



CoolHeating
.eu



MALA MREŽA DALJINSKOG GREJANJA

Studija slučaja – OŠ Stojana Novaković IO Letnjikovac

SMALL DH NETWORK

Case study – Elementary school Stojan Novaković Šabac

Drugi tehnički dan u Šapcu

u okviru projekta CoolHeating (Horizon 2020)

Šabac, 21. Septembar 2017.

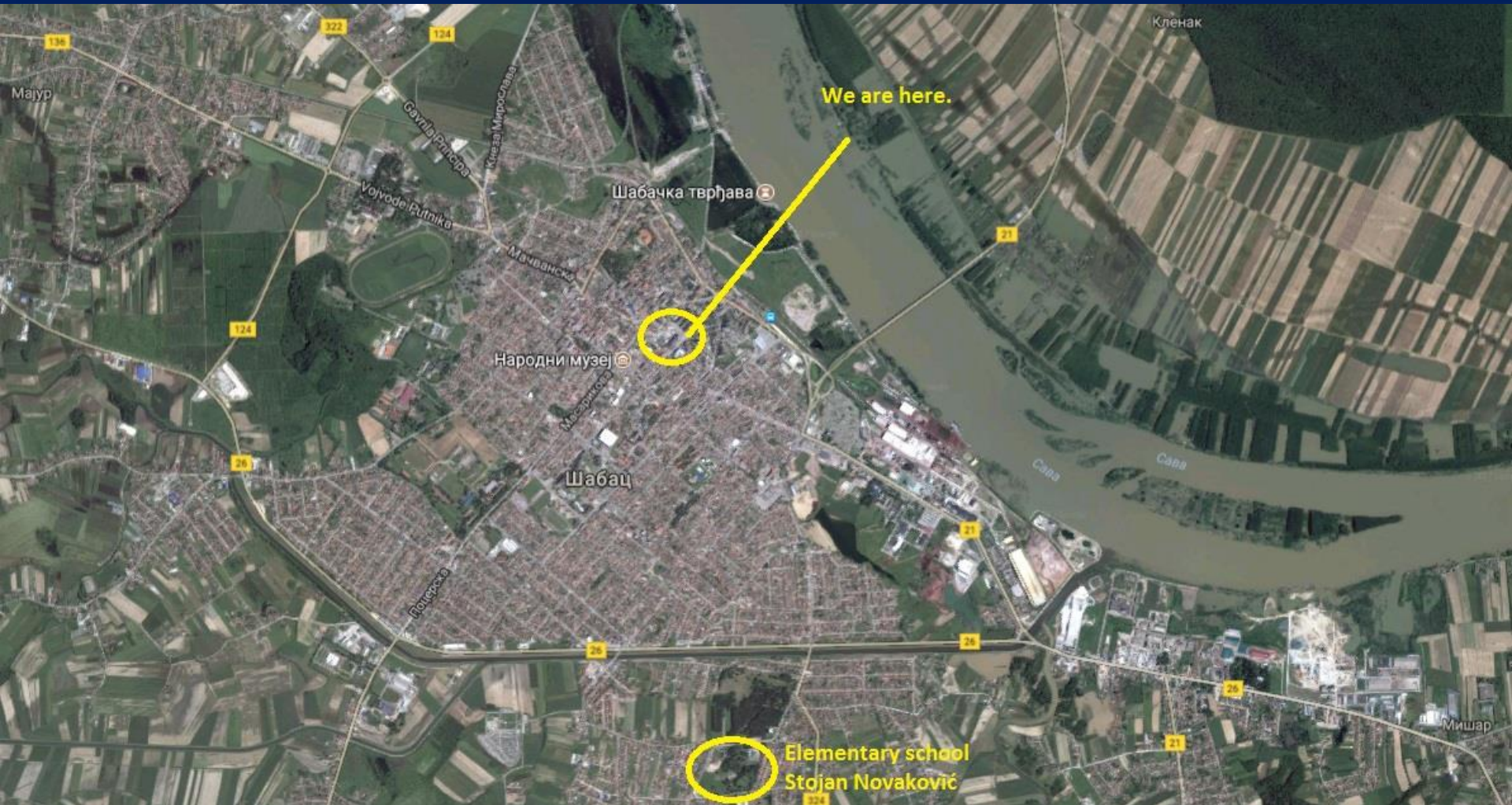


Mala mreža DG – Small DH network



Lokacija

Location





Objekti na lokaciji

Buildings at site



- A – kotlarnica
Boiler house
- B – škola
School building
- C – centar SU
Education center
- D – Parohijski dom
Orthodox church
- E, F – obdanište
Kindergarten
- G – izviđači
Scouts building
- H – dom zdravlja
Health center

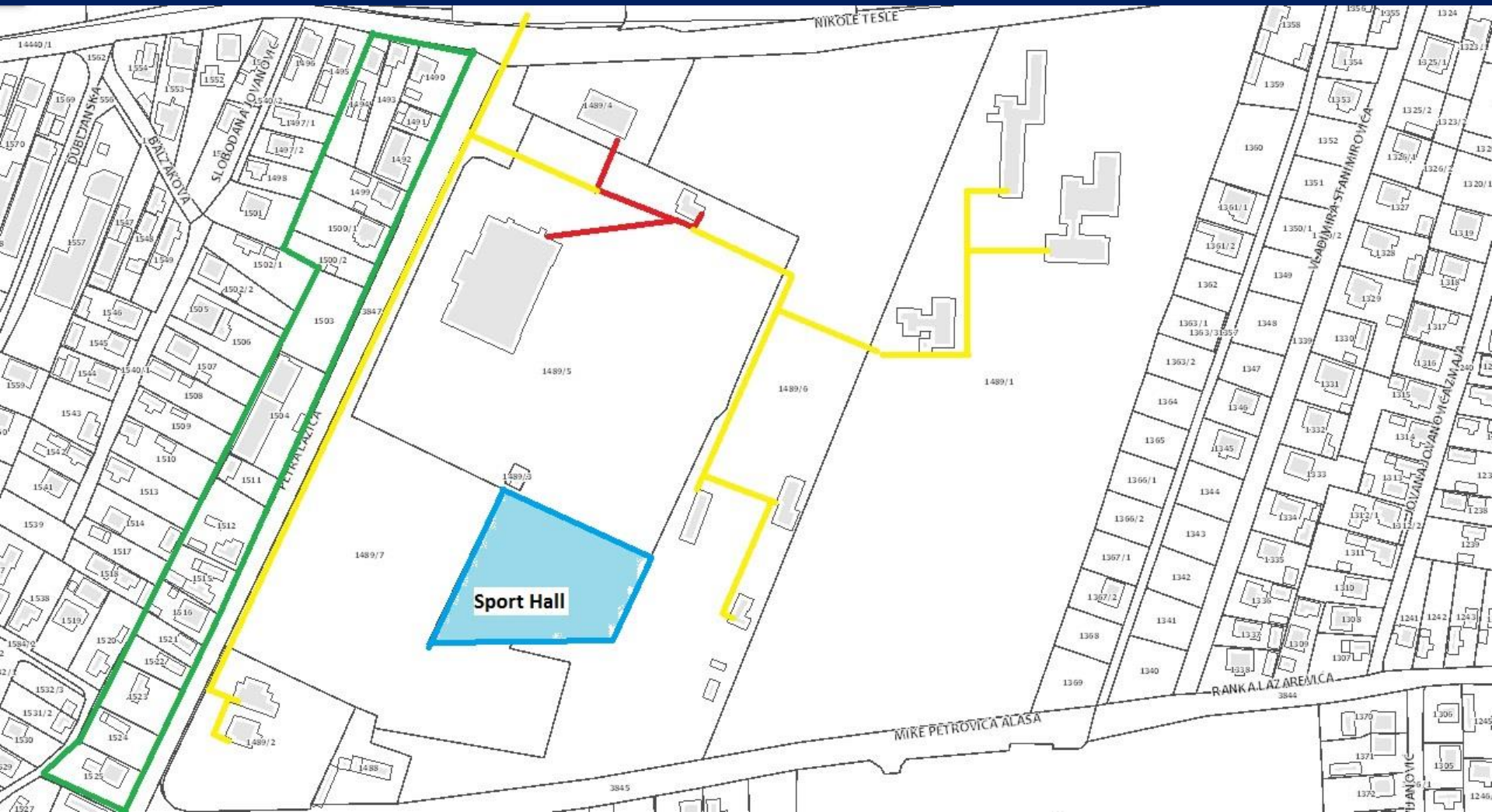


Mala mreža DG – Small DH network



Tehnički koncept
Mreža daljinskog grejanja

Technical solution
Small heating network



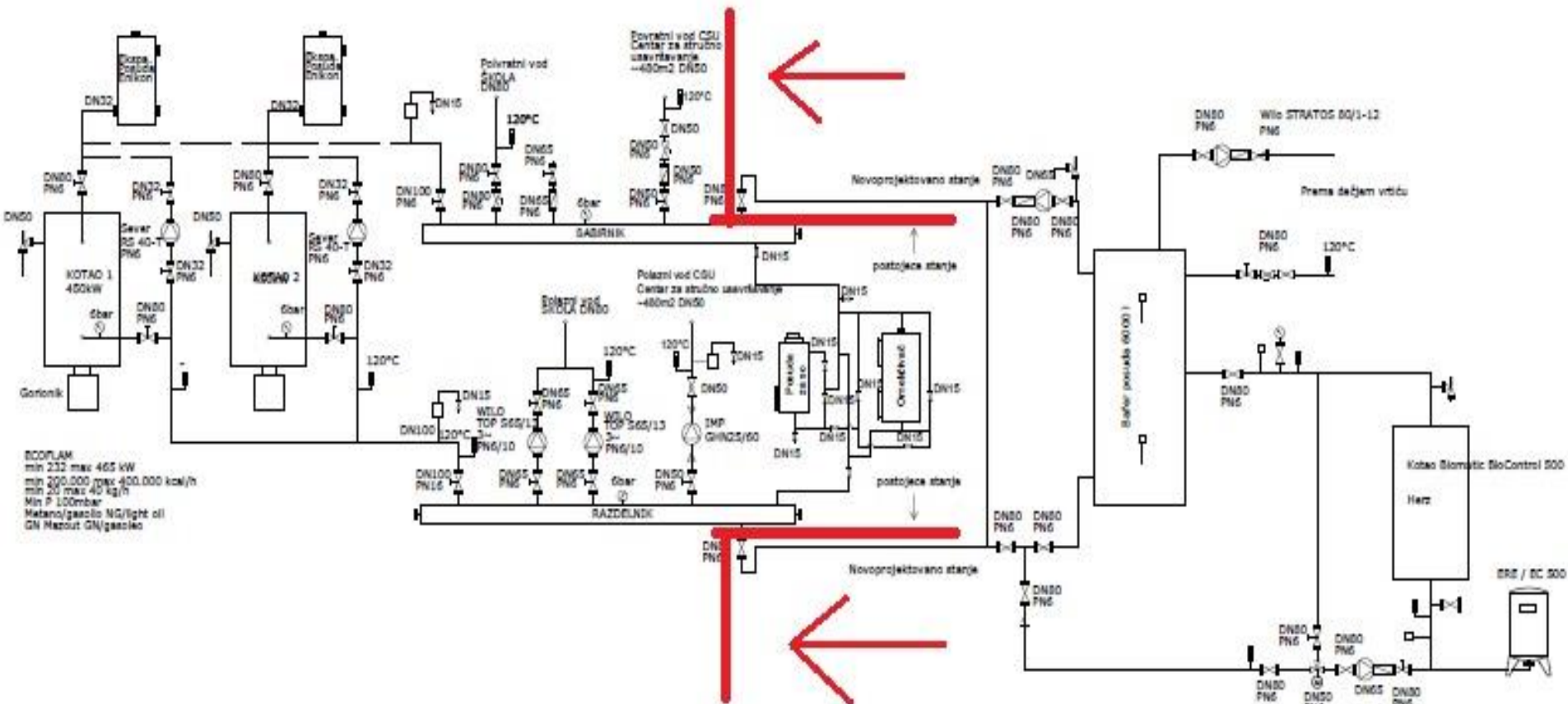


Mala mreža DG – Small DH network



Tehnički koncept

Technical solution





Mala mreža DG – Small DH network



Tehnički koncept

Technical solution

Stack and boiler construction.

Loamers should be installed to provide sufficient free air for the boiler. (Check manufacturer's regulations.)

Check when opening the combustion chamber door door. Do not leave the door open when boiler is combustion.

Make the power supply to the boiler before opening the combustion door or conducting any maintenance work.

Do not use fuel or other materials with the boiler room. Furthermore storage of materials, dust, needed for maintenance or operating, not allowed.

While sitting in the fuel storage room with pellets, the door should be closed.

The fuel should be stored in separate compartment.

If the capacity of the wood pellets fuel store is more than 20 m³, it must have sufficient ventilation to provide 2 air changes per hour. Also:

- Smoking or other flames are strictly forbidden
- Keep pellets dry
- The access of the site of store due to possible spill
- Keep children away

Loamers when using solid fuels (wood).

- The door should be remained at least 100 mm
- Do not open the pellet cover when
- Turn off the boiler at the main isolator and lock the access off.

The boiler must be used with the correct specification fuel.

The boiler should be covered off and locked while loamers are being taken into the fuel store.

The wall should be insulated into a temporary storage enclosure and not to avoid it when loamers put to being burned.

The health and safety handbook should be read after any maintenance work being undertaken. The health and safety instruction should be stored at all times.

HRZ (Herz) Requirements:

Chimney:
The flue should be designed to EN 13381 and be tested against water ingress.
The flue pipe must be externally and must be thermally insulated. Flue should incorporate a draught regulator and expansion top to the chimney.

Access:
HRZ recommends that the pellet boiler system (i.e. boiler plant, fuel delivery system, fuel gas systems, feeder system, etc.) is located with external access, unobstructed, if possible, allowing a system that supports, safety corridors must be clear on the side and discharge. If required, the fire extinguisher must be available.

Checklist:
Check pellet quality should be in accordance with EN 14961-1:2010 or EN 12453 and/or VDI 2234.

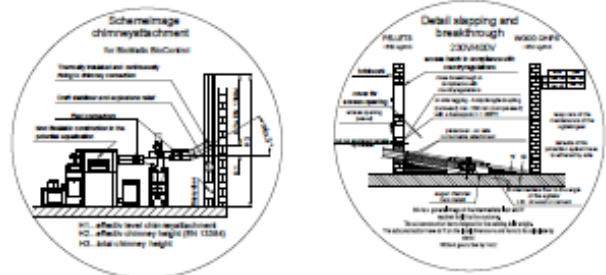
Boiler Handling:
The boiler handling system should be well located in case of pellet filling system to allow an operator clear A 1100mm to be taken straight into the pellet hopper.

Power supply:
A power supply (230V/50Hz) for the pellet supply line to be installed near the boiler and system. In case of remote installation or maintenance the separate connection for the 230V system must be installed by the customer.
Power supply for boiler (Boiler + Stack) 230V/50Hz + N + PE, 20A for (Boiler).
Power supply for boiler (Boiler + Stack, pelletiser) 230V + N + PE, 32A.
Max. line 10A electricity.
For general electricity a Protection should be provided.

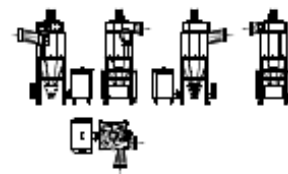
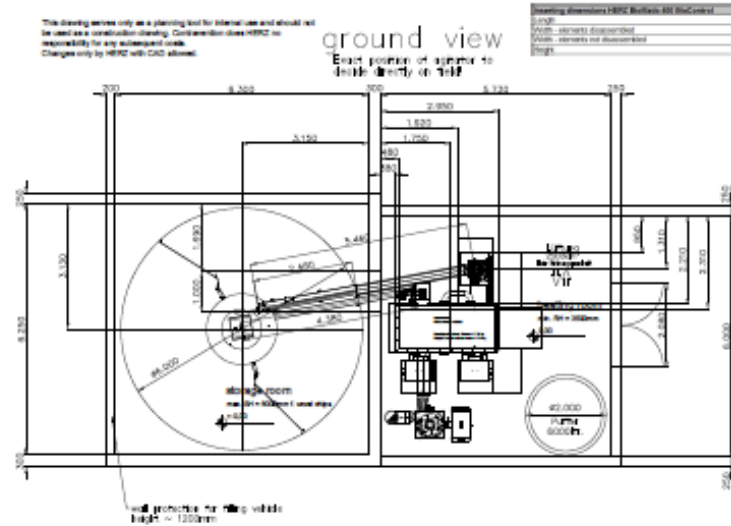
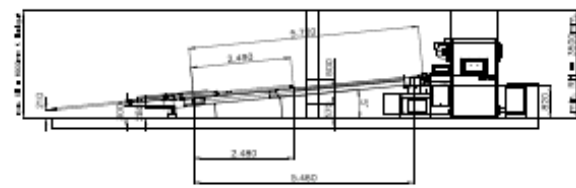
Boiler lock:
HRZ recommends by all automatic biomass heating systems to use a specific (biomass) boiler lock. For each filling system the boiler lock is required.

Autotank:
The tank system should be filled with the appropriate quantity of wood from the boiler.

Fire protection system:
An automatic fire heating system temperature control instead of a fire protection.



section view



230V/50Hz for 300 – 500, Holzhaufen 270'

- 1) Heiz Bioblock 400 BioControl
- 2) Fördermaschine "503P"
- 3) Raumabkantung 0,600
- 4) mit "TDP" für Holzbohle max. 40 x 100 mm
- 5) Steuerkasten
- 6) Lichtschalter aller RL
- 7) Feuerlöcher
- 8) Heißluftgebläse

H.S. - Mindest einstufige Leuchtanrichtung (beide als ein- oder zweistufige Leuchtanrichtung > 50 m²)
TDL - Temperaturüberwachung für Aufgabebühne

Anlagenleistung [kW] 79-400
Kamin Durchmesser [mm] lt. EN 13384
Notwendiger Kaminzug [Pa] 10
Kaminhöhe [m] lt. EN 13384

Alle Durchdringungen durch bestehende Mauer (PK), die für die Anlage erforderlich sind, müssen nach der Aufgabebühne herbeizuführen und dabei nicht auf die Aufgabebühne hinausragen.

Alle technischen Maßnahmen zur Einleitung der TRNS HT18 sind auf Auftraggeber einzulassen und fallen somit nicht in den Aufgabebühne.

Re- und Entladung (in Pa)
Zur Einleitung dieser Förderungsmenge von 300/2 je 600 kg je Sekunde einem Zustromgewicht von max. 600 und bei niedrigem als das Betriebsverhältnis nicht größer als 1,5:1 sein. Bei Vergrößerung entsprechender Zuleitung zu beachten, damit der freie Querschnitt genügend hinreichend erreicht. Mindestdurchmesser gemäß TDL table. Mindestspezifische Wirkleistung (mindestens) 1000 W/m² sind auf Auftraggeber einzulassen.

Die Fördergrate sind über zu liefernden Komponenten sind die Aufgabebühne zu kontrollieren und fallen somit nicht in seinen Verantwortungsbereich.

BIOMASSEFEUERUNG FÜR:
HERZ Srbija

O.S.S. Novakovic, Sabac

Maße zur Kleinanfertigung sind bis zur Verkleidung! Achtung: alle Maße in mm!

Kotao za sagorevanje drvne sečke sa pratećom opremom

Wood chips boiler with auxiliary equipment

Izvor: Herz, Austrija

Source: Herz, Austria



Tehnički koncept

Technical solution



Kotao za sagorevanje
drvne sečke
kapaciteta 500 kW

Wood chips boiler,
500 kW thermal
capacity

Izvor: Herz, Austrija

Source: Herz, Austria



Energetski bilans

Energy balance

Energetski bilans	kW	Energy balance
Škola	290	School
Centar	20	Education center
Parohijski dom	20	Orthodox church
Obdanište	150	Kindergarten
Ostali objekti	75	Other buildings
Planirani objekti	200	Planned buidings

Ukupno potreban toplotni kapacitet – 755 kW – Total thermal capacity
Bazni kotao (drvena sečka) – 500 kW – Basic load
Vršni kotao, postojeći (lož ulje) – 400 kW – Peak load



Mala mreža DG – Small DH network



Pre projekta – I Faza: 555 kW

Before project – I Phase: 555 kW

Finalna energija	kWh/a	Final energy
Lož ulje	357.500	Fuel oil
Električna energija	282,500	Electricity
Ukupno	640,000	Summ

Primarna energija	kWh/a	Primary energy
Lož ulje	427,000	Fuel oil
Električna energija	704,000	Electricity
Ukupno	1,131,000	Summ

Emisija CO2	t/a	Fuel oil
Lož ulje	127	Fuel oil
Električna energija	373	Electricity
Ukupno	500	Summ



Mala mreža DG – **Small DH network**



Efekti posle projekta – I Faza: 555 kW

Results after project – I Phase: 555 kW

Finalna energija	kWh/a	Final energy
Lož ulje	65,000	Fuel oil
Drvena sečka	575,000	Wood chips
Ukupno	640,000	Summ

Primarna energija	kWh/a	Primary energy
Lož ulje	78,000	Fuel oil
Drvena sečka	712,000	Wood chips
Ukupno	790,000	Summ

Emisija CO2	t/a	Fuel oil
Lož ulje	24	Fuel oil
Drvena sečka neutral	30	Wood chips
Ukupno	54	Summ



Šema finansiranja

Financing shema

Vlasnik projekta Grad Šabac: Investicioni program, izrada projekta, tenderska procedura

Project owner City of Šabac: Building selection, creating Investment program and technical documentation, tendering procedure.

Izvori finansiranja: UNDP fond za EE, Budžetski fond Republike Srbije za EE i OIE, grad Šabac.

Financing: UNDP EE fund, Budget fund of Republic of Serbia, City of Šabac

Uslovi za prijavu: pripremljena projektna dokumentacija, dozvola za građenje, energetski efikasan objekat razred C (energetski pasoš).

Tender procedure requirements: prepared technical documentation, issued building approval, energy efficient building nominated, minimum class C (energy passport needed).

Prema ZJN rekonstrukcije instalacija i tehničkih sistema vrše se po skraćenoj proceduri (član 145 ZJN).

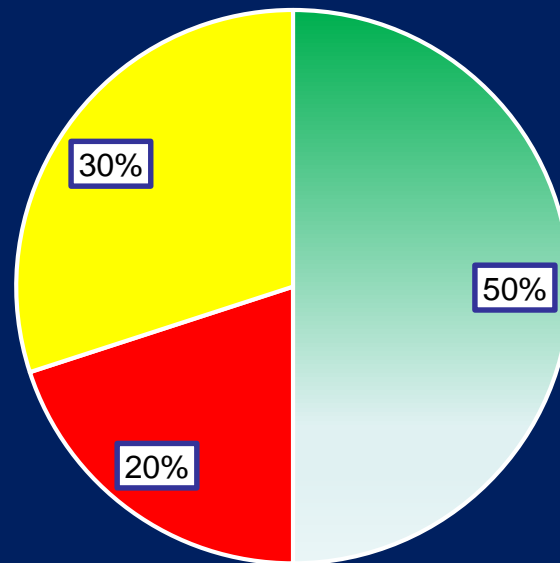
According to Public Procurement Law all reconstructions of installation and technical systems in existing buildings being performed within shortened procedure.



Šema finansiranja

Financing shema

Učešće/Share



- UNDP budžetski fond/UNDP budget fund
- Budžetski fond za EE RS/Budget fund EE RS
- Grad Šabac/City of Šabac



Hvala na pažnji

Thanks for your attention

This Project (Contract No. 691679) is Co-funded by the Horizon 2020 Framework Programme of the European Union



Slobodan Jerotić

Slobodan.jerotic@sabac.org