

# **BIOMASS HEATING IN CROATIA: EXAMPLES OF IMPLEMENTED PROJECTS**

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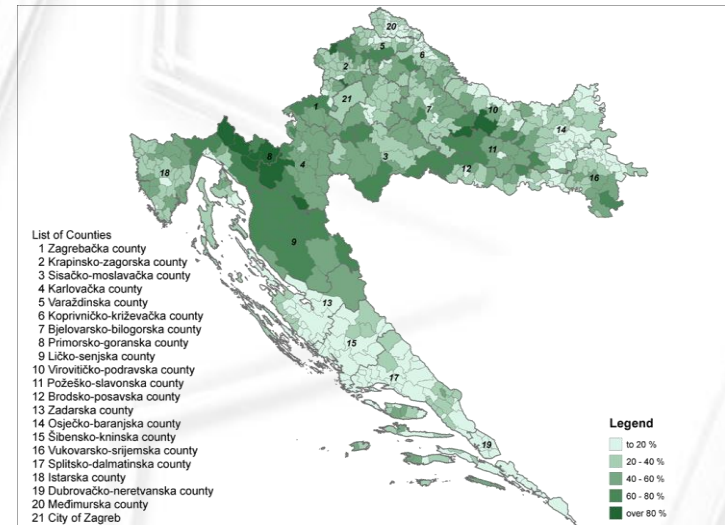


*Data intelligent operation of district heating and district cooling systems*

April 3 2019

# INTRODUCTION

- Biomass potential in Croatia
- Biomass utilisation in Croatia
  - Pellets
  - Wood chips
  - Fuelwood
- Biomass DH in Croatia
  - 3 systems in total (3x1 MW)



Share of municipal surface covered by forest in Croatia



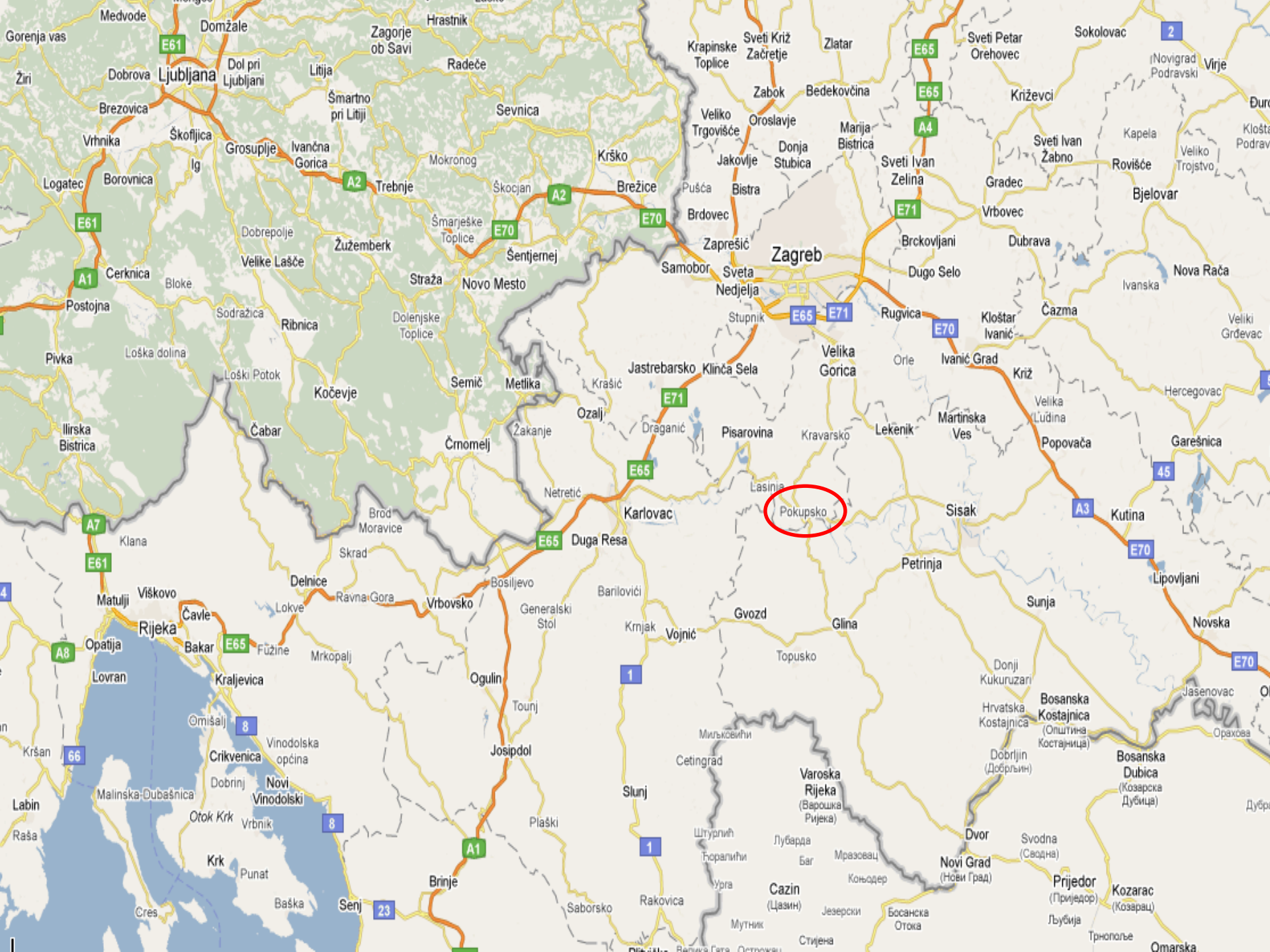


# BIOMASS DH IN POKUPSKO

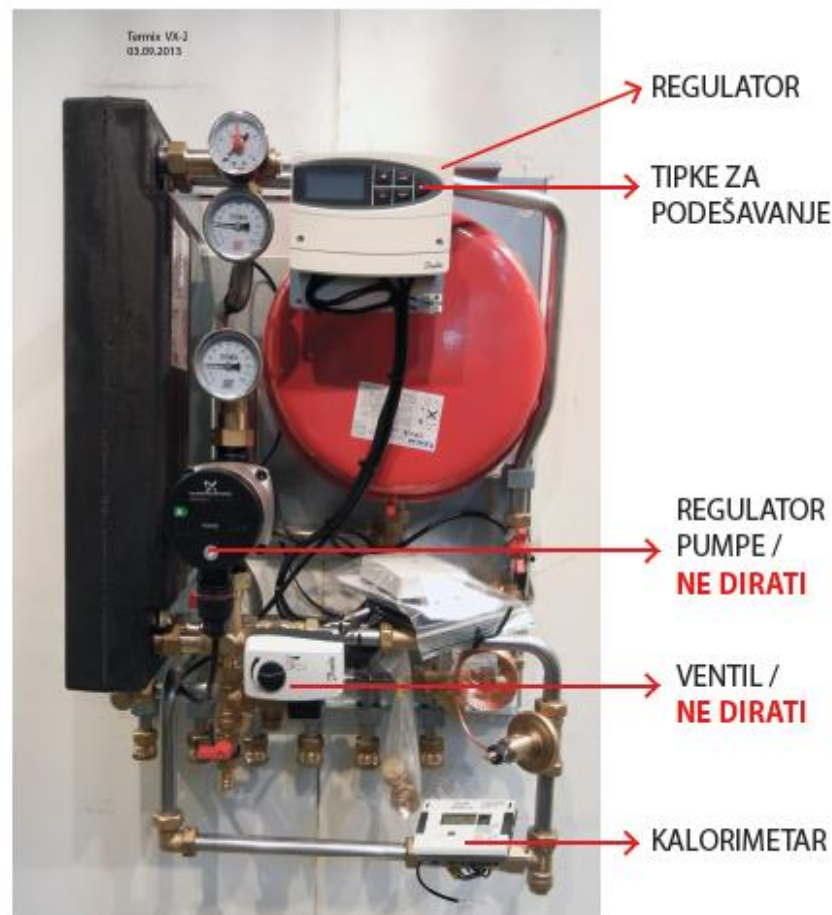
- Municipality of Pokupsko
- Near river Kupa in North-West Croatia
- 2.224 inhabitants (2011 census)
- Economy
  - Agriculture
  - Small crafts
  - Tourism (Kupa river)



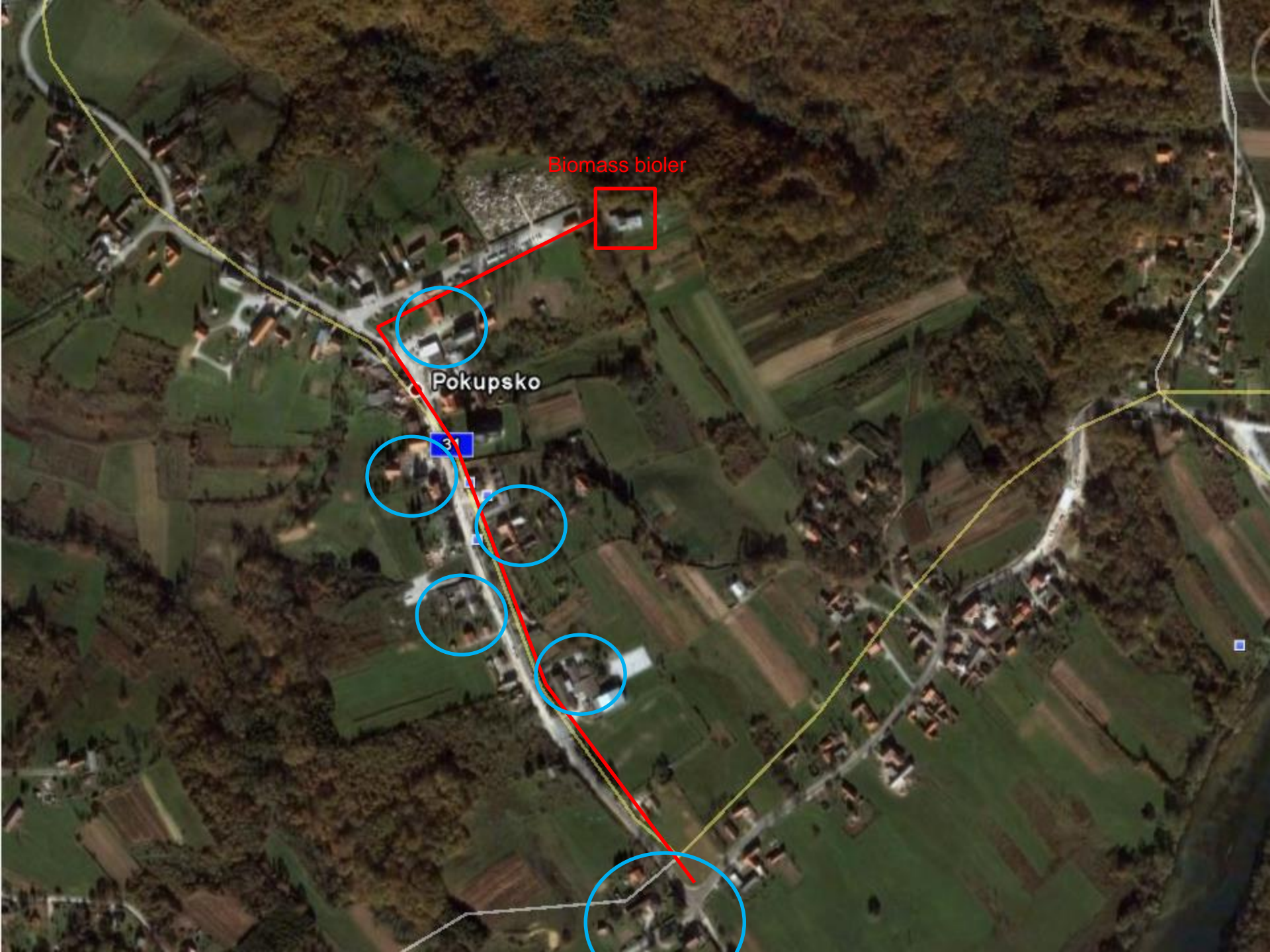




# Heating in Pokupsko







Biomass boiler

Pokupsko

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# Pokupsko biomass DH: Timeline

- 06/2008: Start of concept development
- 2009-2011: Preparation of documentation
- 01/2011: Application to IPARD
- 2011-2014: Public procurement for works  
3 times
- 11/14-11/15: Construction
- 27/11/2015: Official opening















**SUSTAINABLE  
ENERGY LEADER**

This is to certify that the project  
**Pokupsko Municipality sustainable-energy  
transformation** implemented by the  
**Municipality of Pokupsko** has been awarded  
the **EU Sustainable Energy Award 2016**  
in the **Public Sector** category.

  
**Jerzy Buzek**  
President of the Jury

  
**Miguel Arias Cañete**  
Commissioner for Energy and Climate Action

The winners were selected by a Jury of energy experts from a shortlist of the year's most successful projects for clean, secure and efficient energy.

The EU Sustainable Energy Awards 2016 are an initiative of the European Commission.  
They recognise outstanding innovation in energy efficiency and renewables.



# POKUPSKO LESSONS LEARNED

- Replication?
  - Key factors of success?
    - Enthusiastic and supportive Mayor
    - Fanatic dedication of project team in fighting administrative/bureaucratic hurdles
  - IPARD: 100% cofinancing, 12 M eur
    - 100% money available for 12 DH (1 MW)!
    - Only one built!!!
    - Replicate???
    - Croatian OP Rural Dev 2014-2020: No!!!



# BIOMASS HEAT CONTRACTING

- Business model
  - Client (building owner) contracts a specialized company to provide energy service (heat supply) for a defined time
    - A form of PPP
  - Replication?
    - Hundreds of projects in Austria, Finland, Slovenia, Italy, Germany,...
    - Examples in Croatia...





# CRAFTS CENTER KARLOVAC

**Clients:** Karlovac County, Crafts Association of City of Karlovac, Crafts Chamber



- Replacement of heat oil boiler with biomass (pellets) boiler
- Capacity 250 kW
- Avg. Yearly consumption of heating oil: 20 000 l



# CRAFTS CENTER KARLOVAC

**Service provider:** REGEA ulaganja d.o.o.

**Construction and start:** 2014.

**Objects:** 3 administrative buildings

**Heating needs:** 120 MWh/y

**Boiler capacity:** 180 kW

**Heat tank:** 1500 l

**Fuel:** pellets

**Investment:** 330.000 kn (app 44.000 eur)

**Co-financing:** MINGO, FZOEU

**Heat costs:**

- Initial cost: 10% lower in comparison to average initial cost of heating oil
- Heat cost correction yearly

**Contract duration:** 10 years





# ELEMENTARY SCHOOL SLUNJ

**Client:** OŠ Slunj (KAZUP)

**Service provider:** FOREST

**Construction:** Sept 2016.

**Building:** School + sport hall

**Heat needs:** 330 MWh/yr

**Boiler capacity:** 300 kW

**Heat storage:** 3 000 l

**Fuel:** wood chips

**Investment:** app 200.000 eur

**Subsidy:** 53% FZOEU

**Heat price:**

- Min 20% lower then current costs
- 4,8 eur c/kWh
- Yearly correction

**Contract duration:** 10 yrs



# ELEMENTARY SCHOOL SLAVA RAŠKAJ OZALJ

**Client:** OŠ Slunj (KAZUP)

**Service provider:** FOREST

**Construction:** Sept 2016.

**Building:** School + sport hall

**Heat needs:** 315 MWh/yr

**Boiler capacity:** 250 kW

**Heat storage:** 3000 l

**Fuel:** wood chips

**Investment:** app 150.000 eur

**Subsidy:** 36% FZOEU

**Heat price:**

- Min 10% lower then current costs
- 5,1 eur c/kWh
- Yearly correction

**Contract duration:** 10 yrs





# HIGH SCHOOL DUGA RESA

**Client:** High School Duga Resa (KAZUP)

**Service provider:** MI-MARIS Ltd.

**Construction:** Sept 2018

**Building:** High school Duga Resa

**Heat needs:** 350 MWh/yr

**Boiler capacity:** 300 kW

**Heat storage:** 3000 l

**Fuel:** wood chips

**Investment:** app 190.000 eur

**Subsidy:** IPA CBC HR-BIH-ME

**Heat price:**

- Min 10% lower then current costs
- 5,4 eur c/kWh
- Yearly correction

**Contract duration:** 10 yrs



# CONCLUSIONS

- For a successful realisation of biomass heating projects:
  - Vision/idea – political decision and support
  - Knowledge, expertise – Project designers, consultants
    - Operation and management – Fuel quality (wood chips), maintenance...
  - Financing – subsidies, innovative models
  - Persistence, persistence, persistence (!!!)



# Thank you for your attention!

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