



Framework for a German-Serbian Bioenergy-Partnership





Facts about the GIZ DKTI programme

- Objective:** To strengthen capacities and create an enabling environment for sustainable use of bioenergy in Serbia
- Funded by:** German Federal Ministry for Economic Cooperation and Development (BMZ) under the German Climate Technology Initiative (DKTI)
- Duration:** March 2013 – December 2017
- Political partners:** Ministry of Agriculture and Environmental Protection & Ministry of Mining and Energy





Structure of the programme:

Policy advice

GIZ:

Support to harmonization of laws and regulations to EU standards

Support to policy definition and strategy implementation

Biomass supply

KfW:

Advise to investments in district heating companies.

GIZ:

Support to the creation of a sustainable supply with bio-resources

Eff. firewood use in HH

GIZ:

Support to a promotion of efficient stoves and ovens / firewood drying

Advise to implement efficiency- and emission standards

Project development

GIZ:

Advise to the implementation of cost efficient and innovative bioenergy projects

Technology and knowledge transfer

BioRES

GIZ:

Support to the creation of regional Biomass Trade and Logistic centres.

Support local supply chains for biomass.



Cross-cutting theme: Sustainability



Project development

Objective: Innovative bioenergy projects are implemented

Activities:

- Identification of projects and potential investors for bioenergy heating systems in public buildings, biogas facilities, facilities for generation of industrial process heat
- Consultancy for plant design and project concepts, elaboration of bankable (pre-) feasibility studies, project documentation, etc.
- Support/Intermediation of financial opportunities and investment subsidies
- Logistical concepts for biomass
- Technical support for permit application and support to increase the efficiency of processes related to procurement procedure, permits and licensing agreements for bioenergy projects
- **Best-practice-documentation and Capacity-Building**
- Dialogue-platform for Serbian and international companies and institutional stakeholders to exchange project ideas, information and experiences



Objectives of the Bioenergy-Partnership

➤ **Development of a sustainable bioenergy market in the Danube-region and Europe as a contribution to energy supply security and climate protection in the context of the EU-Strategy for Danube-region**

To achieve this goal, the following activities will be implemented:

- Based on the engagement of the ministry of Baden-Württemberg in cooperation with the Republic of Serbia, the Bioenergy-Partnership should be extended on more partners in Germany and the Danube-Region **to support favorable framework conditions**
- Stirring of innovation and business potentials for and with the private economy
- **Development of cross-border public-private partnership projects** in cooperation with governmental institutions, the private and the science sector



General reasons to implement a bioenergy heating system in Serbia

- Strong savings in heat energy costs
- Replacement of old boilers necessary (heat supply safety)
- Emission reduction (smell and visibility)
- Strengthening of local and regional income and production (biomass supply chain) by using existing energy potentials
- Labelling of Green Tourism → Marketing Benefits





Fields of Action within the Bioenergy-Partnership

The Bioenergy-Partnership is based on three fields of action:

1. Support the political dialogue for a favourable regulative framework (examples: exchange of experts, parliamentary night)
2. **Support cooperation between companies** in the implementation of their specific projects and investments in the bioenergy market
3. Strengthen the already existing practical cooperation in science and the educational sector



(C) Paul Trainer (DBFZ)



Approach of the Bioenergy-Partnership

What kind of development opportunities could the Bioenergy-Partnership provide for the future ?

Examples:

- Establish a political dialogue format for favourable regulative framework conditions through visible public events
- Create support opportunities for the development of a sustainable bioenergy market in the Danube region
- Joint development of projects for EU-tenderships or other donors
- Support joint cooperations of companies from the Danube region and Germany
- Creating a structure for the Bioenergy-Partnership: how should the partnership be organized between public institutions, academic and the private sector?





Potential Business-Bionergy- Partnerships

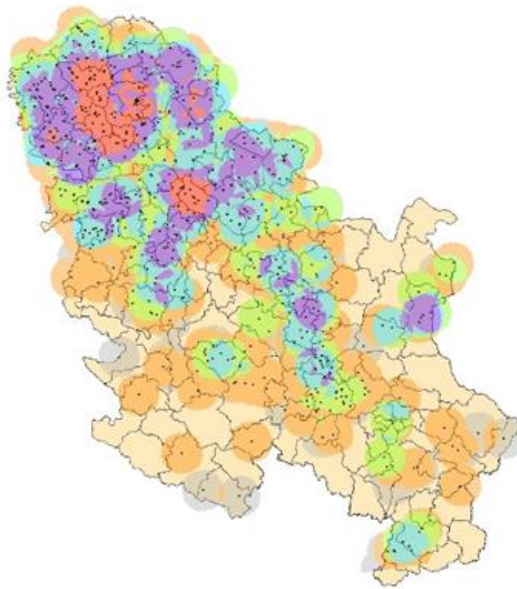
- ESCO-Projects with public clients according Serbian PPP-Law for heat delivery from biomass in public buildings (→ substitution of diesel, LPG and fuel oil boilers)
- Joint-Ventures for ESCO-Projects regarding technology supply, financing, service and engineering
- Joint-Ventures for biomass supply: distribution and service for biomass supply technology like chippers, dryers, balers, agro-forestal equipment
- Joint-Ventures for turnkey-biogas or straw combustion projects: approved technology adapted on local demand regarding biomass composition: e.g. organic waste water, straw waste material
- Cooperation in technology adaption for low quality and agro biomass
- Cooperation to implement bioenergy villages (exchange of experiences, financing structures etc.)





Agricultural substrate potentials

Potential for installing power capacity in [kW] within the radius of 15 km of medium and big farms

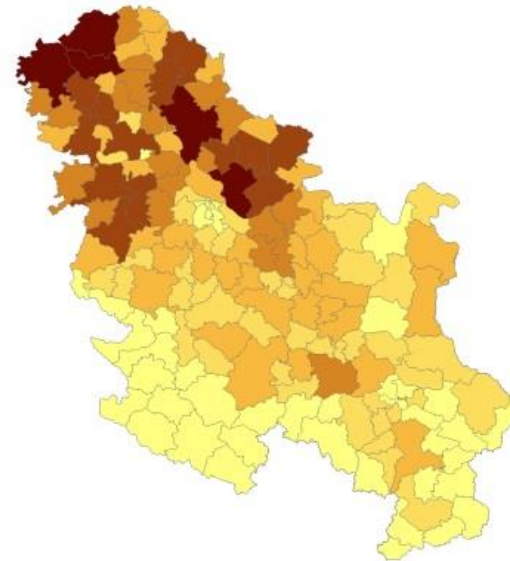


Potential for installing power capacity within the radius of 15 km in [kW]

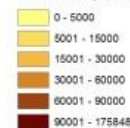


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Technical potential from maize stover- the highest yields 2010



Technical potential from maize stover-year with the highest yields 2010 in [t]



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Fuel prices for heating in Serbia

FUELS	Heat Values	Price per Unit (net)	Calorific Price	Boiler Efficiency	Heat Price
Agro Pellets	3.9 kWh/kg	100 €/t	26 €/MWh	85%	30.2 €/MWh
Brown coal	4.5 kWh/kg	100 €/t	22 €/MWh	75%	29.6 €/MWh
Electricity	1.0 kWh/kWh	60 €/MWhel	60 €/MWh	85%	70.6 €/MWh
Light Oil	12.6 kWh/kg	1.05 €/l	98 €/MWh	85%	115.3 €/MWh
LPG	12.9 kWh/kg	1.00 €/kg	78 €/MWh	90%	86.3 €/MWh
Heavy Fuel Oil (Mazut)	11.2 kWh/kg	550 €/t	49 €/MWh	80%	61.3 €/MWh
Natural gas	10.0 kWh/m ³	0.41 €/m ³	41 €/MWh	95%	43.2 €/MWh
Wood Pellets	4.7 kWh/kg	160 €/t	34 €/MWh	90%	37.8 €/MWh
Woodchips (moisture 35 %)	3.1 kWh/Kg	55 €/t	18 €/MWh	85%	20.9 €/MWh
Straw in Bales	3.9 kWh/kg	45 €/t	12 €/MWh	80%	14.4 €/MWh
Firewood (moisture 45%)	2.5 kWh/kg	60 €/t	24 €/MWh	65%	36.9 €/MWh

Current fuel prices for heating in Serbia without VAT Source: GIZ study and calculation (prices may vary depending on the region and the quality of the fuel)

Prices can differ due to region, quality and quantity



Project example with simple numbers: public school building in Serbia

Current heating system and its costs:

- 2 oversized, 20-years-old light fuel oil boilers á 400 kW
- Current consumption: 75 t/a light fuel oil á 1.000 €/t = 75.000 €/a



Source: GIZ, 2014

Solution with a straw pellet boiler concept:

- 1x 500 kW straw pellet system for around 150.000 – 200.000 € Investment cost, current system for peak load and back-up
- Future fuel costs: 200 t/a á 100 €/t = 20.000 €/a



55.000 €/a savings of fuel costs



Thank you for your attention!

Thomas Mitschke, GIZ-DKTI Component Leader Project Development

Please visit us on: www.bioenergy-serbia.rs

Deutsche Gesellschaft für
Internationale Zusammenarbeit
(GIZ) GmbH

**Development of a Sustainable
Bioenergy Market in Serbia**

Bože Jankovića 39
11000 Belgrade
Serbia

T +381 11 3912 507
E bioenergy-serbia@giz.de