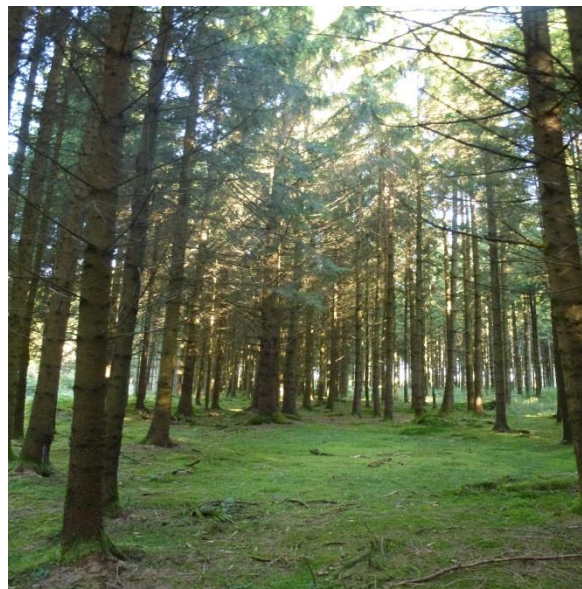
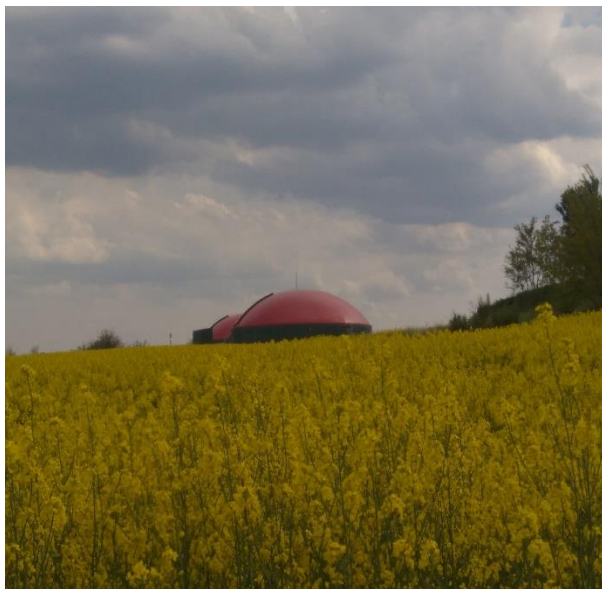




Development of a Sustainable Bioenergy Market in Serbia – results and impacts

GIZ DKTl programme





Structure of the presentation

1. GIZ DKTI Bioenergy programme in Serbia
2. Realized projects and achieved results
3. Opportunities for Biomass-ESCO Investments in Serbia
4. Innovative biogas concepts



GIZ DKTI Bioenergy 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 and Technology Initiative (DKTI)

Duration: 2013 – 2017 with an extension through the end of 2020

Political partners: Ministry of Mining and Energy
Ministry of Environmental Protection
Public Investment Management Office



16.10.2017.



Milica Vukadinovic, GIZ DKTI programme



Seite 3



GIZ technical cooperation programme

Policy advice

GIZ – TA:

Support to harmonization of laws and regulations to EU standards; institutional strengthening

- ✓ Amendments to the law on agricultural land
- ✓ Harmonisation of VAT for wood fuels

Biomass supply

KfW – FA:

Financing district heating companies (DHCs) able to switch to use of biomass

GIZ - TA:

Support to creation of sustainable biomass supply chains for DHCs:

- ✓ 12 supply chains
- ✓ 5 mini-grids for delivering biomass based heat

Efficient use of firewood in HH

GIZ - TA:

Promotion of efficient utilisation of wood fuels in households in pilot regions:

- ✓ From 1 to 22% of HH using wood fuels efficiently

Standardization of wood fuels and combustion devices:

- ✓ 2 laboratories accredited

Project development

GIZ - TA:

Advisory to private and public sector partners to implementation of sustainable, innovative and replicable bioenergy projects:

- ✓ 2 implemented fuel switching projects
- ✓ 25 in different phases of implementation
- ✓ 10 innovative biogas concepts

BioRES

GIZ - TA:

Support to creation of regional Biomass Trade and Logistic centers in Serbia, Croatia and Bulgaria



Cross-cutting theme: sustainability



Thematic areas for project development

*Biogas
project
development*

*Straw
combustion for
process heat*

*Fuel switch in
off-grid public
buildings*

Identification of projects / Acceptance

Concept development / pre-feasibility

Feasibility assessment / Investment structuring / A2F

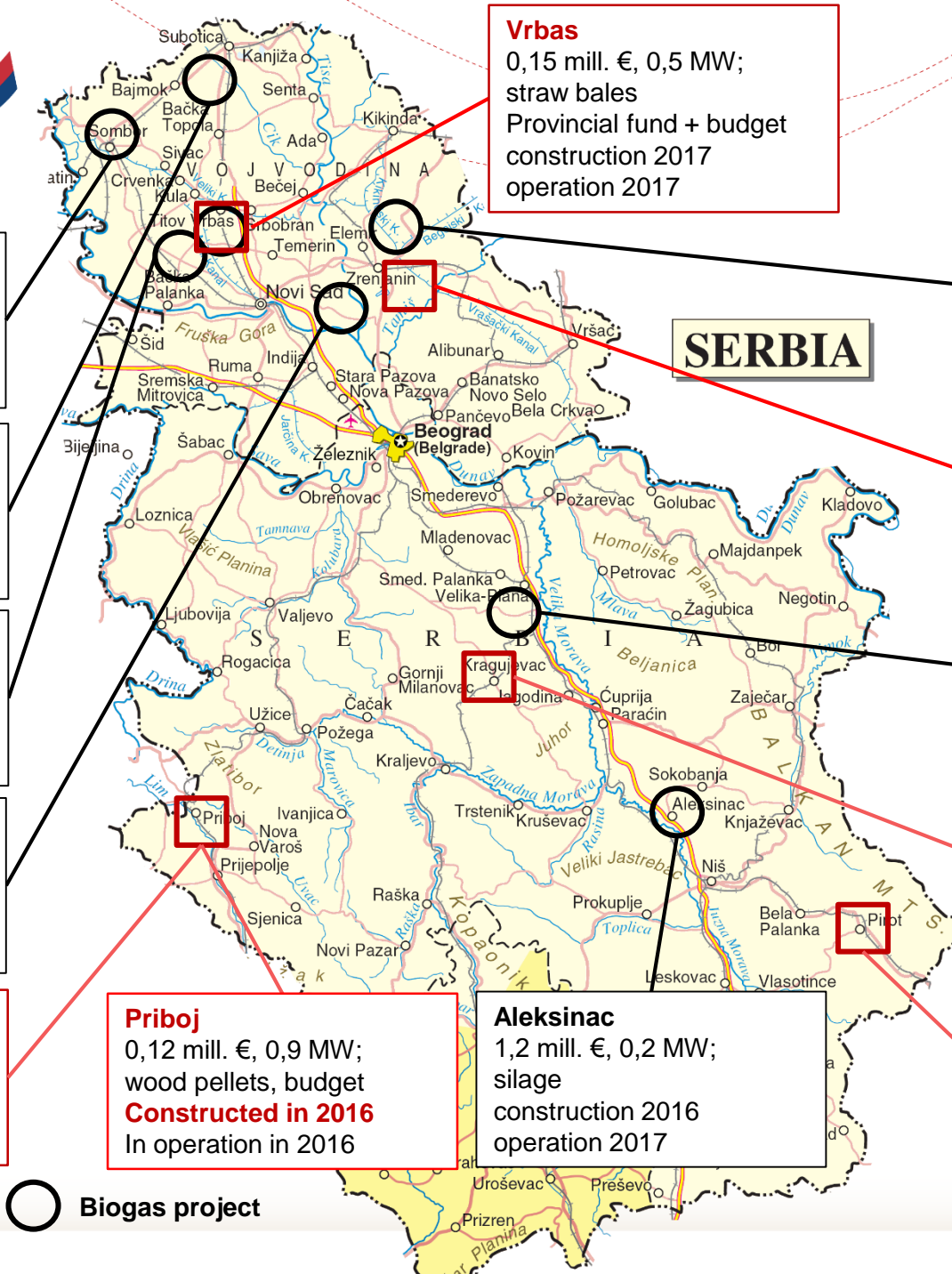
Implementation

Awareness raising
Capacity building measures
Technology partnership / Multiplication of best practices



**Немачка
сарадња**
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Zusammenarbeit (GIZ) GmbH



Vrbas
0,15 mill. €, 0,5 MW;
straw bales
Provincial fund + budget
construction 2017
operation 2017

Čestereg
2,76 mill. €, 0,6 MW;
cow manure + silage
construction 2017/2018
operation 2018

Botoš (extension + heat usage)
2,4 mill. €, 2 x 0,6MW;
silage, construction 2018
operation 2019

Pojate
1,85 mill. €, 0,45 MW,
Chicken dung +
slaughterhouse waste
operation 2018

Kragujevac
0,6 mill. €, 0,6 MW;
wood chips, budget
construction 2017
operation 2017

Pirot
0,6 mill. €, 0,6 MW;
wood chips
First heat delivery PPP
construction 2017
operation 2017

Sombor
3,5 mill. €, 1MW;
Manure + silage
construction 2017
operation 2018

Energy cooperative Verusic
2,5 mill. €, 0,5MW;
Manure + silage
Construction 2018

Selenča
2,76 mill. €, 0,6 MW;
organic products residues
construction 2018
operation 2019

Žabalj
1,2 mill. €, 0,2MW;
pig manure
construction 2017
operation 2018

Priboj
0,4 mill. €, 2,1 MW;
wood pellets, budget
Constructin 2017
In operation in 2017

Priboj
0,12 mill. €, 0,9 MW;
wood pellets, budget
Constructed in 2016
In operation in 2016

Aleksinac
1,2 mill. €, 0,2 MW;
silage
construction 2016
operation 2017

Fuel switch project **Biogas project**



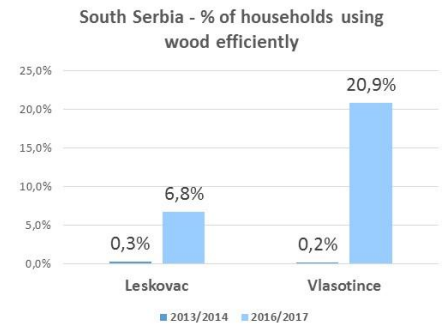
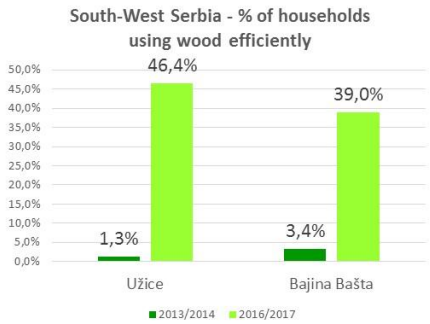
**Немачка
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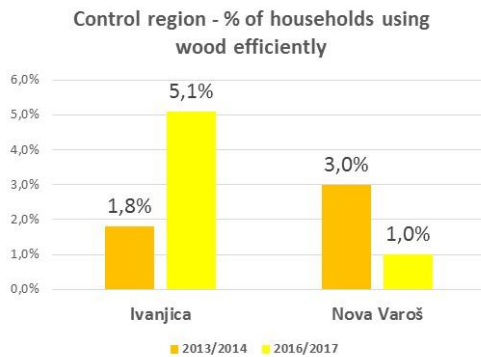


SERBIA

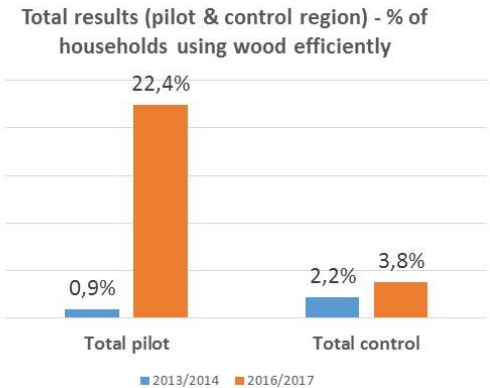
**Two pilot regions:
South Serbia and South-
West Serbia**



One control region:



Total (pilot and control regions):





Structure of the presentation

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Implemented projects

Priboj

Objective of the new initiative: Assessment of possibilities to disconnect 7 public buildings from (un)functional DHC in order to switch to biomass from the use of fossil fuels.

Realized project: Municipality of Priboj invested their own budget funds to install new biomass-based boilers in 4 schools using previously coal in outdated combustion devices (1MWth).



Pirot

Project objective: Development of the acceptable technical solution for fuel switching in schools and financing through PPP-ESCO model

Results: The first PPP-ESCO biomass heat delivery contract in Serbia signed in 2017. In operation for the 2017/2018 heating season.





Biomass PPP-ESCO potential in Serbia

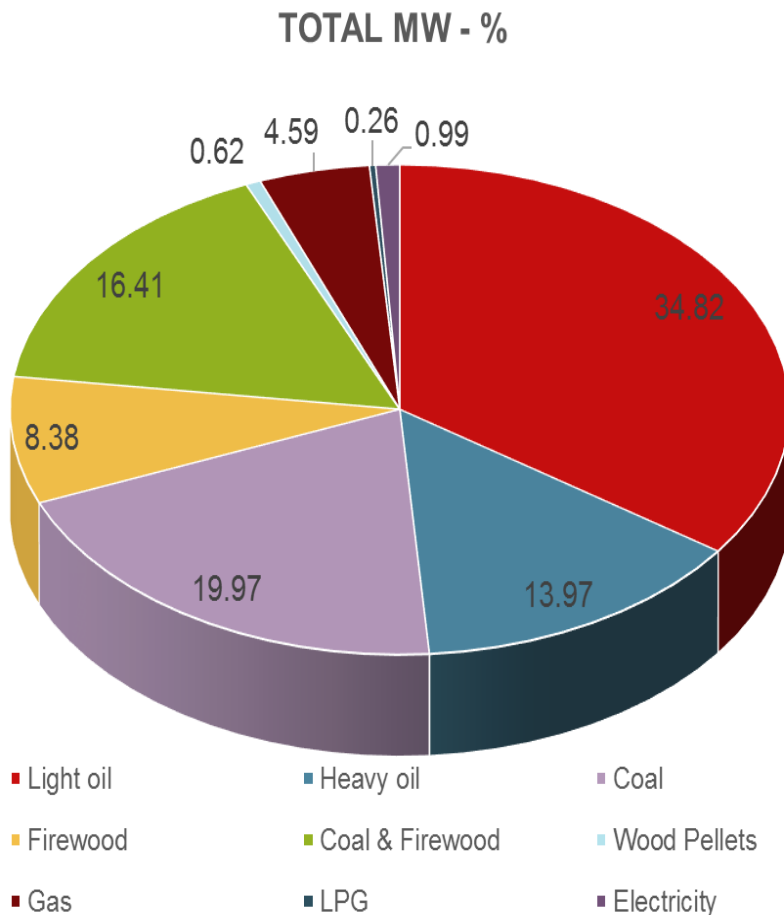
Heat delivery project in Pirot

- Subject of procurement: replacement of existing heating light-oil boilers with biomass boilers and delivery of heat in selected public buildings over the period of 15 years
- First public call ended in May 2016 – no offers
- Second public call ended in February 2017 – 1 offer
- Contract signed in May 2017
- In operation in October 2017

The investment in biomass-based boilers of €700K; the total contract value over the period of 15 years 3.2 MEUR.



Biomass PPP-ESCO potential in Serbia



Photos: GIZ 2014/2017



→ Total installed heat capacity in public buildings not connected to the district heating infrastructure:

ca. 900 MW



Key steps in developing PPP with ESCOs in Serbia

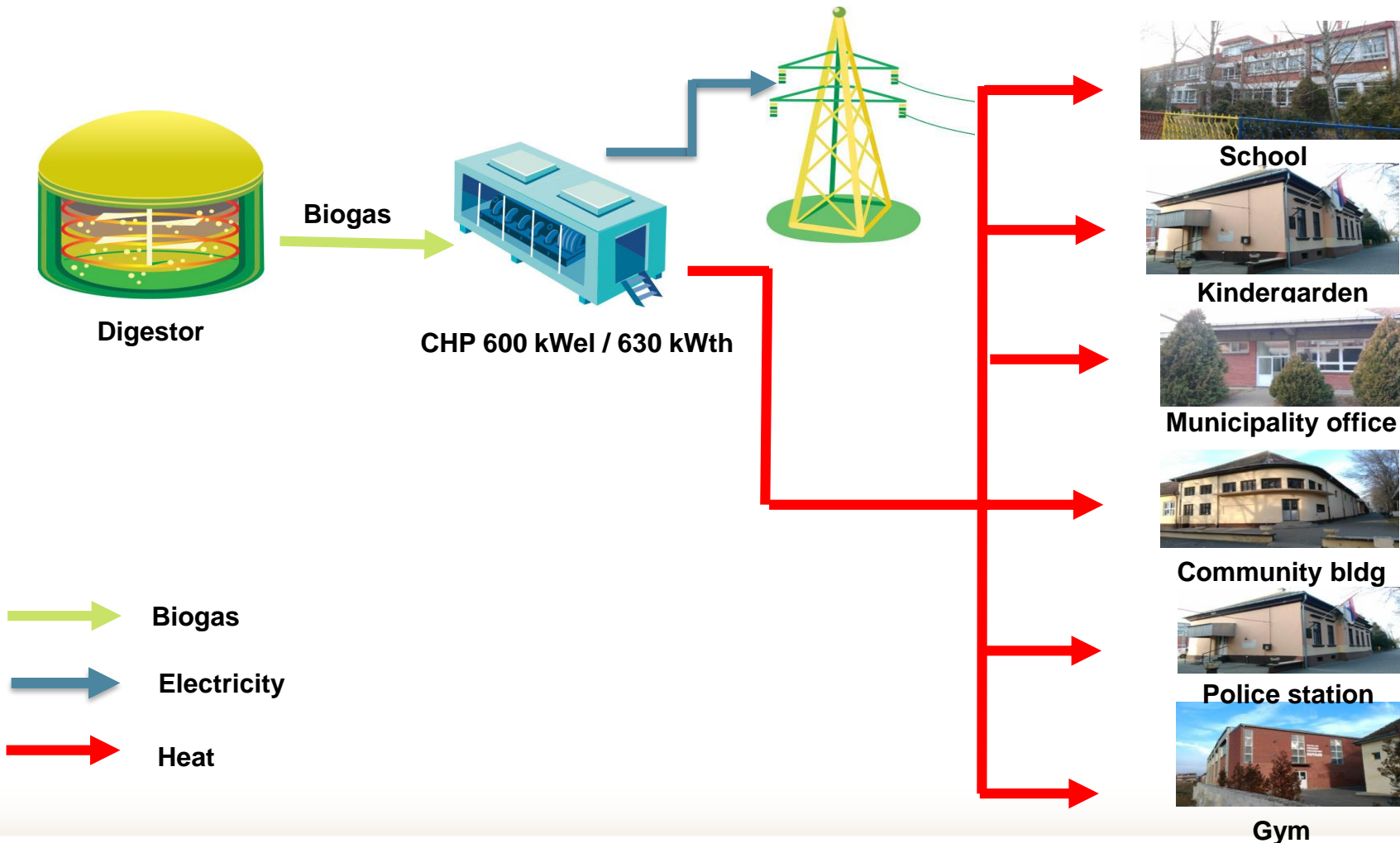
- Project proposal to be approved by city/municipality assembly
- Formation of the project team
- (Pre)feasibility study preparation
- Revision and approval of application by the PPP Commission
- Council/assembly approval for procurement procedure
- Contract model and specifications
- **Bidding and selection criteria**
- Council/assembly approval for selected bidder and final contract



Legal Framework for PPP established and doable!

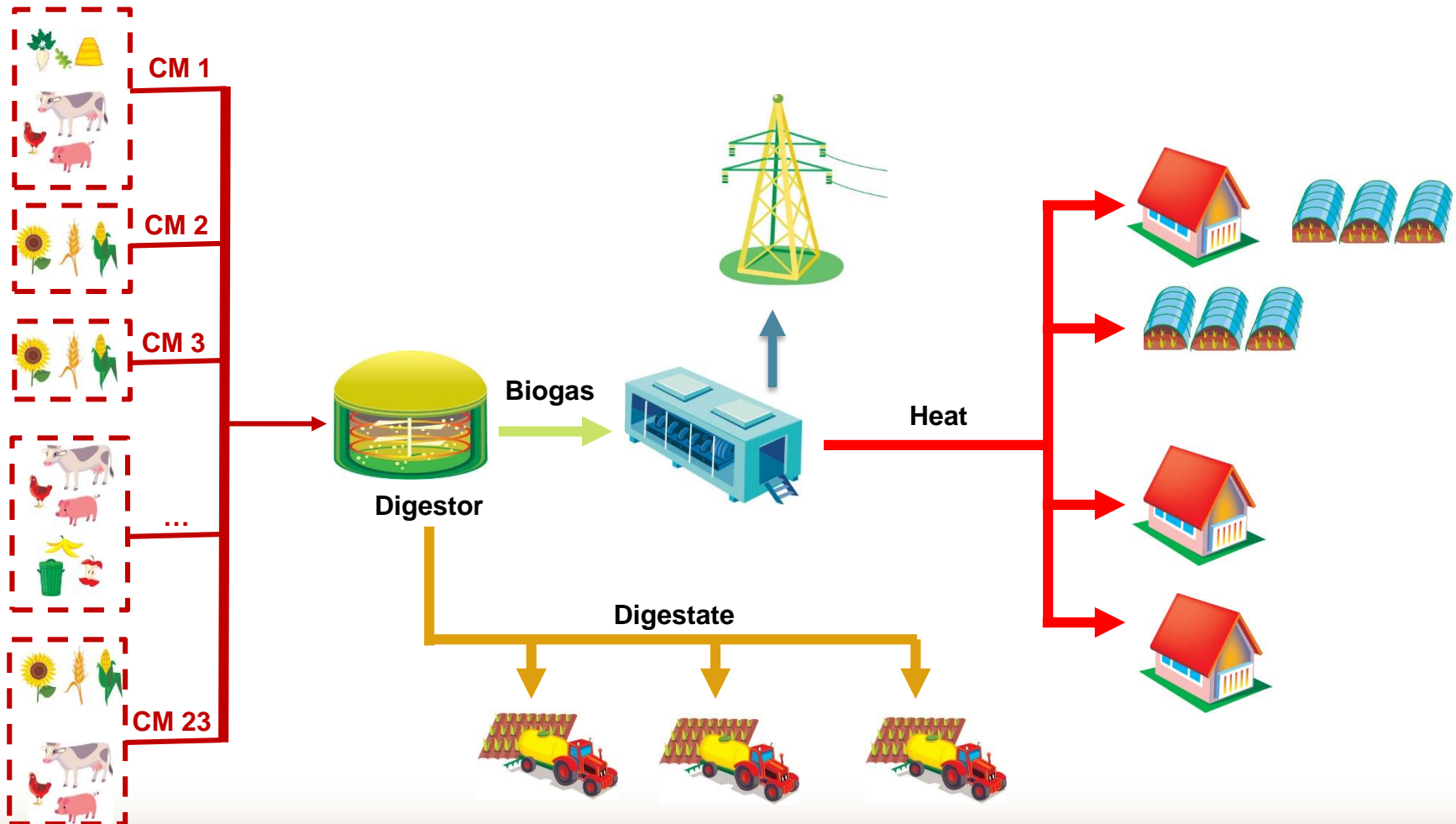


Innovative biogas concepts: heat usage





Innovative biogas concepts: energy cooperative model





Thank you for your attention!

Milica Vukadinovic, GIZ-DKTI Component Leader Project Development

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

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