„Heating & Power from Straw“

Conception for sustainable Energy Supply in Combined Heating & Power Plant by using the Renewable Energy Source Straw

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The Hermes EPC Group

..established a team of German and British Experts as an Engineering Center of Excellence for renewable energy to develop infrastructure and power plant projects in many different countries.

We promote the restoration of healthy human habitats with clean soil & water and clean energy in the public interest. The main focus is on biomass power plants (straw, wood chips), but also waste gasification power plants, wind turbines et cetera.

Entities of Hermes are located in

- Hermes EPC Group LLP – United Kingdom in 55 Sedgeford Road, London W 12 ON A
- Hermes EPC Group LLP – Germany in Bösenberg 27, 46514 Schermbeck
- Comming Soon:
  - Hermes EPC Group LLP Serbia
  - Hermes EPC Group LLP Czech Republic
  - Hermes EPC Group LLP Cameroon

Experts are all self-employed engineers and scientists (like hydrogeology, geology, electrical, mechanics, chemical, structural engineering, architecture, environment and natural scientists) who are internationally established and living. All authorities in there fields with long experiences.

Specials: Hermes EPC Group - Member of BBE Bundesverband Bioenergie Germany
Important issues for generation of Heating & Power by Straw

• Straw is a by-product of cultivation of grain & therefore no superseding of production of food on agricultural areas!

• High energy supply safety {security} due to the regional availability

• Contribution to the reduction climate-damaging emissions

• Creation of value for farming and support of the rural development
Important issues ..... (2)

• One arises at repatriation of the **straw ash** from thermal power plant as a **fertilizer** lasting a circulation economy

• The special characteristics, however, of burning straw are of great importance: under others the inclination the scorification by alkalines (low melting point ) and the corrosive components (e.g. chlorine) require a special technology.

• ... but there are approved solutions for it ... (next slide!)
Technology of a Straw Power Plant

- Technology started in Denmark
- Technique to the incineration on a water-cooled vibration grate is approved and for over 25 years in use Europe-wide.

One of the most modern and efficient straw-fired CHPs is in Emlichheim (Germany) since 2013 in operation. That Technology was developed further in many areas e.g. the use of different bales of straw concerning dimensions.
Technology of a straw-fired Power Plant

- efficient energy utilisation
- low emissions
- innovative CHP-concept
- flexible Strawale dimensions
- optimal fuel feeding
Our straw-fired powerplant Emlichheim/ Germany in Operation (2014)

See actual Video from 2014

Video StrohHKW BEKW Emlichheim\BEKW_Englisch.mp4
### Economic figures for a Construction of a straw-fired 49,8MWe CHP

#### CHP Data
- **Electrical capacity**: 13.5 MW
- **Heat capacity**: 30 MW
- **Fuel consumption**: Biomass - straw
- **Emission limits**: beyond limit values (TAL)

#### Economic activities
- **Sell of electricity & feed in the grid & sell of heat?**
  - **Answer**: Fix-price-contract with local government!
- **Supply with straw?**
  - **Answer**: By a long term Contract with local government to supply with straw for 10 years

#### Conditions for operation
- **Operation-time**: 8000 h/a
- **Electricity production**: 80,000 MWh/a
- **Heat production**: 120,000 MWh/a
- **Straw consumption**: 75,000 t/a
- **Electricity price**: 138.20 €/MWh
- **Heat price**: 20 €/MWh
- **Cost for straw in bails**: 45 €/t

#### Investment
- **Investment total**: ~ € 50,000,000

#### Cash Flow
- **Turnover for 1. year**: ~ €/a 13,500,000
- **Total operating cost 1.y**: ~ €/a 5,500,000
- **Profit for 1. year**: ~ € 1,700,000
Conception and Plannings for straw-fired powerplants

Hermes EPC is offering:

- **Advisory & Consulting services**

- **Preparation of feasibility studies - among others**
  - site-/location-analyses (straw, warmth, straw, infrastructure),
  - check of legal framework conditions
  - outline of a technical basic concept
  - determination of the economic bases
  - economy considerations and sensitive analyses

- **Realization of straw-fired combined heat & power station projects**
  - creating of the corporate environments
  - make of financing concepts
  - examination and acquisition of possible promoting possibilities
  - engineering of project-planning over erection up to the successful commissioning
Thanks for your attention!
&
We enjoy your visit on our platform - welcome!

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