PROBIOPOL

Biogas Polygeneration for Romania

SIXTH FRAMEWORK PROGRAMME

Technical Equipment and components of an industrial biogas polygeneration plant which could be produced in Romania

Dr.-Ing. Dragos Balan

Sibiu, 18. 3. 2009

Cuprins

PROBIOPOL
Biogas Polygeneration for Romania

1. Analiza componentelor care pot fi produse in Romania
2. Materiale folosite
3. Standarde
4. Producatori identificati in Romania
5. Concluzii

1. Analiza

PROBIOPOL
Biogas Polygeneration for Romania

Identificarea componentelor:

- Discutii cu specialisti si membri in proiect
- Road-show in Germania in Feb. 2008:
  - Vizitarea de centrale de biogaz la fata locului
  - Vizitarea a doi producatori de centrale din Germania (BioConstruct si Haase)

1. Analiza

PROBIOPOL
Biogas Polygeneration for Romania

Etape:

Componentele unei centrale

↓

Materiale

↓

Detalii tehnice (volum,diametru,etc.)

↓

Standarde pentru componente

1. Analiza
Componente

PROBIOPOL
Biogas Polygeneration for Romania

- Fermentatorul
- Rezervor amestec
- Hala si rezervoare primire materie prima
- Rezervor igienizare
- Rezervor substrat
- Incalzire fermentator
- Conducte substrat
- Conducte gaz
- Conducte apa
- Conducte incalzire
- Conservare caldura
- Rezervor de desulfurizare
- Filtru biologic si cos de evacuare
- Arzator gaz
- Mixer fermentator
- Generator electric

2. Materiale

PROBIOPOL
Biogas Polygeneration for Romania

Materiale pentru componente

- **1) Beton / Concrete**
- **2) Conducte / Piping**
- **3) Metal / Steel**
- **4) Electricitate / Electrical**
- **5) Lucrari de constructie / Solid works**

2. Materiale

PROBIOPOL
Biogas Polygeneration for Romania

- **1) Beton (rezervoare)**
  - **1.1. Beton armat**
  - **1.2. Beton fundament**

- **2) Conducte**
  - **2.1. Conducte inox**
  - **2.2. Conducte tabla neagra**
  - **2.3. C. tabla neagra izolata**
  - **2.4. Conducte PEHD**

2. Materiale

PROBIOPOL
Biogas Polygeneration for Romania

- **3) Metal (rezervoare)**
  - **3.1. Inox**
  - **3.2. Inox emailat**
  - **3.3. Placi metal**
  - **3.4. Tabla neagra**
- **4) Electricitate**
  - **4.1. Cabluri electrice**
  - **4.2. Motoare**
- **5) Lucrari constructie**
  - **5.1. Lucrari beton**
  - **5.2. Suduri tabla**

3. Standarde

PROBIOPOL
Biogas Polygeneration for Romania

Standarde pentru materiale folosite in constructia de centrale de biogaz

- **RAL GZ 629** German Quality-Guarantee-Standard , Germany, March 2001
- **VDMA 4330** “Biogas-plants. Suggestions for planning, realization and function”, Germany, February 2006

3. Standarde germane pentru materiale folosite in centrale de biogaz

PROBIOPOL
Biogas Polygeneration for Romania

Norma DIN		**RAL-GZ-629 chapter**
DIN 1045	Metal si INOX	2.3.1.2
DIN 28052	Beton emailat	2.3.1.2
DIN 4030	Agresiune chimica	2.3.4.1
DIN 8074	Conducte, armaturi pentru gaz	2.3.8.1.
EN 10204	Conducte	2.3.8.1.1
DIN 2403	Conducte substrat	2.3.8.1.1
DIN 16986	Conducte aer cald	2.3.8.3.1.
E DIN 12319-2	Conducte aer cald	2.3.8.3.1.
DIN 16969	Conducte aer cald	2.3.8.3.1.
VD 2055	Conducte aer cald	2.3.8.3.1.
DIN 2740-1	Conducte gaz pentru presiuni p<16 bar. Cerinte impuse componentelor de montare conducte	

4. Producatori identificati in Romania

PROBIOPOL
Biogas Polygeneration for Romania

Beton armat	Conducte inox	Conducte tabla neagra (+ izolare)
DIN 1045	**EN 10204**	**EN 10204**
Constructim	Profiland/Intfor Galati	Lugomet
General Beton	Polymetal Bucuresti	Profiland/Intfor Galati
Incontro Prefabricati	Otelinox Targoviste	Girometal Galati
Promokonstruct Bucuresti	Ispat Siderurgica Hunedoara	Tubomet Craiova
Metabet CF Arges	TMK Resita	Polymetal Bucuresti
Iridex Group Constructii Bucuresti	Tenaris Silcotub Zalau	Tenaris Calarasi
Constructii Feroviare Craiova	Petrotub Roman	Tenaris Silcotub Zalau
Arcom Bucuresti	Tenaris Calarasi	Zimtub Zimnicea
Chrytis Brasov	Zimtub Zimnicea	
Sinecon Sibiu	Technosteel LBR Iasi	
Aedificia Carpati Bucuresti		
Cominco Bucuresti		
Diekat Construct Bucuresti		
Trust Construct Ros. de Vede		
Transilvania Constructii CJ		

4. Producatori identificati in Romania

PROBIOPOL
Biogas Polygeneration for Romania

Conducte PEHD	Inox (+emailat)	Placi metal
EN 10204		
Romcarbon Buzau	Duroterm	Bega Tehnomet
Plastunion Baia Mare	Lugomet	Duroterm
Pipelife Bucuresti	Rominex	Lugomet
Samiplastic Suceava	Otelinox Targoviste	Neferprod
Valrom Bucuresti	Ispat Siderurgica Hunedoara	Rominex
Metalplast Buzau	TMK Resita	TCP
Magureni Constructii	LaForja Cluj	Industrial Steel
Pipepex Timisoara		LaForja Cluj
		Galfiband Galati
		Otelinox Targoviste
		Ispat Siderurgica Hunedoara
		TMK Resita
		MetalPanel Bucuresti

4. Producatori identificati in Romania

PROBIOPOL
Biogas Polygeneration for Romania

Tabla neagra	Cabluri si legaturi electrice	Motoare electrice
	Rombal Targu Mures	Mahle
Duroterm	Romcab Targu Mures	Sircuc
Lugomet	Romlux Targoviste	Bega Electromotor
Mettim	Electroplast Bistrita	IameGrup Sf. Gheorghe
Rominex	ICME ECAB SA Bucuresti	UCM Resita
TCP	Iproeb Bistrita	Ana Imep S.A.
Profiland/Intfor Galati	RCB Electro Bistrita	Electroprecizia Brasov
Exparom Galati	Paderteg Sibiu	UMEB Bucuresti
Rovimetal Galati	DRM DRAEXLMAIER Satu Mare	Braco Industrial Bragadiru
Galfiband Galati	Pirelli Romania Slatina	Componente Industriale Barlad
Polymetal Bucuresti	Geca Bucuresti	TMD Filiasi
	Romcablu Valenii de Munte	Electroputere Craiova

4. Producatori identificati in Romania

PROBIOPOL
Biogas Polygeneration for Romania

Lucrari civile si cu beton	Sudura	Transport greu
DIN 28052		
General Beton	AD Profial	Universal Transport
Constructim	Bega Tehnomet	Trafictrans Bradu - Sibiu
Incontro Prefabricati	Lugomet	Apromet Oradea
Promokonstruct Bucuresti	LaForja Cluj	Holleman Bucuresti
Metabet CF Arges	Sudometal Cluj	Van der Vlist
Iridex Group Constructii Bucuresti	Asam Iasi	TAS Constanta
Constructii Feroviare Craiova	Cautis Bucuresti	Obermair Cluj-Napoca
Arcom Bucuresti	Dovexim Oradea	TSR Remarul Cluj
Aedificia Carpati Bucuresti	Metal Techniks Rm. Valcea	Rontransmar Bistrita
Cominco Bucuresti	Sudometal Bacau	International Alpha Trans Ploiesti
Diekat Construct Bucuresti	Sacomet Braila	Intermodal Bucuresti
Trust Construct Ros. de Vede	Indrimet Chisoda	TimTranzit Bucuresti

4. Producatori identificati in Romania (WP 2.4.)

PROBIOPOL
Biogas Polygeneration for Romania

Categorie	Nr. firme
Beton	25
Conducte	17
INOX/Metal	13
Electric	33
Sudura / confectii metal	21
Conducte PEHD	8
INOX emailat	8
Placi metal	13
Tabla neagra	10
Motoare	11
Lucrari beton	14
Transport greu	15

5. Concluzii
Parte procentuala din costurile totale. Exemplu

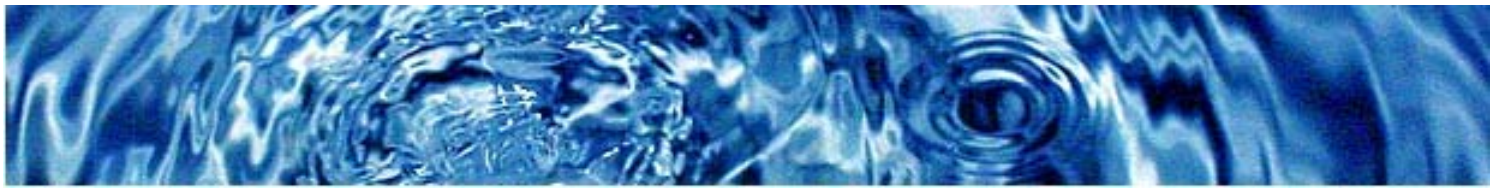
PROBIOPOL
Biogas Polygeneration for Romania

Engineering	70.000 €	3,1			
Preparing the site	12.000 €	0,5			
earthworks	150.000 €	6,6			
feedstock cavity	30.000 €	1,3			
Piping including Armatures	93.000 €	4,1			
Compressor (Air)	3.000 €	0,1			
Input for Feedstock	80.000 €	3,5			
first Digester [2000 m³]	240.000 €	10,5			
second Digester [2000 m³]	220.000 €	9,6			
Gassystem and - analyser	13.000 €	0,6			
Gastreatment / drying	37.000 €	1,6			
Tank for Digestate [3000 m³]	145.000 €	6,4			
CHP-Plant 537 kWel	440.000 €	19,3			
Flare	25.000 €	1,1			
Electric equipment	60.000 €	2,6			
Pumps	20.000 €	0,9			
Process measurement	20.000 €	0,9			
concrete works	10.000 €	0,4			
Lorry-Balance	35.000 €	1,5			
Transformator	40.000 €	1,8			
miscellaneous	30.000 €	1,3			
land / estate	200.000 €	8,8			
Feeder to electric grid	50.000 €	2,2			
Heat-distribution	10.000 €	0,4			
infrastructure (roads, water)	70.000 €	3,1			
permits	30.000 €	1,3			
spare parts	150.000 €	6,6			
Total costs	2.283.000 €	100,0	100,0	41,4	%

5. Concluzii

PROBIOPOL
Biogas Polygeneration for Romania

- **Nu doar bigazul, ci si constructia centralelor este profitabila**
- **Not only the biogas, but also the construction of biogas-plants is profitable**

Ar mai fi multe de spus. Daca doar as sti ce…

There is much more to say. If I only knew what…