



Tendencies and Opportunities for Utilization of Farm Waste for Production of Clean Energy (biogas) in Leningrad oblast, Russia



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Leningrad oblast – waste of animal farms



- Livestock and swine breeding waste **400,000 ton yearly**
 - Chicken plants waste **800,000 ton yearly**
- Totally **1,2 mln ton** (independent experts: **3-3,5 mln ton**)

Leningrad oblast – waste of animal farms

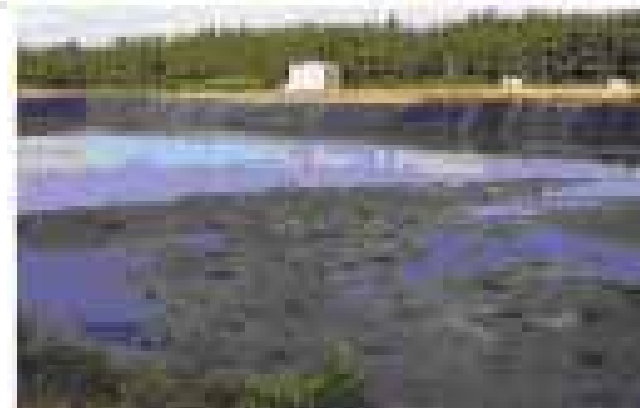
Dung yield

	per day, kg	per year, ton
Cattle	55	20,1
Pig	12	4,4
Poultry	0,6	0,22



Leningrad oblast - waste of poultry breeding farms

- 17 big and medium scale plants
 - 20 millions poultry (chickens)
- 800,000 ton waste:
- 3,000 ton Phosphorus & 14,000 ton Nitrogen
- 90 dung storages – 70 % in bad conditions
- 10 % waste flows to the Gulf of Finland
- Limit 20 kg P per hectare (EU) –
- 4 % may be utilized at the farm lands



Biogas from the farm waste - opportunities

In 2008 - 5 % farm waste were processed into biogas in RF
Three ways for utilization for energy production are under consideration:

1. Direct production of biogas from waste.
2. Production of pellets for burning.
3. Direct burning.

Pellets from poultry dung:

- 1,8 times cheaper than natural gas,
- 2 times cheaper than coal,
- 4 times cheaper than oil fuel.

3000 ton dung - 1 ton pellets - 3,5 кВт•ч

Replacement of 55-80% farm energy consumption.



Biogas from the farm waste - opportunities

Biogas production from one ton of dung:

- Cattle - 60 m³
- Pigs - 65 m³
- Poultry - 50 m³



1 m³ of biogas (50-70% methane):

- **3-6 kW*hour electricity or 3-6 kCal heating energy**

Energy consumption of Primorshoe village 500 MWt*h/month near biggest poultry plant Roskar.

Then it needs about 100 000 m³ biogas,

processing 2,000 ton dung monthly (Roskar – up to 8,000)

Biogas from the farm waste – positive example

Agro-complex Kovdorskij (Murmansk oblast)

320 cattle

1,000 pigs

56,000 poultry

Biogas equipment (4 meta-tanks) –
10,000 EUR, paid back in 8 months

Profit in 2005 - 170 000 EUR
(biogas & fertilizes)

In 2006 - 340,000 EUR

Energy supply for the agro-complex
and part of neighbor settlement



Biogas from the farm waste in Leningrad oblast – prospects

Companies, developing plans of dung utilization for energy purposes:

- Ruchyi (2,500 cows, 10,000 pigs) – US invested \$ 0,5 mln. Burning & producing briquettes from 18 ton dung per year. Biogas production – under planning.
- Roscar (2.9 mln chicken) – biogas production under planning, investment € 16 mln is needed (Biolan, Finland);
- Primorskaya (0,7 mln chicken) - project on biogas production on \$ 10 mln



Burning or biogas production?



Biogas from the farm waste in Russia – barriers and challenges

- National Program “Development of agricultural sector in RF” will cause grows of a/c industry and amount of waste on 30 %.
- NP doesn't include any measures on environmental management and utilization of agricultural waste.
- **Challenges:** to revise National Program “Development of Agricultural sector, adopt Federal Law on Resource Saving.



Biogas from the farm waste in Russia – barriers and challenges

- 8.01.2009 Russian Government Decree:

Renewable energy to 2010 - 1,5%,

2015 – 2,5%,

2020 году – 4,5%.

No yet mechanisms of its implementation,
agriculture is not mentioned.

- **Challenge** - link RE to the resources of agricultural sector, support initiatives of decentralized energy solutions.

A scenic landscape featuring a vibrant green field in the foreground, a large, leafy tree on the right, and a body of water in the lower half. The sky is filled with large, white, fluffy clouds. In the distance, several dark-colored cows are grazing on the grass.

Thank you!

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