

Appendix I.

Bayreuth, 10 March 2016

拜羅伊特, 2016 年 3 月 10 日

项目建议书和可行性简要分析 Project proposal



项目名称:

雏鹰农牧集团股份有限公司尉氏分公司
1百万头生猪产业化基地沼气发电项目
和开封雏鹰肉类加工有限公司
日产500吨污水处理项目
可行性分析
地址: 尉氏, 开封, 河南 中国

Project:

Biogas plant pig farm
Chorying AGRO-PASTORAL GROUP Co. Ltd.
Weishi Branch
Weishi, Kaifeng, China

**Chorying AGRO-PASTORAL GROUP
Co. Ltd.
Weishi Branch
Weishi, Kaifeng, China**

Dear Sir.

It is us the HOEBA Group are honored to introduce our biogas plants with the best and most profitable system at the moment.

We are in a position producing through our special system 365 days biogas.

The recovered energy (methane gas) we transform into electricity and heat.

The heat (over 400 ° C) can be used prepare hot water or to change through heat exchangers in refrigeration.

Full of energy yield of methane gas.

In the following quotation, we present a sample of a biogas plant.

From the groundbreaking to finish our offer includes everything.

Planning

Concrete work and earth work

Machine Technology

Commissioning

Familiarization training for staff

The detailed role and functioning of a biogas plant is following in detail.

The biogas plant will be ready for the existing methane converted into electricity.

Next is dried manure in bags packaged for sale processed.

Similarly, high-quality liquid fertilizer (nitrogen and phosphorus fertilizer) won that can be sold.

According to our experience we can for your documentation a

Biogas production of circa: **m³/a** **11.223.400**

Electricity production of circa: **kWh/a** **28.339.200**

Heat production of circa: **kWh/a** **30.012.000**

CO² Grants:?????

This biogas project shall be implemented as CDM

**维鹰农牧集团股份有限公司尉氏分公司
尉氏, 开封, 河南 中国**

亲爱的先生。:

我们赫巴 (HOEBA) 集团很荣幸能有机会向您介绍我们目前最先进的和有经济效益的沼气生产系统。

我们有能力通过我们的特殊沼气生产系统确保 365 天连续运营。

从沼气中被回收的能源(甲烷气)将被转换成电能和热能。

热能(400 度以上)可被用于准备热水或通过换热器转换后用于制冷。

可以使发酵原料达到最大的产气量

在下面的報價中, 我們提供了一個完整的沼氣廠的模式。

我们的报价包括從地面土建 (包括建筑材料) 到交钥匙工程全部完工的一切程序:

規劃 (方案设计)

混凝土工程和土方工程

機械技術

調試 (试运转)

员工的熟悉培训工作

沼氣廠詳細的作用和功能的詳細說明如下:

沼氣廠將可以對沼气中的甲烷气体轉化成電力, 热能或天然气, 车用燃气。

其次是袋包裝干燥肥料 (沼渣) 的出售。

同樣, 高品質的液體肥料-沼液 (氮, 磷肥) 可以出售。

根据我们的经验和你们提供的资料, 我们可以估算出

沼气生产量大约为: **m³/a** **11.223.400**

如果产生的沼气全部用来发电,

可产生的电能大约为: **kWh/a** **28.339.200**

产生的热能大约为: **kWh/a** **30.012.000**

二氧化碳 证书:?????

该沼氣工程將根據京都議定書 (清潔發展機制) 第12條規

project according to Article 12 of the Kyoto Protocol (Clean Development Mechanism), and its associated rules of the CDM Executive Board (EB) to the United Nations Framework Convention on Climate Change (UNFCCC).
A detailed report on the CDM procedure can be found following.

定, 以及相关的聯合國氣候變化框架公約 (UNFCCC) 清潔發展機制 (CDM) 執行理事會 (EB) 的相關規則, 作為CDM (清潔發展機制) 項目實施。

關於清潔發展機程序的一個詳細的報告可從下面段落找到。

QUESTIONS FOR THE KIND AND QUANTITY OF LIQUID ANIMAL MANURE 有关动物液体粪便的种类和数量的问题

Liquid animal manure 液体动物粪便	Quantity Piece 数量 Kg/头 · 天	% drying substance 干物质	% organic drying substance 有机干物质
PIGS 猪 ; 640.000pcs			
Breed sows 繁殖母猪 ; 42.400pcs	2.8kg	29%	26%
Piglet 小猪: 100.000pcs	0.6kg	26%	22%
Runner 20 - 50 kg, 20-50 公斤的猪 : 140.000pcs	1.2kg	28%	24%
Pigs over > 50 kg 50 公斤以上的猪: 300.000pcs	1.8kg	29%	25%

2.)

Litter 干草 (草荐) Kind of indoor livestock farming 牲畜饲养场的种类	Columns ground Piece 存栏猪数量	Straw Piece 秸秆量	wood shavings Piece 木刨花	Other Stuff Piece 其他材料
PIGS 猪	640.000			
Breed sows 繁殖母猪	42.400			
Piglet 小猪	100.000			
Runner 20 - 50 kg 20-50 公斤的猪	140.000			
Pigs over > 50 kg 50 公斤以上的猪	300.000			

3.)

Litter per day per animal 每头猪每天的干草 (草荐)	Columns ground Water kg per animal 存栏量每头猪 每天用水的公 斤数	Straw kg per animal 每头猪每天用 稻草的公斤数	wood shavings kg per animal 每头猪每天用 木屑或刨花的 公斤数	Other Stuff kg per animal 每头猪每天使 用的其他材料 的公斤数
PIGS 猪				
Breed sows 繁殖母猪	30			
Piglet 小猪	10			
Runner 20 - 50 kg 20-50 公斤的猪	15			
Pigs over > 50 kg 50 公斤以上的猪	20			

important Note

The pig manure has a very low concentration of dry solids
The power of the biogas plant can be considerably increased if the dry matter can be increased in the slurry.
The manure is passed through a separator, and raised the dry substance to approximately 15%.
The manure with the increased dry matter content is fed to the fermenter.
The thin phase of the manure is used directly as a liquid fertilizer

重要提示

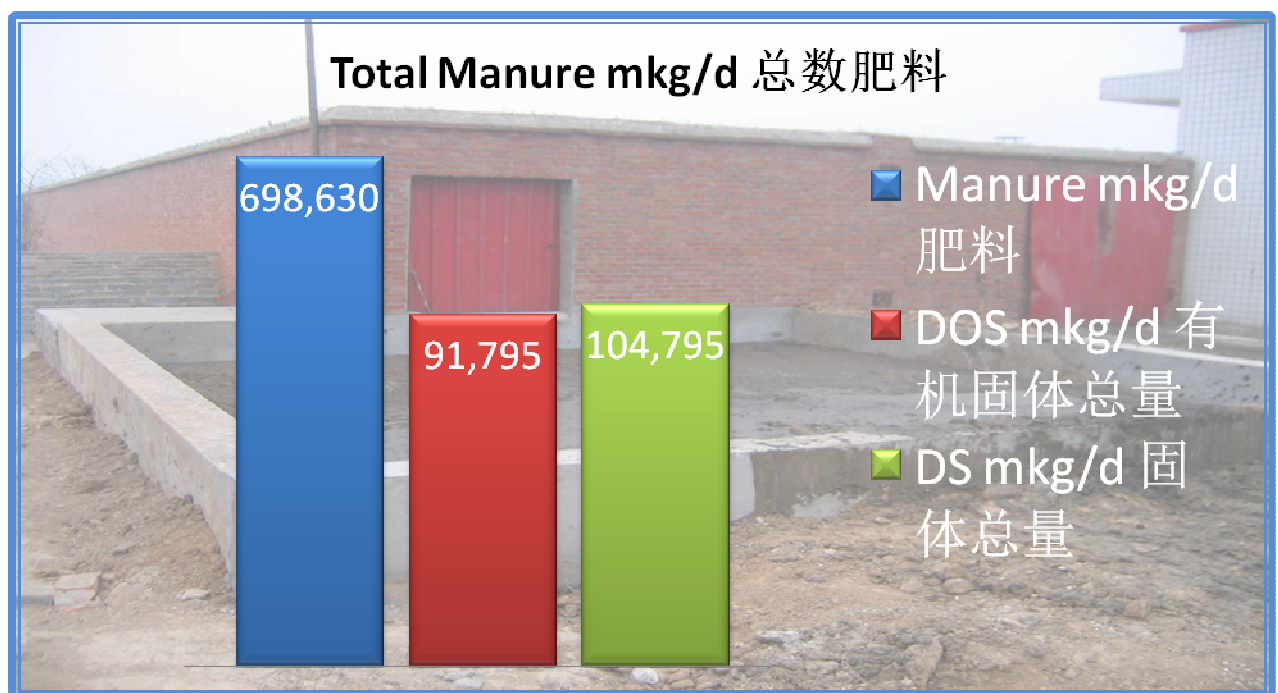
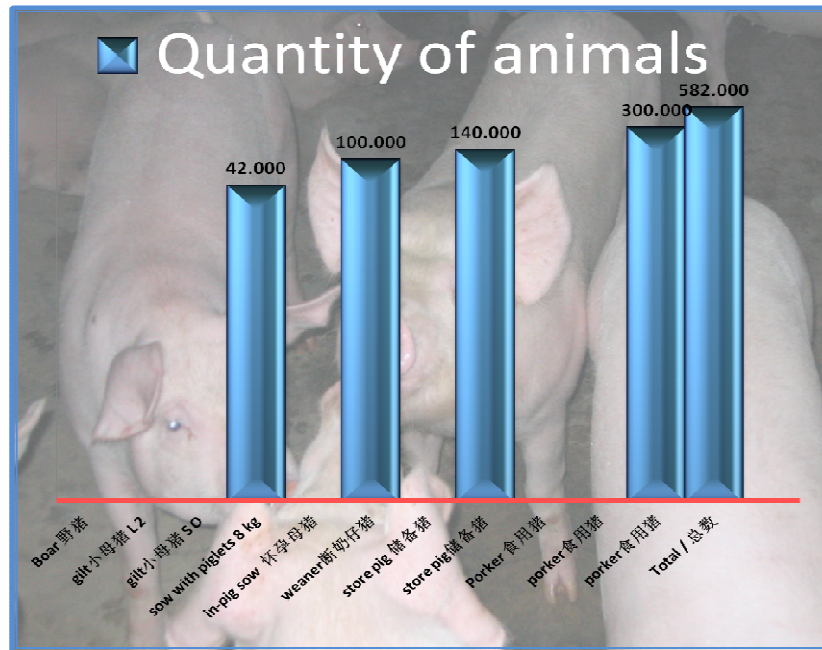
猪粪污水的干物质浓度非常低
如果在发酵浆料中增加干物质的含量，沼气的效能可以被大大增加，
原始的发酵浆穿料通过一个分离器，可以把干物质的含量增加到约15%。
把增加了干物质含量的浆料放进发酵罐发酵。
干物质含量稀少的粪水可直接用作液体肥料。

Dung and sewage processing concept

粪便和污水处理概念

SUBSTRATES FOR THE FERMENTATION BIOGAS PLANT 沼气发酵厂的基质				
Substrate 基质	unit 单位	Sows manure 猪粪便	Sows manure Concentrate 猪粪便/浓缩	Total 总数量
Amount 总数	Mg/ a ¹⁾ 吨/每年	842.466	238.699,00	238.699
	kg/d 公斤/每天	2.465.753	698.630,00	698.630
Dry solids 固体总量	% (百分比)	5,00	15,00	14,70
Organic dry solids 有机固体总量	% (百分比)	4,40	13,10	12,80
yield of Gas 产气量	l/kg ods		360,00	360
Methane content 甲烷含量	% by volume 与总体积的百分比		62,00	62
Dry solids-freight 干物质	kg/d 公斤/每天		104.795,00	104.795
Organic dry solids-freight 有机干物质	kg/d 公斤/每天		91.695,00	91.695
Bio Gas production 沼气产量	m _h ³ /d 立方米/每天		33.010,00	33.010
	m _h ³ /h 立方米/每小时		1.375,42	1.375
	m _h ³ /a ¹⁾ 立方米/每年			11.278.510
Methane production 甲烷生产	m _h ³ /d 立方米/每天		20.466,20	20.466
relative proportion 相对比例	% (百分比)		100,00	100
Biogas production 沼气生产	m _h ³ /1000 kg FM 立方米/ 每吨液体发酵原料		43,30	43
Calorific value 热值	kWh/a ¹⁾ 千瓦时/每年			69.723.976
Calorific value 热值	kWh/d 千瓦时/每天		205.070,52	
Calorific value 热值	kWh/h 千瓦时/每小时		8.544,60	
Power, electrical 电能	kWh/a ¹⁾ 千瓦时/每年			28.339.200
Power, electrical 电能	kWh/d 千瓦时/每天		83.350,59	
Power, electrical 电能	kWh/h 千瓦时/每小时		3.472,94	
Power, thermal 电能, 热能	kWh/a ¹⁾ 千瓦时/每年			30.012.000
Power, thermal 电能, 热能	kWh/d 千瓦时/每天		88.270,59	
Power, thermal 电能, 热能	kWh/h 千瓦时/每小时		3.677,94	

¹⁾ 340 operating activities/yearly = 100% 每年340天100% 运转率

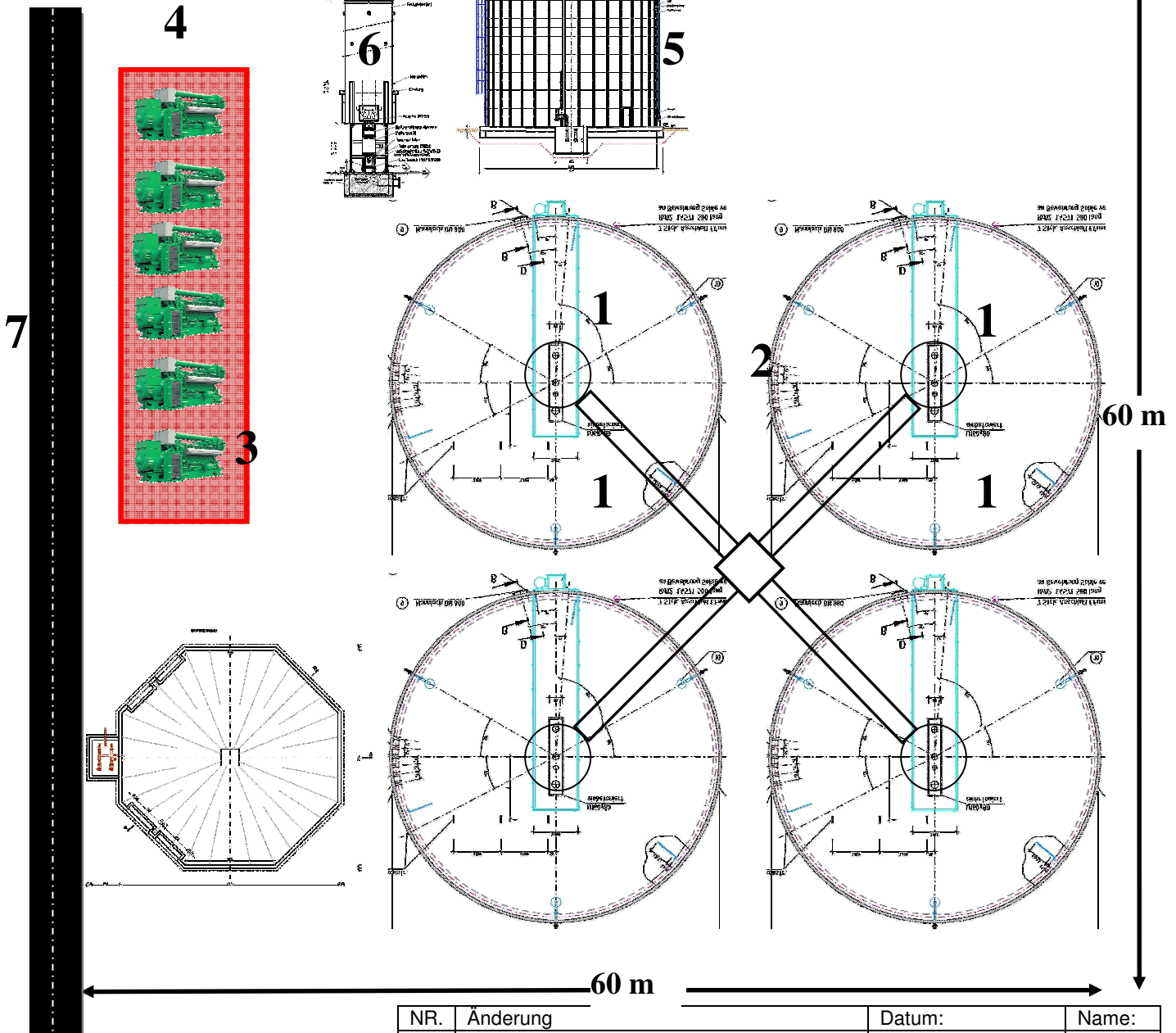


PROCESSING PARAMETERS / 工藝參數

Operational mode Mesophilic

运作模式 中温

Operating temperature 操作溫度	°C (度)	35 – 38
Fermenter diameter 发酵罐直径	m (米)	20,49
Fermenter - Height (cylinder) 发酵罐 - 高度 (圆柱体)	m (米)	19,63
Fermenter - Height (total) 发酵罐 - 高度 (总高)	m (米)	22,45
Fermenter capacity - gros 毛发酵能力,	m ³ (立方米)	6.877
Fermenter capacity - net 净发酵能力	m ³ (立方米)	6.308
Piece of the Fermenters 发酵罐数量	Amount 总数	4
Fermenter capacity –gros (total) 毛发酵能力 (总发酵量)	m ³ (立方米)	27.510
Fermenter capacity – net (total) 净发酵能力 (总发酵量)	m ³ (立方米)	25.233
Hydraulic detention time 水力停留时间	Days 天	34
Room - load 立方米-负荷	kg oDS/m ³ x d 公斤/立方米×天	3,78
Drysubstance content in the fermenter 发酵罐中干物质含量	% (百分比)	8,80
Bio Gas production 沼气產量	m ³ /d (立方米/天)	33.010
	m ³ /h (立方米/小时)	1.375
Middle Methane contingent 甲烷气体含量	Vol. % (占总体积的百分比)	62
Middle electrical power of the CHP 热电联产 (CHP) 的中温电力	kW/h (千瓦/小时)	3.600
Gas consumption of CHP 热电联产(CHP)的气体消费量	m ³ /h (立方米/小时)	686
Gas consumption of CHP specific 热电联产 (CHP) 的具体气体消费量	kWh _{th} /kWh _{el} 千瓦时热能/千瓦时电能	2,36



- 1 Fermenter
- 2 Stair tower
- 3 Collection tank
- 4 Maschine house
- CHP
- 5 Gasholder
- 6 Flare
- 7 Road

NR.	Änderung	Datum:	Name:
hoeba 赫巴 hoeba j.hoereth gmbh 赫巴 约翰. 赫列有限公司		Fichtelgebirgsstr.53 D- 95448 Bayreuth Tel. 0921 793015-0	
Biogas plant pig farm Chorying AGRO-PASTORAL GROUP Co. Ltd. Weishi Branch Weishi, Kaifeng, China		Plan Nr.	
		Maßstab	
		Lagestatus	
		Hohe m ü. Ms	
Biogas plant sample		Datum:	Zeichen:
		Gezeichnet:	
		Bearbeitet:	
		Geprüft:	
Phase of planning: Angebot / Offer			
Vorhabenträger:		Entwurfs verfasser:	
(Datum)	Unterschrift	(Datum)	Unterschrift

B. Biogas plant description and operational function

B. 沼氣工廠描述和功能介绍



B.1. FOR AGRICULTURAL APPLICATIONS

The provision of energy for the supply of an efficient society can be ensured in remarkable proportions with natural resources of a modern agriculture.

Biogas plants can produce high-quality energy ("biogas") out of agricultural and other bio-residues like e.g. liquid manure from the keeping of cattle, and so on. Afterwards the biogas is refined in fully developed gas engines to electricity and heat.

B.2. BIOGAS PRODUCTION

The technique of the biogas production is known for decades and all over the world small and large biogas plants are operated successfully.

The heart of a biogas plant is the digester, in which the methane bacteria use e.g. liquid manure from the keeping of cattle and dried straw powder as "food" to produce biogas out of it. Biogas consists of approximately 50 – 65 % flammable methane. The methane provides the required energy for the gas engine so that the engine can power a generator, which produces electricity as a good sellable product.

According to the german "Renewable Energy Law" an attractive remuneration for electricity from renewable resources/ energy plants is paid. Therewith a high profitability of the biogas plant and the agricultural enterprise can be ensured.

Beside the digester and the combined heat and power unit (CHP) a biogas plant has a few more components

B.1. 農業應用

一個有效的社会提供的能源供应能够确保现代农业自然资源的显著比例。

沼氣發電廠可從農業殘餘物和生物垃圾，如从饲养猪，牛和家禽得来的液体粪便等，生产出高品質的能源（沼氣）。此后，沼氣被提純，可燃燒的气体经过全面改进的燃气发动机产生电力和热。

B.2. 沼氣生產

沼氣的生產技術已經被人知晓有幾十年的時間。在世界各地的小型 and 大型沼氣工廠都在成功运行。

沼氣廠的核心是消化罐。在消化罐中，甲烷菌以发酵基质如混合的粪便和干秸秆粉等为“食物”生产出沼氣。

沼氣中含有約50 - 65 %的可燃燒甲烷氣。甲烷氣提供氣體發電機所需要的能源來發電。以便發電機產生電力。

電力是一個很好出售的“產品”。

根據“可再生能源法”用於生產的電力如果來自可再生原材料，會得到有吸引力的報酬。

对此，沼氣工廠和农业企业可以得到高利润的保证。

such as a substratum receiving station, pumps, gas treatment, gasholder and a storage tank for the fermentation product.

B.3. FERMENTATION RESIDUE AS FERTILISER

The fermentation residue plays an important part in the operating of a biogas plant which runs on liquid manure from the keeping of cattle / power plants. Inside the digester only the carbon is extracted from the renewable resources. The carbon is contained in the biogas as methane and carbon dioxide, which were metabolized by the methane bacteria. The rest of the nutrients are still contained in the fermentation residue. The nitrogen is available as the attractive ammonium.

B.4. HEAT AND COLD UTILISATION

Beside the electrical power also heat is produced. This heat can be used for the heating of buildings and glasshouses, drying of several goods, for fish farming and many more purposes to increase the efficiency of the biogas plant. The intelligent utilisation of the produced heat is remunerated by the legislator with an additional bonus.

The heat can also be converted to cold. With this cold you can operate cold stores, or use in the summer as air conditioning.

B.5. PROCESS DESCRIPTION

The biogas process is based upon the activity of so called methane bacteria. These bacteria "eat" organic substances which are available from the manure or the energy plants (renewable resources). A small part of the "food" is needed for the growth of the bacteria, but the largest part of these substances is excreted as gas. The principal constituents of the biogas are flammable methane and not flammable carbon dioxide. Substantial amounts of methane are produced which can be transformed with gas engines into electricity and heat.

The biogas plant consists of several components so that biogas can be produced out of the organic substances: In the first instance the substances out of which the biogas is produced, such as e.g. liquid manure, is stored in a receipt station. If required in this container fermentable substances, such as e.g. fats, can be added as co-substratum.

The sludge is pumped constantly from the container in the digester. The digester is a completely closed tank made of steel or reinforced concrete. The digested sludge in the digester has a temperature of approximately 35°C. This high temperature provides optimal living conditions for the methane bacteria, so that an effective gas production can result. The digester is equipped with heat insulation to keep the self energy consumption low. Furthermore the digester is constructed gas-proof because the bacteria only survive and work under the absolute elimination of oxygen.

The produced gas is discharged in a pipeline. In a

除了沼气池和热电联产机组（热电联产）一个沼气厂有一些更多的组件，如底层接收站，泵，氣體處理，氣體存儲器和和发酵生产原料的儲罐。

B.3. 发酵残余物作为肥料

发酵残渣在一个使用可再生资源的沼气发电厂的运作中发挥着重要的作用。

沼气池内，只有碳被从可再生资源中去除。

沼气中含有碳、甲烷和二氧化碳。它们由甲烷菌新陈代谢产生。

其余的养分仍然存在于发酵残渣中。氮可作为有吸引力的铵得到。

B.4. 冷热能源的利用

除了電力，熱能也被生产。這種熱能可用於建築物的供暖和溫室。

可用于各種貨物的干燥，用于鱼类养殖和有更多的用途，以增加沼气的經濟效益。

熱能的智能利用可向立法機關獲得額外的獎金。

熱也可以被轉化為冷。您可以把它用于冷藏庫，或用于夏天的空調。

B.5. 程序描述

沼氣的產生過程是基於所謂的甲烷菌的活動。這些細菌“吃”掉糞便和能源植物中的有機物質。

存在。甲烷細菌的生長需要吃掉一小部分“飼料”，大部分這些物質將作為氣體被排出。

沼氣的主要成分是易燃的甲烷和不易燃的二氧化碳。所生产的大量的甲烷可被燃气发动机转化成电和热。

沼氣工厂包括若干组成部分，这样就可以用有机物质产生出沼气。首先，用于生产沼气的物质，如液体粪便被存储在一个接收站。如果该容器内的发酵基质需要，比如脂肪，可以增加为共同底层基质。

沼渣被不断从发酵罐中泵出。发酵罐是一个完全封闭的用钢筋混凝土制成的罐

在发酵罐中约 35 度的温度中发酵原料被消化。這種高溫为甲烷菌提供了最佳的生存條件，因此，可以有效产生沼氣。

厌氧发酵罐配备了熱絕緣设备以减少自身能量的消耗。另外，发酵罐还建造有气体密封装置，因为，細菌只在完全厌氧的环境下工作。

purifying unit condensate and contaminants are eliminated. Afterwards the gas is stored intermediately in a gas holder and from there is transformed by a combined heat and power unit (CHP) into electricity and heat. The electricity can be used internally or fed gainfully in the public electricity network.

The heat is used partly for the heating system of the digester. The surplus of the heat quantity from the CHP can be used for e.g. keeping of pigs, glass houses, drying processes, etc..

The biogas process proceeds continuously, that means every day sludge is pumped into and a corresponding amount is taken out of the digester. The digested sludge is stored in a storage tank till it is used as fertiliser for the arable land. The pre- and the final storage are installed beside the digester. The pump technology, gas treatment and the CHP are installed on strip foundations in factory-made pre-assembled containers.

B.6. CONSTRUCTION OF A BIOGAS PLANT

A biogas plant is a small factory, the various appliances, containers and equipment such as pumps and motors, in order to produce biogas and electricity to be able to convert. The components need to be sensible voted for an effective and trouble-free operation can achieve. The main components of a biogas plant are described below for an idea of building a biogas plant to receive.

B.7. FERMENTER

The fermenter, or septic tanks, is the most important part of a biogas plant. In fermenter, the liquid manure from the keeping of cattle converted into biogas. The fermenter consists of a large gas-tight containers, made of reinforced concrete or steel is. We can, depending on the desired and necessary requirements Fermenter both systems (s u) offer.

B.8. CONSTRUCTION OF FERMENTER

The fermenter is a stationary cylinder with a ratio of diameter to the height of approximately 1:1 and is made with a special shuttering on the spot. The slim reinforced concrete container can be executed into heights of 8 to 20 m. Is established either from reinforced concrete or from stainless steel plates the ceiling or roof structure of the container and closes gastightly. The roof is usable so that in the maintenance or repair case all important safety and machine technical equipments of the fermenter can be reached.

产生的沼气從发酵罐的管道被排放出。在提纯装置里，凝析油和污染物被消除。然後可燃气体暫時被儲存在一个气体儲罐中，並從那裡被输送到一个熱電聯產装置以生產電力和熱。電流可用於内部使用或潰入公共電網。或把可燃气体直接输入天然气管道和做车用燃气。

从熱電聯產装置得来的部分熱被用來加熱发酵罐（保持发酵罐內的恒溫）。多餘的熱量可被用于养殖场建筑内部的供暖或致冷，供应溫室和乾燥工藝等。

沼氣产生的过程是連續的。即每天泵入原料并從发酵罐中泵出相应數量的沼渣。发酵过的原料经固液分离后被儲存在儲罐中，并被加工成液体肥料和固体废料用于有机农业。在发酵罐旁邊安裝有前期和后期的存储设备。泵技術站，气体处理和在工廠被預組裝的熱電聯產发电机组集裝箱安裝在条形地基地里。

B.6. 一個沼氣工廠的建設

沼氣廠是一家小工廠，有各種設施，容器和设备，如水泵，電動機，以便產生沼氣并轉化為電能。各組成部分需要切合实际的协调一致产生一個有效和無故障操作才能實現。

收到建立一個沼氣廠的想法后。沼氣工廠的主要組成部分分述如下，

B.7. 發酵罐

發酵罐，或者被称为“厌氧消化罐”，是沼氣廠最重要的一個組成部分。在發酵罐中，液体的粪便等有机垃圾轉化為沼氣。

發酵罐包括一個大的由鋼筋混凝土或鋼材製造的不透氣（密封）的容器。

我們可以根據所期望的和必要的要求，提供两种發酵系统的發酵罐（見下文）。

B.8. 發酵罐的結構

發酵罐是一個高度和直徑的比率約為 1:1 的固定气罐。由特殊的模板制造。

轻质的鋼筋混凝土的容器可用於 8 至 20 米的高度。

它是用鋼筋混凝土或不銹鋼板建造。容器的天花板或頂盖结构是不透氣和封閉的。

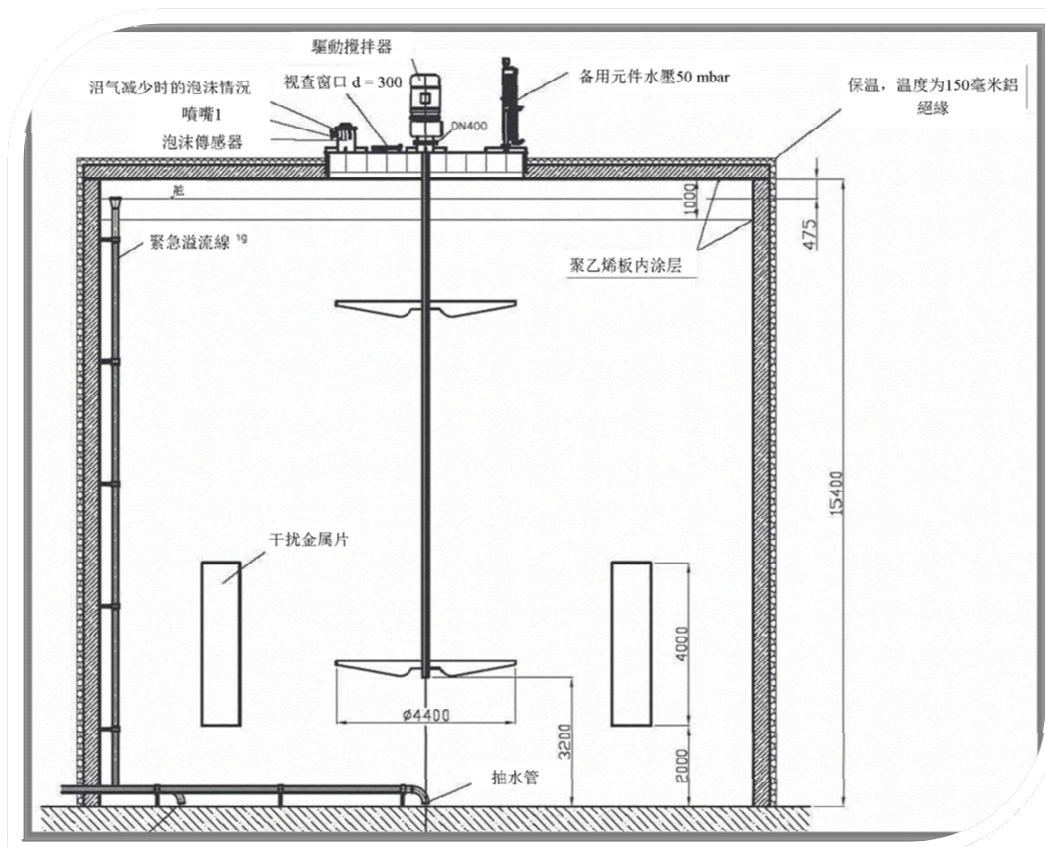
頂盖可以在維護或修理的情況下使用。可以检查所有發酵罐的重要的安全設施和機械設備。

Fermenter with vertical stirring work

發酵罐 / 垂直攪拌器



Example / 典范





B.9. SLIM STYLE

In comparison with fermenters in a flat style bad containers stand out due to the following advantages in a slim style:

Roof structure

By the relatively small diameter of the containers stable roofs have to be established easily. Stirring appliances working effectively can be integrated in stable roofs. Heat losses can want to a good insulation be made minimised also in the roof there. With a good insulation the warmth of one's own need of the bad container is minimised so that the warmth can be used economically and increases the yield of the biogas plant. In comparison with thin membrane roofings the heat losses are up to 75% lower. The slim style is the prerequisite for an optimal homogenization of the bad container contents.

The relationship height: Diameter = 1:1 is advisable for a good by mixture of the contents. The surface is small, through this be able to sink and swim stack be fought better. A good distribution of the warmth and the fresh fermenting good is obtained with that with a low expenditure of energy, this is an essential prerequisite for an optimal bio gas-production. This can be much more simply and more safely to operate reached unlike fermenters in a flat style. At a disturbance the stirring appliance can be dismantled without the one emptying of the fermenter becomes necessary.

B.10. SUBSTRATUM SUPPLYING

The substrata made of which the biogas can be won are very various. A biogas plant can be operated with liquid substrata like dung, dried straw powder, sewage, sludge, and other bio-wastes. An adapted supplying technology is therefore an indispensable necessity for a trouble-free operation. The supplying and preparation of the substratum takes care that the substances are brought in liquidly into the Bio gas fermenter to obtain an effective operation.

B.11. FERMENTING SUBSTRATUM RESIDUE

The mud which leaves the Biogasfermenter is still a valuable substance. Only the carbon has been withdrawn from the liquid manure from the keeping of cattle for the biogas extraction. Furthermore nitrogen, phosphorus and the further plant nutrients are available and n can be used optimally for the manuring in the agriculture. The fermenting remains are therefore stored in a store bin which can take a stock of 180 days. Particularly the nitrogen is in the ground wholesome ammonium form and can be used effectively in the growing season.

B.9. 小型建筑风格

相比發酵罐的平板的建設特點，消化罐的輕薄設計由于以下優點脫穎而出：

頂部結構

由於相對較小直徑的容器穩定的頂部結構更容易建造，。攪拌設備的工作可以有效地在穩定的頂部結構內進行。

在那樣一個很好的保溫隔熱的頂部結構內，熱損失可以減少到最低限度。

具有良好的隔熱的消化罐，減少了其自身需要的熱量，熱能會被經濟地使用，並增加了沼氣廠的熱能產量。

相對於哪些用橡膠薄膜做的頂部結構，我們鋼筋混凝土的頂部結構將發酵罐熱量的損失降低了 75 %。輕薄風格設計的先決條件是發酵罐的物質有一個最佳的同質化。

相關的高度：直徑= 1:1 有利於有一個良好的物質的混合。

由于表面小，物質可以更好的下沉，漂浮的堆積物質被更好地粉碎。

一個好的熱量分配和使用低的能源消費獲得新鮮發酵物質。

這是一個最優沼氣生產必不可少的先決條件。

不同于平板式的發酵罐，這種消化罐的操作更簡單和更安全。

在發生故障時，該攪拌器可被去除，不需要清空發酵罐。

B.10. 基質供應

產生沼氣的基質有多種物質

一個沼氣廠可使用養殖場的液體糞便，屠宰場和食品加工廠廢水，污水處理廠的污泥，或其它生物質廢棄物，農林廢棄物來運作。

要做到無故障操作。先進和與發酵原料適應的技術是不可缺少的和必要的。

基質的供應和準備要確保液體物質被送入沼氣發酵罐，以保證有效的運作。

B.11. 發酵基質殘渣

從沼氣池中排出的發酵殘渣仍然是一種寶貴的物質。在沼氣提取中，碳是唯一被去除的。氮，磷和其他植物的營養物質仍然存在於殘渣中，可在農業上作為生態（綠色和無公害）有機肥料被最大限度地利用。

發酵殘渣可以在存儲容器中儲存 180 天。

特別是氮是在地面以銨的形式得到。可有效地用於種植季節的施肥。

SEWAGE TREATMENT PLANTS - BIOGAS PLANTS financing plan / profit and loss account / amortization

污水處理廠-沼氣發電廠融資計劃/損益表/攤銷

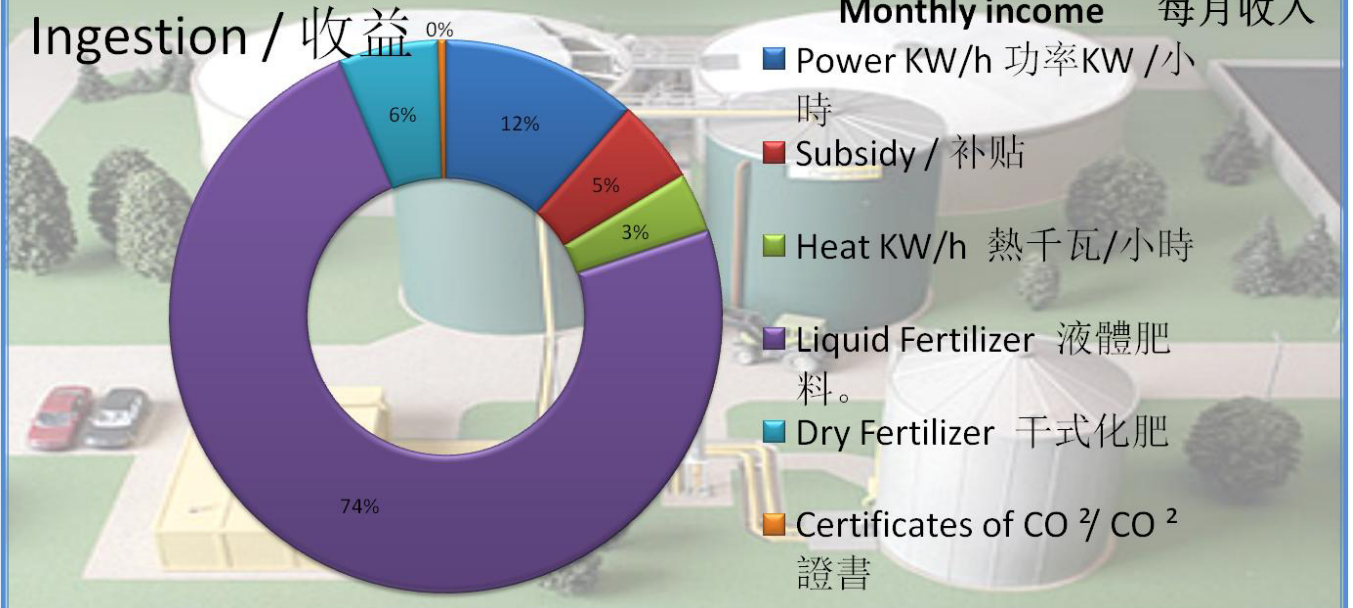
Property costs: 項目成本:	17.027.245,62 €	Total investment: 總投資:	17.027.245,62 €	Loan amount: 貸款:	17.027.245,62 €
Cost of concrete and earth: 土建工程費用:		Of which equity: 其中股權:	- €	Interest per year: 利息每年的:	7,470%
Land cost: 土地成本:		Long-term loans: 長期貸款:	17.027.245,62 €	Duration years: 使用年限:	15
Processing costs: 處理費用:				Start date of the loan: 該貸款的开始日期:	2012.11.15
Total / 總計:	17.027.245,62 €			Monthly Payment: 每月付款:	315.109,06 €
				Payment periods: 支付:	360
				Total interest: 利息總額:	11.332.570,16 €
				Total cost of credit: 总的信貸成本:	28.359.815,78 €

Ingestion / 收益

	Quantity / mkg/d 數量/每天	Price per unit 單位價格	Daily income 每日允許攝入量	Monthly income 每月收入	Yearly income 每年入息	Profit-loss 盈虧
Power KW/h 功率KW /小時	3.472	0,07 €	5.395,49 €	161.864,64 €	1.942.375,68 €	
Subsidy / 補貼	3.472	0,03 €	2.312,35 €	69.370,56 €	832.446,72 €	
Heat KW/h 熱千瓦/小時	3.678	0,02 €	1.633,01 €	48.990,16 €	587.881,93 €	
Liquid Fertilizer 液體肥料。	2.300	15,00 €	34.500,00 €	1.035.000,00 €	12.420.000,00 €	
Dry Fertilizer 干式化肥	80	34,00 €	2.720,00 €	81.600,00 €	979.200,00 €	
Certificates of CO ₂ / CO ₂ 證書	14	15,00 €	211,14 €	6.334,26 €	76.011,16 €	
Total / 總計:	13.016		46.771,99 €	1.403.159,62 €	16.837.915,49 €	16.837.915,49 €

Ingestion / 收益

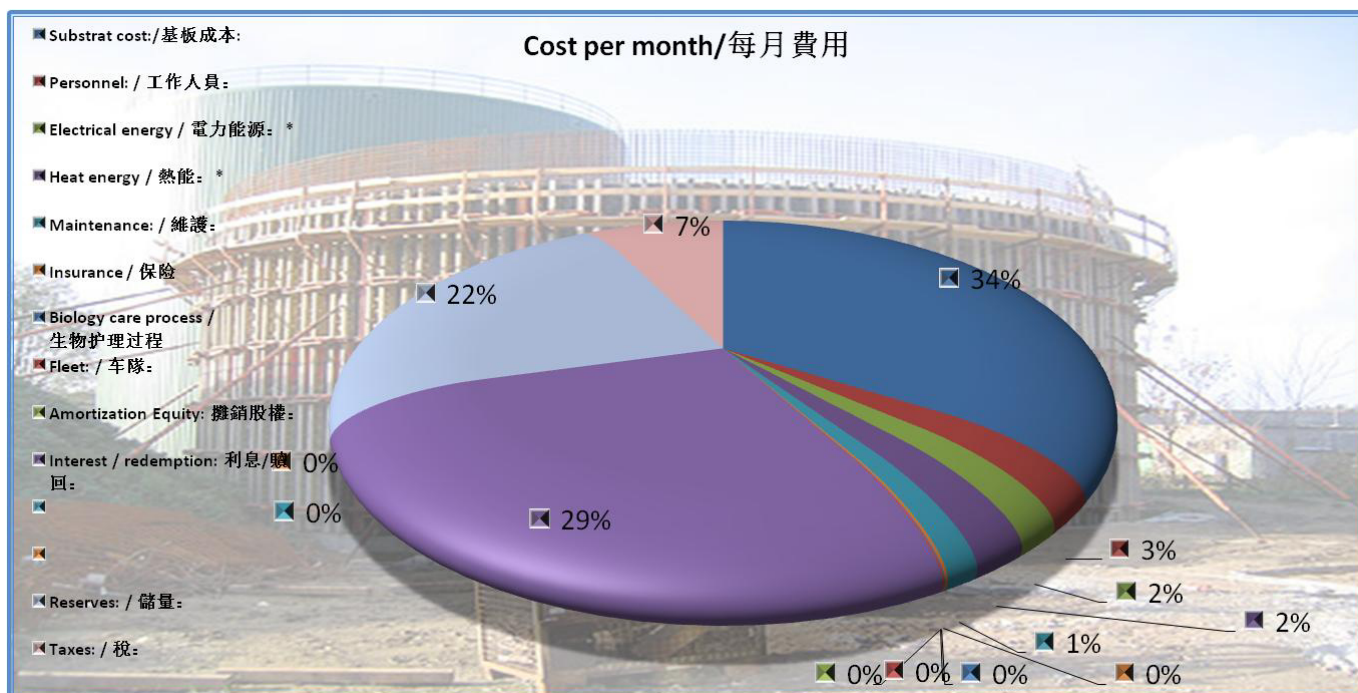
Monthly income 每月收入



Expenditure / 支出

	Cost per month/每月費用	Price per ton 价格每吨	Substrate ton per Day: 基板吨每一天:	Cost per year / 每年費用
Substrat cost/基板成本:	188.032,50 €	2,50 €	2.466	2.256.390,00 €
Personnel: / 工作人員:	13.216,44 €	Energy for plant per hour/沼气厂每小時電量		158.597,26 €
Electrical energy / 電力能源: *	10.674,32 €	208	kW/h Electrical/千瓦/小時電力	128.091,80 €
Heat energy / 熱能: *	12.247,54 €	919	kW/h Heat/千瓦/小時熱	146.970,48 €
Maintenance: / 維護:	7.094,69 €			85.136,23 €
Insurance / 保險	694,40 €			8.332,80 €
Biology care process / 生物護理過程	200,00 €			2.400,00 €
Fleet: / 車隊:	400,00 €			4.800,00 €
Amortization Equity: 攤銷股權:	- €	Depreciation Years: 折舊年限:	- €	- €
Interest / redemption: 利息/贖回:	157.554,53 €	Duration years: 使用年限:	15	1.890.654,39 €
Subtotal: / 小計:	390.114,41 €			4.681.372,96 €
Reserves: / 儲量:	121.565,43 €	Reserve rate / 準備金率 %:	1,00%	1.458.785,10 €
Taxes: / 稅:	40.521,81 €	Tax Rate / 比率 %:	4,00%	486.261,70 €
				11.670.280,83 €

* Energy: / 能源: The energy (electricity and heat) is from owned production and is unofficially free. / 能源（電力和熱）是由自有生產，免收費用。



Profit - loss / 盈虧

Profit / loss from sales are calculated / 利潤/損失計算銷售

Profit / loss from the investment calculated/
利潤/損失的投資計算
% of investment per year /
每年的投資

	Euro per year / 每年	Euro per month / 每月	% per year / 每年	
Gross profit/loss reserves including: 毛利/虧損準備金, 其中包括:	12.156.542,53 €	1.013.045,21	72,20%	71,39%
Gross profit / loss without reserve: 毛利潤/无条件損失:	11.670.280,83 €	972.523,40	69,31%	68,54%
Gross profit / loss after repayment reserves including: 毛利潤/準備金還款後損失, 其中包括:	14.047.196,91 €	1.170.599,74	83,43%	82,50%
Gross profit / loss after excluding earnings Repayment: 毛利潤/扣除收入償還後損失:	13.560.935,21 €	1.130.077,93	80,54%	79,64%

Profit - loss / 盈虧



B.12. GAS CLEANING

The biogas which leaves the fermenter still must be processed for the use in the gas engine, so that the engine has a long life time. Condensate (water) must essentially be removed from the gas. As well the hydrogen sulphide which is contained in different concentrations in the biogas must be removed. Hydrogen sulphide is poisonous and very corrosive. The HÖBA corporate group has extensive experiences and techniques for the effective elimination of pollutants of gas. A pressureless gas carrier serves the even supply for the block-type thermal power station to guarantee an uninterrupted operation. A need torch rounds off the gas cleaning and provides an environmentally favourable and sure disposal of the gas in the disturbance case.

B.13. COMMUNAL HEATING/POWER STATION

The block heating work changes the biogas in electric current and warmth, two energy forms are valuable secondary energies which gain large proceeds and make the biogas plant profitable that way. Block-type thermal power stations can be delivered in all sensible sizes. For the fast assembly the block-type thermal power stations can prefabricatedly be delivered into containers. An assembly in buildings is also possible. The current from the block-type thermal power station is escorted and tempered correspondingly about a transformer station after the conditions of the energy-feeding in law into the public power supply system. The

B.12. 沼氣淨化

离开发酵罐的沼氣依然需要进行加工后才能被用于气体发动机。
以便发动机能有长时间的工作寿命。
凝结水必须全部地从沼氣中去除。
同樣, 不同浓度的沼氣中含有的硫化氢也必须清除。
硫化氢是有毒的和有非常强的腐蝕性。
对有效地清除沼氣中的污染物, 赫巴集團公司有著豐富的經驗和技術。
一个没有压力的气体运输罐为热电联产发电站提供供应服务以確保设备不間斷運行。
需要有一个点火器来圆满结束气体的清洁, 并提供一个良好的环境和保证在有故障的情况下气体的安全处置

B.13. 热电联产发电站

该热电联产发电站把气体转化为电流和热能。
该兩種形式的能源是寶貴的二次能源。并可以获得大的收益, 使沼氣厂盈利。
可提供有各種合理規格的熱電聯產发电站。熱電聯產发电站可被快速预先装配在集裝箱內交付。
安裝在建築物內也是可能的。从熱電聯產发电站产生的電流將由一個變电站根據法律规定的电能注入条款进入公共電力網。
熱能可以用於不同的項目, 例如建築物內的供熱和溫室, 养鱼场 或干化技術過程, 如乾燥木材或其他物品。

warmth can be used variously e.g. to the heating of buildings and hothouses in the fish farm or too technical processes like the drying of wood or other goods.



C. CLIMATE PROTECTION PROJECTS

Climate protection projects can with

C.1. CLEAN DEVELOPMENT MECHANISM (CDM)

being carried out.

With the CDM under the Kyoto Protocol committed governments and companies generate mitigation credits. These are investments in saving projects in developing or emerging countries. The mitigation credits

C.2. CERTIFIED EMISSIONS REDUCTION – CER

these by these projects arise, can be credited to the investor since 2005. These credit notes are tradable.

Carbon dioxide contributes considerably to the warming of the atmosphere - CO₂ as a waste product of combustion of fossil energy carriers like carbon, mineral oil, natural gas.

This has serious effects on the environment and the social structure. Methane - CH₄ - arises in large quantities at the rice growing and in the cattle keeping. At the unchecked storage of dung large quantities of methane are handed in into the atmosphere. At methane, the harmfulness for the atmosphere is greater than at carbon dioxide around the factor 21!

C.3. PROJECT TYPES - EXAMPLES

Energy efficiency project - co.²

Rise of the degrees of effectiveness from power stations

C. 氣候保護項目

氣候變化項目

C.1. 清潔發展機制 (CDM) (環境友好機制的發展)

執行

京都議定書下的清潔發展機制要求各國政府和企業提供信貸。

這些是投資在發展中國家或新興國家的節能減排工程。

C.2. 經核證的排減量 CER

通過這些項目所產生的(CER)，可記入自 2005 年以來投資者的名下。這些(CER) 是可以在國際上進行交易的碳減排指標。

二氧化碳-甲烷氣作為化石能源載體比如碳，礦物油，天然氣燃燒的廢棄產品。大大促進了氣候變暖，

這已嚴重影響了環境和社會結構。

甲烷-CH₄， 甲烷-來自大量的水稻種植和牲畜養殖業。

如果不加控制地儲存糞便，大量的甲烷會進入大氣。甲烷對大氣的危害比二氧化碳的危害大 21 倍

C.3. 項目類型-實例

能源效率項目-二氧化碳

提高熱電聯產電力和熱的效率，

cogeneration of power and heat
Renewable energy - co. ²
Biomass - particularly procedure to the methane avoidance
Methane avoidance - CH⁴
Landfill gas, gas from purification plants
Minegas
Manure slurry management - Cattle ranching

可再生能源-二氧化碳
生物质-避免甲烷的特别程序
避免甲烷
垃圾填埋氣，污水淨化厂氣體
煤层氣
牲畜糞便管理

C.4. CRITERIA OF SUSTAINABLE DEVELOPMENT - SUSTAINABILITY -

After the Kyoto Protocol a sustainable development can be described with the following criteria:

Economy: Creation of prosperity and livelihoods concrete generation of incomes job creation.

Sozial: Improvement on the quality of life, abolition of poverty concrete development of the water supply, sewage system energy supply.

Ecology: Improvement, increase and expansion of the natural resources concrete reduction of use of fossil energy
Improvement of the air quality
Improvement of the land utilization

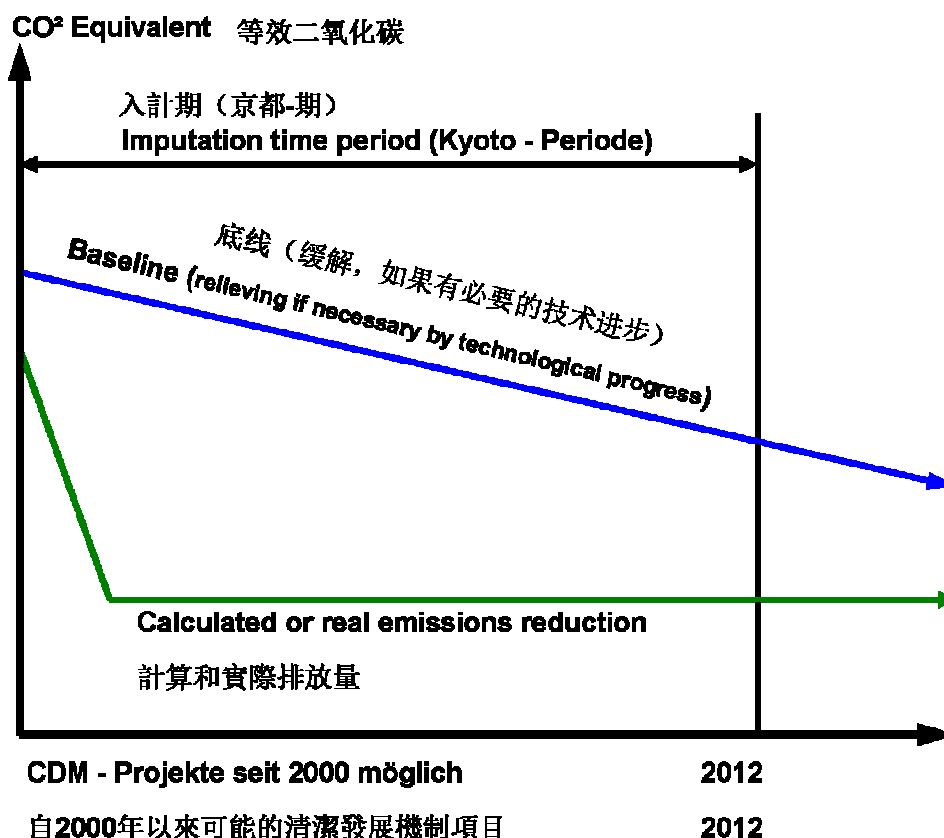
C.4. 可持續發展的標準:

根據京都議定書，可持續發展的標準描述如下：

經濟學: 創造財富和實際生活收入，創造就業機會

社會: 提高生活質量，消除貧困，特別是發展供水，污水处理系統能源供应

生態學: 改進，加強和擴大自然資源，具体的减少使用化石能源
改善空氣質量
改進土地利用



C.5. BASELINE

The baseline serves and to find the consequence of a project out. A scenario is built in the front-end and to grasp the situation without execution of the project.

It is tried also to include the technological progress and changes of the legal framework conditions.

C.5. 基線

使用的基线影响到找出一个项目的结果，在前端酝酿建立一个设想并在把握形势下执行项目。

它同时也试图包括了技术进步和法律框架条件的变化。

C.6. COURSE OF THE PROJECT

Working steps		Responsibly
Project idea	CDM Registrierung ↓	Project developer
Short documentation (Projekt idea note) PIN		Project developer
Development of the PDD with Baselineszenario		Project developer
Audit of the PDD		Independent Operational Entity
Participation of the public		Project developer
Validation		Independent Operational Entity
International audit		CDM Executive Board
International registration and re-cognition		CDM Executive Board
Planning and conversion	CDM Realisierung ↓	Project developer
Monitoring (yearly)		Project developer
Certification		Independent Operational Entity
Expenditure of certificates		Project developer

Project Idea Note PIN

In the Project Idea mark the project bearer states general information about the project. The PIN serves for the preliminary examination of the project.

Project design Document PDD

The successful registration of a CDM project assumes the production of a comprehensive project documentation – PDD. She is comparable with a licence application and puts high requirements for the proof of the additionality (Additionality).

C.6. 項目課程

步驟		責任
項目設想	清潔發展機制 註冊 ↓	開發商
簡短文件 (項目構想說明) PIN		開發商
起草項目設計書 与基準情况		開發商
審查項目設計書		獨立經營實體
公眾參與		開發商
驗證		獨立經營實體
國際審查		清潔發展機制執行理事會
國際註冊和承認		清潔發展機制執行理事會
規劃和實施	清潔發展機制 實現 ↓	開發商
監測 (每年一次)		開發商
證書		獨立經營實體
簽發證書		開發商

項目概念書

在項目理念里面，承载着国家有关项目的一般资料。项目概念书适用于项目的初步审查。
PIN 是用於篩選項目。

項目設計文件 PDD

成功註冊的清潔發展機制項目，假定建立一個全面的項目文件-PDD。它是類似于申請許可證，並提出很高的要求證明額外性。

C.7. REALISATION

After registration of the project as a climate protection project and the necessary formal liquidation by a specified service company the condition is created created for the generation of the certificates. The certificates have a tradable value and serve the Refinanzierung of the layout.

C.7. 实现

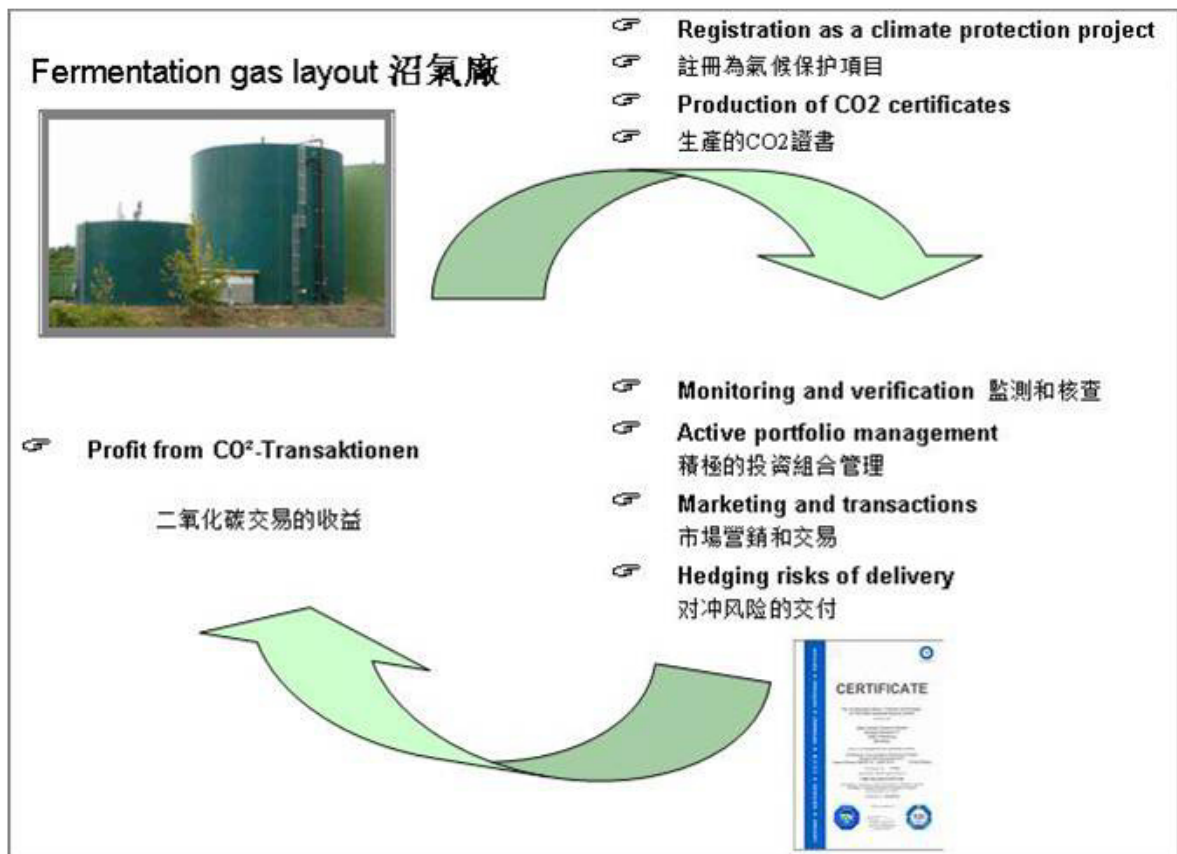
注册后的项目作为一个气候保护项目，需要由专门的服务公司正式的处理，创造生成证书的條件。該證書有交易的價值和融資服務的布局。

C.8. ECONOMIC EFFICIENCY

The climate protection projects should show a least size.
The formal liquidation is cost-intensive, so that bigger projects or "convoy projects" can lower these expenses.

C.8. 经济效率

气候保护项目至少应该表明规模大小。
正式解决成本昂贵，因此，較大的項目或“車隊項目”可以減少這些費用。



E. FUNCTION GRAPH EXAMPLE

E. 功能图示



item / 项目		Bauteil – Leistung / Component – power 组件 - 电源		
I.		采用的基材（验收） Substrate adoption Substratannahme		
I.1	1 pcs./ 片	粪便收集箱	Manure collection tank	Sammelbehälter Gülle
I.2	1 pcs./ 片	带有保护涂层的粪便收集箱	Protective coating Manure collection tank	Schutzbeschichtung Sammelbehälter
I.3	3 pcs./ 片	初步收集罐搅拌机	preliminary tank mixer	Rührwerk Vorbehälter
II.		Biogas – Container Substratförderung / Biogas – Container substrate support 沼气 – 罐内基质提升		
II.1	0 pcs./ 片	容器/发酵罐	Container	Container
II.2	2 pcs./ 片	研磨机	Macerator	Zerhackerpumpe
III.		Fermenter / Fermenter 发酵罐		
III.1	4 pcs./ 片	发酵罐	Fermenter	Fermenter
III.2	4 pcs./ 片	热绝缘	Thermal insulation	Wärmedämmung
III.3	4 pcs./ 片	基础	Footing	Fundament
IV.		Gasspeicher / Gas storage 气体储存		
IV.1	1 pcs./ 片	储气	Gas storage	Gasspeicher
IV.2	1 pcs./ 片	基础	Footing	Fundament
V.		Rohrleitungen-System / Plumbing - System 管道系统		
V.1	1	管道设施 - 基材	Plumbing - substrate	Rohrleitungen-Substrat
V.2	3 hP/马力	泵	Pump	Pumpen
V.3	2 pcs./ 片	热交换器	Heat exchanger	Wärmetauscher
VI.		发酵产物分离		
VI.1	2 pcs./ 片	发酵产物分离	Fermentation product separation	Gärprodukttrennung
VII.		Gastechnik / Gas technique 天然气技术		
VII.1	6 pcs./ 片	气体压缩机	Gas Compressors	Gasverdichter
VIII.		Gasreinigung / Gas cleaning 气体净化		
VIII.1	1 pcs./ 片	硫化氢	Hydrogen sulfide	Schwefelwasserstoff
VIII.2	1 pcs./ 片	活性炭	Activated Carbon	Aktivkohle
VIII.3	1 pcs./ 片	基质吸附器	Foundation adsorber	Fundament Adsorber
IX.		Gasfackel / Gas flare 废气燃烧器		
IX.1	1 pcs./ 片	废气燃烧器	Gas flare	Gasfackel
IX.2	1 pcs./ 片	基质沼气燃烧器	Foundation Gas flare	Fundament Gasfackel

X.	1	pcs./ 片	管道 - 天然气	Pipelines - Gas	Rohrleitungen - Gas
XI.			Elektro- und Messtechnik / Electrical and measuring technology 电气和测量技术		
XI.1	1	pcs./ 片	交换系统	Switching system	Schaltanlage
XII.			Messtechnik / Measuring technology 测量技术		
XII.1	1	pcs./ 片	测量技术	Measuring technology	Messtechnik
XII.2	1	pcs./ 片	气体质量测量	Gas quality measurement	Gasqualitätsmessung
XII.3	1	pcs./ 片	电线和测量	Cables Electrical and measuring technology	Leitungen Elektro- und Messtechnik
XII.4	1	pcs./ 片	防雷	Lightning Protection	Blitzschutz
XIII.			Blockheizkraftwerk (BHKW) / Electric current (CHP) 热电联产 (CHP)		
XIII.1	6	pcs./ 片	电流 (热电联产)	Electric current (CHP)	Blockheizkraftwerk (BHKW)
XIII.2	1	pcs./ 片	主机室	Machine hall	Maschinenhalle
XIV.			Bauarbeiten / Construction work 建设工程		
XIV.1	1	pcs./ 片	经营场址	Factory premises	Betriebsgelände
XIV.2	1	pcs./ 片	土方工程	Earthworks	Erdbauarbeiten
XV.			Sonstige Leistungen / Other services 其他服务		
XV.1	1	pcs./ 片	基本规划	Basic planning	Grundlagenplanung
XV.2	1	pcs./ 片	实施规划	Implementation planning	Ausführungsplanung
XV.3	1	pcs./ 片	导体装配	Conductive mounting	Leitmontage
XV.4	1	pcs./ 片	施工管理 - 调试	Construction Management - Commissioning	Bauleitung - Inbetriebnahme
XV.5	1	pcs./ 片	文件编制	Documentation	Dokumentation
XVI.	1	pcs./ 片	运费	Freight charges	Frachtkosten
Kosten / costs / 成本			交钥匙工程费用大约	Turnkey Circa	Schlüsselfertig Zirka
			17.027.245 €	17.027.245 €	17.027.245 €
			价格估算时间是在: 2012年11月8日	Price calculated on: 08 November 2012	Preis kalkuliert am: 8. November 2012
			价格有效期至: 2012年11月22日	Pricing valid until: November 22, 2012	Preiskalkulation gültig bis: 22. November 2012

If we have all the documentation that we need for a serious pre-planning, we can of course call binding numbers and handle also the sludge from your sewage treatment plant in fermenter and convert the energy contained in electricity.

To hear from you soon a positive response, we remain

Sincerely yours



Johann Hoereth

赫列·约翰

President of

公司东主/总裁

hoeba j. hoereth gmbh

赫巴 约翰。赫列有限公司

如果我们能得到所有我们需要的的文件和资料来做出认真的初步设计,我们当然可以计算出确切数据,以及把你们污水处理厂的污水污泥泵入厌氧发酵罐一并进行处理,把其中所包含的能量转化为电能。

我们殷切希望很快得到你们积极的回应。

Creator:

承包者和創建者:


hoeba j. hoereth gmbh
赫巴 约翰。赫列有限公司
kläranlagen 污水处理厂
biogasanlagen 沼气发电厂
hoch- u. tiefbau 高架和地下工程

Fichtelgebirgsstr. 53, 95448 Bayreuth, Germany

Internet: <http://www.hoeba.eu>

<http://www.klaerwerke.hoeba.eu>

Regie /直接经管人:

Planning /規劃:

Johann Höreth /赫列·约翰

Helmut Muche /

Chief Engineer, Architect /

水利工程的总工程师 建筑师和专家

Specialist for

Process Engineering and Hydraulics