelet

$$P_x(c) = \frac{U}{J}(e^{4Jc} - 1) \qquad (1)$$

$$U = \frac{1}{4}\frac{dP_x}{dc} \qquad (2)$$

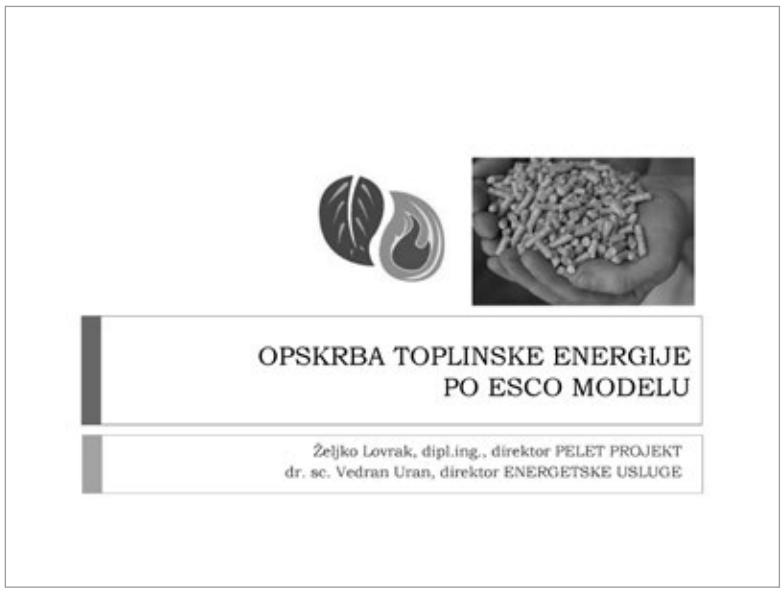
U parametar se određuje iz linearnog dijela krivulje P_x - c (pri $c < 1$) primjenom izraza (2). Korištenjem dobivene vrijednosti U, J parametar se određuje korištenjem izraza (1) pomoću eksperimentalno određenih podataka. Testovi peletiranja prema ovoj metodi provode se pri mnogo nižim omjerima kompresije nego je to slučaj kod velikih industrijskih peletirki ($c \approx 7 - 10$). Pomoću laboratorijske preše za pelet izrađuju se peleti uzastopnim dodavanjem vrlo male količine materijala u matricu kako bi se simulirao proces doziranja materijala koji se odvija u matrici peletirke.

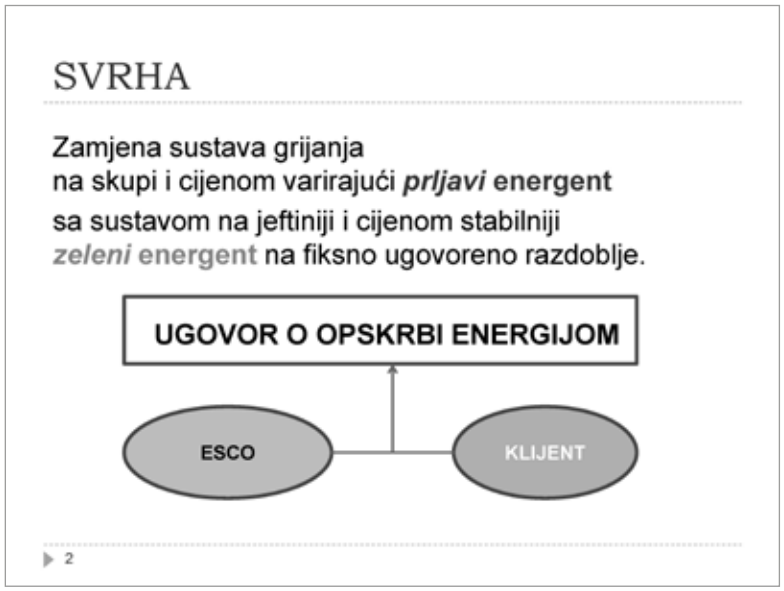


Slika 6. Krivulja tlak prešanja – kompresijski omjer ($P_x - c$)

Željko Lovrak, dipl.ing.
Pelet projekt d.o.o.
dr. sc. Vedran Uran
Energetske usluge

OPSKRBA TOPLINSKE ENERGIJE PO ESCO MODELU





ESCO – RASPON USLUGA

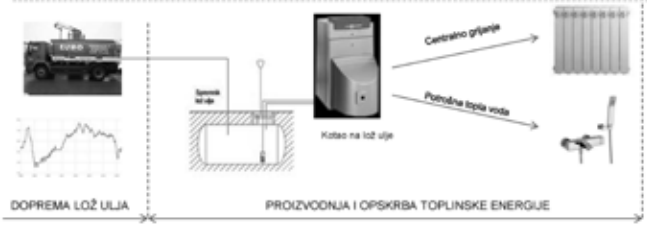
1) PROJEKTIRANJE
2) FINANCIRANJE
3) PROVEDBA
4) REALIZACIJA
5) ODRŽAVANJE

NAJVAŽNIJE:

- **JAMČI UŠTEDU ENERGIJE odnosno UŠTEDU NA TROŠKOVIMA ENERGIJE KROZ UGOVORENO RAZDOBLJE**

3

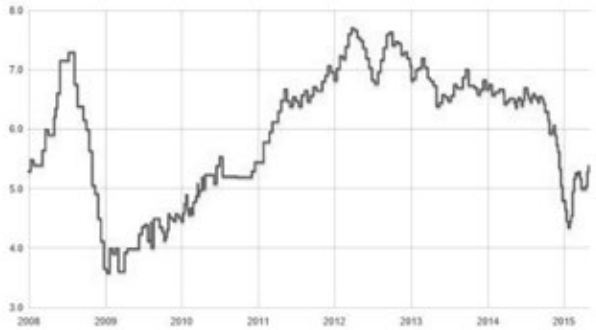
POSTOJEĆE STANJE – LOŽ ULJE



Karakteristike:
- ✓ Cijena lož ulja varirajuća (7 kn/l krajem 2014., 4,5 kn/l početkom 2015., od sredine 2010. do kraja 2014. držala cijenu iznad 5 kn/l)
- ✓ Klijent u bilo kom trenutku može promijeniti dobavljača lož ulja
- ✓ Klijent sam brine o pogonu i održavanju kotlovnice, o opskrbi toplinske energije krajnjim potrošačima te pokriva sve fiksne i tekuće troškove

4

KRETANJE CIJENA LOŽ ULJA



5

BUDUĆE STANJE – PELETI

Karakteristike:
- ✓ Cijena peleta zajamčena kroz ugovorno razdoblje
- ✓ Klijent u tom razdoblju ne može mijenjati dobavljača peleta jer je to obveza ESCO-a
- ✓ ESCO preuzima obvezu dopreme peleta, proizvodnju i opskrbe toplinske energije
- ✓ Klijent je obvezan kupovati toplinsku energiju od ESCO-a kroz ugovoreno razdoblje

6

KRETANJE CIJENA LOŽ ULJA I PELETA

7

OBVEZE UGOVORNIH STRANA (1)

ESCO:
- ✓ Izrada projektnog rješenja
- ✓ Demontaža starog i montaža novog kotla
- ✓ Financiranje – zaduživanje kod banaka
- ✓ Puštanje novog kotla u pogon
- ✓ Doprema i skladištenje peleta
- ✓ Redovno i periodično održavanje kotlovnice
- ✓ Očitanje kalorimetara

U potpunosti preuzima tehničke i financijske rizike!

8

OBVEZE UGOVORNIH STRANA (2)

KLIJENT:

- ✓ Ustupa svoju kotlovnicu na ugovorno razdoblje
- ✓ Kupuje toplinsku energiju od ESCO-a (na osnovi očitane potrošnje)

9

KORISTI ZA KLIJENTA

- ✓ Zajamčena cijena toplinske energije
- ✓ Nema brige oko održavanja kotlovnice
- ✓ Ne mora se zaduživati kod banaka
- ✓ Preuzima kotao i svu popratnu opremu za 1 kunu nakon isteka ugovornog razdoblja

10

TIJEK RAZVOJA PROJEKTA

1) Preliminarna ponuda
- Potrošnja postojećeg energenta (lož ulja, UNP…)
- Sadašnja cijena postojećeg energenta
- Kapacitet postojećeg kotla ili planirane potrebe za toplinskim konzumentom

2) Potpisivanje Ugovora o opskrbi toplinskom energijom
3) Projektiranje
4) Financiranje i provedba projekta preuzimanjem postojeće kotlovnice
5) Puštanje kotla u pogon, doprema peleta i održavanje kotlovnice
6) Preuzimanje kotla i popratne opreme za 1 kunu nakon isteka Ugovora o opskrbi toplinskom energijom

11

mr.sc. Josip Dundović, dipl.ing.šum.
Hrvatska udruga za biomasu -sekcija HŠD
dr.sc. Kristina Čelić
Ministarstvo gospodarstva

BIOENERGIJA STATUS QUO 2020. – 2030. – 2050. u HRVATSKOJ

	Količina m³/ha	Udio %
UKUPNO	300	100
OTPAD	51	17
OBLOVINA	175	58
PROSTORNO DRVO	74	25

Toplina i struja iz šume

U Hrvatskoj je 47% površine pokriveno šumskim zemljištem! Drvna zaliha iznosi oko 400 mil. m³. Godišnji prirast iznosi do 10.5 mil. m³, a godišnji etat oko 6.6 mil. m³ Relativno mala zemlja s velikom biološkom raznolikošću!

U Hrvatskim šumama gospodari se po načelu potrajnosti već dvjesto pedeset godina! „Kaskadno" korištenje drveta je u Hrvatskoj saživilo! Državne šume već više od 10 godina gospodare po FSC certifikatu!

VRSTA DRVA	DRVNA SJEČKA (kn/t)				
	Drvna sječka fco. kamion šumska cesta	Drvna sječka fco. kupac			
		Udaljenost do 20 km	Udaljenost do 50 km	Udaljenost do 100 km	Udaljenost do 150 km
BUKVA, GRAB	268,31	316,44	335,70	374,21	403,10
HRAST, OTL	262,53	310,66	329,93	368,43	397,32
ML	235,93	284,07	303,33	341,84	370,72
CD	223,49	271,63	290,89	329,40	358,28

Cjenik se primjenjuje od 1. travnja 2013. godine – izvor: Šumska biomasa d.o.o., direktor Željko Sučić, dipl.ing.šum.

Predugovor i ugovori za šumsku sječku

1. Ugovoreno s 11 ugovaratelja srpanj - rujan 2012. 318 tisuća tona šumske sječke godišnje
2. S 5.11.2015. sklopljeno 7 ugovora i 29 predugovora na 600 tisuća tona šumske sječke godišnje

ZAHVATI NJEGE I OBNOVA KAO NAČIN PRIDOBIVANJA DRVA ZA ENERGIJU I POVEĆANJA KVALITETE ŠUMA U HRVATSKOJ (Slavko Matić, HAZU, 15.11.2006.)

Prvi scenarij (2006.-2015.) 6.5 mil. m³ propisanog godišnjeg etata
20% ogrjevno drvo 1.3 mil. m³
40% otpad 2.6 mil. m³

Drugi scenarij 2020 (2006.-2015.) 6.5 mil. m³ propisanog godišnjeg etata
45% drvo za energiju 3.0 mil. m³
15% otpad 0.9 mil. m³

Treći scenarij 2030 (2006.-2015.) 7.3 mil. m³ mogućeg godišnjeg etata
45% drvo za energiju 3.3 mil. m³
15% otpad 1.1 mil. m³

Četvrti scenarij 2050 (2006.-2015.) 7.3 mil. m³ mogućeg godišnjeg etata

- drvo za energiju u uvjetima povećanog etata 3.3 mil. m³
- drvo za energiju iz njege čišćenjem – izvan etata 0.2 mil. m³
- drvo za energiju iz šikara i makija – izvan etata 0.7 mil. m³
- sveukupno drvo za energiju 4.2 mil. m³

- 2020. 4.000 ha kultura kratkih ophodnji (KKO) 60.000 tona energetskog drva! (prof. dr. Davorin Kajba, Šumarski fakultet, Zagreb)

Zaključci

KKO mogu biti značajan izvor biomase za energetske potrebe

Uz proizvodnju biomase, KKO pružaju i neke druge mogućnosti (slabije produktivna šumska tla, napuštena poljoprivedna tla, diversifikacija poljoprivredne proizvodnje, sekvestracija ugljika, trgovanje emisijanma CO_2, pročišćavanje otpadnih voda – fitoremedijacija)

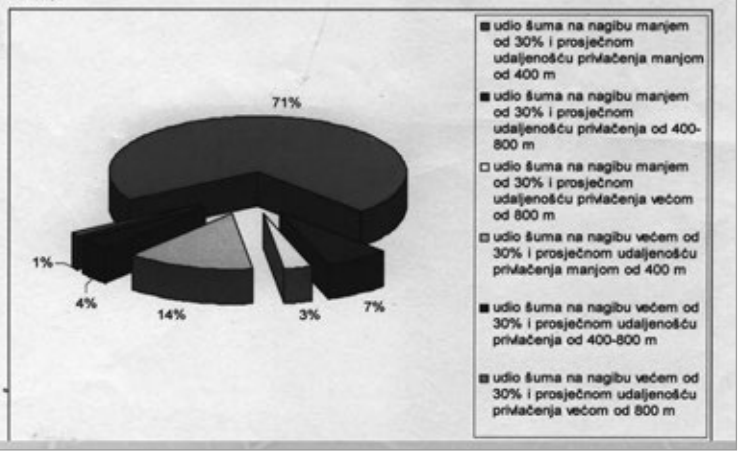
U Hrvatskoj do sada najveći potencijal produkcije biomase u kratkim ophodnjama pokazuju testirani klonovi vrba i topola

Zbog trenutne nerazvijenosti tržišta biomasom, istraživanja se usmjeravaju prema selekciji klonova sa sposobnošću adaptacije na marginalna šumska i napuštena poljoprivredna staništa

Primjenom intenzivnijih uzgojnih i zaštitnih mjera produkcija biomase može se znatnije povećati!

prof. dr. Davorin Kajba, Šumarski fakultet, 19.1.2015.

Prema uvjetima korištenja glavnina gospodarskih šuma (71%) na razini Republike Hrvatske je u najpovoljnijoj kategoriji (nagib manji od 30% i prosječna udaljenost privlačenja manja od 400 m).



EUROPA 2020

VIZIJA EUROPSKE SOCIJALNO TRŽIŠNOG GOSPODARSTVA ZA 21. STOLJEĆE:

3 PRIORITETA ZA RAST

- Pametan – rast gospodarstva temeljen na znanju i inovacijama
- Održiv – promicanje niskougljičnog, konkurentnog gospodarstva temeljenog na učinkovitom korištenju resursa
- Uključiv – poticanje ekonomije visoke stope zaposlenosti, uz rezultat ekonomske, socijalne i teritorijalne kohezije

5 CILJEVA

- Stopa zaposlenosti stanovništva u dobi između 20 i 64 godine mora biti najmanje 75%;
- Ulaganje 3% BDP-a u istraživanje i razvoj;
- Ispunjenje klimatsko-energetskih ciljeva „20/20/20":
  - smanjenje emisije stakleničkih plinova za barem 20% u odnosu na razine iz 1990. godine, odnosno za 30% ako to uvjeti dopuste; 20% udjela energije iz OIE u krajnjoj potrošnji;
  - povećanje energetske učinkovitosti za 20%
- Broj Europljana koji žive ispod nacionalnih granica siromaštva potrebno je smanjiti za 25%, 20 milijuna manje ljudi trebalo bi biti u opasnosti od siromaštva.

7 INICIJATIVA - 2 ZA ODRŽIVI RAST –RESURSNO UČINKOVITA EUROPA

-Industrijska politika za globalizacijsko doba
-Učinkovito iskorištavanje resursa u Europi

GLAVNI IZAZOVI ENERGETSKOG SEKTORA

Neki od glavnih izazova prijelaza energetskog sektora u niskougljičnom gospodarstvu:

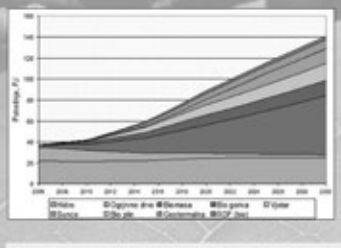
- ENERGETSKI I KLIMATSKI CILJEVI
- ZAKONODAVNI OKVIR
- ZAJEDNIČKO EUROPSKO ENERGETSKO TRŽIŠTE
- PLANIRANJE I GOSPODARSKI RAST
- STRUKTURA POTROŠNJE
- SUSTAVI POTPORA
- ISPLATIVOST
- FINANCIRANJE
- POTENCIJAL ZEMLJE (energetski, financijski, tehnološki……)
- RAZVIJENOST, STABILNOST I KRUŽNI TOKOVI ELEKTROENERGETSKE MREŽE
- VLASNIŠTVO TEHNOLOGIJA I PRIMJENA……

USPJEŠNA ENERGETSKA POLITIKA 2020-2030-2050 MORA DATI ODGOVORE NA OVA PITANJA

CILJEVI ENERGETSKE STRATEGIJE KROZ OPTIMALNO KORIŠTENJE ZRELIH TEHNOLOGIJA OIE-E 2020-2030

Obnovljivi izvor	Instalacija do 2020 za 20% OIE (MW)	Instalacija do 2030 za 30% OIE (MW)
Vjetar	1200	2000
Biomasa	140	420
Komunalni otpad	60	60
Geotermalna	20	30
Sunce	45	250
Male hidroelektrane do 10 MW	100	140
Hidroelektrane veće od 10 MW	300	reverzibilne elektrane

POTENCIJAL BIOMASE PROCIJENJEN U STRATEGIJI 2020-2030



Projekcija strukture obnovljivih izvora energije do 2020. godine (s projekcijom 2050. godine)

		2010.	2020.	2050.
Biomasa	[PJ]	16,14	36,77	64,72
Biogorivo	[PJ]	2,50	9,55	14,35
Energija vjetra	[PJ]	3,02	9,50	15,84
Energija vodotokova – male HE	[PJ]	0,40	0,67	1,35
Energija vodotokova – velike HE	[PJ]	21,06	21,76	23,76
Geotermalna energija	[PJ]	0,15	5,51	8,54
Sunčeva energija	[PJ]	0,51	5,27	13,87
UKUPNO	[PJ]	43,78	88,42	140,43
	[t_{ekv}]	1 042 000	2 105 000	3 401 000

Strategijom se postavlja cilj da će u 2030. godini od ukupnog potencijala biomase na teritoriju Hrvatske koristiti čak 72% u energetske svrhe i da će od danas do te godine uporaba biomase kontinuirano rasti.

Do 2020. godine predviđeno je iskoristiti 40%ukupnog potencijala (bez energijskih šuma).

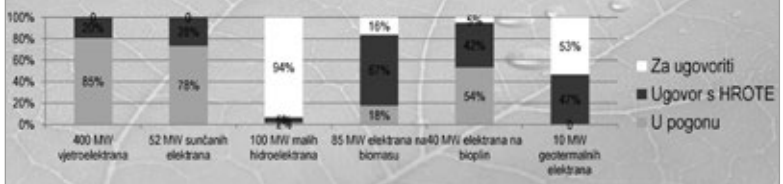
Različite tehnologije i električnu i/ili toplinska energija ili preraditi u komercijalno pogodnije oblike energije (pelete , brikete i drveni ugljen).

Dio biomase upotrijebit će se i za proizvodnju biogoriva druge generacije.

OIE-E U SUSTAVU POTICAJA

Technology	Strategija 2009 Ciljevi 2020	NAP Ciljevi 2020	OIE FiT u radu #ujan 2015	OIE FiT ugovoreno #ujan 2015
	[MW]	[MW]	[MW]	[MW]
Sunce	45	52	40,69	14,65
Vjetar*	1200	400	339,25	81,5
Male hidro	100	100	1,59	4,74
Biomasa	140	85	14,93	56,80
Biopln		40	21,43	16,72
Geotermalna	20	50	0	4,71

* izvan kvote NAP-OIE sklopljeno ugovora s HROTE za 323,2 MW (izvor HROTE)



PREDNOST BIOMASE U PROIZVODNJI ENERGIJE

Prednost korištenja biomase u energetici:

- Mogućnost visokoučinkovite proizvodnja električne i toplinske energije u kogeneracijskim postrojenjima
- Pouzdani i stabilni izvor električne energije – bazna energana
- Bioenergana sa sinkronim generatorom poboljšava naponske prilike u elektroenergetskoj mreži i može raditi neovisno od mreže (otočni rad) – eneretska neovisnost
- Kontinuirana proizvodnja energije i do 8000 sati godišnje
- Više različitih tehnologija koje koriste sve oblike biomase
- Decentralizacija proizvodnje energije uz područja proizvodnje biomase
- Proizvodnja bioplina uz dobivanje gnojiva visoke kvalitete (digestat) pretvaranjem biomase u bioplin, uz zatvoren ciklus nutrijenata (tzv. Nitratna direktiva)
- Proizvodnja i korištenje biomase pruža brojne socio-ekonomske koristi za društvo

Te se na taj način učinkovito doprinosi:

- *poboljšanju energetske učinkovitosti u industriji i općenito*
- *smanjenju emisija stakleničkih plinova i ostalih emisija u okoliš.*

Zašto povratak na dobivanje topline iz OIE?

- Weil wertvolle Primärenergieträger eingespart werden!
- Weil die Abhängigkeit von Krisenregionen im Ausland abnimmt!
- Weil der CO2-Ausstoß verringer wird!
- Weis es sich rechnet! Direkte Einsparung
- Damit man nicht bestraft wird: EU-Richtlinie 2012/27/EU: jeder Energielieferant >25GWh muß pro Jahr 0,6% des Energieabsatzes vom Vorjahr einsparen, ansonsten Strafzahlung 200 €/MWh
- Aus IDEALISMUS

Nadam se da će potencijali biomase po novoj ŠGOP (2016. – 2025.)

Hrvatska drvna industrija i Hrvatske šume d.o.o.trebaju sustavnije promišljati o rješavanju problema većeg energetskog korištenja biomase i aktivnijim pokretanjem kogeneracijskih postrojenja (BE-TO), proizvodnji briketa i peleta. **(U izradi je ŠGOP 2016. – 2025.** i treba planirati radovima njege i obnove, povećanje godišnjeg etata drva za energiju smanjenjem otpada u šumi s 40% na 15%i podizanjem „kultura kratkih ophodnji" na šumskom zemljištu i zapuštenom poljoprivrednom zemljištu!).

Hrvatsko šumarstvo ima velike kadrovske i financijske potencijale, te stvarne mogućnosti proizvodnje i uporabe drva za bioenergiju.

ZAKLJUČK:

1. **Ugljen, nafta i prirodni plin** u suvremenom energetskom sustavu budućnosti **igrati će sve manju ulogu**,
2. **Biomasa, vjetar i solarna energija su goriva budućnosti**! Biomasa prije svega nudi se za opskrbu toplinom, za kogeneracijska postrojenja u zimskim mjesecima; i za proizvodnju goriva. Struja iz biomase u ljetu bez uporabe topline ne bi se trebala forsirati.
3. **Energetskom strategijom postavlja se cilj, da će u 2030.godini** od ukupnog potencijala biomase (poljoprivredne i šumske) na teritoriju Hrvatske koristiti čak 72% u energetske svrhe ili 420 MWel., te da će od danas do te godine energetska uporaba biomase kontinuirano rasti. **Energetskom strategijom do 2020.godine** predviđeno predviđeno je iskoristiti 40% ukupnog potencijala (bez energetskih kultura) ili 140 MWel.(vidi predavanje gđe.Dr.Kristine Čelić!)

Bez biomase nema energetskog zaokreta!

HRVATSKO ŠUMARSKO DRUŠTVO 1846 ŠUMARSKI LIST - 1877

SEKCIJA ZA BIOMASU

250 GODINA HRVATSKOGA ŠUMARSTVA 1765-2015

HRVATSKA UDRUGA ZA BIOMASU

TOPLINA I STRUJA IZ ŠUME

10. HRVATSKI DANI BIOMASE 2006.-2015.

Sirovinsko i energetsko korištenje

U Hrvatskoj je 47% površine pokriveno šumskim zemljištem! Drvna zaliha iznosi oko 400 mil. m³.

Godišnji prirast iznosi do 10.5 mil. m³, a godišnji etat oko 6.6 mil. m³.

Relativno mala zemlja s velikom biološkom raznolikošću!

U Hrvatskim šumama gospodari se po načelu potrajnosti već dvjesto pedeset godina!

„Kaskadno" korištenje drveta je u Hrvatskoj saživilo!

Državne šume već više od 10 godina gospodare po FSC certifikatu!

Uprava šuma Gospić 1MW centralizirani toplinski sustav (iz šumske sječke)

Šumarija Lokve, uprava šuma Delnice primjer grijanja na pelete 30 kW toplinski - domaća tehnologija: zamjena kotla (umjesto dosadašnjeg starog grijanja kotlom na lož ulje)

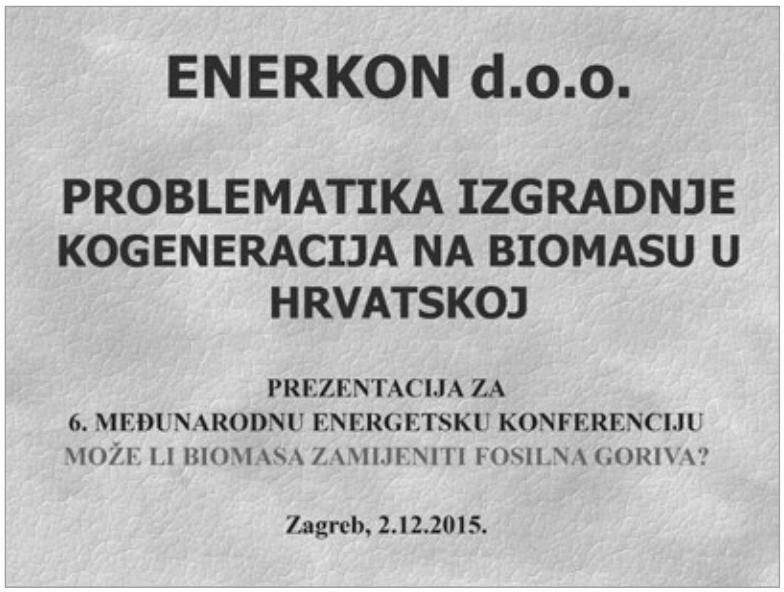
Ciprijanović d.o.o. Orahovica industrija proizvodnje drvnih ploča i namještaja te drvenih peleta i briketa; kapacitet komora sušara od 2.000 m³ drvnih elemenata (energija iz kore)

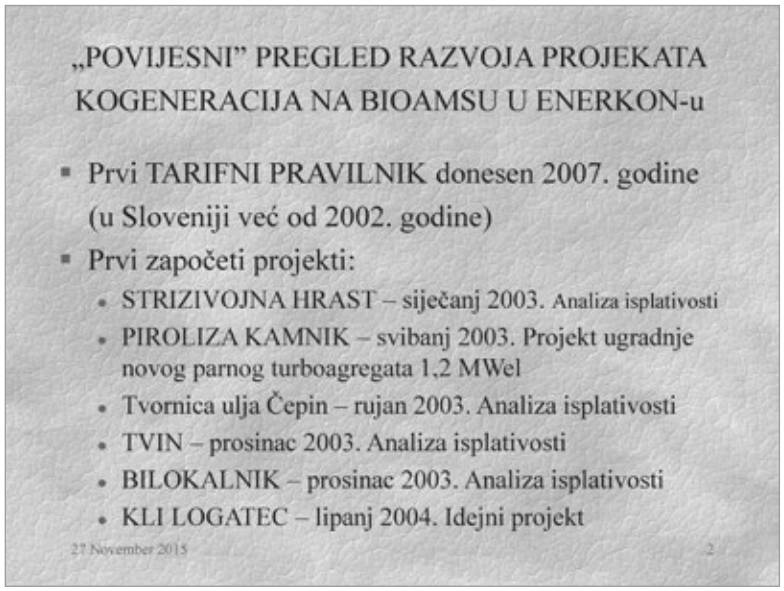
Strizivojna Hrast d.o.o., Strizivojna, industrija parketa, kogeneracija snage 3.3 MW električne i 15 MW toplinske: proizvodnja struje iz biomase (iz drvnog ostatka) - na primjeru parnog procesa (parne turbine)

Likaenergo d.o.o, Udbina, snage 0.959 MW električne i 4.1 MW toplinske: proizvodnja struje iz biomase (iz kore) - na primjeru ORC procesa, a toplinsku energiju koriste za proizvodnju drvenih peleta

Stanko Plevnik, dipl. ing.
ENERKON d.o.o.

PROBLEMATIKA IZGRADNJE KOGENERACIJA NA BIOMASU U HRVATSKOJ





„POVIJESNI" PREGLED RAZVOJA PROJEKATA KOGENERACIJA NA BIOAMSU U ENERKON-u

- Prvi započeti projekti (nastavak):
  - SPAČVA – veljača 2006. Analiza isplativosti
    - studeni 2006. Investicijska studija
  - SPIN VALIS – studeni 2006. Analiza isplativosti
  - DI Novoselec – svibanj 2007. Analiza isplativosti
  - SLAVONIJA DI – svibanj 2007. Analiza isplativosti
  - BRESTOVAC – rujan 2007. Analiza isplativosti
  - UNIVERZAL – siječanj 2008. Investicijski elaborat
  - LIPA – kolovoz 2008. Idejni projekt
  - VINKOVCI 1,2 MW – rujan 2009. Analiza isplativosti
  - PROMMING 250 kW – listopad 2009. Idejni projekt

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Završeni projekti kogeneracija na biomasu

- PIROLIZA KAMNIK 1,2 MW – u pogonu od 2004. godine
- STRIZIVOJNA HRAST 3,3 MW – u pogonu od 2011. godine
- TYRONE , Irska, 2,6 MW – u pogonu od 2013. godine
- UNIVERZAL 2,4 MW – (rekonstrukcija kotlova) – u pogonu od 2013. godine

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Projekti kogeneracija na biomasu u realizaciji

- LIPA 1,2 MW - Građevinska dozvola, EO, Ugovor s HROTE-om
- BRINJE 5 MW – Građevinska dozvola, EO, Ugovor s HROTE-om, potpisan ugovor za izgradnju
- VIROVITICA 3 MW - Građevinska dozvola, EO, Ugovor s HROTE-om, potpisan predugovor za izgradnju
- DIN Novoselec 1,2 MW - Građevinska dozvola, EO
- OGULIN 1,2 MW - Građevinska dozvola, EO
- TRŠĆE 1,2 MW – U izgradnji

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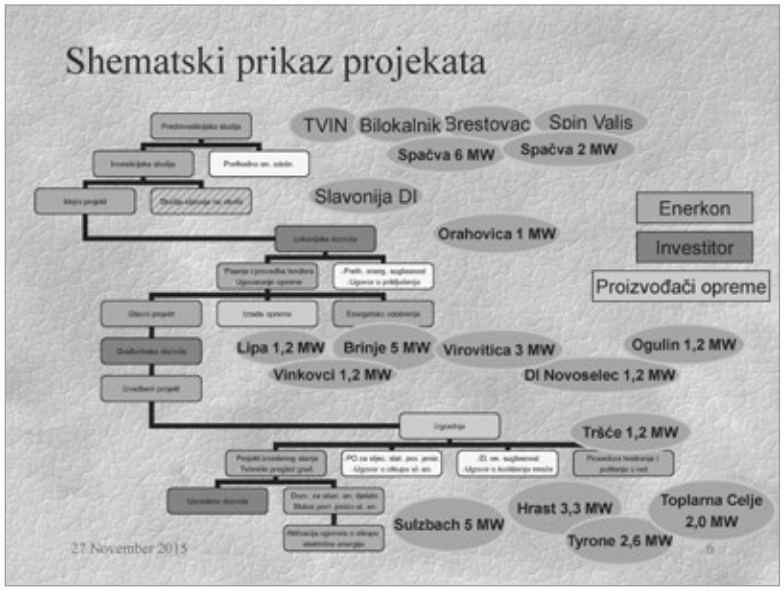

Problematika izgradnje

- Nepotrebno zamršen administrativni postupak
- Nepriznavanje kompetencija između državnih službi (Ministarstvo graditeljstva, Ministarstvo gospodarstva, HERA)
- Dugi rokovi ishođenja dokumenata (npr. EOTRP)
- Donošenje novih propisa koji nepotrebno usložnjavaju razvoj projekata
- Banke i dobivanje kredita
- Uloga HBOR-a?

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Prijedlozi za poboljšanje postupka

- Skratiti rok za izradu EOTRP-a na 30 dana
- Izdavanje Građevinske dozvole bez primjedbi
- Skratiti vrijeme izdavanja EO na 5 dana (uz napomenu da treba minimizirati potrebne dokumente na razini obrazaca bez mogućnosti greške)
- Ista napomena za dokumentaciju za HERA-u
- Postupak potpisa ugovora s HROTE-om bez primjedbi
- Postupak ugovaranja biomase s HŠ

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MOŽE LI BIOMASA ZAMIJENITI FOSILNA GORIVA?

Pravilnije je postaviti pitanje:

GDJE MOŽE BIOMASA RAVNOPRAVNO KONKURIRATI FOSILNIM GORIVIMA?

27 November 2015 9

Moj odgovor:

- Prije svega u drvnim industrijama
- U proizvodnji biogoriva (peleta i briketa)
- Za grijanje staklenika
- Za grijanje manjih naselja (≥ 1 MWt)
- Za kontinuirane tehnološke procese (npr. mljekare i mesne industrije)

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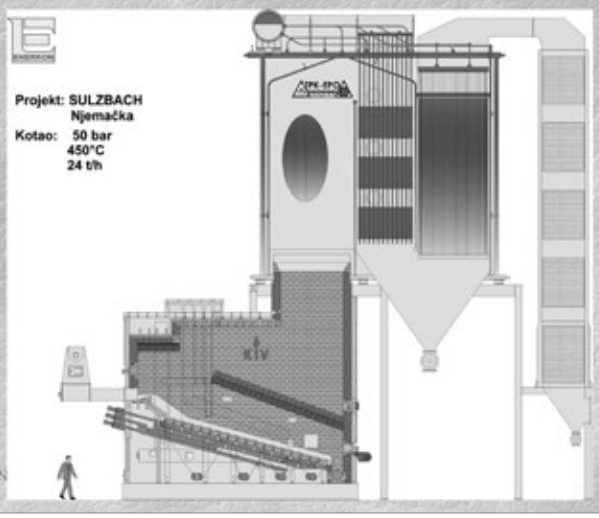
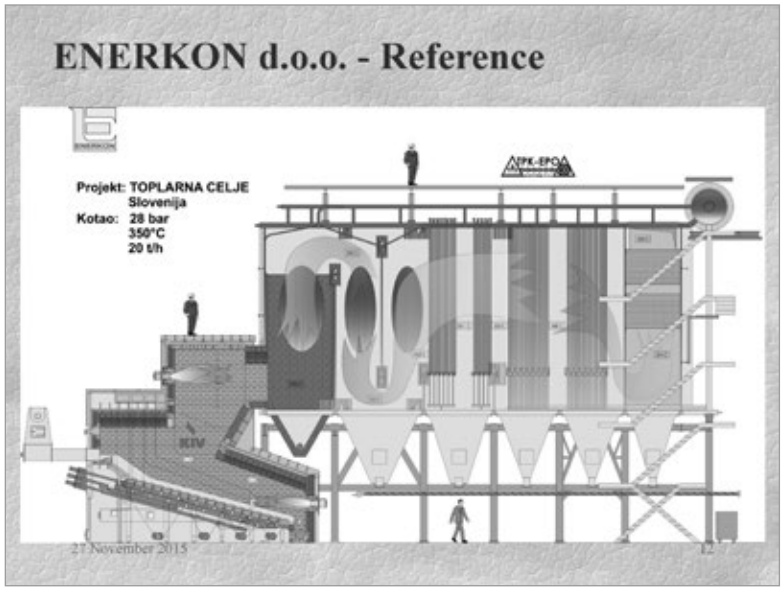
ENERKON d.o.o. - Reference

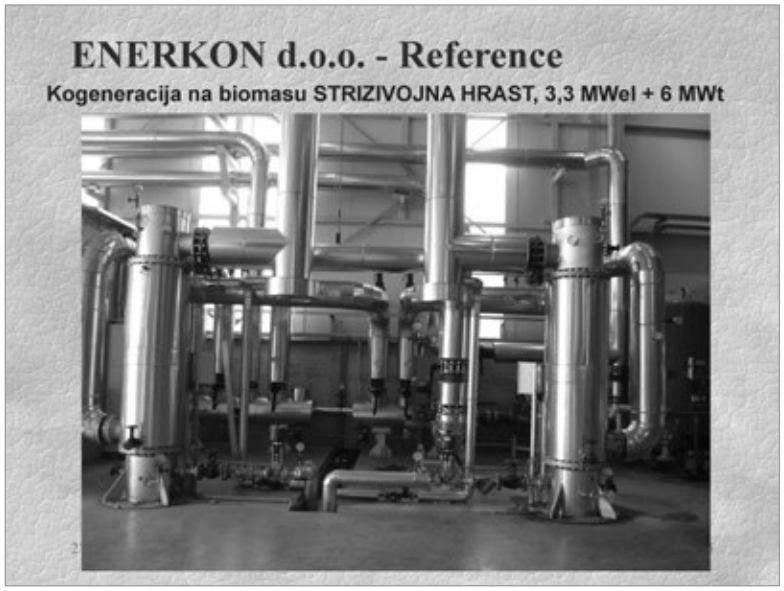


27 N 11


ENERKON d.o.o. - Reference
Projekt: TOPLARNA CELJE
Slovenija
Kotao: 28 bar
350°C
20 t/h
27 November 2015
12

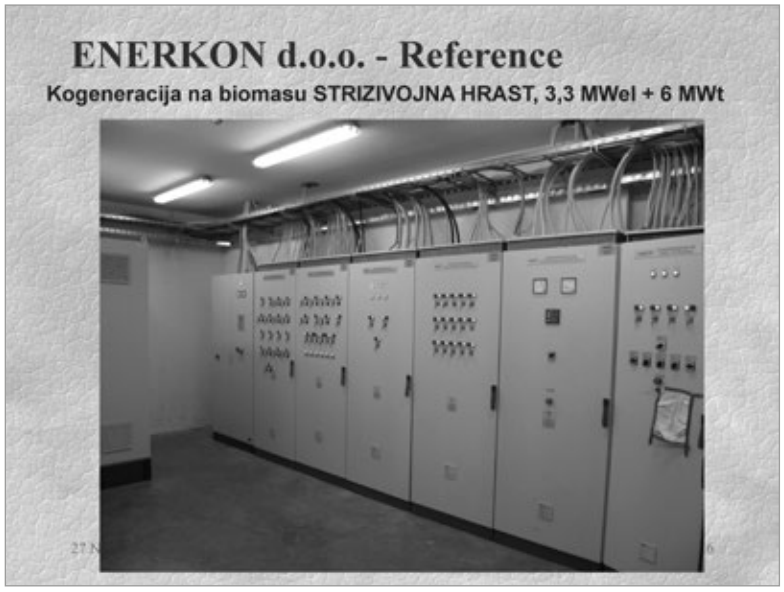

ENERKON d.o.o. - Reference
Kogeneracija na biomasu STRIZIVOJNA HRAST, 3,3 MWel + 6 MWt
Parni kotao (lijevo) i kemijska priprema vode i napojni spremnik s otplinjačem i napojnim pumpama (dolje)


ENERKON d.o.o. - Reference
Kogeneracija na biomasu STRIZIVOJNA HRAST, 3,3 MWel + 6 MWt
Indar
14



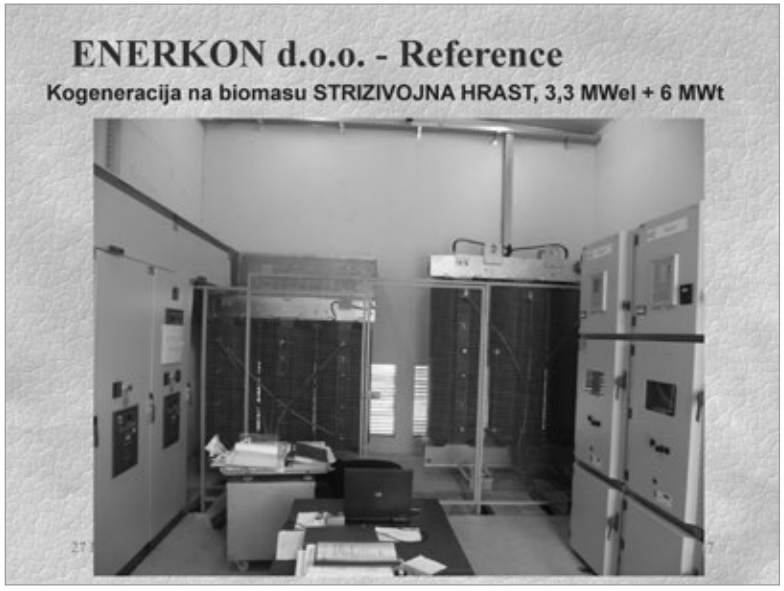
ENERKON d.o.o. - Reference

Kogeneracija na biomasu STRIZIVOJNA HRAST, 3,3 MWel + 6 MWt



ENERKON d.o.o. - Reference

Kogeneracija na biomasu STRIZIVOJNA HRAST, 3,3 MWel + 6 MWt



ENERKON d.o.o. - Reference

Kogeneracija na biomasu STRIZIVOJNA HRAST, 3,3 MWel + 6 MWt


ENERKON d.o.o. - Reference
Kogeneracija na biomasu STRIZIVOJNA HRAST, 3,3 MWel + 6 MWt


ENERKON d.o.o. - Reference
Kogeneracija na biomasu STRIZIVOJNA HRAST, 3,3 MWel + 6 MWt


ENERKON d.o.o. - Reference
Kogeneracija na biomasu
STRIZIVOJNA HRAST, 3,3 MWel + 6 MWt

ENERKON d.o.o. - Reference

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- www.enerkon.hr
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HVALA NA PAŽNJI

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SRC+

www.srcplus.eu

SRC plantations for local supply chains and heat use

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

SRCplus – BACKGROUND

Short rotation crops (SRCs) such as willow, poplar, robinia and others are woody, perennial fast growing tree species that can either re-grow (coppice) or be replanted after harvest. They are an excellent alternative to annual energy crops and can be complementary to the existing agricultural system.

Aside from being used for energy production, the cultivation of SRC has many benefits compared to annual crops. They can help to improve water quality, enhance biodiversity, provide other ecosystem services and mitigate climate change.

The leading EU countries with SRC plantations are Sweden, the UK and Poland while other member states have minor experience. SRC+ project undertakes actions to trigger and facilitate the implementation of local supply chains of SRC in Europe.

SRCplus – OBJECTIVES

Solid biomass from SRC can contribute significantly to reaching the 2020 bioenergy targets.

The SRCplus project aims to support and speed-up the development of local supply chains of SRC by:

- implementing 68 capacity building events for farmers, public land owners and small and medium users of woodchips.
- implementing regional mobilization actions
- facilitating cooperation activities with the industry
- promoting sustainable practices in the SRC supply chains
- highlighting the environmental benefits of SRC in comparison to other (annual) crops.

SRCplus – TARGET REGIONS

In the SRCplus project SRC plantations are promoted in seven European regions.

- Achental region (Germany)
- Eastern Croatia region
- Vidzeme region (Latvia)
- Rhone - Alps region (France)
- Zlin region (Czech Republic)
- Kentriki Makedonia region (Greece)
- Prespa region (Macedonia)

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Swedish University of Agricultural Sciences, Sweden
Jannis Dimitriou (Jannis.Dimitriou@slu.se)

Duration: March 2014 - March 2017

Contract No.: IEE/13/574

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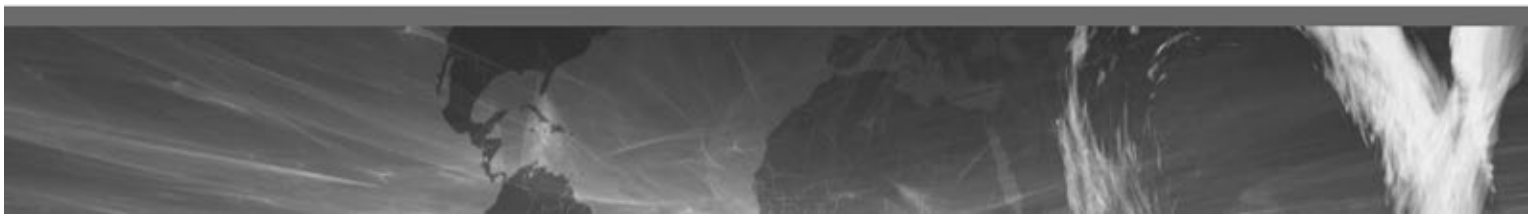
Facts And Figures About Kohlbach

- Family business since 1945
- About 220 employees
- More than 2,000 Installations in 26 countries, with a heat output 400 kW – 15,000 kW
- In-house R&D, design and project management
- Assistance from the initial project idea throughout the entire development
- In-house manufacturing and local service partner

Company Structure

- Austrian company
- Worldwide activities
- Subsidiaries
- License partners
- Partner companies



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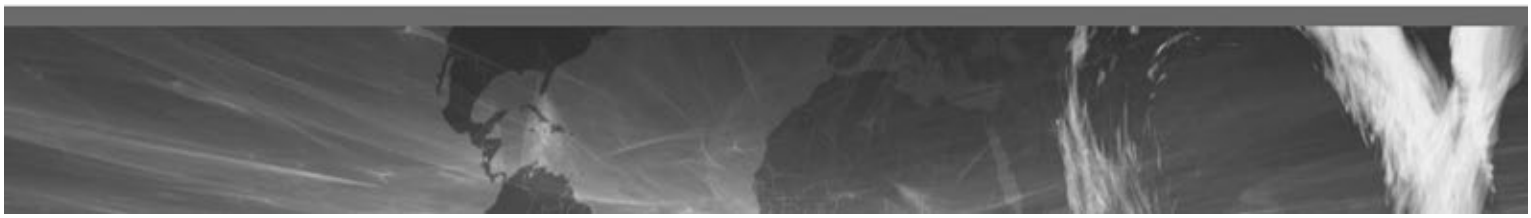
WHY KOHLBACH

- Creating the best solution
  for our customer and together ***with*** our customer
- Equipment designed and built by KOHLBACH
- Reliable technology, built in industrial standard
- High availability with more than 8,000 operating hours per year
- Quick spare parts support
  because of in-house manufacturing
- Close to our customers
- Low energy self consumption

EXPERIENCE, INNOVATION, RELIABILITY

- More than 60 years of **experience** in producing and installing biomass boiler systems
- **Customized solutions** for our customers
- Continuous **innovation** and new technologies for a changing fuel market
- Permanent **improvements** by working together with our customers
- **Highest quality** by latest process and manufacturing technologies
- **Local service and maintenance** by KOHLBACH and our partners
- 24/7 on call service



Solid Biomass

- Wood chips
- Bark
- Saw dust
- EN A1, A2 and B pellets
- Corn spindles
- Straw bales
- Wood from landscaping
- Special fuels

Virgin Wood

Wood chips

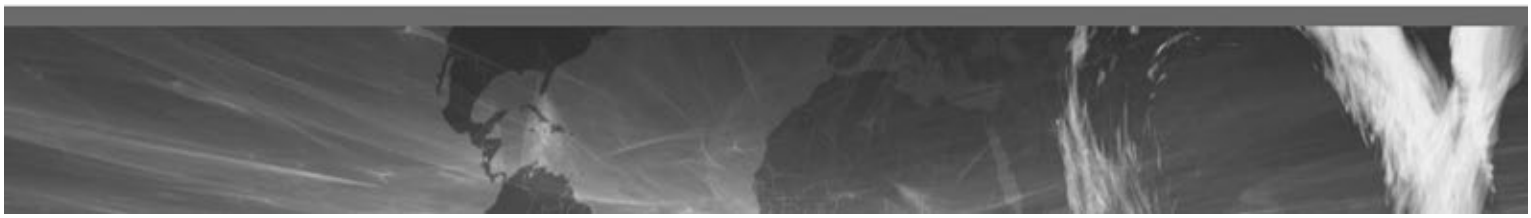
- water content (M) 20 – 60% on wet basis
- size (P) 30 – 100mm

Bark

- water content (M) 20 – 60% on wet basis
- cross section up to 25cm²
- length up to 80cm

Saw dust

- water content (M) 10 – 50% on wet basis
- size (P) 1 – 10mm



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Untreated Wood And Special Fuels

EN A1, A2 and B pellets

- water content (M) <10 – % on wet basis
- size (P) 4 – 20mm

Landscape conservation material

- water content (M) not defined

Particle boards, waste of furniture industry

- water content (M) 4.3 – 10%

Corn spindles

- water content (M) 8 – 30% on wet basis

Special Fuels

Straw bales

- water content (M) <15% on wet basis
- size ~ 2.5 x 1.2 x 0.7m

Cherry stones

- water content (M) 48%

Draff (dried)

- water content (M) 60%

Milling by-products

- water content (M) 14%

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APPLICATIONS

Heat & Process Energy

Co and Tri-Generation

COMBUSTION SYSTEMS

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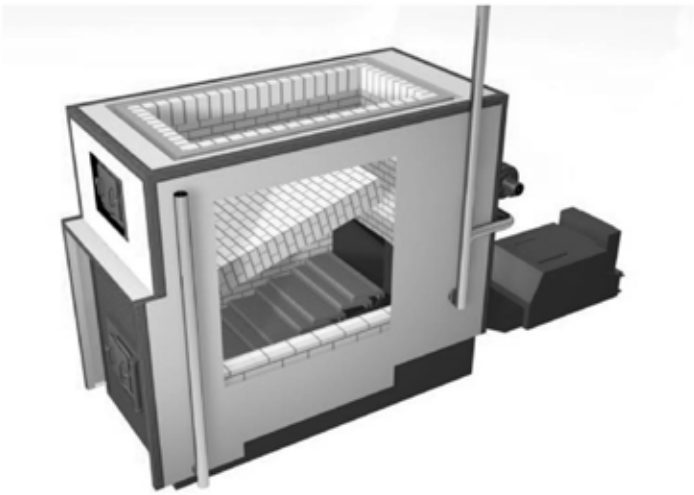
SYSTEM-K8

Combustion technology

- Counter flow furnace with moving grate and water cooled compression cone
- Hydraulic stoker (pusher)



Furnace power

- 525 - 10,225 kW

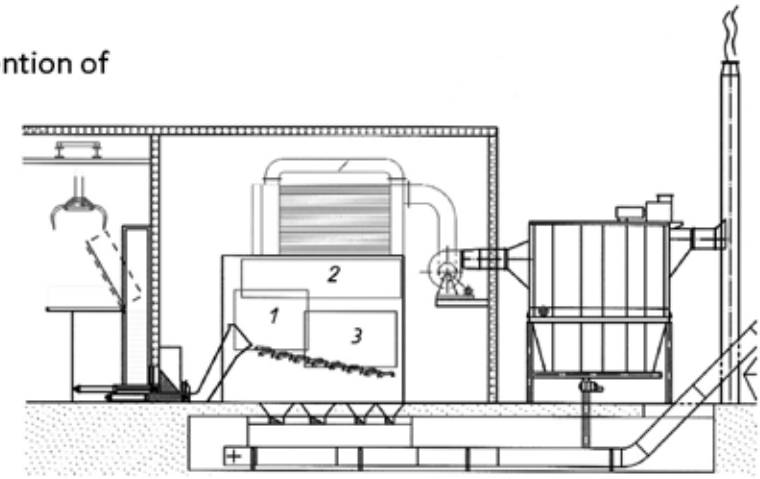
Fuel

- Wood chips and bark
- Water content [weight %]: 20 to 60
- Fuel size [P in mm]: 30 to 100
- Maximum ash content [weight %]: 8

SYSTEM-K10

Combustion technology

- Straw combustion with compact metering stoker and backfire safety
- Low emission combustion and prevention of slag accumulation



Furnace power

- 2,500 to 7,675 kW

Fuel

- Straw whole-bales

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SYSTEM-K11

Combustion technology

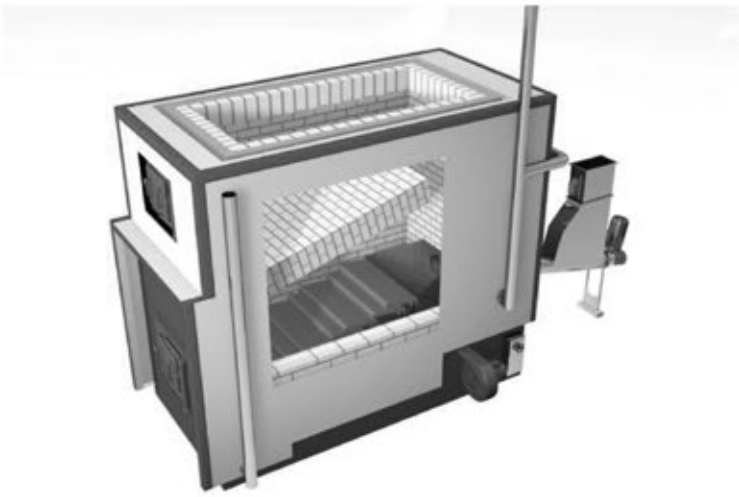
- Counter flow furnace with moving grate
- Frequency controlled screw auger

Furnace power

- 525 - 7,675 kW

Fuel

- Wood chips and saw dust
- Water content [weight %]: 10 to 55
- Fuel size [P in mm]: up to 50
- Maximum ash content [weight %]: 5



SYSTEM-K12

Combustion technology

- Center flow furnace with moving grate and water cooled compression cone
- Hydraulic stoker (pusher)

Furnace power

- 4,000 - 18,000 kW

Fuel

- Wood chips and bark
- Water content [weight %]: 20 to 60
- Fuel size [P in mm]: 30 to 100
- Maximum ash content [weight %]: 12

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SYSTEM-K13

Combustion technology

- Furnace with moving grate
- Frequency controlled screw auger

Furnace power

- 900 - 6,800 kW

Fuel

- EN pellets, quality A1, A2 and B (industrial pellets), as well dry wood chips
- Water content [% weight]: up to 30 for wood chips
- Fuel size [P in mm]: up to 30 for wood chips
- Maximum ash content [weight %]: 3

SYSTEM-K14

Combustion technology

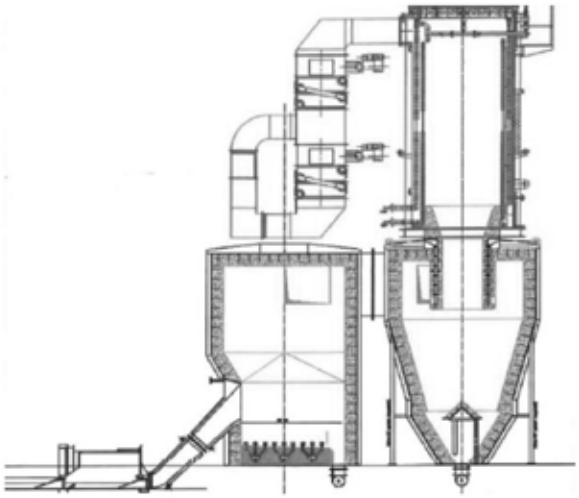
- Stationary fluidized bed combustion

Furnace power

- 4,000 to 15,000 kW

Fuel

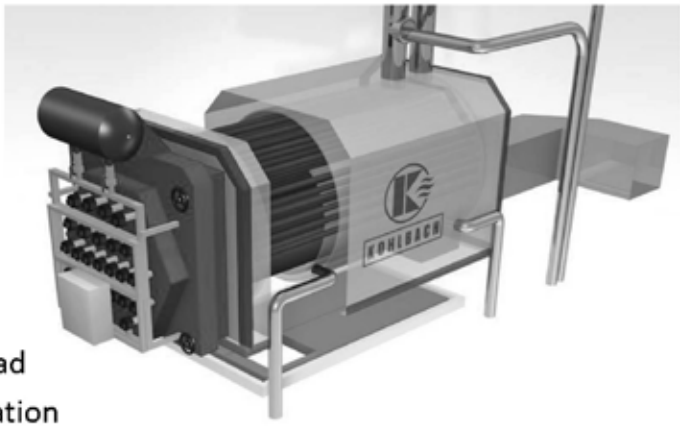
- Biogenetic residues
- Waste from rape-seed oil production
- Waste from spice production
- Recycled wood



Warm Water / Hot Water Boiler

Boiler output

- 400 to 15,000 kW



Flow temperature

- Warm water until 110°C
- Hot water up to 200°C

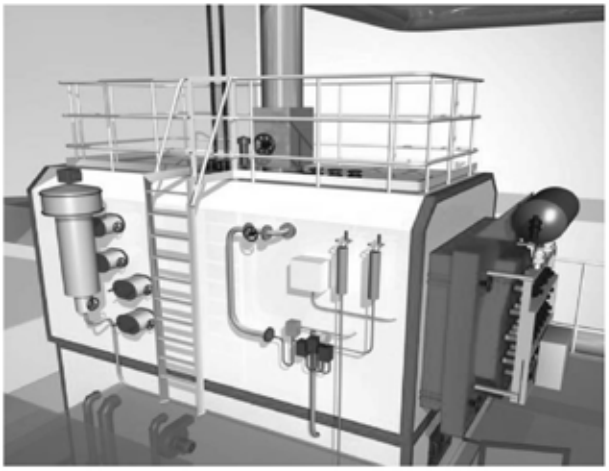
Design

- 3-pass smoke tube boiler for continuous full load
- 2-pass version, optimised for partial load operation
- Boiler tube cleaning system by compressed air
- Horizontal or vertical design
- Up to 24 bar operating pressure

Steam Boiler

Boiler output

- 800 - 15,000 kW for saturated steam
- 5,000 – 15,000 kW for superheated steam



Working pressure / temperature level

- Up to 32 barg and 235°C for saturated steam
- Up to 40 barg and 450°C for superheated steam
- Water tube boiler: up to 61 barg and 480°C

Design

- 2-pass smoke tube boiler for saturated steam
- Smoke and water tube boiler for superheated steam
- Boiler tube cleaning system by compressed air
- Horizontal design

Thermal Oil Boiler

Boiler output

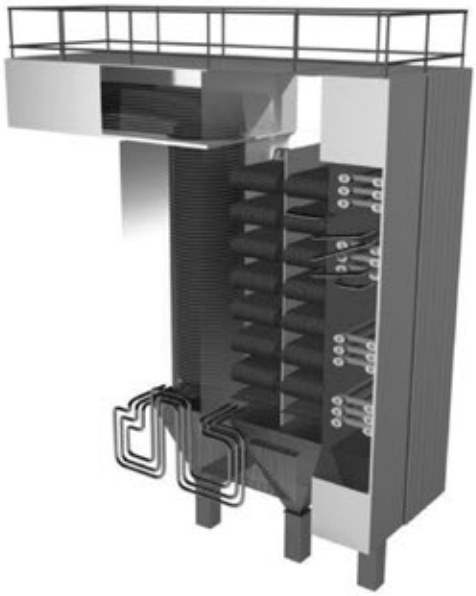
- 3,000 - 15,000 kW

Flow temperature

- Up to 315°C

Design

- Separate heat exchanger passes for radiation and convection energy
- No compressed air cleaning system required
- Accessibility for service and maintenance
- Vertical design



Flue Gas Condensation

- Previously unused residual heat in combustion gases is also utilized insofar as is possible
- Compact self-sufficient system with individual design tailored to the specific system
- Switching on and off of the condensation system independent of the operation of the boiler system
- Operation and cleaning implemented largely automatically

Reduction of Emissions

Variants

- Multi-cyclone: To pre-separated dust at < 150 mg/Nm³ (half-hour average value).
- Flue gas scrubber: To reduce particles by using a washing fluid.
- Electro static filter: To remove dust content to < 10 mg/Nm³ (half-hour average value).
- Bag filter: To reduce the fine dust content further to < 5 mg/Nm³.
- SNCR injection or SCR catalysers: To reduce the NOx values

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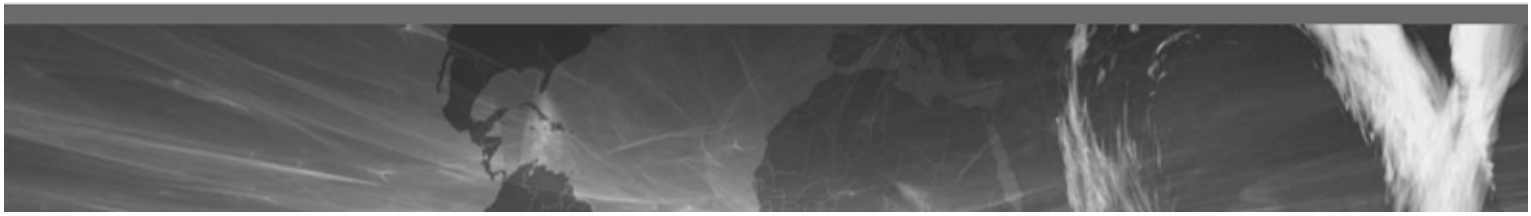
Some References In Region

Location	Name	Type	Power [kW]	Year
Zagreb	Tvornica Četaka Karačić d.o.o.	K9-600	600	1997
Gradec	Adriadrvo d.o.o.	SU-200 D/W	2000	1994
Gradec	Adriadrvo d.o.o.	K8-2000	2000	2000
Dugo Selo	Liston d.o.o.	K11-800	800	2000
Sv. Ivan Zelina	Drvna Industrija ZELINA d.d.	K8-3000	3000	2009
Jastrebarsko	DIR Drvna Industrija Rubinic	K8-1500	1500	1997
Jastrebarsko	Drvoproizvod d.d.	U-3000	3000	1991
Jastrebarsko	Drvoproizvod d.d.	K8-2500	2500	2002
Jastrebarsko	Palma d.o.o.	K9-1500	1500	2000
Krašić	Pilana Krašić d.o.o.	K9-600	600	1996
Čakovec	Pana. d.o.o.	K8-2500	2500	2006
Varaždin	ITC d.d.	2xK9-2500	2 x 2500	1997
Turčin	Otk d.o.o.	K8-1500	1500	2007
Martijanec	Otk d.o.o.	K9-1000	1000	2004
Donji Martijanec	Hrast-Export-Puklavec d.o.o.	K8-3000	3000	2004
Ivanec	Drvodjelac d.o.o.	K9-1500 ND	1500	2005
Bjelovar	Česma-Energana d.d.	K8-7000	7000	1998/2015
Čazma	DI Čazma d.o.o.	K8-4000	4000	2007
Križevci	Arena	SU-2000	2 x 2000	1992+1994
Duga Resa	PM Lignum	K8-1500	1500	2003
Duga Resa	PM Lignum	K8-5000	5000	2007
Lukovdol	Sabina d.o.o.	K8-500	500	2005
Gospic	Gpv – Gradjenje Gospic	K8-1000	1000	2003
Perusic	Visevica Komp d.o.o.	K8-3000	3000	2003
Udbina	Udbina	K12-5140 HTK	5140	2010



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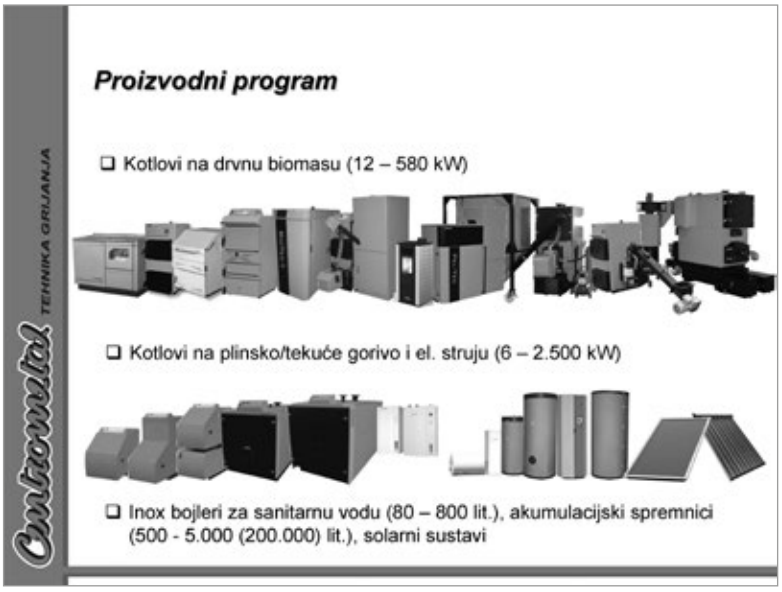
Some References In Region

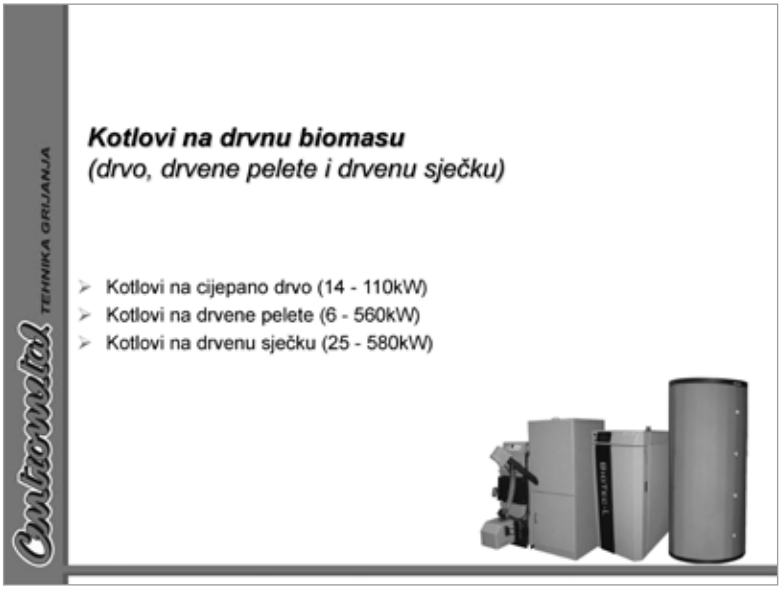
Mjesto	Ime	Tip	Snaga [kW]	Godina proizvodnje
Škofljica	Hoja d.d.	K8-1500	1500	2002
Log pri Brezovici	Zadruga NOVAKI Z.O.O. LOG	U-800	800	1995
Maribor	Lumar IG d.o.o.	K8-2000	2000	1999
Velenje	Gorenje notranja oprema d.d.	K9-2500	2500	1999
Luce ob Savinji	Biomasa d.o.o.	K8-800	900	2002
Preddvor	Energetika Preddvor d.o.o.	K8-2500	2500	2002
Šentjernej	Podgorje d.o.o.	2xK9-1500	2x1500	2001
Šentjanž pri Dravogradu	Imont d.o.o.	K8-1500	1500	2001
Recica ob Savinji	Mizarstvo Marovt d.o.o.	U-800	800	1994
Pivka	Interma d.o.o.	HTK/RKV-2,0/40	2300	1992
Ogulin	Traheja Ogulin	U-2000	2000	1992
Ogulin	Hrvatske Šume Mehanizacija, graditeljstvo i prijevoz Ogulin d.o.o.	SU-1000	1000	1995
Koprivnica	Bilokalnik-Drvo d.o.o.	K8-7000	6700	2001
Kastav-Rijeka	Štimac d.o.o.	K8-1000	1000	2007
Gerovo	Finvest Corp d.d.	SU-2500	2500	1995
Gerovo	Finvest Corp d.d.	K8-6000	6000	2006
Ravna Gora	Ravna d.o.o.	K8-4000	4000	2006
Lokve	Lokve d.d.	K8-4000	4000	2007
Fužine	Drvenjača d.d.	K8-2500	2500	2003
Fužine	Drvenjača d.d.	K8-6900 HTK	6900	2007
Vrbovsko	Gerard d.o.o.	K11-500	500	2002
Srbac	Stirokart Paneli d.o.o.	2 x K8-1500SD	2x1500	2009
Kiseljak	JWC Boswood Co d.o.o.	K8-1500	1500	2000
Sokolac	Termag	K8-1500	1500	2005
Gračanica	Eko Toplane d.o.o.	K8-6000	6000	2008
Prijedor	Prijedorčanka a.d.	K8-2500	2500	2006
Prijedor	Prijedorčanka a.d.	K8-5000	5000	2006

Centrometal d.o.o.

SUSTAVI GRIJANJA NA BIOMASU (DRVO, DRVENI PELETI, DRVENA SJEČKA)


Izvozna orijentacija tvrtke "Centrometal"
Albanija
Alžir
Austrija
Belgija
BiH
Bjelorusija
Bugarska
Crna Gora
Češka
Danska
Estonija
Finska
Francuska
Grčka
Irska
Italija
Kosovo
Latvija
Litva
Mađarska
Makedonija
Nizozemska
Njemačka
Norveška
Poljska
Portugal
Rumunjska
Rusija
Slovačka
Slovenija
Srbija
Španjolska
Švedska
Švicarska
Ukrajina
Velika Britanija
Centrometal TEHNIKA GRIJANJA


Proizvodni program
Kotlovi na drvnu biomasu (12 – 580 kW)
Kotlovi na plinsko/tekuće gorivo i el. struju (6 – 2.500 kW)
Inox bojleri za sanitarnu vodu (80 – 800 lit.), akumulacijski spremnici (500 - 5.000 (200.000) lit.), solarni sustavi
Centrometal TEHNIKA GRIJANJA


Kotlovi na drvnu biomasu
(drvo, drvene pelete i drvenu sječku)
Kotlovi na cijepano drvo (14 - 110kW)
Kotlovi na drvene pelete (6 - 560kW)
Kotlovi na drvenu sječku (25 - 580kW)
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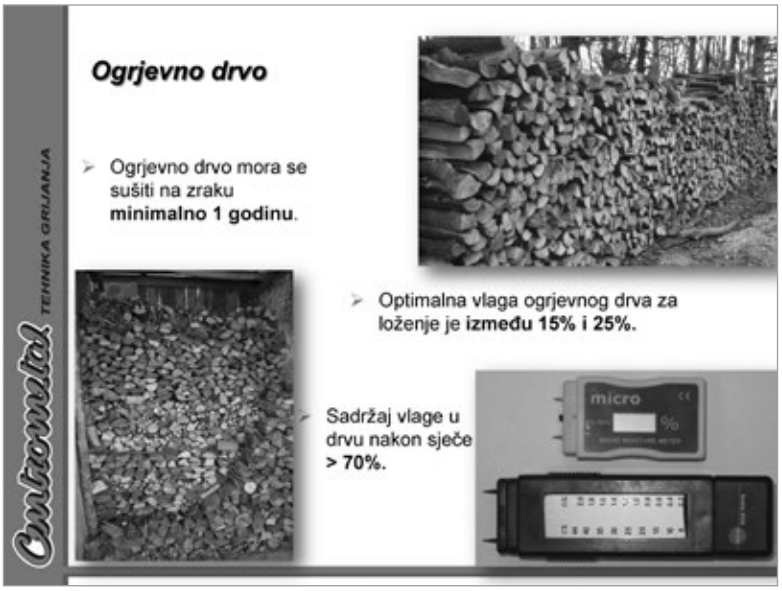
Ogrjevno drvo
Ogrjevno drvo mora se sušiti na zraku minimalno 1 godinu.
Optimalna vlaga ogrjevnog drva za loženje je između 15% i 25%.
Sadržaj vlage u drvu nakon sječe > 70%.
micro
%
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Kotlovi na ogrjevno cijepano drvo - tehnologije
Kombinirani kotlovi
Klasično izgaranje, mogućnost loženja krutog goriva te sa dodatnom opremom drvenih peleta, lož ulja i plina.
Kotlovi na drvo
Klasično izgaranje, ventilator za dim. plinove i regulacija, nasljednici klasičnih kotlova na kruto gorivo.
Pirolitički kotlovi
Pirolitičko izgaranje, veća iskoristivost u odnosu na klasične kotlove, obavezno uz ak. spremnik.
Pirolitički s lambda sondom
Pirolitičko izgaranje, kontrola procesa preko lambda sonde i senzora temperature, veća iskoristivost, obavezno uz akumulacijski spremnik.
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Kombinirani toplovodni kotlovi
EKO-CK P 14 – 110 kW
EKO-CKB P 20 – 50 kW
Toplovodni kotao za centralno grijanje, snaga 14 do 110 kW.
Predviđen za loženje krutim gorivom, drvenim peletima, uljem ili plinom.
Velika vrata omogućuju lako korištenje i čišćenje kotla.
Ugrađen termostat pumpe grijanja.
Prednost kotla EKO-CKB P je ugrađen inox spremnik sanitarne vode.
Kod loženja krutog goriva potrebno ugraditi regulator propuha i ovisno o sistemu grijanja termičku zaštitu kotla.
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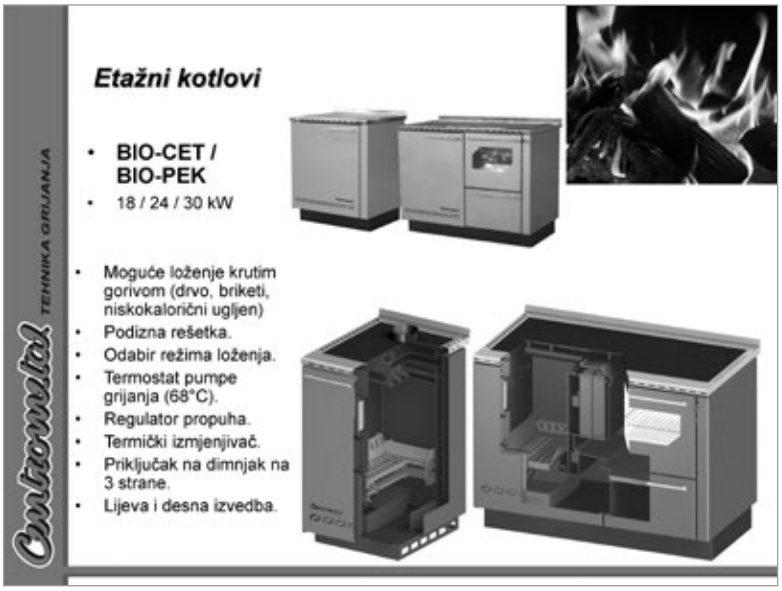
Etažni kotlovi
BIO-CET / BIO-PEK
18 / 24 / 30 kW
Moguće loženje krutim gorivom (drvo, briketi, niskokalorični ugljen)
Podizna rešetka.
Odabir režima loženja.
Termostat pumpe grijanja (68°C).
Regulator propuha.
Termički izmjenjivač.
Priključak na dimnjak na 3 strane.
Lijeva i desna izvedba.
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Kotlovi na drvo
BioSolid 17 – 34 kW
Nova generacija toplovodnih kotlova za centralno grijanje, snaga 17, 26 i 34 kW.
Predviđen za loženje drvom.
Niske emisije CO i visoka iskoristivost odlike su ovog kotla.
Velika vrata omogućuju lako korištenje i čišćenje kotla (ubacivanje drva s gornje strane).
Radom kotla (ventilatorom i pumpom grijanja) upravlja ugrađena kotlovska regulacija.
Moguće spajanje na sistem grijanja direktno ili preko akumulacijskog spremnika.
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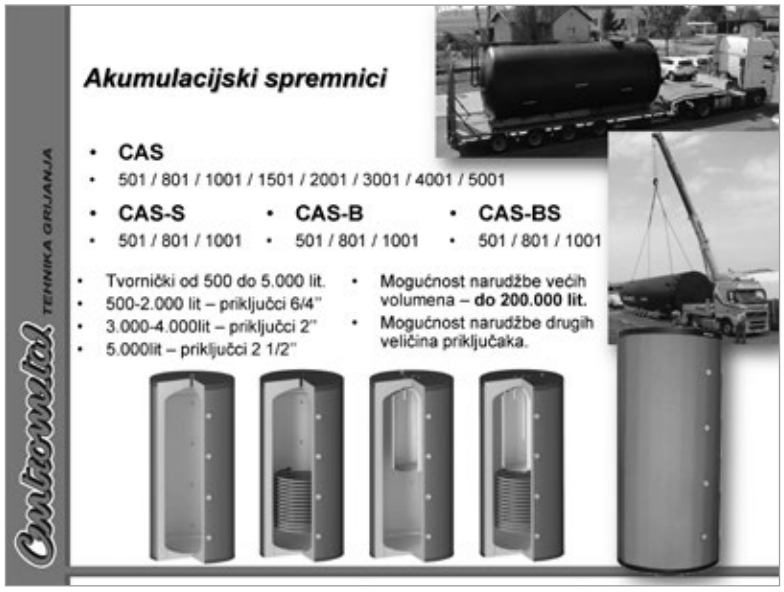
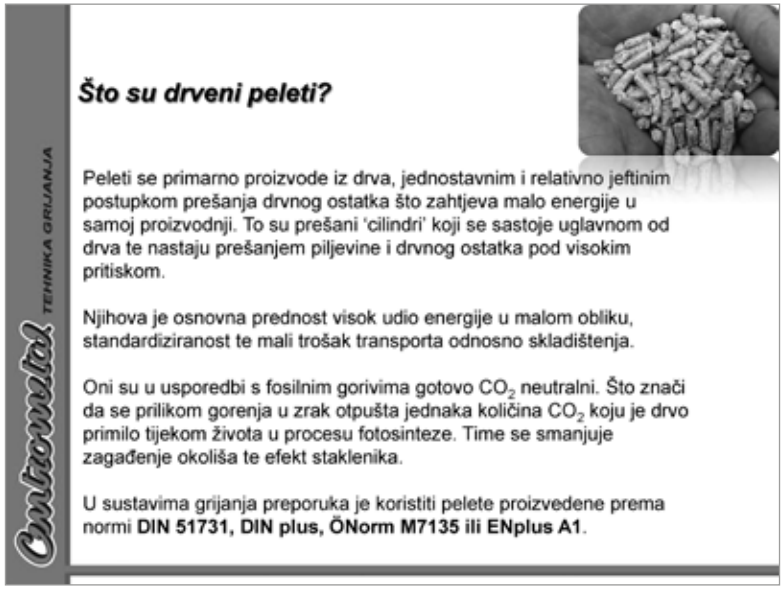
Pirolitički kotlovi na cijepano drvo
Bio-Tec 25 – 45 kW
CAS 500 – 5.000 lit.
Toplovodni, pirolitički kotlovi za centralno grijanje, snaga 25, 35 i 45 kW.
Predviđen za loženje drvom, max. vlage 25%.
Niske emisije CO i visoka iskoristivost.
Obavezna ugradnja akumulacijskog spremnika određenog volumena.
Radom kotla i grijanja (ventilatorom i pumpom kotla, grijanja i PTV-a) upravlja ugrađena kotlovska regulacija.
Veliki komfor loženja krutim gorivom.
Mogućnost korištenja suvremenih digitalnih regulatora grijanja vođenih vanjskom temperaturom.
Centrometal TEHNIKA GRIJANJA


Pirolitički kotlovi na cijepano drvo
BioTec-L 25 – 45 kW
CAS 500 – 5.000 lit.
Toplovodni, pirolitički kotlovi za centralno grijanje, snaga 25, 34 i 45 kW.
Predviđen za loženje drvom, max. vlage 25%.
Kotao Klase 5, eta = 93,3%.
Niske emisije CO i visoka iskoristivost te ekonomična potrošnja goriva.
Obavezna ugradnja akumulacijskog spremnika određenog volumena.
Rad kotla vođen lambda sondom, ugrađenim senzorom u ložištu te temp. dimnih plinova preko kontrole ulaska kisika i modulacijskog ventilatora.
Veliki komfor loženja krutim gorivom.
Regulacija kotla preko ekrana osjetljivog na dodir, vođenje kruga grijanja vanjskom temperaturom.
BIOTEC-L
Centrometal TEHNIKA GRIJANJA


Akumulacijski spremnici
CAS
501 / 801 / 1001 / 1501 / 2001 / 3001 / 4001 / 5001
CAS-S
501 / 801 / 1001
CAS-B
501 / 801 / 1001
CAS-BS
501 / 801 / 1001
Tvornički od 500 do 5.000 lit.
500-2.000 lit – priključci 6/4''
3.000-4.000lit – priključci 2''
5.000lit – priključci 2 1/2''
Mogućnost narudžbe većih volumena – do 200.000 lit.
Mogućnost narudžbe drugih veličina priključaka.
Centrometal TEHNIKA GRIJANJA


Što su drveni peleti?
Peleti se primarno proizvode iz drva, jednostavnim i relativno jeftinim postupkom prešanja drvnog ostatka što zahtjeva malo energije u samoj proizvodnji. To su prešani 'cilindri' koji se sastoje uglavnom od drva te nastaju prešanjem piljevine i drvnog ostatka pod visokim pritiskom.
Njihova je osnovna prednost visok udio energije u malom obliku, standardiziranost te mali trošak transporta odnosno skladištenja.
Oni su u usporedbi s fosilnim gorivima gotovo CO_2 neutralni. Što znači da se prilikom gorenja u zrak otpušta jednaka količina CO_2 koju je drvo primilo tijekom života u procesu fotosinteze. Time se smanjuje zagađenje okoliša te efekt staklenika.
U sustavima grijanja preporuka je koristiti pelete proizvedene prema normi DIN 51731, DIN plus, ÖNorm M7135 ili ENplus A1.
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Drveni peleti

	Cm preporučeni	DIN 51731	DINplus	ENplus A1
ogrjevna vrijednost (kWh/kg (MJ/kg))	**4,9 ≤ Q ≤ 5,4 (17,5 ≤ Q ≤ 19,5)**	4,9 ≤ Q ≤ 5,4 (17,5 ≤ Q ≤ 19,5)	≥ 5 (18)	4,6 ≤ Q ≤ 5,3 (16,5 ≤ Q ≤ 19)
promjer (mm)	**6**	6	6	6 (±1)
dužina (mm)	**≤ 50**	≤ 50	≤ 30	3,15 ≤ L ≤ 40
postotak prašine (%)	**≤ 1**	≤ 1	≤ 1	≤ 1
postotak vlage (%)	**≤ 12**	≤ 12	≤ 10	≤ 10
postotak pepela (%)	**≤ 1,5**	**≤ 1,5**	**≤ 0,5**	**≤ 0,7**

- *Peleti se isporučuju u vrećama od 15 kg i jumbo vrećama od 1.000 kg.*

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Kotlovi na drvene pelete

- **EKO-CK P + Cm Pelet-set**
  14 – 50 kW
- **EKO-CKB P + Cm Pelet-set**
  20 – 50 kW

- Toplovodni kotao za centralno grijanje **EKO-CK P / CKB P** sa ugrađenim **Cm pelet-set**-om, snaga **14 do 50 kW**.
- Predviđen za loženje **drvenim peletima.**
- Potpuno automatiziran rad kotla preko ugrađene **digitalne regulacije** koja vodi rad kotla te pumpe grijanja i sanitarne vode.
- Mogućnost dogradnje automatske dopune pelet spremnika.
- Ušteda na gorivu i do 40% u odnosu na lož ulje.
- Mogućnost loženja krutim gorivom.
- Čišćenje plamenika i kotla nakon jednog potrošenog spremnika peleta (ca. 200 kg) što ovisi o kvaliteti peleta.

Centrometal TEHNIKA GRIJANJA

Kotlovi na drvene pelete

- **EKO-CK P + Cm Pelet-set**
  51 – 90 kW

- Toplovodni kotao za centralno grijanje **EKO-CK P** sa ugrađenim **Cm pelet-set**-om, snaga **51 do 90 kW**.
- Predviđen za loženje **drvenim peletima.**
- Potpuno automatiziran rad kotla preko ugrađene **digitalne regulacije** koja vodi rad kotla te pumpe grijanja i sanitarne vode.
- Mogućnost dogradnje automatske dopune pelet spremnika.
- Ušteda na gorivu i do 40% u odnosu na lož ulje.
- Mogućnost loženja krutim gorivom.
- Čišćenje plamenika i kotla nakon jednog potrošenog spremnika peleta (ca. 450 kg) što ovisi o kvaliteti peleta.


Primjeri ugrađenih kotlovnica
Objekt: dječji vrtić, Mađarska
Kotlovnica: 3x 50 kW (150 kW)
Gorivo: drveni peleti
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Kotao za loženje peletima
PelTec / PelTec-Lambda
12 / 18 / 24 / 36 / 48 kW
Loženje drvenim peletima.
Kotao Klase 5.
Moguće loženje i peletima lošije kvalitete te košticama masline, višnje...
Pražnjenje kutije za pepeo nakon potrošenih 2-3 spremnika (400-600kg) te čišćenje kotla 1x godišnje.
Osnovna oprema:
Multifunkcijska digitalna regulacija sa ekranom osjetljivim na dodir.
Modulacija kotla 30%-100% snage.
Automatsko čišćenje rešetke plamenika i dimovodnih prolaza.
Osjetnik razine peleta u spremniku.
Ugrađena zaštita povratnog voda.
Dodatna oprema: alarm, GSM modul, kaskadni manager, vođenje krugova grijanja prema vanjskoj temperaturi...
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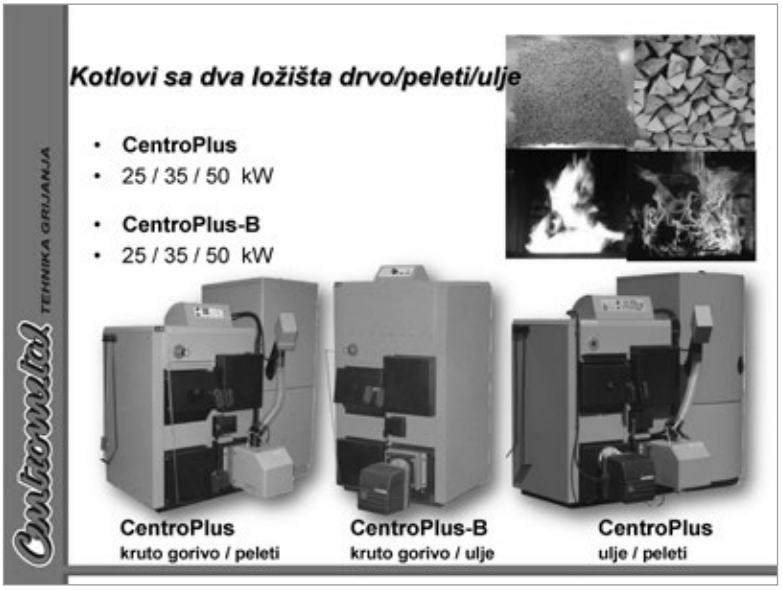

Kotlovi sa dva ložišta drvo/peleti/ulje
CentroPlus
25 / 35 / 50 kW
CentroPlus-B
25 / 35 / 50 kW
CentroPlus
kruto gorivo / peleti
CentroPlus-B
kruto gorivo / ulje
CentroPlus
ulje / peleti
Centrometal TEHNIKA GRIJANJA

Centrometal TEHNIKA GRIJANJA

Peći za loženje peletima

- **CentroPelet Z8 i Z12**
- 6,42 i 9,05 kW

- **CentroPelet ZS10**
- 9,01 kW

- Toplozračno grijanje prostora pomoću drvenih peleta.
- Daljinski upravljač za komforno namještanje temperature prostora i namještanje dnevnih i tjednih programa rada peći.
- Dimnjak promjera fi80mm do fi150mm.
- Priključak za dovod vanjskog zraka za izgaranje.

Centrometal TEHNIKA GRIJANJA

Peći za loženje peletima

- **CentroPelet ZV14 i ZV20/24/32**
- 10,48/1,98 kW, 15,05/3,41 kW, 18,1/4,04 kW, 24,38/6,10 kW

- Toplozračno i toplovodno grijanje prostora pomoću drvenih peleta.
- Ugrađena pumpa grijanja, sigurnosni i odzračni elementi, ekspanzijska posuda, ventilator za upuhivanje toplog zraka u prostoriju (osim ZV14).

- **CentroPelet ZVB15/20/24/32**
- 13,1 kW, 18,6 kW, 22,1 kW, 29,14 kW

- Toplovodno grijanje prostora pomoću drvenih peleta.
- Ugrađena pumpa grijanja, sigurnosni i odzračni elementi, ekspanzijska posuda

Centrometal TEHNIKA GRIJANJA

Postrojenje za centralno grijanje loženo peletima

- **EKO-CKS P Unit =**
  EKO-CKS P + Cm Pelet-set
  91 – 560 kW

Klasa 5

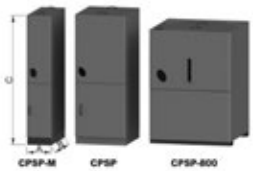
- Toplovodni kotao za centralno grijanje **EKO-CKS P** sa ugrađenim **Cm pelet-set**-om, snaga **91 do 560 kW**.
- Predviđen za loženje **drvenim peletima.**
- **Digitalna regulacija** vodi rad kotla te pumpe grijanja i sanitarne vode.
- Veliki spremnik peleta omogućuje veliku autonomiju loženja.
- Tvornički sa **automatskim čišćenjem plamenika**.
- Mogućnost ugradnje **automatskog čišćenja kotla i vađenje pepela**.

Primjeri ugrađenih kotlovnica

- *Objekt:* **stambena zgrada, Banja Luka, BIH**
- *Kotlovnica:* **2x 350 kW (700 kW)**
- *Gorivo:* **drveni peleti**

Spremnici peleta

- **CPSP**
- CPSP-M / CPSP / CPSP-800



pelet spremnik	CPSP-M	CPSP	CPSP-800
Volumen (lit.)	230	370	800
Kapacitet (kg)	142	240	520
Širina A (mm)	300	625	1010
Dubina B (mm)	730	730	980
Visina C (mm)	1585	1590	1420

12-50 kW	opcija	**serijski** (CPSP 14-50)	opcija (kut puža 45°)
51-90 kW	X	opcija (CPSP 70/90/110)	**serijski** (kut puža 45°)
91-500 kW	X	X	opcija (+ garnitura za transportere kotl. EKO-OKS P Unit)

- **CentroPelet box**
- 2700 / 3400 / 4000

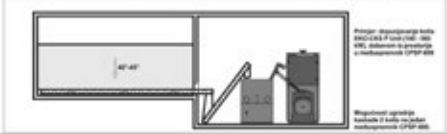
Dobava peleta

Vakuum dobava peleta

Isključivo za pelete klase DINplus ili ENplus A1 radi prašine.

Udaljenost do 10m dužine cijevi, visina do 5m.

Dobava iz prostorije



Drvena sječka

Drvena sječka nastaje usitnjavanjem (sjeckanjem ili drobljenjem) drva i drvenog otpada. U razred A1 i A2 (za neindustrijsku upotrebu, EN 14961-1,4) spadaju cijela stabla bez korijena te oblovina, ostaci od sječe i izrade. U razred B1 i B2 (za industrijsku upotrebu) spadaju šume, nasadi te nusproizvodi i ostaci od industrijske obrade drva.

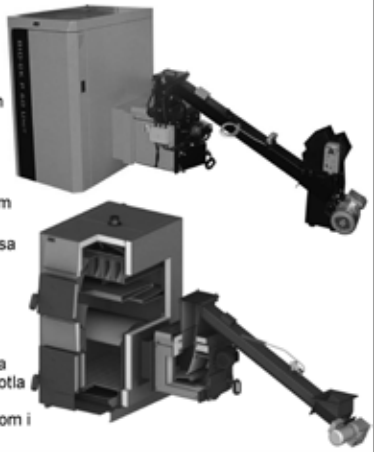
U automatiziranim sustavima grijanja tj. kotlovima za neidustrijsku upotrebu (snaga manjih od 500kW) koristi se drvena sječka razreda **A1 i A2**, veličine čestica **P16A-P45A** (prije G30-G50) te vlage do **M35** (prije W35).

Prednost sječke je da se može vrlo jednostavno i jeftino proizvesti.

Zbog svoje nasipne gustoće (A1=150 kg/m^3 (Q=13MJ/kg), A2=200kg/m^3 (Q=11 MJ/kg)) za skladištenje drvene sječke treba imati mnogo prostora te u spremniku sječke treba obavezno imati mješač koji omogućava transport sječke prema kotlu.

Kotlovi za loženje drvenom sječkom

- **BIO-CK P Unit**
- 25 / 40 / 60 / 100 kW
- Predviđeni za loženje drvenom sječkom P16A-P45A / M35, kominom ili krutim gorivom.
- Osnovna isporuka: kotao, plamenik s transporterom, digitalna regulacija.
- Mogućnost narudžbe kotla sa ugradnjom plamenika na lijevu ili desnu stranu.
- Obavezna oprema spremnik za sječku sa mješačem.
- Potreban napon struje 380/400V
- Dodatna oprema:
  - automatsko vađenje pepela
  - automatsko zračno čišćenje plamenika
  - dodatna regulacija za praćenje rada kotla
  - oplata kotla sa vratima
  - spojni set za 2 transportera sa senzorom i klapnom

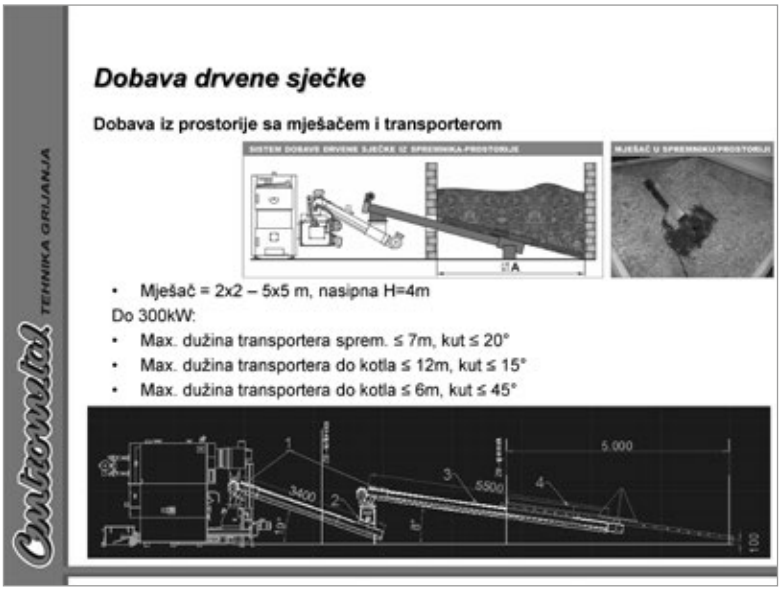


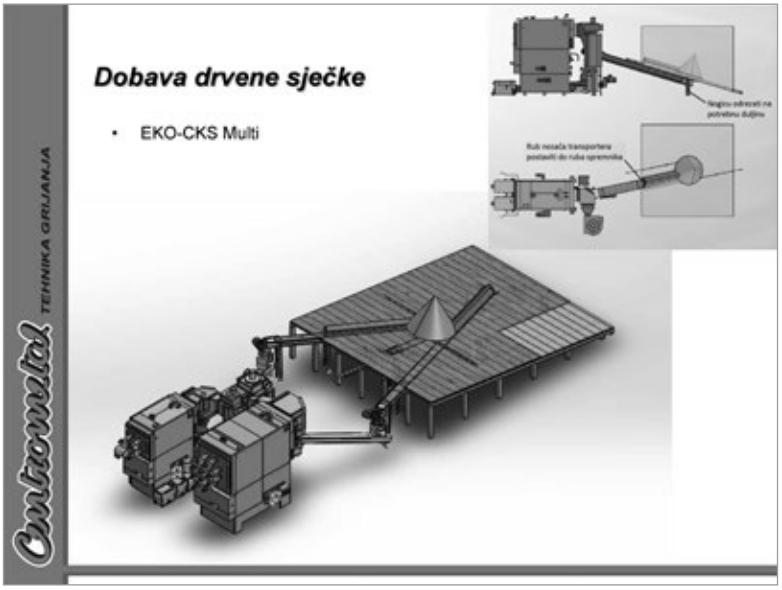
Kotlovi za loženje sječkom

- **EKO-CKS Multi**
- 160 / 210 / 260 / 320 / 440 / 580 kW
- Predviđeni za loženje drvenom sječkom P16A/P16B-P45A / M35.
- Opremljeni su:
- - digitalnom kotlovskom regulacijom (s mogućnošću upravljanja do dva dodatna transportera goriva i mješačem u spremniku goriva.
- - lambda sondom.
- - automatskom dobavom goriva u plamenik pužnim transporterom, automatskom potpalom goriva i automatskim vađenjem pepela iz kotla.
- - odsisnim ventilatorom dimnih plinova i izdvajanjem čestica iz dimnih plinova pomoću ciklona.
- - termičkom zaštitom kotla od pregrijanja, zaštitom od povratnog plamena u spremnik goriva (senzor zatrpavanja, klapna)
- Obavezna dodatna oprema:
- - spremnik drvene sječke sa mješačem i transporterom

Klasa 4


Kotlovi za loženje sječkom
EKO-CKS Multi Plus
170 / 250 / 340 / 450 / 580 kW
Predviđeni za loženje drvenom sječkom P16A/P16B-P45A / M35 ili peletima.
Opremljeni su:
- digitalnom kotlovskom regulacijom (s mogućnošću upravljanja do dva dodatna transportera goriva i mješačem u spremniku goriva.
- lambda sondom.
- automatskom dobavom goriva u plamenik pužnim transporterom, automatskom potpalom goriva i automatskim vađenjem pepela iz kotla.
- odsisnim ventilatorom dimnih plinova i izdvajanjem čestica iz dimnih plinova pomoću ciklona.
- termičkom zaštitom kotla od pregrijanja, zaštitom od povratnog plamena u spremnik goriva (senzor zatrpavanja, klapna)
Obavezna dodatna oprema:
Klasa 5
Centrometal TEHNIKA GRIJANJA


Dobava drvene sječke
Dobava iz prostorije sa mješačem i transporterom
Mješač = 2x2 – 5x5 m, nasipna H=4m
Do 300kW:
Max. dužina transportera sprem. ≤ 7m, kut ≤ 20°
Max. dužina transportera do kotla ≤ 12m, kut ≤ 15°
Max. dužina transportera do kotla ≤ 6m, kut ≤ 45°
5.000
3400
5500
Centrometal TEHNIKA GRIJANJA


Dobava drvene sječke
EKO-CKS Multi
Centrometal TEHNIKA GRIJANJA


Primjeri ugrađenih kotlovnica
Objekt: stambeno/poslovna zgrada, Petrinja
Kotlovnica: 500 kW (kotao na drvenu sječku 1x 320kW)
Gorivo: drvena sječka
Centrometal TEHNIKA GRIJANJA


Kontejnerske kotlovnice
Sa kotlovima na drvene pelete ili drvenu sječku
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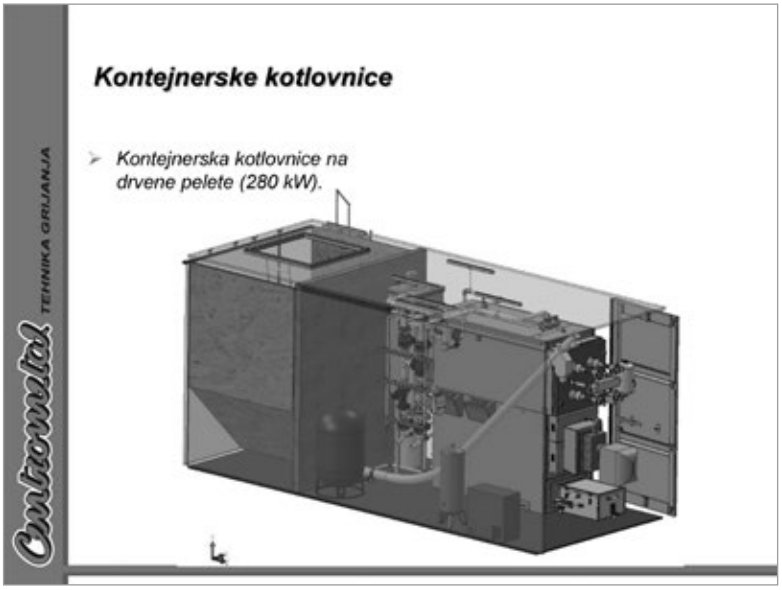
Kontejnerske kotlovnice
Kontejnerska kotlovnice na drvene pelete (280 kW).
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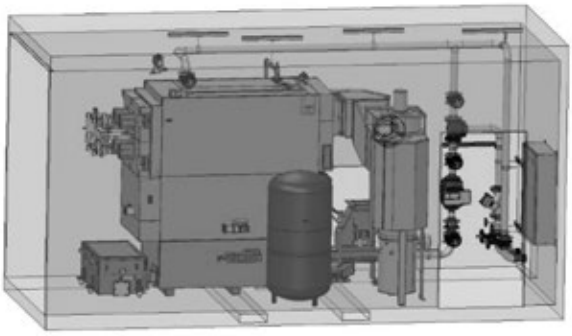
Kontejnerske kotlovnice

- Kontejnerska kotlovnice na drvenu sječku (320 kW).



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QR-code

Hvala na pažnji.

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f: **+385 1 4633 763**
e-mail: **export@centrometal.hr**
www.centrometal.hr

Ivan Mahnić

INFORMIRANJE
U pripremi e-časopis Šumarstvo

Nedavno je u Zagrebu osnovana strukovna udruga „Šumarstvo“ koja namjerava unijeti novi polet u našu gospodarsku granu. Prvenstveni je cilj interesno povezivanje, savjetovanje i informiranje nadležnih tijela državne uprave, stručnjaka, izvoditelja radova u šumarstvu, prerađivača šumskih proizvoda, šumopovlasnika i potrošača te svih drugih sudionika u području zaštite i održivog korištenja šuma i šumskog zemljišta. To namjerava ostvariti organiziranjem znanstvenih i stručnih skupova, edukacija i seminara, objavljivanjem znanstvenih i stručnih publikacija i tematskih napisa na svojoj internetskoj stranici "www.sumarstvo.eu", društvenim mrežama i u sredstvima javnog priopćavanja.

Elektronički časopis "www.sumarstvo.eu" imat će pritom ključnu ulogu. Zamišljen je kao sofisticirano projektirani web portal, u formi lijepo i jednostavno dizajniranog, ilustriranog bloga, što omogućava trenutnu, laku i praktički neograničenu nadogradnju novim relevantnim sadržajima te njihovo jednostavno pronalaženje i razvrstavanje po nizu parametara.

Riječ je o neovisnom, suvremenom, recentnom, stručnom i informativnom javnom glasilu iz područja šumarstva i prerade drva, u kojem će svi zainteresirani pripadnici branše moći neograničeno interaktivno sudjelovati te učinkovito i transparentno promovirati svoje djelatnosti, proizvode i usluge, ako to budu željeli. Naravno, iscrpnim i pravovremenim informiranjem bit će dobro pokrivena sva interesna područja u šumarstvu i preradi drva. Svima zainteresiranima tjedno će stizati i newsletter s kratkim pregledom sadržaja.

Naši zajednički ciljevi i misija su promicanje šumarstva i s njime povezani razvoj gospodarstva, prvenstveno u ruralnim krajevima te regionalno povezivanje, s posebnim naglaskom na promicanje i primjenu najsuvremenijih tehnologija, korištenje obnovljivih izvora energije te sveobuhvatnu i beskompromisnu zaštitu okoliša.

Ivan Mahnić

šumarstvo.eu

e-časopis za promicanje šumarstva

Časopis | **Naše tvrtke** | **Kontakt**

- Sječa
- Uzgoj
- Infrastruktura
- Zaštita
- Proizvodi
- Trgovina
- Turizam
- Poduzetnici
- Šumovlasnici
- Struka
- Doznaka
- Projekti
- Mjeranja
- Standardi
- Potpore
- Propisi
- Oprema
- Prerada
- Kućanstvo
- Energetika
- Pravo
- Informatika
- Magazin
- Regija

Autori

Pretraga

Sviđa li vam se portal šumarstvo.eu?

- Da
- Ne
- Možda

pošalji rezultati

Newsletter Mail

Sponzori

Sponzori

Potpore, Propisi / 30/11/2015

SPORNI POTICAJI

Hoće li hrvatski šumovlasnici, među kojima je sama država daleko najznačajniji, morati vratiti poticajna sredstva iz naknade za općekorisne funkcije šuma zbog neshvatljivog nemara Ministarstva poljoprivrede?...

Potpore, Oprema / 15/11/2015

POTPORE ZA MEHANIZACIJU

Ministarstvo poljoprivrede donijelo je novi Pravilnik koji poduzetnicima i šumovlasnicima omogućava povlačenje sredstava EU fondova za nabavu šumske mehanizacije...

Turizam / 07/10/2015

NEISKORIŠTENI POTENCIJALI

Gotovo polovina teritorija naše zemlje prekrivena je šumama, u koje rijetko tko zalazi, iako bi bilo moguće organizirati raznovrsne turističke aktivnosti, kako to uspješno čine u...

Šumovlasnici / 21/09/2015

POSJEDI ZA ŠTRUMFOVE

U gospodarskom smislu privatni šumoposjed prosječne veličine od jednog hektara bio bi možda dostatan za potrebe prosječne štrumfovske obitelji. Nažalost Hrvati su puno...

Sječa / 08/09/2015

UGLEDNI OBRT „BUKVIĆ"

Vlasnik uslužnog obrta „Bukvić", gospodin Jasenko Bukvić ponosan je na dugu tradiciju obaranja stabala upotrebom oštre sjekire koja je u posjedu obitelji točno 250 godina od...

Uzgoj / 22/08/2015

TVRTKA „ABIES ALBA"

Prvaci u pošumljavanju goleti na Europskom tlu od davne 1902 godine, kada im je car Franjo Josip I udijelio priznanje za uspjehe postignute u pošumljavanju jadranskog krša...

Prerada, Oprema / 14/08/2015

ENERGIJA IZ BIOMASE

Pilana „Drvko", iz Gerova, pustila je u pogon novo postrojenje za proizvodnju energije iz drvne biomase. Projekt je ostvaren uz korištenje sredstva koje je donirala kraljevina Norveška u...

Infrastruktura / 01/08/2015

TERENAC ZA SVE UVJETE

Bez obzira na stanje šumske infrastrukture postoje osobe koje su spremne raditi kao konji te su sposobne odraditi i najteže poslove u skoro pa nemogućim uvjetima...

1 2

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PALFINGER KRAN

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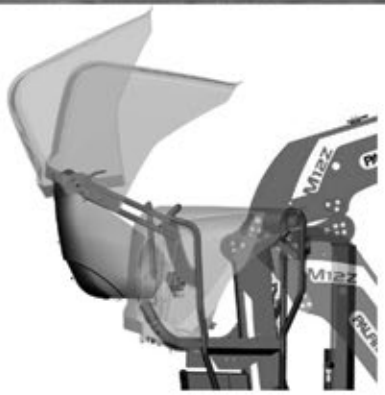

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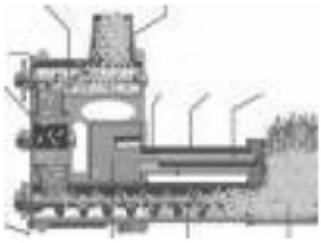
www.pk-rijeka.hr

WVterm d.o.o.

WVTerm d.o.o. jamči kvalitetu svojih proizvoda sa certifikatima koji su sastavni dio dokumentacije svakog kotla. Svi proizvodi nose znak jamstva za kvalitetu TÜV CE 0036. Priprema sastavnih dijelova za kotlove vrši se na vrhunskoj CNC tehnologiji i laserskom krojenju kako bi bila postignuta veća produktivnost i najbolja kvaliteta. Investicije u nove tehnologije, modernizacija zavarivanja sa novijom pulsnom tehnologijom te robotsko zavarivanje kotlova stavlja WVTerm na tehnološki vrh europske konkurencije u proizvodnji kotlova.



PREDNOSTI KOJE NUDE PLAMENICI NA PELETE
potpuno automatski rad
sagorijevanje sa optimalnim iskorištenjem
dobra regulacija brine za štedljiv rad
visoko iskorištenje goriva preko 90 %
nema problema sa pripremom goriva
dostava peleta podobna kao kod lož ulja
brinemo za okoliš

Proizvodi:

- Plamenici na pelet
- Kotlovi na drva
- Klasični kotlovi
- Kotlovi na pelet
- Kotlovi na drvenu sječku
- Kotlovi na plin - ulje
- Spremnici energije
- Transportni sistemi
- Regulacija i vizualizacija
- Pročišćivanje dimnih plinova

Kontakt:

Valvasorjeva 73, 2000 Maribor
Telefon: +386 2 429 28 10, fax: +386 2 420 21 67
e-mail: wvterm@wvterm.si
www.wvterm.si




Centrometal

TEHNIKA GRIJANJA

Visokoučinkoviti kotlovi na drvo, drvenu sječku ili drveni pelet

Hrvatski proizvođač kotlova, inox spremnika i solarne opreme

Ovlašteni servis diljem zemlje

50

1965.-2015.

Solarni paketi za grijanje PTV

KORISTIMO OBNOVLJIVE IZVORE ENERGIJE

Kotlovi na drvene pelete

Pirolitički kotlovi

Solarni paketi s INOX bojlerom

- Solarni inox bojler s regulacijom STEB
- Solarni kolektori - pločasti
- Montažni set za kosi ili ravni krov
- Solarni odzračni lončić sa zapornim ventilom
- Solarna pumpna grupa CSPG-260
- Solarna ekspanzijska posuda
- Solarna tekućina (koncentrat)

Pirolitički kotlovi na cijepano drvo

- BioTec - visokoučinkoviti pirolitički kotao na cijepano drvo
- BioTec-L - pirolitički kotao sa Lambda sondom Klase 5

Kotlovi na drvene pelete

- CentroPelet ZV i ZVB - sobne pelet peći za grijanje
- EKO-CK P + Cm Pelet-set - kombinirani pelet kotlovi
- PelTec /-L - pelet kotlovi sa automatskim čišćenjem

Centrometal d.o.o. 40306 Macinec, Glavna 12, Hrvatska, tel:+385 (0)40 372 600, fax:+385 (0)40 372 611

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GLAVNA SEKTORSKA KONFERENCIJA

(25.-26. veljače 2016., KUPRES)

2016.
KUPRES

Budućnost prerade drva i šumarstva u Bosni i Hercegovini

OPĆE INFORMACIJE O SKUPU

VRSTA SKUPA

Dvodnevni središnji nacionalni strukovni skup uz održavanje povezanih događanja dan prije i dan nakon konferencije uz mogućnost posjete lokalnim šumskim sastojinama ili postrojenjima za preradu drva.
Radni jezici konferencije: hrvatski i engleski uz simultani prijevod.

VRIJEME, MJESTO

25.-26. veljače 2016., Kupres, BiH

PROGRAM

25.02. ČETVRTAK
13.00 – dolazak na Kupres, smještaj i registracija
14.00 - početak rada, pozdravni govori, uvodni filmovi
15.00 – prezentacije, rasprave i razgovori
16.00 – pauza za kavu i network
16.30 – nastavak rada, prezentacije
18.30 – završetak rada prvog dana
19.30 – zajednička večera sudionika
26.02. PETAK
09.00 – nastavak rada konferencije
11.00 – pauza za kavu i network
11.30 – nastavak rada, prezentacije
13.30 – završetak konferencije; preporuke i zaključci
14.00 – ručak
15.00 – polazak s Kupresa

TEME:

- tržišna kretanja i trendovi u šumarstvu i drvopreradivačkoj industriji u BiH
- analiza postojeće tehnološke razine domaćeg šumarstva i drvne industrije u kontekstu neophodne primjene EU zakonodavstva
- ostvarivanje potrajnog i održivog gospodarenja
- izazovi u gospodarenju privatnim šumama
- sadnja energetskih nasada i gospodarenje vrstama kratke rotacije
- sakupljanje i prerada energetskog drva i drvnog ostatka
- veća uporaba šumske biomase u proizvodnji električne energije
- primjene inovacija (proizvodnih i procesnih)
- implementacija europske šumarske strategije
- ostvarivanje većeg udjela nedrvnih prihoda u šumarstvu
- nužnosti sektorskog udruživanja i specijalizacije, poslovnog povezivanja prerade drva u zadruge ili klastere
- upoznavanje s programom ruralnog razvoja i mogućnostima korištenja EU potpora
- teme veće primjene informatike i GPS sustava u šumarstvu
- projekti e-šume, certificiranja, trgovanja CO_2 kvotama
- uloga sektora u poboljšanju života u brdsko-planinskim područjima po uzoru na najbolja EU iskustva i prakse, itd.

PODACI ZA PRIJAVU:

NAZIV TVRTKE	TEL./FAX.	OIB
1. IME I PREZIME	E-MAIL	MOB
2. IME I PREZIME	E-MAIL	MOB
3. IME I PREZIME	E-MAIL	MOB
4. IME I PREZIME	E-MAIL	MOB
5. IME I PREZIME	E-MAIL	MOB

*Obavezna je prijava i registracija sudionika. Sudjelovanje je osigurano bez kotizacije i bilo kakve financijske naknade.
Uvjet je sektorska djelatnost ili iskazani poslovni interesi sudionika za suradnju sa sektorom

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Toplo/vrelo-vodna, parna i termouljna kotlovska postrojenja od 400 do 18.000 kW po modulu, kogeneracijska rješenja pomoću parnih i termouljnih kotlovskih postrojenja.

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- Vlastita servisna flota za optimizaciju postrojenja, te servis i održavanje svih vrsta kotlovnica

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