

ENERGY EFFICIENCY CENTRE GEORGIA

CDM as Instrument for Industrial Development and Poverty Alleviation in Caucasus"

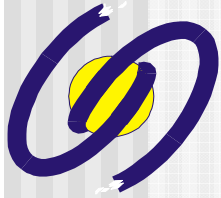
Small Biodigesters for Georgian Regions

**MINISTRY OF ECONOMIC DEVELOPMENT
ENERGY EFFICIENCY CENTRE GEORGIA
*MALKHAZ SANIKIDZE / LIANA GARIBASHVILI***

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Tbilisi, Georgia





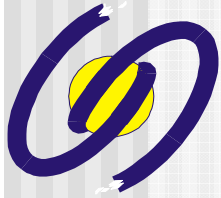
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Small Biodigesters for Georgian Regions

**Applicant: Ministry of Economic Development ,
Department for Regional Policy Development**

**Project Location: 10 regions of Georgia- Racha,
Guria, Samtskhe-Javakheti, Shida Kartli,
Kvemo Kartli, Mtskheta-Mtianeti, Adjara,
Kakheti, Samegrelo-Svaneti, Imereti.**





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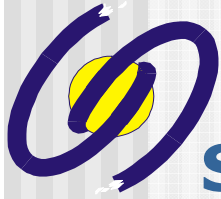
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Project Background-in Georgia there are about 600 000 small farms. In 1997-2006 growth of animal husbandry is estimated at 29,8%, which means the growth of bio energy potential in the country. Current total number of cattle on farms is about – 1265100 heads.

Annually about 20 mln.tons of animal waste remains on farms causing serious environmental problems.

Only pilot biogas programs have been implemented with support of donors. Currently 337 small biogas digesters are functioning in the country.



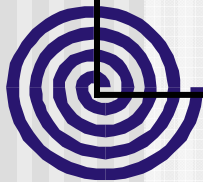


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Project activities: Construction of 10500 small biodigesters in rural regions. The proposed project envisages the installation of 3 various types of spherical biogas digesters with capacity 1,5 m³, 2 m³ and 4 m³ constructed of polymeric-fiber material with the expected lifetime of 20 years.

Number of heads	Daily manure, kg	Digester volume, m³	Received biogas, m³	Cost USD
4	100	1,5	1,3	2450
6	150	2	1,9	2780
10	250	4	3,1	3270



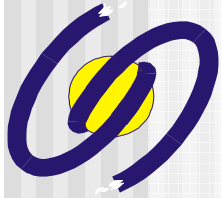


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Year	Type of digester	Number of digesters	
2008	1,5 m3	600	1500
	2 m3	600	
	4 m3	300	
2009	1,5 m3	1200	3000
	2 m3	1200	
	4 m3	600	
2010	1,5 m3	1200	3000
	2 m3	1200	
	4 m3	600	
2011	1,5 m3	1200	3000
	2 m3	1200	
	4 m3	600	
			10500





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CH₄ emission from manure management

GWP * 1/1000 * N heads * 13 kg/head/yr

According to IPCC Tier 1, Emission factor for methane emission from manure (cow & buffalo) is taken to be 13 kg/head/yr

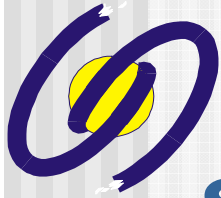
CH₄ emission from manure management for various types of digesters:

1,5 m³ digester-**1,092 tCO₂e/yr**

2 m³ digester-**1,638 tCO₂e/yr**

4 m³ digester-**2,73 tCO₂e/yr**





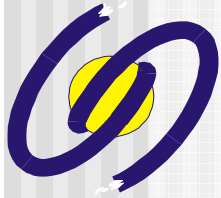
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**The proposed project envisages the gradual construction of 10500 plants, thus estimated annual emission reductions after the plants are constructed will be- 17 199 tCO₂eq/year
For the 10 year crediting period emission reductions will be- 132 440 tCO₂eq/year**

Emissions tCO₂ 2008-2012

2008	512
2009	4573
2010	9623
2011	14537
2012	17199





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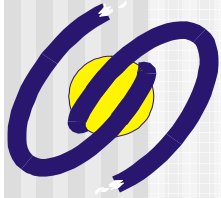
Additionality

Barriers to the project implementation:

- Investment barrier
- Technical barrier
- Barrier from Prevailing practice

demonstrate that the proposed CDM project is additional





Small Biodigesters for Georgian Regions

Expected contribution to sustainable development :

Increased local incomes- reduced expenditures for household energy needs (fire wood).

Residual biological slurry from biogas plants can be used as superior organic fertilizers to enhance agricultural yields. Additional income from selling locally excess of received fertilizer.

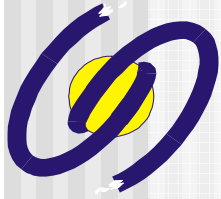
Improved local environment and health-

ground and surface water contamination reduced;
improved indoor air quality for families;

Reduction of CH₄ emissions; diversification of rural energy supply reducing deforestation;

Social aspects- reduced respiratory illnesses better living conditions, employment opportunities;





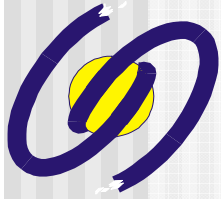
Cost and financing:

Estimated revenues from sale of emission reductions for 10 years:

€ **132 440** x 12 = € 1 590 000 about
2,5 ml USD

Expected scheme of financing the project: Renewable Energy Revolving Fund-
7 mln.USD





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THANK YOU

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