

KeepWarm

The Priboj heating plant in
Serbia and its path towards
the complete transition of
heating from fossil fuel to
biomass wood chips

Goran Živković, Vinča Institute



Ovaj projekat dobija finansijsku podršku od Programa
Evropske Unije za istraživanje i inovacije Horizon 2020 u okviru
Sporazuma o grantu br. 784966. Iznešeni stavovi su stavovi
projekta.

Ovaj projekat dobija sufinansiranje od
nemačkog Federalnog ministarstva za
ekonomsku saradnju i razvoj.





Renewing district heating



This project is funded by the EU's Horizon 2020 research and innovation programme under grant agreement N°784966, and lasts from April 2018 – September 2020.

This project receives co-funding from the German Federal Ministry of Economic Cooperation and Development.

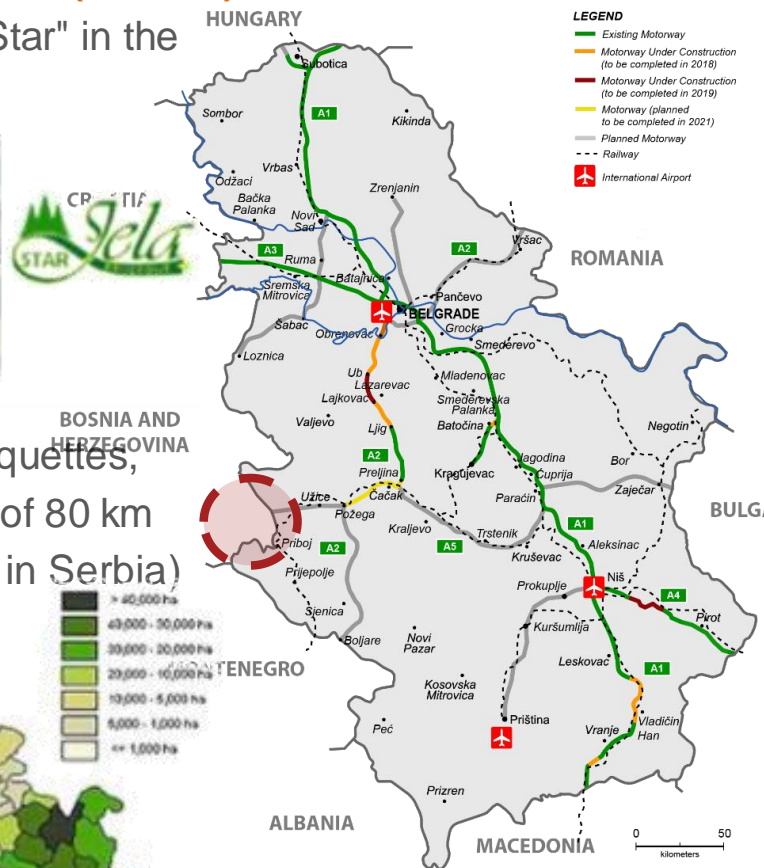
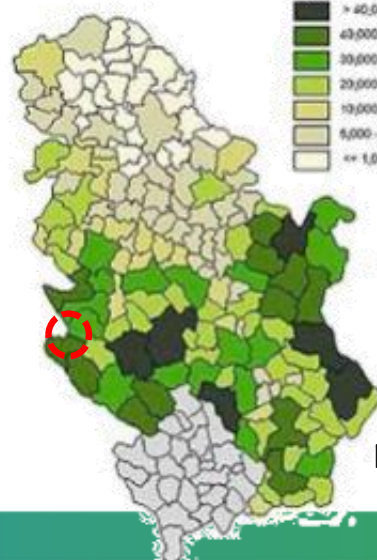


Resources availability & location

- **Region with higher forest cover than the average in Serbia (45/39%)**
- The largest producer of wood biomass in the country "JelaStar" in the immediate vicinity



- High concentration of wood biomass producers (pellets, briquettes, wood chips, firewood) - over 30 companies within a radius of 80 km
- 10 associations of private forest owners (out of a total of 18 in Serbia)
- Good road infrastructure
- Excellent regional cooperation
- (Biomass and Energy Efficiency Working Group of Zlatibor area, RDA Zlatibor)



Source: Priboj.rs

Forest cover by municipality in Serbia

DHS Priboj

(JP "Toplana Priboj")

- Operating since: **2012**
- Ownership: **Municipality** of Priboj
- Grid: **4750 m** (not owned by DHS)
- Customers: **1390** households (81.720 /m² heating surfaces), **100** office buildings & schools (36.780 /m²)
- Connected load: **16338 kW**
- Boiler output: **29000 kW**
(2 boilers aged about 40 years)
- Type of DHS: **hot-water**
- Current fuel: **Oil**
- Potential renewables nearby:
wood chips



Source: http://www.bioenergy-serbia.rs/images/documents/studies/BSCstudy_final.pdf

Investment plans:

Construction of a completely new biomass heating plant of 8 MW on wood chips, construction started on September 21, 2020. / test operation of the plant is planned for April 2022

Više informacija naći ćete:

- www.keepwarmeurope.eu/country-pages/serbia
- toplana.priboj@gmail.com

Total replacement of fossil fuels (mazut) by introducing 8.0 MW boiler on wood chips, extended operation including night shift, integration of presently segmented grid into one unified system, enabling increase in heat consumption



Primary work-steps and investment drivers:

- planning and selection of location **finished 02/2020**
- contract with investors **03/2020**
- public procurement and selection of bidder **finished**
- tech.documentation elaboration & permits obtaining **09/2020**
- boiler&boiler house construction, grid segments connection
- operation of plant **05/2022**

Results:

- RES-share increase: **18 %** ⇒ **100%**
- Emissions: **↓7305 tCO₂ (-100%)**
- Payback Period (PP) = 12 years
⇒ Annual ROI: **1,64%**

Strategic background documents:

- Energy Sector Development Strategy of the Republic of Serbia for the period by 2025 with projections by 2030
- The National Sustainable Development Strategy
- Priboj has signed the "Covenant of Mayors"



Stakeholder involvement:

- Leading: **Priboj municipality and DHS operators, KfW, PIMO, Regulatory and energy agencies**
- Other: **Wood chips producers (Srbijašume, Jela Star)**



Required resources:

Financial investment:

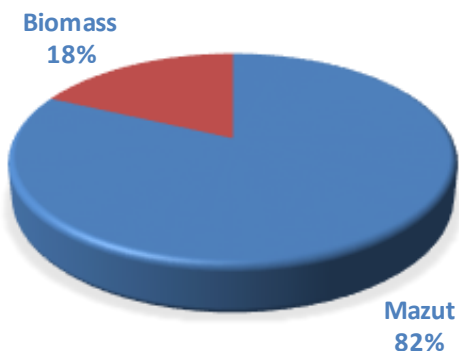
~7,000,000€: 16.5% German and Swiss Government, the rest is loan from KfW Bank.



• Marko Janjušević, energy manager of Priboj municipality
• marko@priboj.rs, M: +381 64 20 66 826

- In addition to the investment in an 8MW plant on wood chips
- Today, the Municipality of Priboj has 2.95 MW of wood biomass installed, mainly for heating public buildings

CURRENT PARTICIPATION OF ENERGY SOURCES IN DHS PRIBOJ

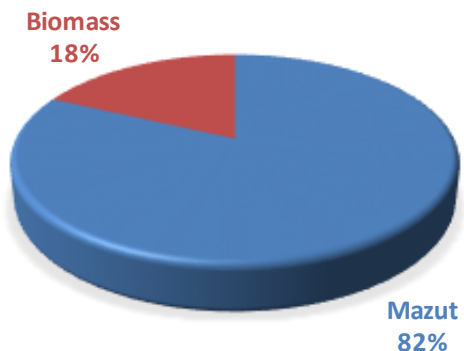


Source: Priboj.rs

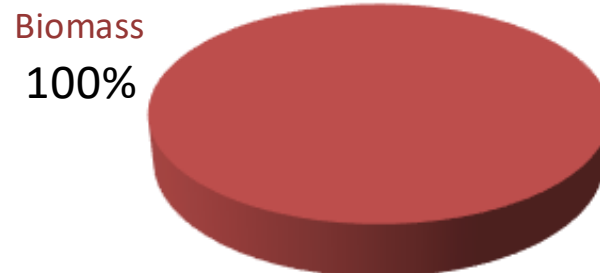
1.8MW wood chipps plant

Strategic plan → completely replacement of fossil fuels with biomass in the district heating system in the Municipality of Priboj

CURRENT PARTICIPATION OF ENERGY SOURCES IN DHS PRIBOJ



SHARE OF ENERGY SOURCES IN THE NEAR FUTURE



Phases of transition to biomass

Phase 1 (2016): replacement of coal boilers in the elementary school "Branko Radičević" with wood pellet boilers with a capacity of 0.9 MW (3 boilers x 0.3 MW). The boiler room heats public buildings: the Municipal Administration, the preschool institution "Neven", the House of Culture and the Elementary School "Branko Radičević". The local self-government funds of 16.2 million dinars (€ 140,000) were used for the realization of the investment. An additional 3 million dinars (€ 25,500) are currently being invested for additional regulatory equipment.



Više informacija naći ćete:

- www.keepwarmeurope.eu/country-pages/serbia
- toplana.priboj@gmail.com

Phases of transition to biomass

Phase 2 (2019): Boiler room in Novo Naselje with a capacity of 1.8 MW on wood chips, which heats two primary, two secondary schools and a children's dispensary. Investment of 126 million dinars (1,071,573 €) from the funds of the Government of RS through the PIMO/Public Investment Management Office.

Boiler room in the elementary school "Nikola Tesla" with a capacity of 0.25 MW on pellets, Pribojska spa



Više informacija naći ćete:

- www.keepwarmeurope.eu/country-pages/serbia
- toplana.priboj@gmail.com

Phase 3 (ongoing): 8MW biomass boiler room:

September 2020, construction begins (building permit obtained)

The project consists of three parts:

- Construction of the boiler room - 5,250,000 euros (works begin)
- Complete reconstruction of the heating pipeline - 1,050,000 euros (selected contractor)
- Substation replacement - 754,000 euros

October 2021, planned completion of construction and beginning of the trial period

January 2022, end of the trial period and handover of the boiler room

- The municipality will subsidize the replacement of individual fireplaces with 80% participation, with the help of funds from the state budget, in parallel with the introduction of energy efficiency measures in residential buildings.

Više informacija naći ćete:

- www.keepwarmeurope.eu/country-pages/serbia
- toplana.priboj@gmail.com

DHS Priboj

(JP "Toplana Priboj")



Više informacija naći ćete:

- www.keepwarmeurope.eu/country-pages/serbia
- toplana.priboj@gmail.com

Thank you for your attention



This project is funded by the EU's Horizon 2020 research and innovation programme under grant agreement N°784966, and lasts from April 2018 – September 2020.

This project receives co-funding from the German Federal Ministry of Economic Cooperation and Development.

