MetalERG- straw boilers

AN ECONOMIC AND TECHNICAL SUCCESS

We would like to present a case of successful business in Poland in green energy field. Polish company METALERG Oława, Poland.

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Alternative:

- **Local** use of biomass
- In **small**-to-medium size units
  (at present primarily for heat only)

Primarily in **rural areas** where biomass is available at spot
The technology is mature and is readily available.
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<th>Pollutant</th>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
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<tbody>
<tr>
<td>SO₂</td>
<td>68.9</td>
<td>15.8</td>
<td>14.0</td>
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<tr>
<td>NO₂</td>
<td>19.6</td>
<td>12.2</td>
<td>11.1</td>
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<tr>
<td>CO</td>
<td>272.6</td>
<td>92.1</td>
<td>99.4</td>
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<td>Dust</td>
<td>17.5</td>
<td>101.7</td>
<td>113.9</td>
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<tr>
<td>CO₂</td>
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<td>2'118.5</td>
<td>433.1</td>
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To deal with the dust emissions, MetalERG and AGH-University have received an 1,5 mln EUR EU grant from KIC InnoEnergy.

Project BioEcoMatic developing a commercial product (automatic boiler with filtering system)
Boiler production was begun in 1993 and consisted in conclusion of a licence agreement between the Metalerg company and Skeltek (Danish).

The licence concerned the transfer of Danish Technology to Poland.

The subject of the licence was a straw boiler RM 10 with 60 kW power manufactured by SKELTEK company for combustion of small square bales (80x40x40 cm). METALERG has begun manufacture of that type of boiler in 1993 and manufactures it during the next years till now.
But on the grounds of that boiler and its counter-current burning system, the company designed further sizes of the boilers, i.e. 40 kW, 100 kW, 200 kW, 300 kW, 400 kW, 600 kW and 700 kW sizes.

**They were named EKOPAL RM boilers**

There was also designed a complete boiler house set, so called “container boiler house” (with a water accumulation tank and connecting and control systems as well), also in different sizes.
In the boilers of different sizes also different bale sizes are burned (round bales with diameters from 125 to 180 cm and big square bales with dimensions 250x120x80 cm).

As for types of straw in our straw boilers various types of straw are burned with good result, for example wheat straw, barley straw or rape straw etc.

The thermal efficiency of our boilers is about 85%.
The boilers are implemented, depending on customer requirements, in farms, schools, small housing estates etc. in the Polish market and a lot of boilers were exported to different countries, especially to Scandinavian countries, to Denmark, Sweeden and Norvay.

In some years, for example in the period 1995 – 1999 we exported to Denmark about 50 – 60 straw boilers per year.

During the last years the export of the boilers was lowered, but export of “container boiler houses” was increased.

Additionally we started to export our boilers to another countries, such as Germany, Chech Republik or the Scotland, Russia, China!!.
In 2006 a new product in the range of straw combustion objects has been designed and made at METALERG company.

It was the **air heater** assigned to replace oil burners or gas burners in grain dryers, especially in dryers for drying such grains like maize, because the air heater can produce air with temperature up to 130°C. Such temperature is required for drying maize in all types of dryers used in Poland. It is not possible to obtain such high temperature in normal straw boilers with water operating in open system, where water can be heated up only to ab. 95°C and in a heat exchanger we can heat air only up to 75-80°C.
The air heater design is based on the counter-current combusting system, like in normal water straw boilers operating in open system, but water is replaced by thermal oil which can be heated up to more than 200°C and in a heat exchanger air can be heated up to 130°C required.

The heat from straw combustion is transferred to the thermal oil with flue tubes and due to that the thermal oil is heated up to more than 200°C.

In the space of thermal oil there through-pipes are mounted, through which air from the outside flows, transferring the heat from the thermal oil to the air.
The air is sucked through the pipes with a fan located behind the air heater. Now we have 3 sizes of the air heater, i.e. 300 kW, 750 kW and 1000 kW.
They are named **EKOPAL S air heaters**

Till now we have sold more than 10 air heaters for Polish farmers and 20 air heaters have been exported to other countries (Kazakhstan, Russia, Romania).

Our program for further activity concerns mainly on export development of straw boilers to another countries, like Russia, Ukraine Slovakia etc. and to increase production of “container boiler houses” for Skandinavian and UK countries.
Taking in consideration benefits from 18 year cooperation of the two companies, METALERG and SKELETEK, another Danish company REFO ENERGY, KÖGE, Denmark started to cooperate with METALERG in 2005 in production of automatic boilers for combustion such biomass materials like pellets, wooden chips, grain etc.
This cooperation obtained good results till now and presents promising prospects for the future.
THANK YOU FOR YOUR ATTENTION