Welcome to Putzmeister

Who we are – Locations

Headquarter of the Putzmeister Group in Aichtal

The pillars of our performance

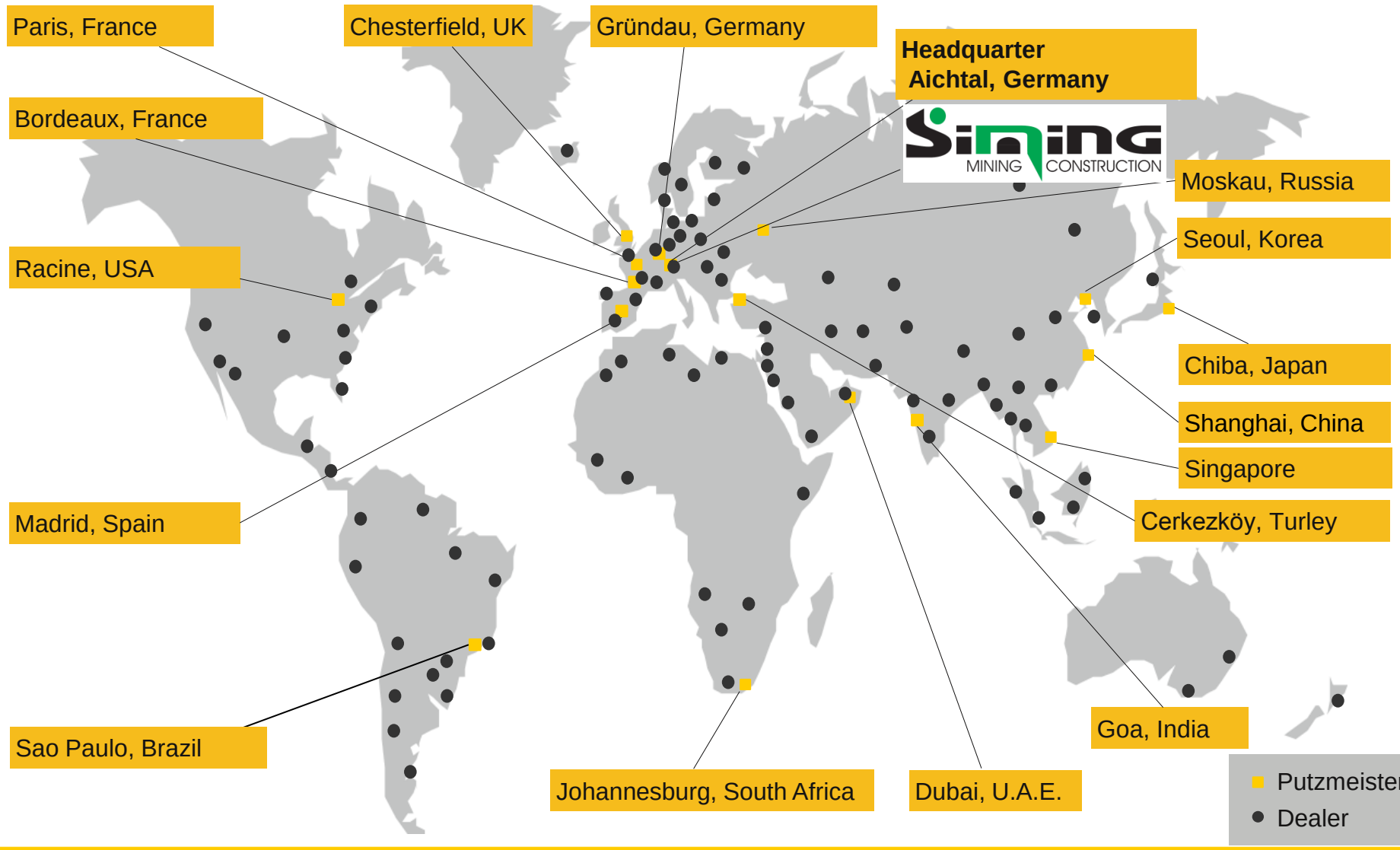
Putzmeister Holding GmbH (PMH)

BU Concrete Technology (PCT)				BU Underground Concreting (PUC)	BU Mortar Technology (PMT)	**BU Industrial Technology (PIT)**
MTF PCT EMEA	MTF PCT Asia Pacific	MTF PCT Indian Continent	MTF PCT Americas	MTF PUC Global	MTF PMT Global	**MTF PIT Global**
Engineering (PEG) – Research & Development for PM Group						
1.1 Concrete pumps 1.2 Telebelt® 1.3 Truck Mixer 1.4 Mixing plants				2.1 Shotcrete Machines 2.2 Mining vehicles	3.1 Mortar machines 3.2 Screed machines	**4.1 Industrial systems**

BU = Business Unit MTF = Market-Technique Field

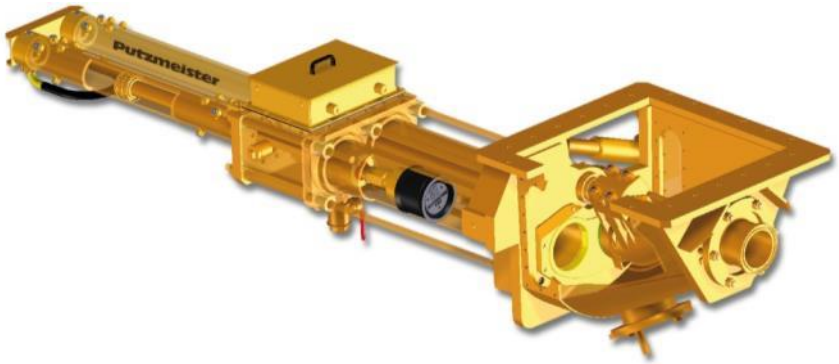
Who we are – Locations

Always close to our customers – our Sales & Service Organisation




Products
Putzmeister
Putzmeister

Products - Pumps

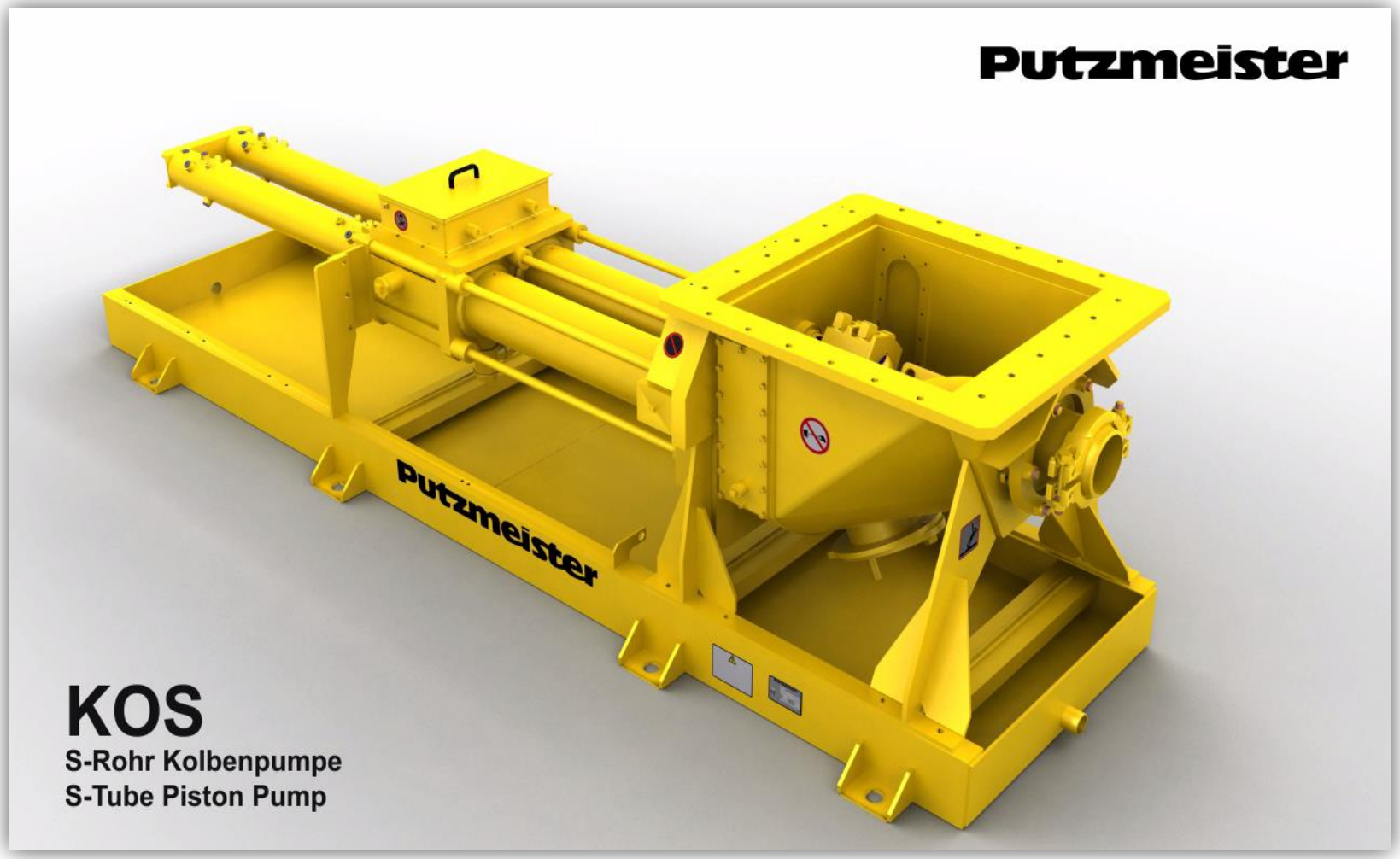


KOS series

Oil-hydraulic double-piston pump with S transfer (without valves)

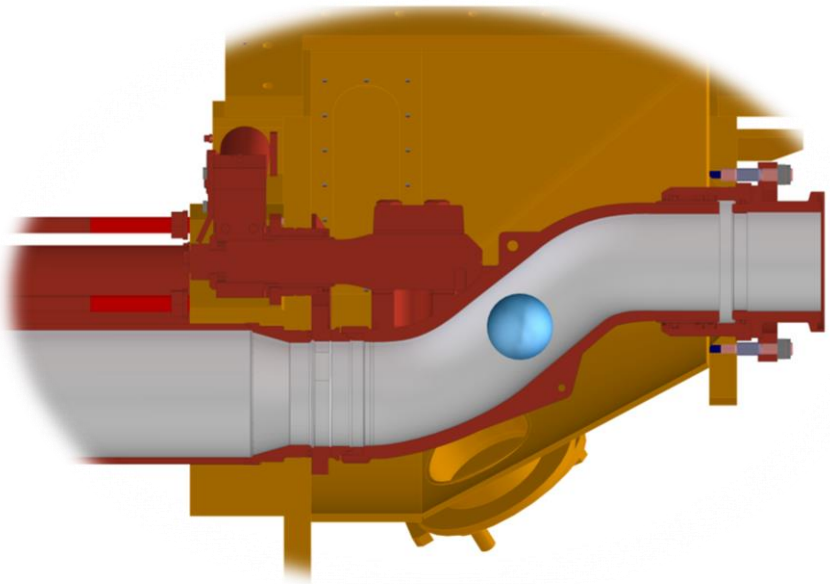
HSP series

Oil-hydraulic piston pump with hydraulically actuated seat valve


Putzmeister
Putzmeister
KOS
S-Rohr Kolbenpumpe
S-Tube Piston Pump

Successful use of Piston Pumps

- S- Tube Piston Pump



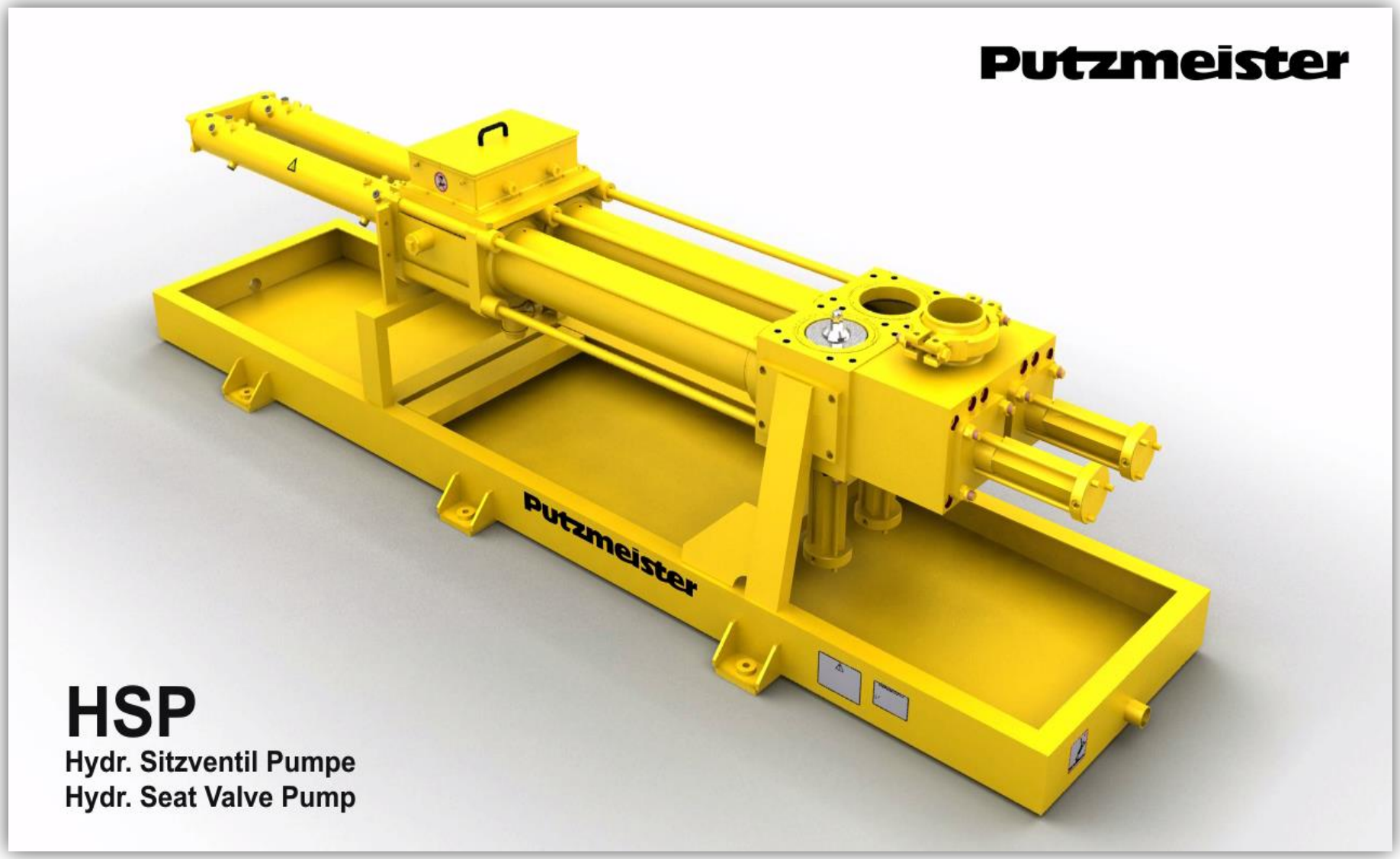
Ability to pump Sewage Sludge, untreated Bottom Ash, Coal Ash due to Free Flow in S-tube

Piston pumps can easily handle a Solids to Water ration from 3:1

- The whole system is robust and not susceptible to changes of parameters during operation

Features of the S-Tube pump KOS:

- Delivery pressure up to 150 bar
- Delivery rates up to 400 m³/h
- Main Material in medium contact : Steel hard chrome plated, DURO 26, NBR
- Stroke length: 1.000 – 2.500 mm
- Delivery cylinder diameter: 120 – 560 mm
- Designed for continuous operation.
- Under severe conditions, many KOS pumps have attained more than 160,000 hours in continuous trouble-free operation


Putzmeister
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HSP
Hydr. Sitzventil Pumpe
Hydr. Seat Valve Pump

Features of HSP solid pumps

- Delivery pressures up to 150bar
- Outputs up to 380 m³/h

- Standard stroke length:
  1.000 mm to 2.500 mm
- Main Material in medium contact :
- Steel hard chrome plated, DURO 26, NBR

- Piston diameter:
  280 mm to 360 mm

- Inlet valve and pressure valve diameter
  280 mm
- Designed for continuous operation


Applications
Putzmeister

Putzmeister Solid Pumps (PSP)

Applications

- **Power stations**
- Biomass
- Mining
- Dredging

- Paper industry
- Animal carcass disposal
- Sugar industry
- Mineral oil industry

Applications

- Offshore
- Cement industry
- **Sewage treatment plants**
- Waste recycling /Hazardous waste


Applications for
Power Plants
Putzmeister

Applications for Power Plants

	Fly & Bottom Ash Slurry	Fly Ash Re-injection	Sewage Sludge co-incineration	Coal Sludge
Power Plant	Brown Coal	Converted Coal to Biomass	Coal fired	Coal fired
Task	Transfer to Deposit	Re-injection of fly ash in the boilers	Co-incineration	Co-incineration
Medium	Fly & Bottom ash between 50 – 70%	Fly ash ~ 65%	Sewage sludge ~35 %	Coal Sludge over 85%

Approved Technologies for Disposal of CCR's

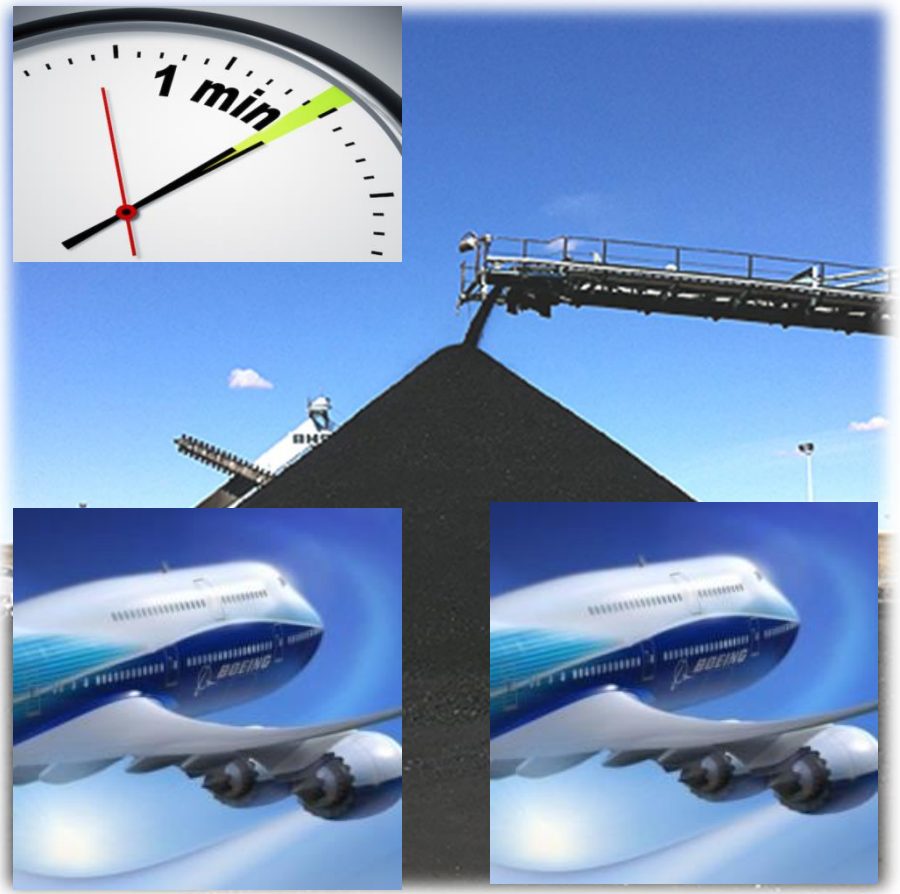
Worldwide Production of Coal Combustion Residuals:

777.000.000 tons

Average CCR Utilisation rate:
53%

CCRs getting disposed:
363.000.000 tons per year

Equivalent weight of
2 Wide-body aircrafts per minute



Approved Technologies for Disposal of CCR's

Flyash handling, management and treatment technologies,

Systems that **Do Generate**
Fly Ash Transport **Water**

Wet-Sluicing Systems

Dense Slurry Systems (DSS)

- (max. 21km/70.000feet)

Systems that **Do Not Generate**
Fly Ash Transport **Water**

Wet Vacuum Pneumatic Systems

- (max. 0,1km/500feet)

Dry Vacuum Systems

- (max. 0,4km/1500feet)

Pressure Systems

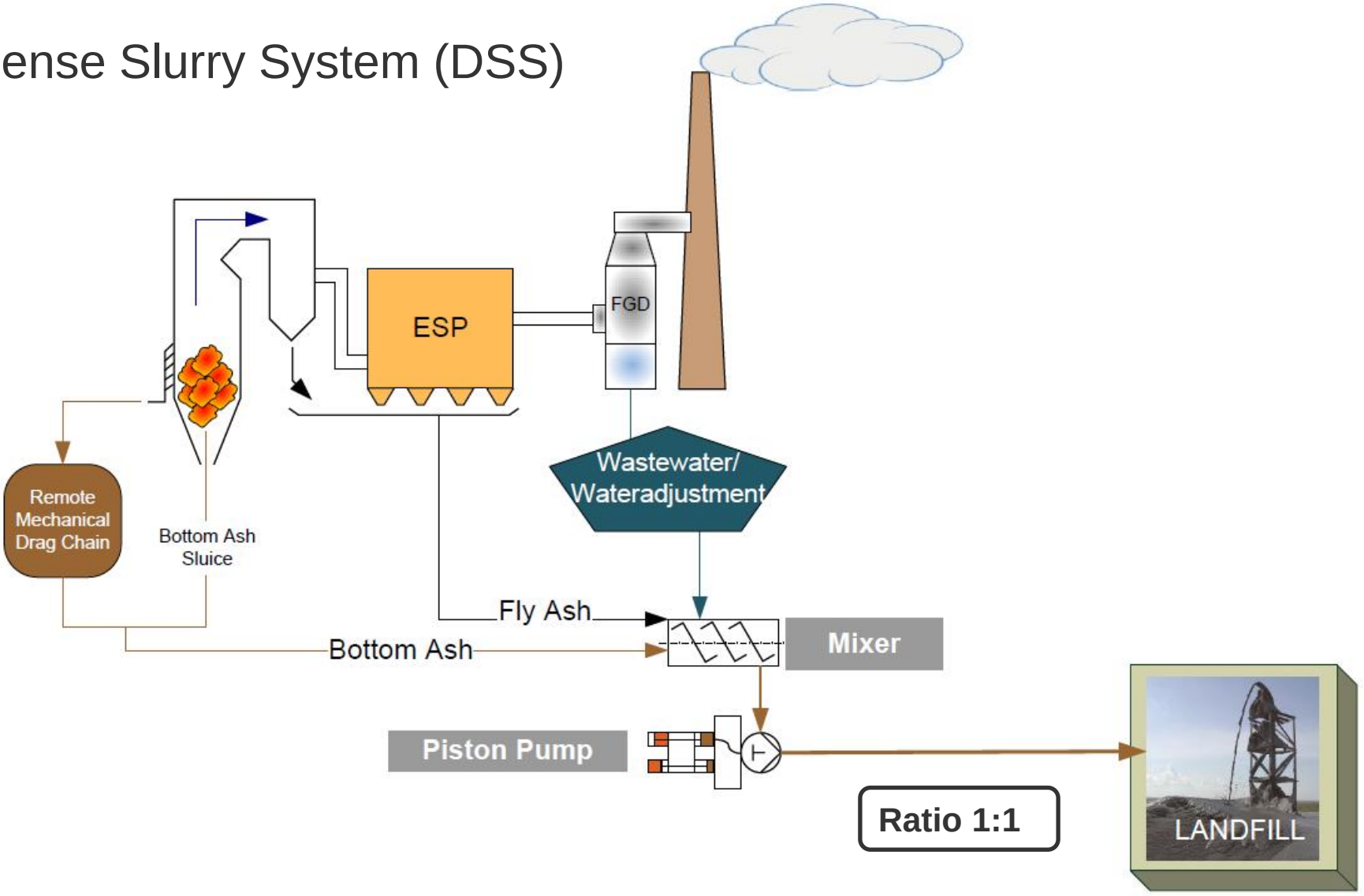
- (max. 2,4km/8000feet)

Combined Vacuum/Pressure

- (max. 2,4km/8000feet)

Conversion from Wet Sluicing to Dense Slurry System

Dense Slurry System (DSS)



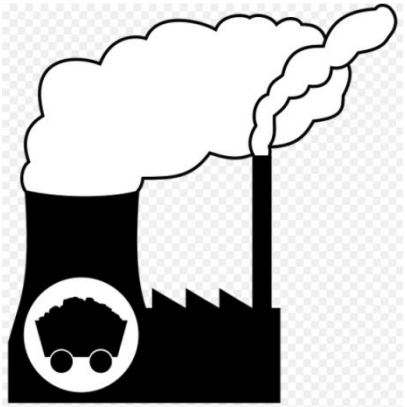
Conversion from Wet Sluicing to Dense Slurry System

- From Rock to Rock

Rock Coal mining for Incineration

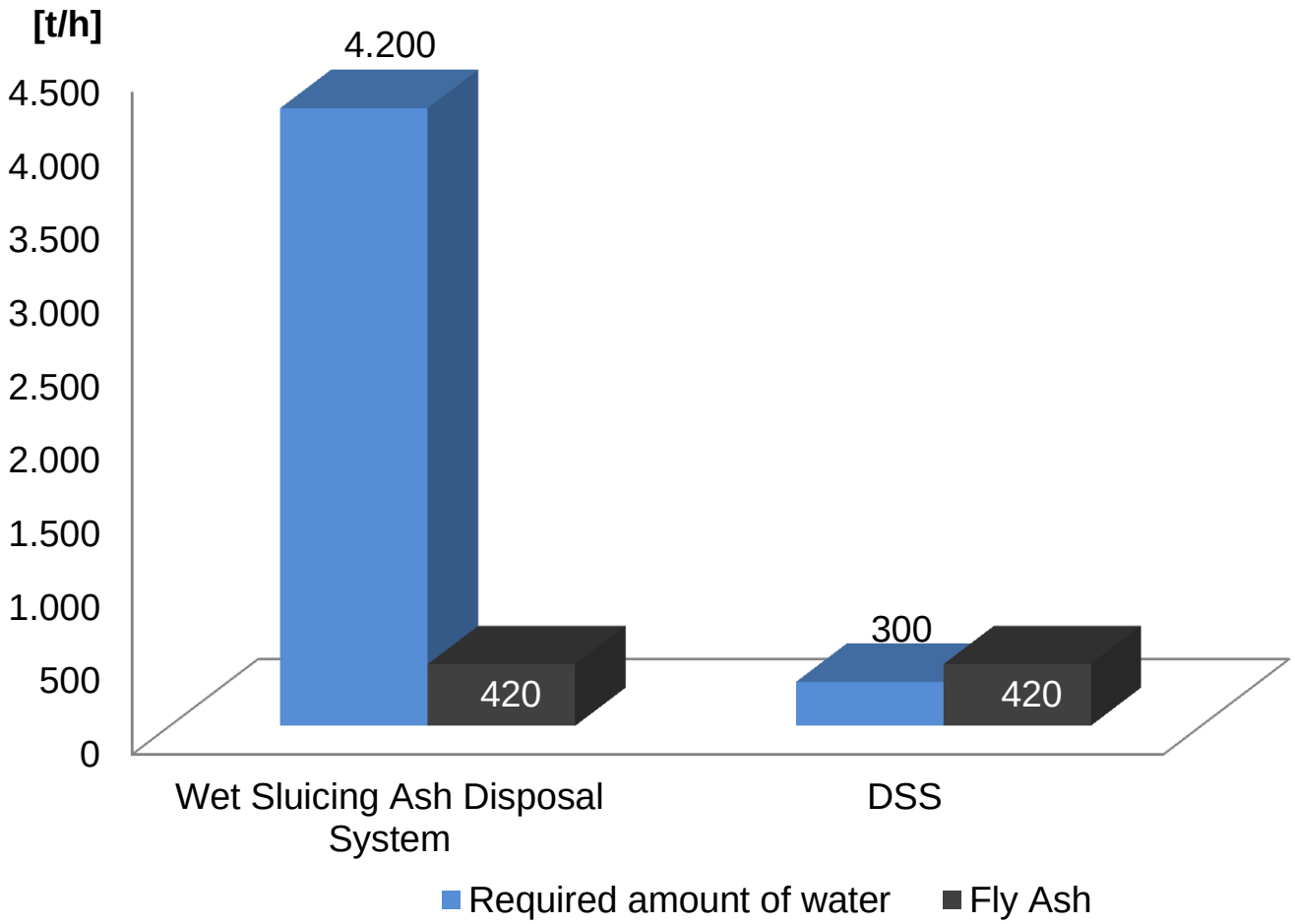
CCR Coal after Incineration

Rock CCR for Landfill with DSS



Conversion from Wet Sluicing to Dense Slurry System

- Wet Sluicing- vs. Dense Slurry System (DSS)



Conversion from Wet Sluicing to Dense Slurry System

Wet Sluicing- vs. Dense Slurry System (DSS)

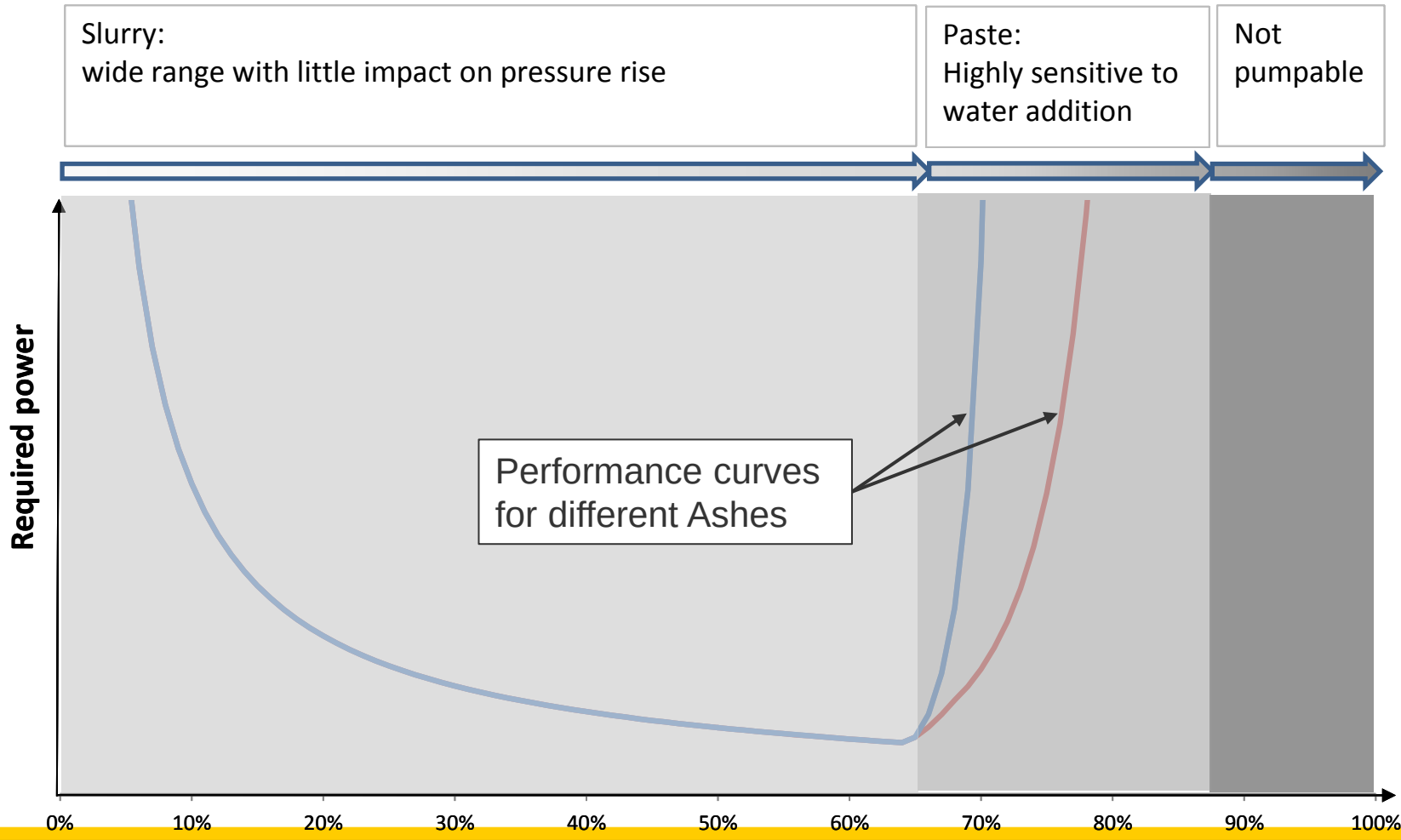
- Savings of 80% of required pipelines (by weight)
- Savings of 2.5M US$ (for a 4mi system)

Wet Sluicing System
System

Dense Slurry

Conversion from Wet Sluicing to Dense Slurry System

- Required power dependent on DS content



Conversion from Wet Sluicing to Dense Slurry System

- NO dust control
- NO water recirculation pipeline
- NO wastewater treatment
- NO groundwater monitoring
- NO Risk of Dike or Dam failures

▪©: Dust Control Technology

▪©: WATERKEEPER ALLIANCE

Disposal solutions for fly ash handling

Economical and ecological disposal solutions for power stations

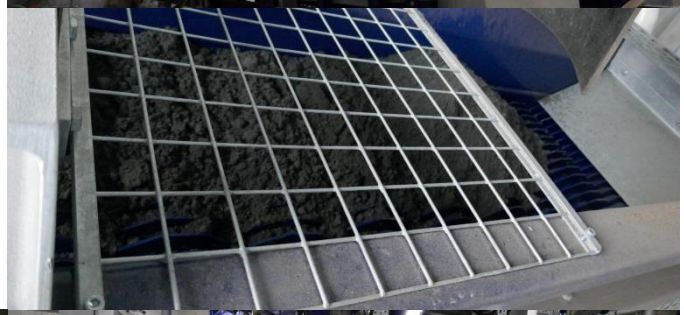
- Low water consumption, only a minimum of contaminated water
- Low energy consumption compared to centrifugal pumps solution
- Reliable pump operation with high dry solids contents up to 70 %
- KOS double piston pump without valves for reliable operation if material contains coarse particles > 5 mm
- Extended lifetime of disposal area
- High availability
- Low maintenance and operating costs
- Service-friendly
- Plants meet EU directives
- Turnkey supply of ash transport systems: silos, mixers, piston pumps, pipework, all necessary accessories
- Worldwide service

The easiest solution: Fly ash slurry for re-injection

Converting a coal fired power plant into a biomass fired power plant can lead to some challenges which might not have been expected. The biomass (woodpellets) can contain a high amount of chlorine which leads to immense corrosion problems in the boiler and the gas treatment system.

To reduce those corrosion effects to an high extend, it has been shown that dosing in coal ash in a slurry like form gives the best results.

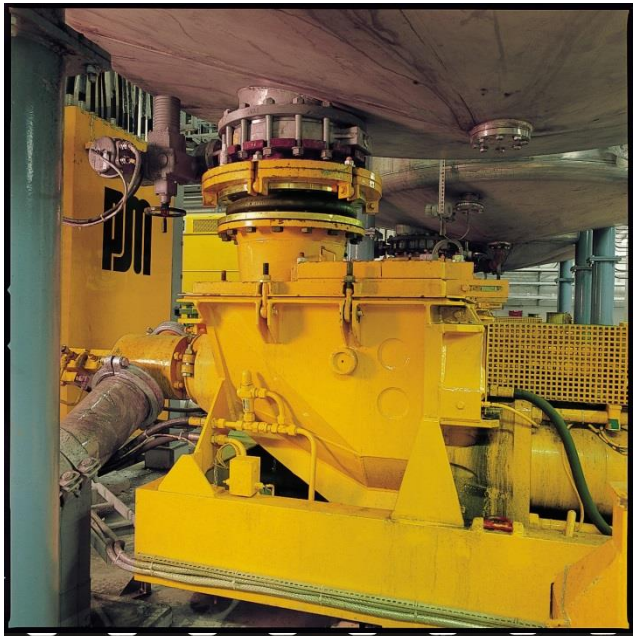
Putzmeister provides full ash handling systems from the tipping point of the ash until the injection into the mill.



Co-incineration of waste coal sludge – more efficient and environmental friendly

- Higher profitability of the power plant
- Reduction of amounts of waste coal reservoirs
- Reliable and continuous pump operation with high dry solids contents over 85 %
- KOS double piston pump feed fuel in form of a coal-paste-water mixture into fluidized bed (PFBC: pressurized fluidized bed combustion)
- High availability
- Low maintenance and operating costs
- Service-friendly
- Plants meet EU directives
- Turnkey supply of coal sludge transport systems: silos, mixers, piston pumps, pipework, all necessary accessories and services
- Worldwide services

Coal Sludge Handling



Putzmeister technology at the heating plant Värtan

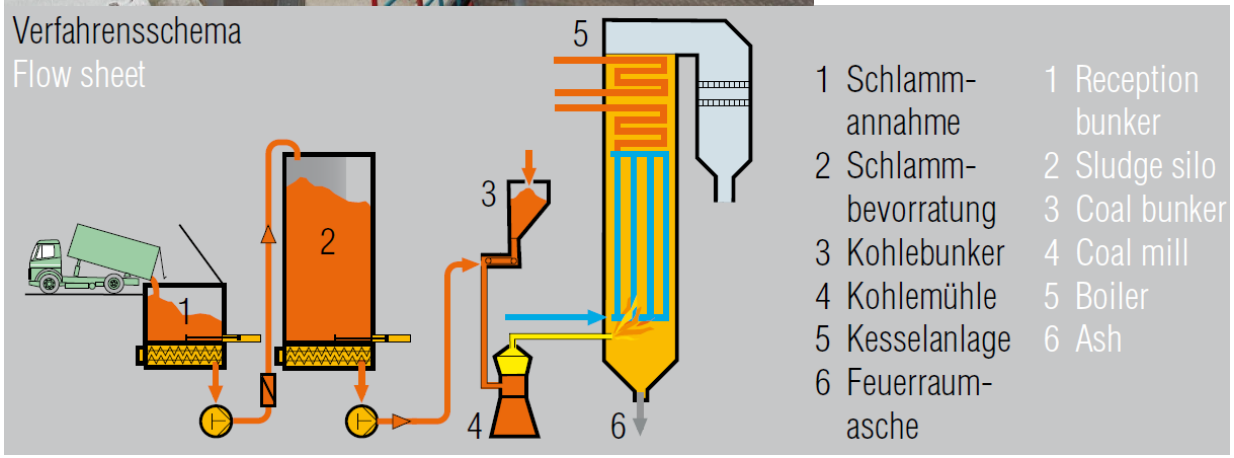
Putzmeister supplied 1991 the Värtan heating and power station in Stockholm with 17 high density solids pumps – Now with more than 90,000 operating hours.

Among these pumps were 3 KOS 2180. They manage the transport of coal from the coal preparation plant to the power station. This over a distance of 350 m and a difference in height of 50 m. 14 KOS 1070 pumps were also needed for the injection of the coal into the PFBC-Boiler.

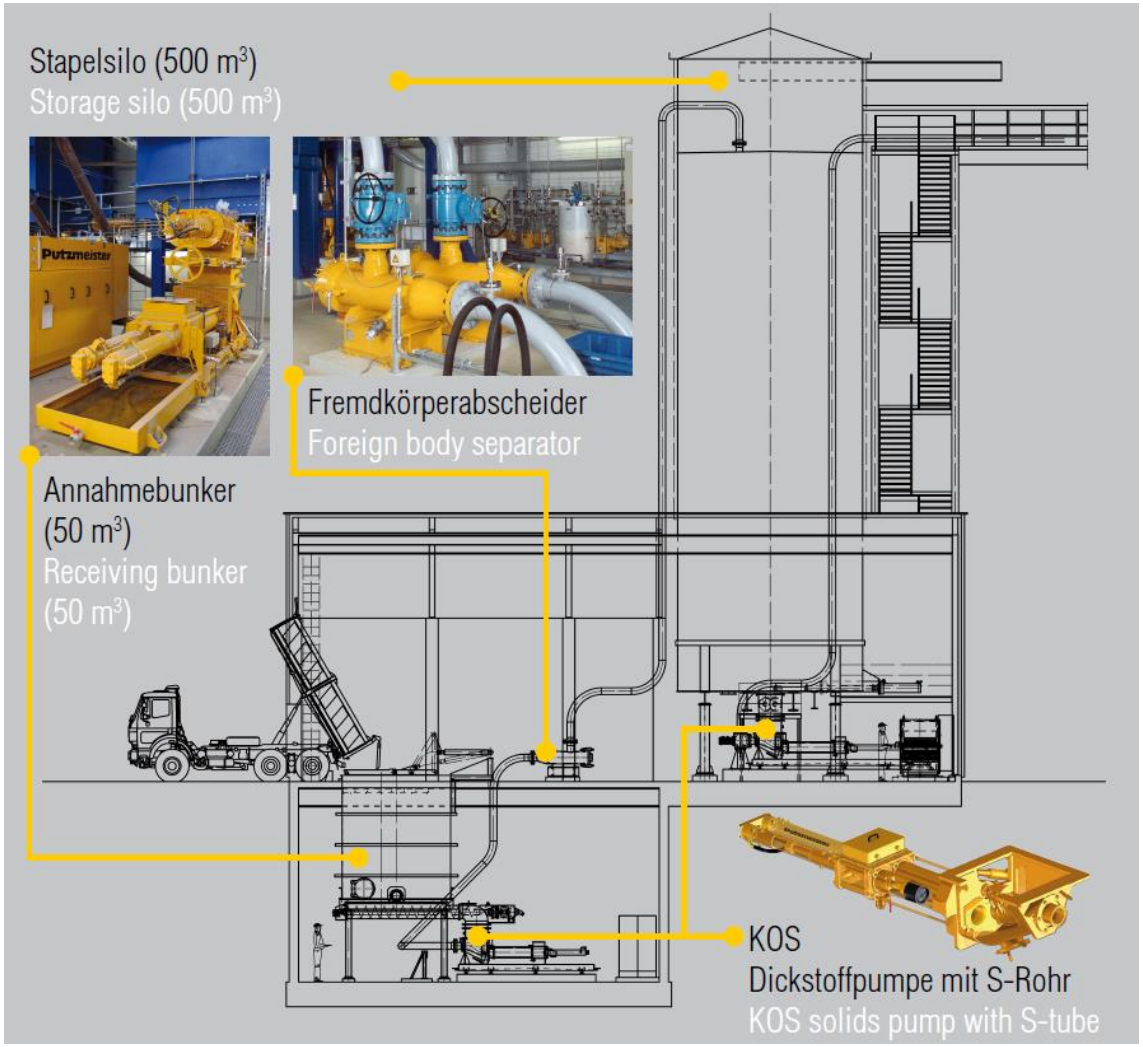
Co-incineration of sewage sludge in coal-fired power plants

Putzmeister supplies the complete systems engineering for:

- Reception of sewage sludge
- Storage of sewage sludge
- Conveyance of sewage sludge
- Metering of the sewage sludge at entry info the coal feeders or the pulverizer chutes.



Co-incineration of sewage sludge in coal-fired power plants




References
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Advatages Belchatow:

Water saving of 3800 tons
of water per hours

Reduction of power requirement by 50%

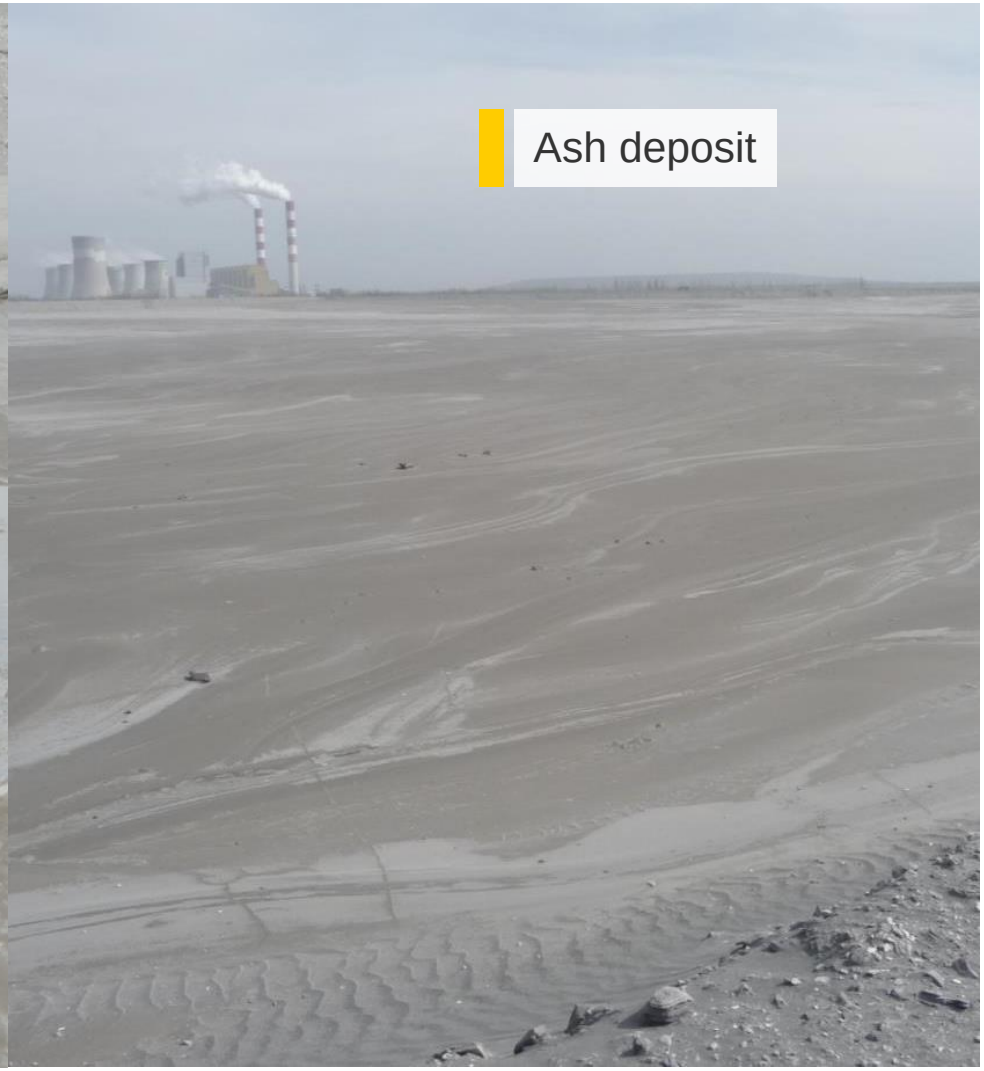
Pipeline Invest savings by 80%

Application data Belchatow:

Medium to be conveyed:	Fly ash slurry
Max. grain size:	10 mm
Dry solids content:	52 % wt
Max. Temperature:	35 ° C
Pumping distance:	8.000 m
Max. output:	200 m³/h
Operating time:	24h

6 x HSP 25.150 HP, HA 400+400 E & PCF


Putzmeister
Made in Germany
Putzmeister



Ash deposit

Application data Staudinger:

Medium to be conveyed:	Sewage sludge
Dry solids content:	20 – 45 %
Max. Temperature:	35 ° C
Pumping distance:	160 m
Max. output:	30 m³/h
Operating time:	6.000 h/a

Receiving area (KOS 1080, HA 200 E)
Storage silo (KOS 1470, HA 200 CE)

Thank you

DEVELOPS IN ORDER TO BE SUCCESSFUL

Our machines and plants offer maximum performance, quality and reliability.

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A STRONG PARTNERSHIP

Cooperation based on trust. Our focus is always on the requirements and needs of our customers. Customer-orientation is our promise. We treat our partners with the utmost respect. We always act fairly and responsibly.

EXPERIENCE PAVES THE WAY

Our global team of highly qualified and motivated employees are constantly working on improving our products and services. In order to break new ground and set standards time and time again, we are continuously investing in research and development.

Putzmeister is a leading solution provider in the area of pumping, mixing and transportation of concrete, plaster and high-density substances. With our parent company, Sany Heavy Industries, we are one of the global leaders in our industry.