Agricultural Biomass as Fuel for Heating in Rural Areas

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and
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NEXT GENERATION OF RENEWABLE ENERGY SOURCES, INCLUDING SOLAR, MARINE, AND GEOTHERMAL ENERGY

Brussels

6 November 2013

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How important is biomass as Renewable Energy Source in Poland?

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Renewable energy production in Poland 2006 -2008 [TJ]

Type of RES used	Year		
	2006	2007	2008
Biomass	192 097	1971 50	198 401
Solar energy	11	15	54
Hydro energy	7 352	8 467	7 748
Wind energy	922	1 878	3 012
Biogas			
Landfills	791	879	1432
Sewage	1 803	1 802	3 976
Other	19	27	107
Heat pumps	33	68	605
Liquid biofuels			
Bioethanol	3542	2792	2459
Biodiesel	3423	1822	9943
Geothermal energy	535	439	531
Municipal waste	27	35	9
Total RES	**210 555**	**215 374**	**228 277**

Source: (CSO, 2009)

vs. 895 000 TJ of the estimated potential

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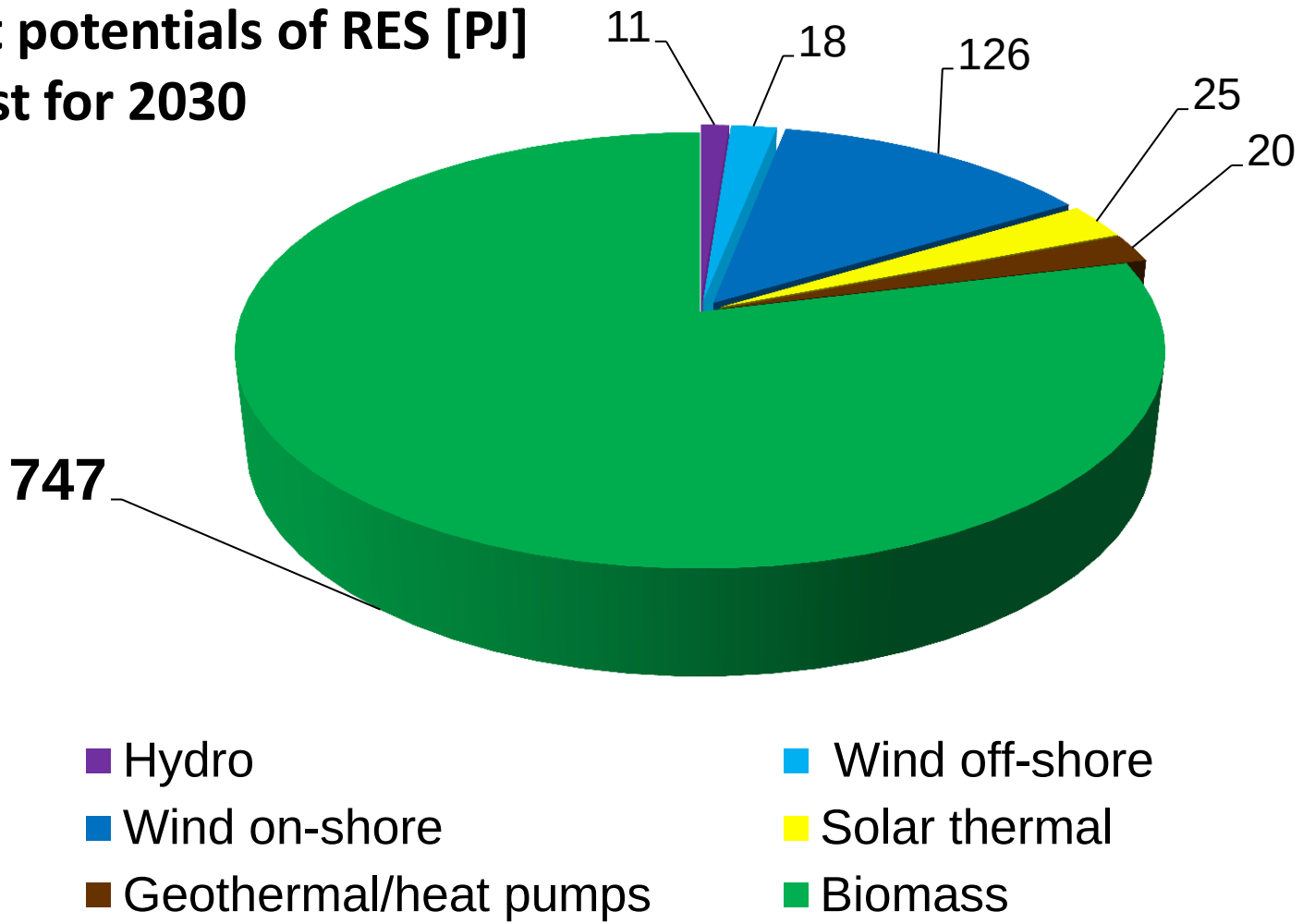
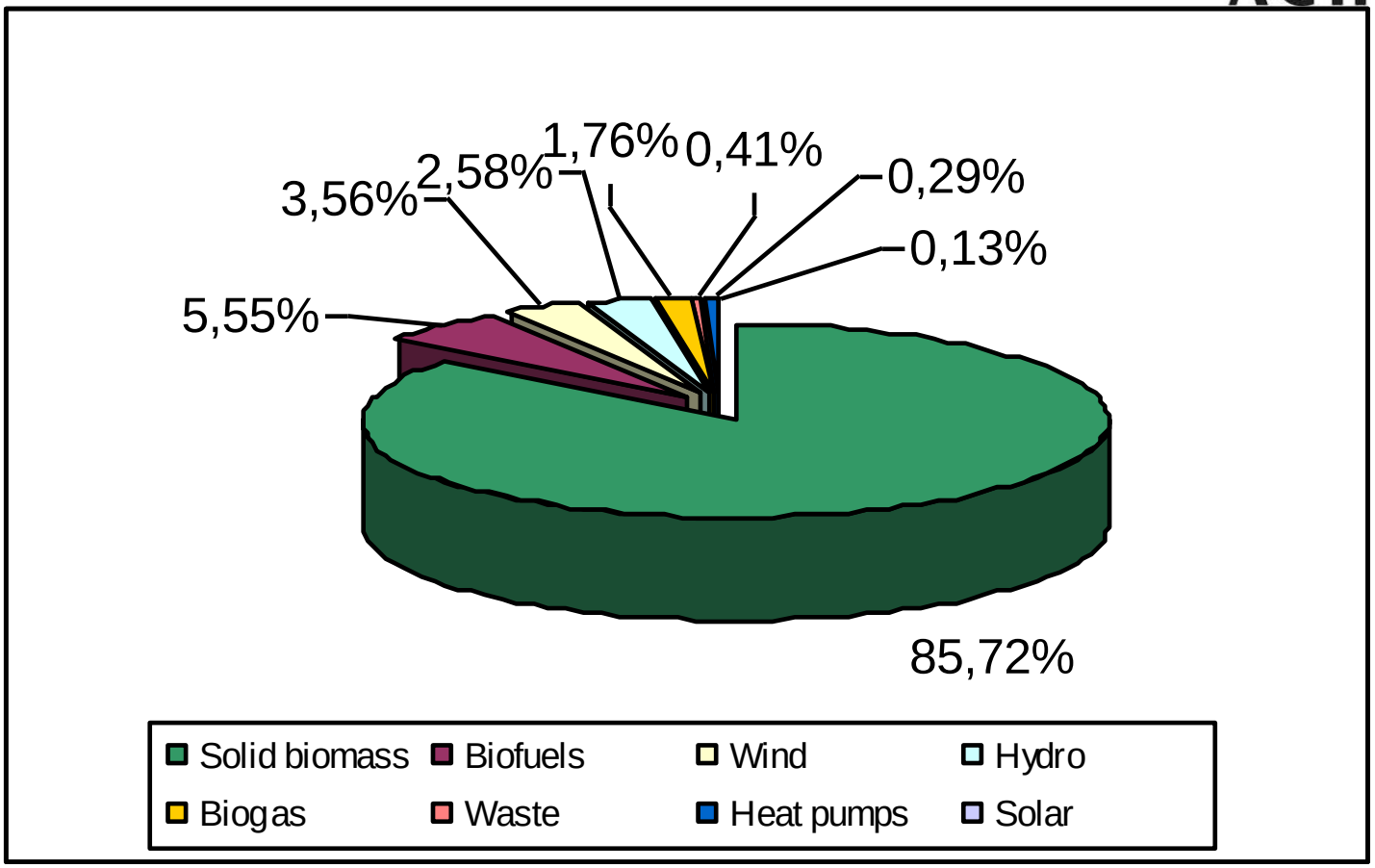
Market potentials of RES [PJ]
Forecast for 2030





Energy production form renewable sources in 2011

Polish Central Statistical Office, Statistical Yearbook for 2011, Warsaw, November 2012

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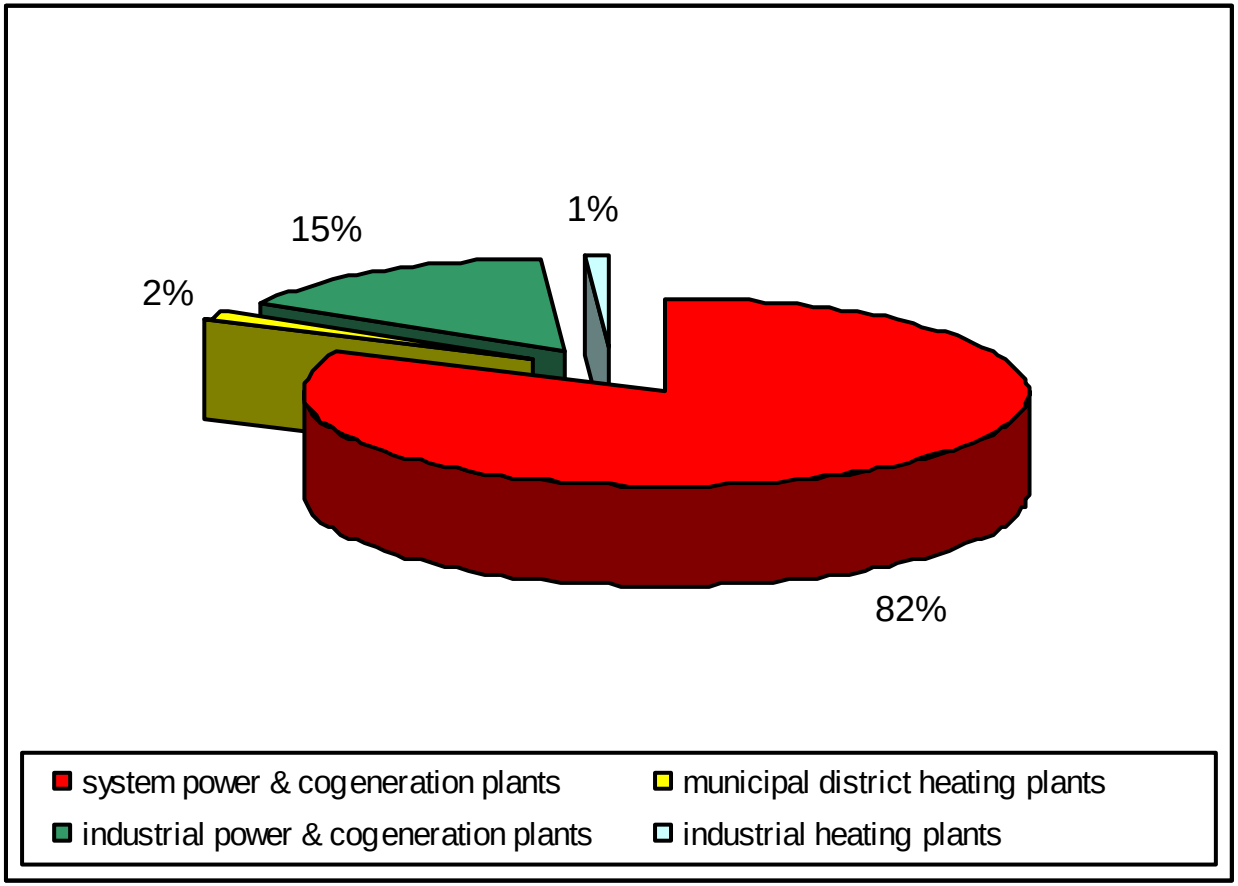
The problem is that

from the point of view

of reduction of CO2 emissions

this potential is used
in a (very) wrong way



Use of biomass for energy purposes in 2011

Polish Central Statistical Office, Statistical Yearbook for 2011, Warsaw, November 2012

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A hypothetical example

ca 400 MW thermal power plant

ca 5% of electricity from biomass

500 tons/day, i.e

50 trucks with **10** tonnes load per day

times **100 km**

gives **5000 km/day (one way)**

every day

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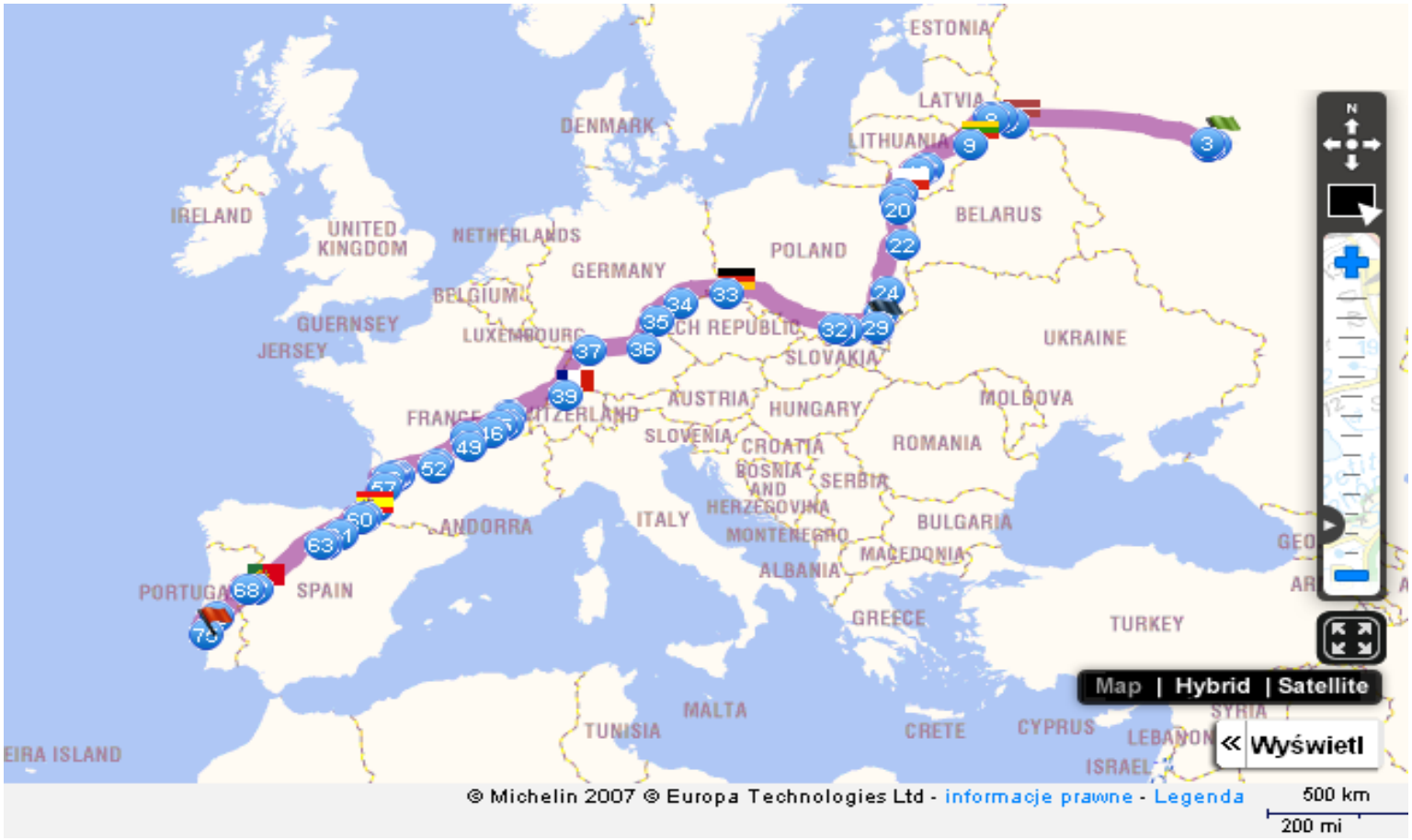
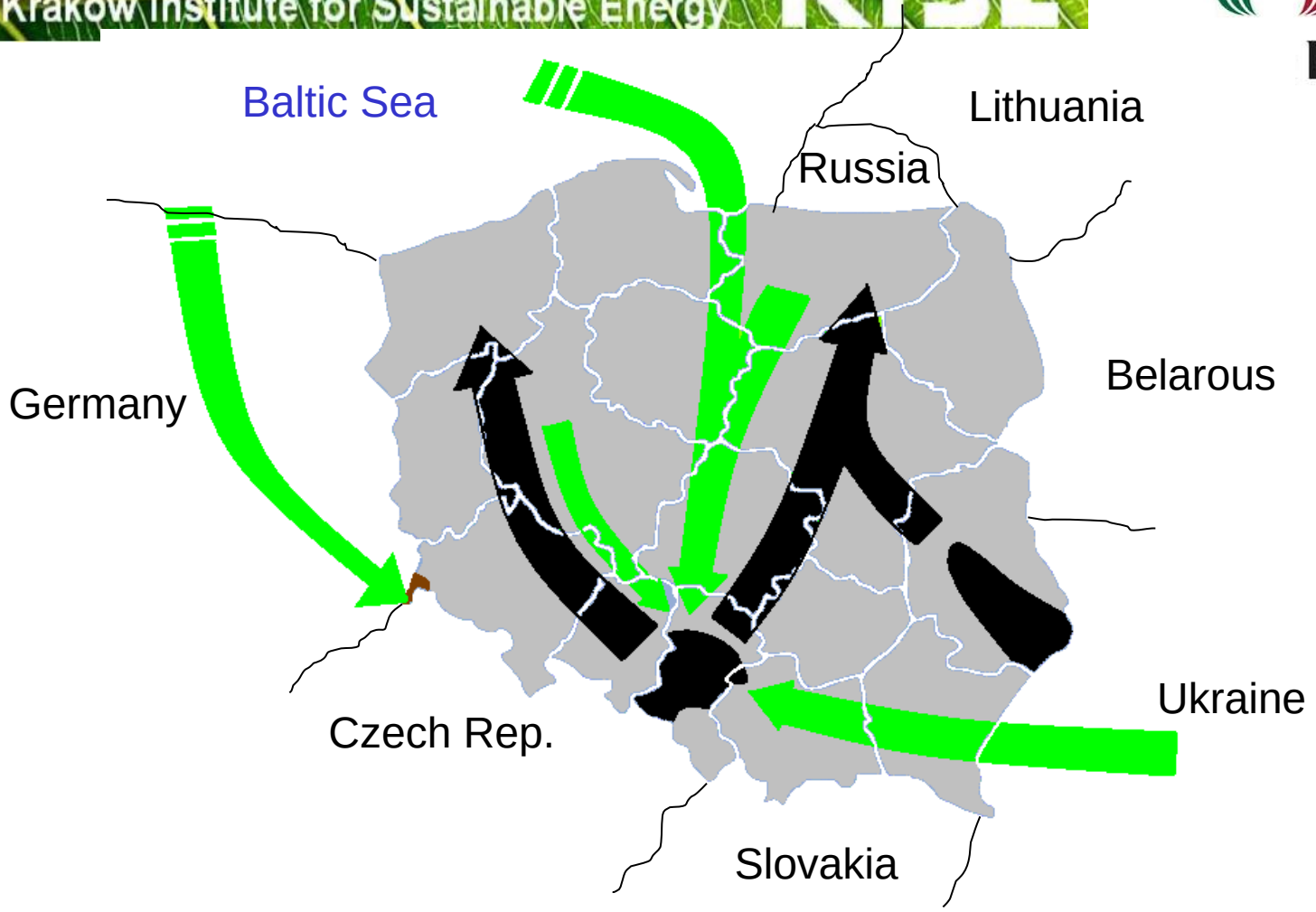
Moscow - Lisbon via PL 5100 km



Źródło: Opracowanie własne

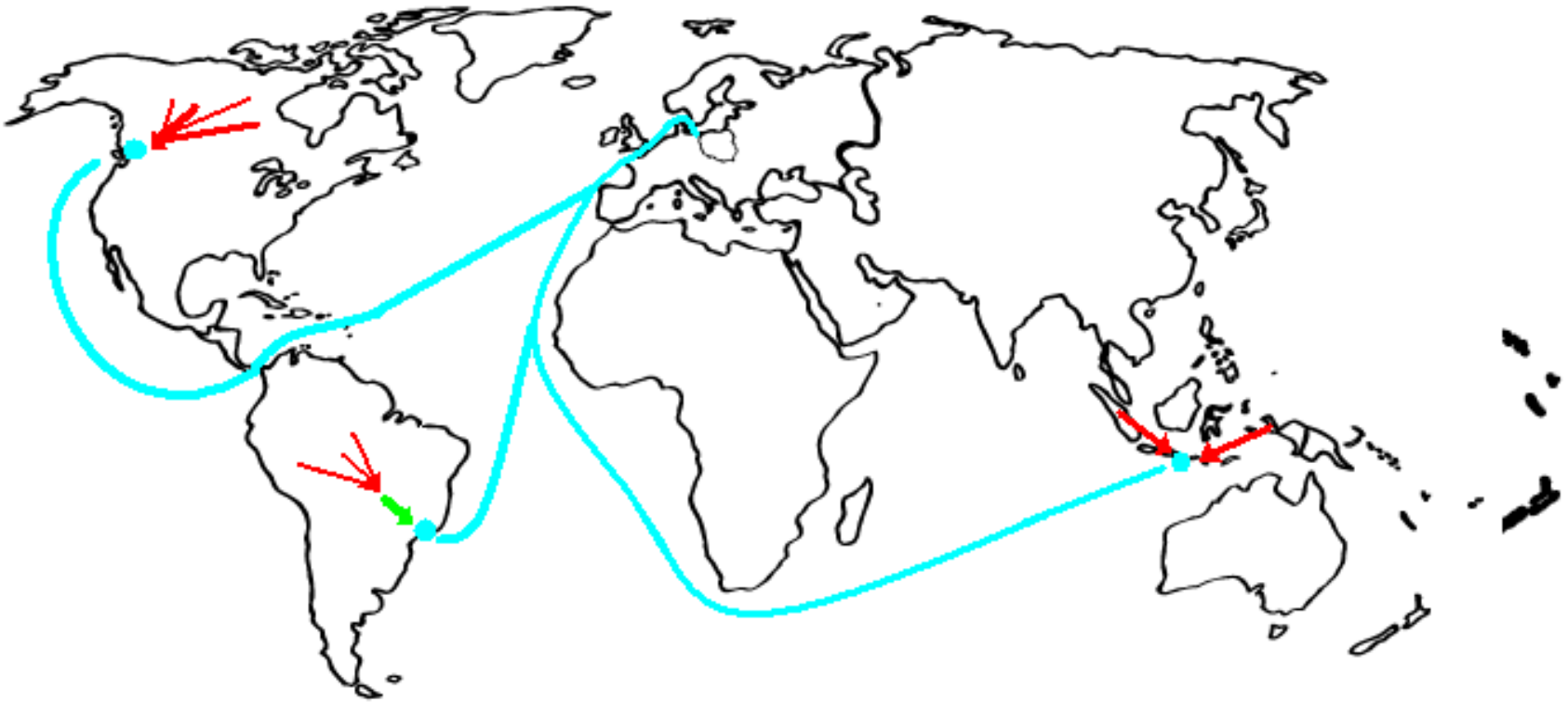


http://www.prw.pl/articles/view/17423/ekologiczny-paradoks

Embeded emissions and energy in transportation – cost of transportation

Costs of imports (also in hard currency)

Phytosanitary risks (fungi, insects, germs, seeds of aggressive plants.....)



Technological problems leading to energy losses:

- Slagging
- Chlorine corrosion
- Grinding
- Energy losses – decreased efficiency

http://jenkins.ucdavis.edu/previous/January2003/January2003.html,

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Energetyka, 11/2011, p. 733-736,

Criticism by experts and politicians

Eg: Dariusz Szwed (National Board of Polish Greens)

February 29, 2012 at the Polish Parliament hearing:

„Energy companies received ***1,7 bln PLN*** *(***ca 400 mln EUR***) of subsidies for co-firing. We hope that this should be subject of investigation of special parliamentary commission."*

Currently the Polish government considers phasing out this support, which meets strong opposition of co-firing industy

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The alternative is:

to use biomass first of all **locally**

i.e.

in small-medium size units

for countries with a climate similar to Poland it means:

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biomass should be used primarily

<u>for heating</u> in rural areas

this will

- **minimise the transportation needs**
- **create local jobs and**
- **help develop rural development**

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CENTRAL EUROPE
COOPERATING FOR SUCCESS.

EUROPEAN UNION
EUROPEAN REGIONAL
DEVELOPMENT FUND

4biomass

Central Europe Project 4BIOMASS

opinion survey on a sample of

1221 biomass experts

from:

Austria, Czech Republic, Germany, Hungary, Italy, Poland, Slovakia and Slovenia

*Authors: Katharina Renner, University of Vienna (statistical analysis)
Johannes Schmidl, Kerstin Schilcher Austrian Energy Agency
Vienna, September 2011

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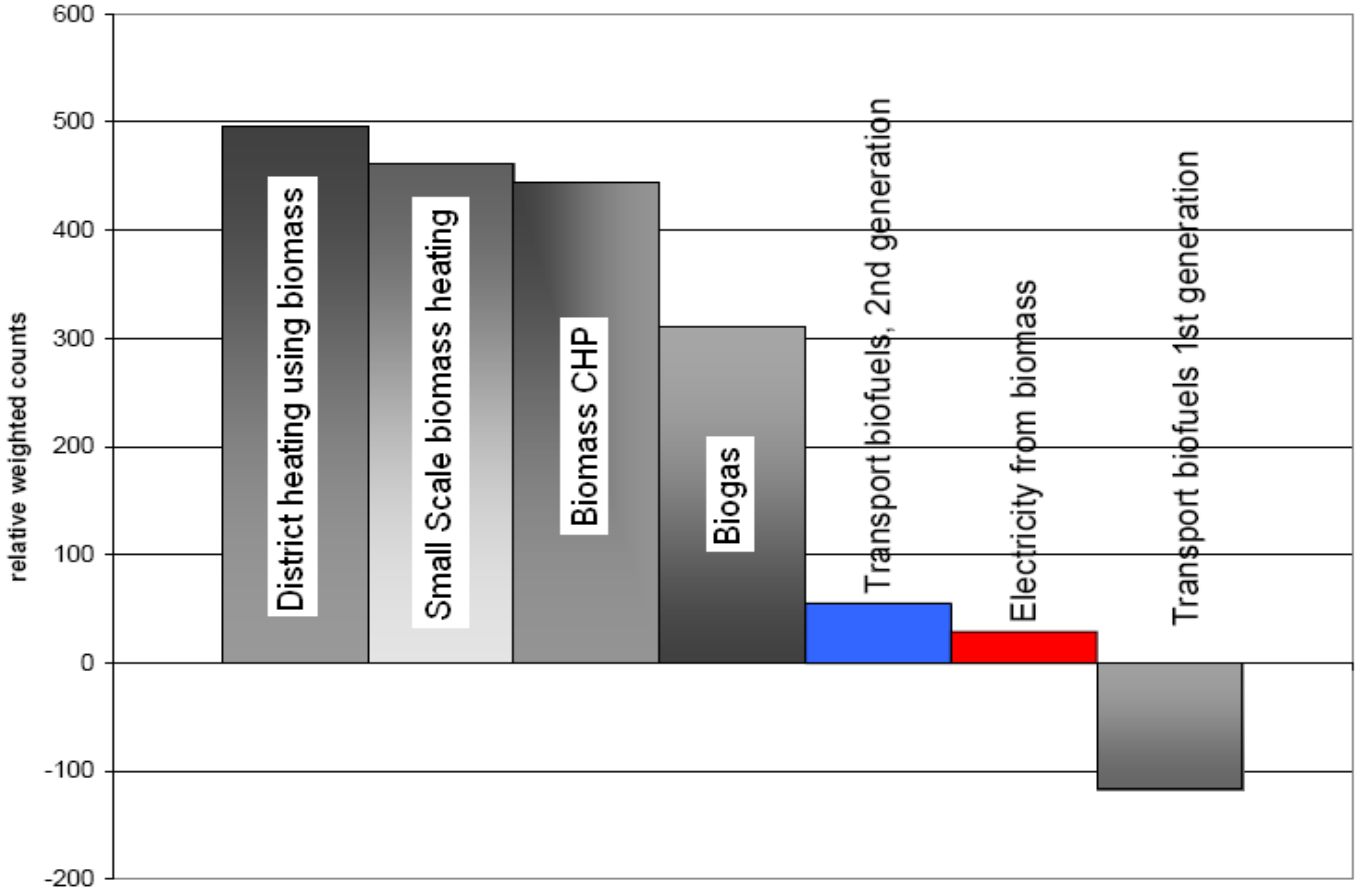
Weighted answers to the question:

Which kind of biomass use will be most important to achieve the environmental-goals in your country?



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The technology is mature

and

is readily available

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- **Left: 500 kW,**
- **Two cubical bails 1,8x1,2x0,7 m**
- **Right: 300 kW,**
- **One round straw bail 180cm diameter**

- **Heating of the school located in a palace and several public buildings in commune of Trzebiechow**
- **Savings several thousand Euro per year depending of the winter**

Chrzelice 100 kW





6 cubical straw bails **4 years payback time**

80x40x40 cm **water tank 6 m3 accumulating heat**

total cost 7000 Euro

but....

there is a challenge

to reduce dust emissions

especially in small-medium units (tens kW – 1 MW)

at cost of the additional investment that would be affordable for individual farmers

KIC InnoEnergy Project Bio-Eco-Matic

Partners:

MetalERG Company (SME)

AGH University of Science and Technology

Deutschen Biomasseforschungszentrum (**DBFZ**)

Tests.

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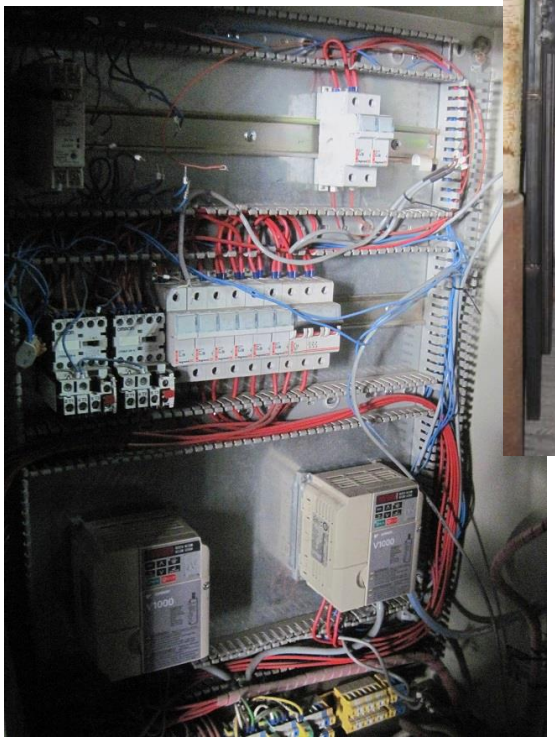
Electronic steering system



Multicyclone chamber
Measuring system

electrostatic participator,
measuring system

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Innovative solution (Metalerg Co patent):

straw bale drying

and pre-removal of particles

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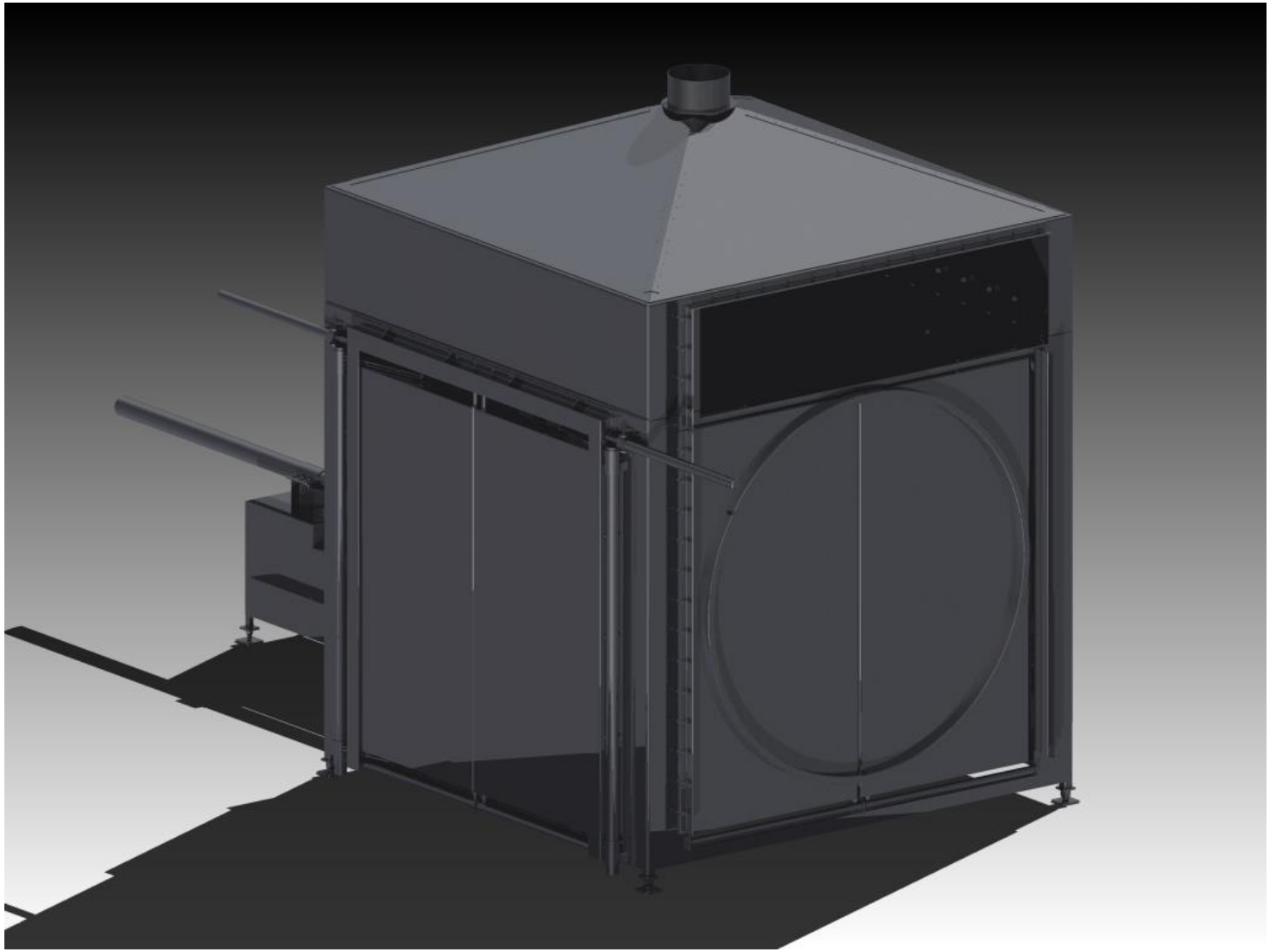

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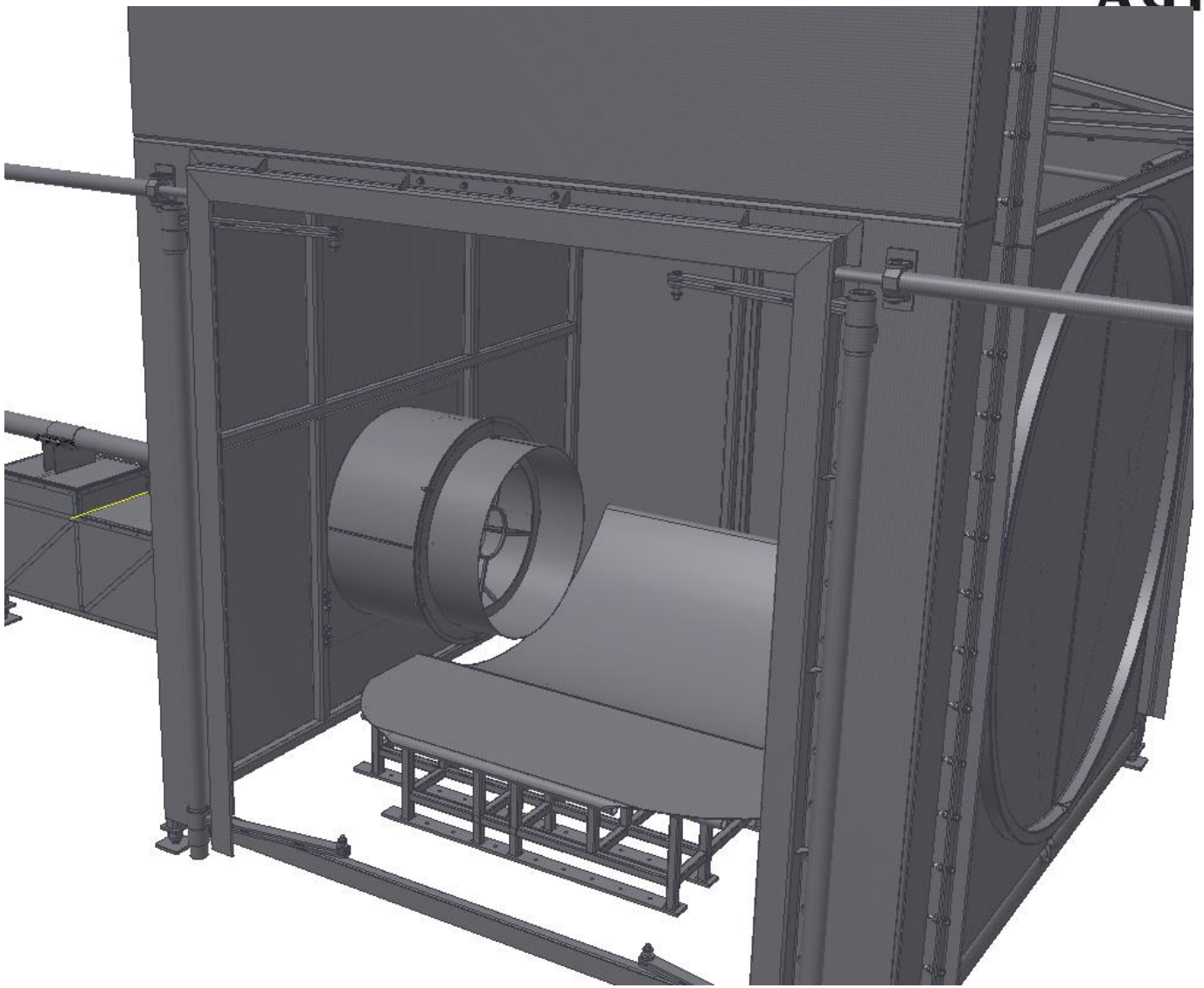

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Thank you