

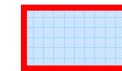
Calorific Mining

Special concept of a CM-CFB plant
for energetic utilisation in the context of
remediation projects of the oil industry

October 2013

ENVIROTHERM

**Experienced and qualified engineering company-
developing and applying proprietary technologies
- acquired from Lurgi**



relevant for CM-
CFB Technology
and plant

CLEAN ENERGY

Modern
Gasification Technologies



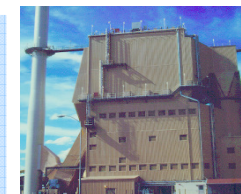
Multi-Purpose
Combustion Technologies
CFB



CLEAN AIR

(Air Pollution Control - APC)

Highly Efficient
Flue Gas Cleaning
Technologies



Production and Distribution of
Honeycomb SCR Catalysts



baufeld®

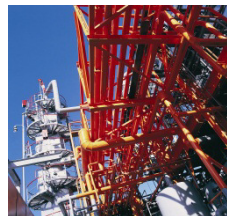
**experienced and qualified engineering partner-
practised projects with proprietary technologies in
a strong group of companies**



relevant for CM-
CFB Technology
and plant

**USED OIL
CHEMISTRY & WASTE WATER**

Services
for Used Oil Collection,
Recycling of Oil, Water, Sludge



Recycling
of Chemical Wastes and
Alternative Combustible Fuels



**REMEDIATION -
CALORIFIC MINING**

Environmental Engineering
Project Management
Remediation Technologies



Calorific Mining
Energetic Use
of Acid Tars/Oil residues



Intension and Goal of Calorific Mining with Extension of CFB Technology (CM-CFB)



Acid tar lagoons and comparable oil contaminated sites of the oil industry worldwide need to be cleaned-up; products from remediation must be used in an economical and environmentally friendly way.



Often no way of usage of waste derived products is available - Stabilization and landfilling are in conflict with EU landfill directive and cause future risks for the sites. CM-CFB Technology is evaluated as an effective variant for a most sustainable remediation.



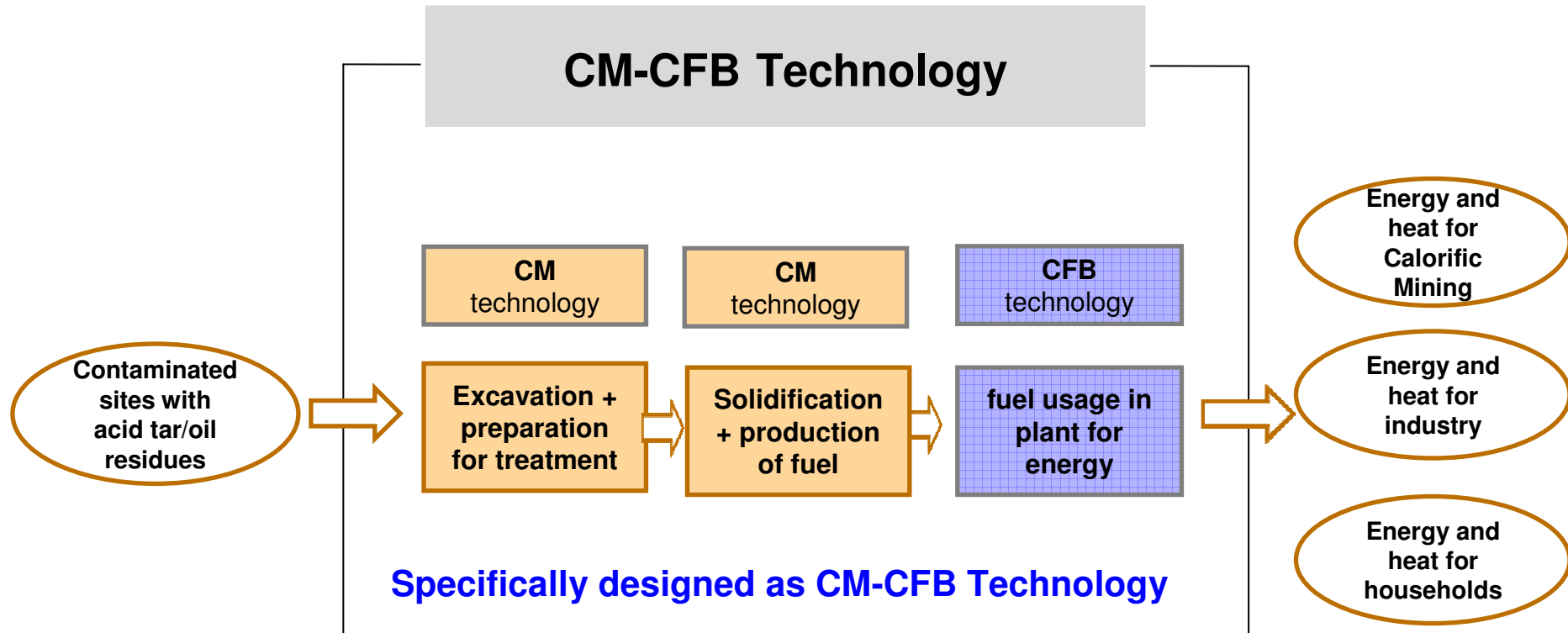
The CM-CFB Technology can be optimized for the combined and subsequent use of waste products from oil industry, domestic and industrial waste.



This very efficient technology is innovative, robust + flexible, for continuous waste management, the system produces clean energy and heat.

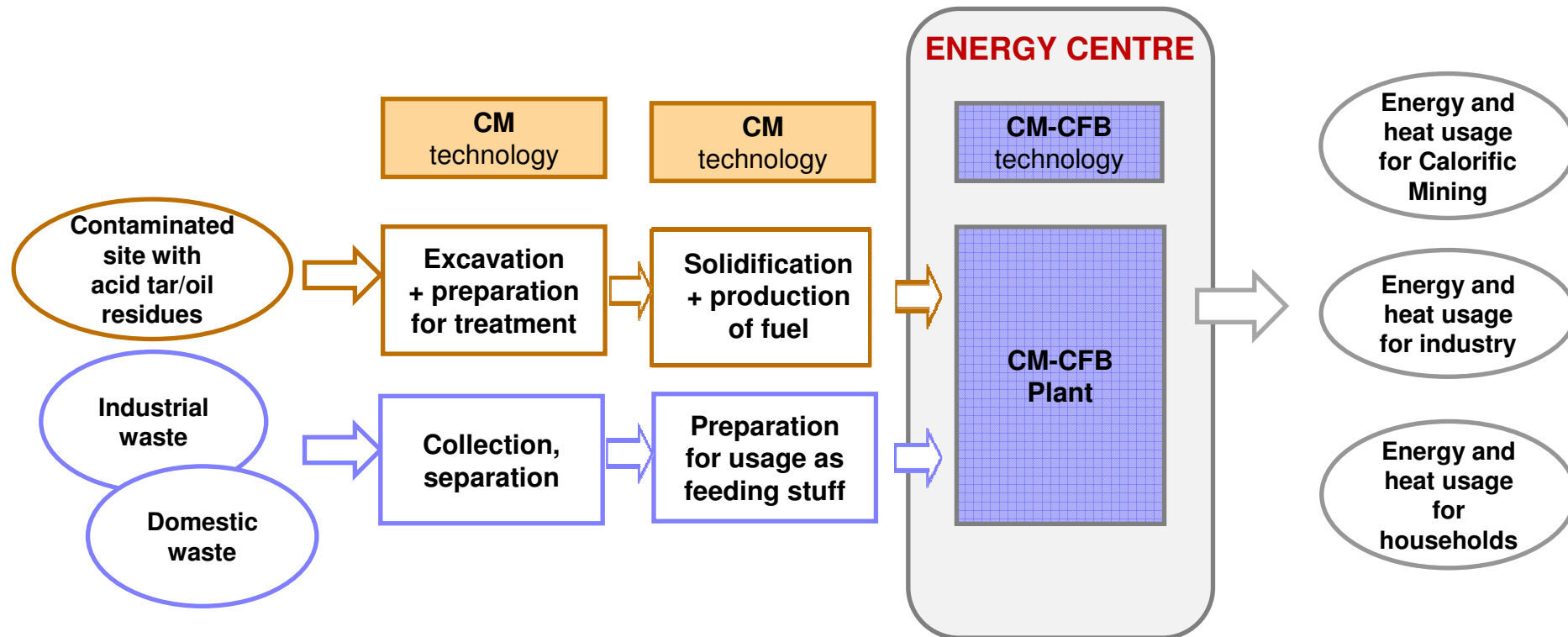


Due to application for various wastes and as renewable energy producing system funding from the EU is feasible - the set up of an Energy Centre is an economical and environmentally friendly solution for infrastructural and waste management demands.



The CM-CFB technology is based on BAUFELD’s experience in treatment of acid tars/oil residues and production of the fuel and on Envirotherm’s experience in utilization of this kind of fuels

CM-CFB-Technology in combination with application for other waste derived fuels



The CM-CFB plant operating within an innovative ECO Centre/Energy Centre can be flexibly used for various waste derived fuels. The energy/heat production can be provided continuously and in a volume independent of single fuel availability.

CM-CFB Plant (Design model)

Input

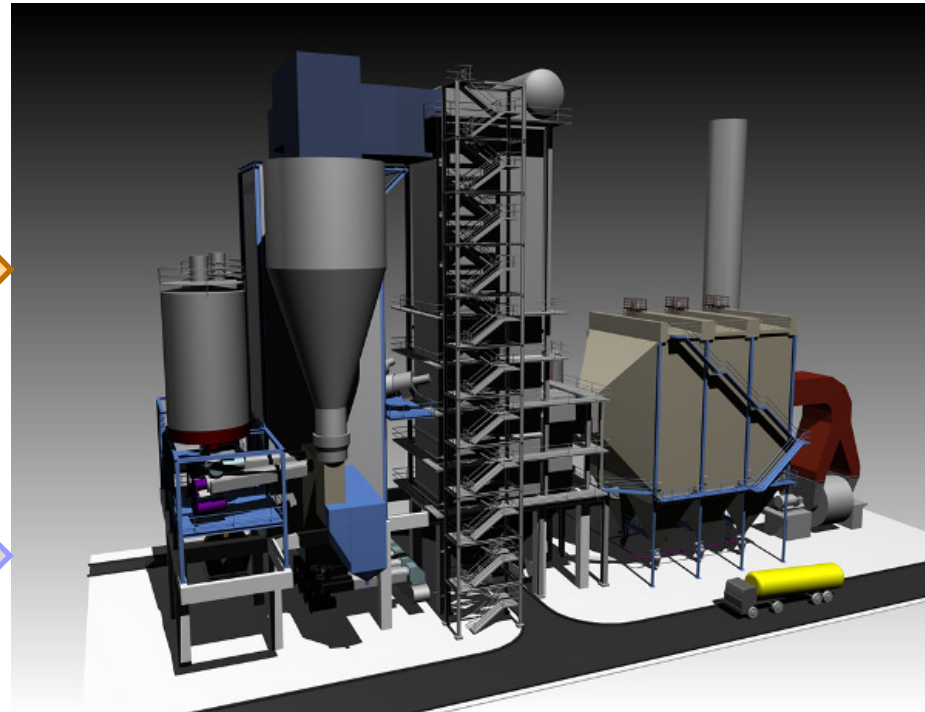
→ 7,500 operating hours/a →

Output

75,000 t/a secondary fuel (15 MJ/kg)

- Special designed for acid tar/oil residues
- Robust flexible system
- Corrosive environment
- Practiced / Proven

- Products derived from industrial and household waste with different calorific values.



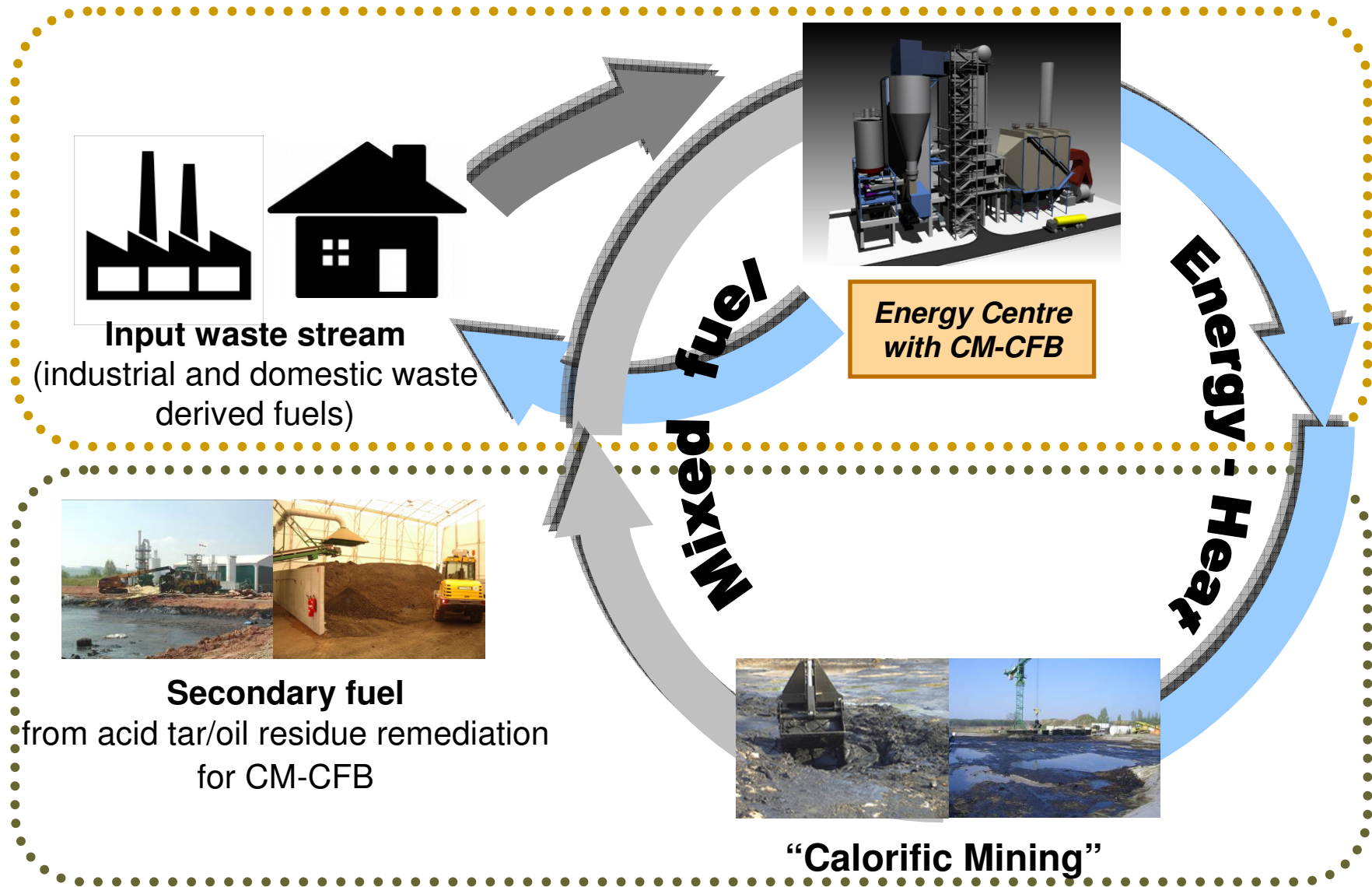
9,000 MWh/a electric power

40,000 t/a coarse and filter ash

Investment 35 MIO €, ROI 9 years, planning/implementation 3 years

Funding support option by EU, due to waste management and infrastructural projects

Energy Loop of CM-CFB-Process



Summary



An CM-CFB based Energy Centre is a sophisticated, economical and ecological solution for the *clean-up of major contaminated sites of the oil industry*.



Due to its flexible and proven technology the special designed *CM-CFB-plant can be included into the specific waste management concepts of refineries*, as it can be fed with different products that are derived from industrial and domestic waste.



The *electric power and heat can be used for industrial and/or residential areas*.



Sustainable Remediation with *maximum acceptance among public stakeholders and maximum reuse of sites*.



Funding by EU-institutions for infrastructural and waste management projects seems feasible.

Actions to be recommended



Request of status of acid tar/oil residues remediation projects of oil industry and status of waste treatment concepts of the oil industry/country.



Status of investment options for CM-CFB plant for combustion of acid tar/oil residue products together with other waste derived products.



Cost benefit analysis of plant investment - investigation of accessible waste volumes to be used.



Task description of engineering works for an overall plant and waste management concept.



Organization of waste streams and establishment an Energy Centre with CM-CFB plant.

Contact

BAUFELD-UMWELT-ENGINEERING GmbH
Chemnitzer Strasse 3
09123 Chemnitz

contact: Dr. Ditmar Gruß (Managing Director)
e-mail: ditmar.gruss@baufeld.de
Web: www.baufeld.de
www.calorific-mining.com



ENVIROTHERM GmbH
Ruhrallee 185
45136 Essen

contact: Dr. Andreas Brors (Head of Business Development)
e-mail: andreas_brors@envirotherm.de
Web: www.envirotherm.de

