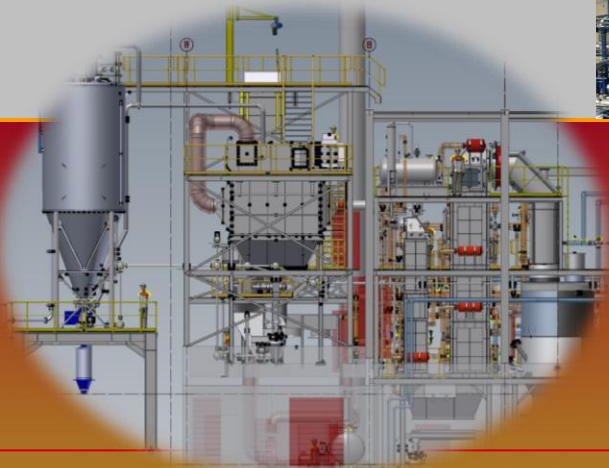


# INTEC Engineering GmbH

## Process heat and power generation



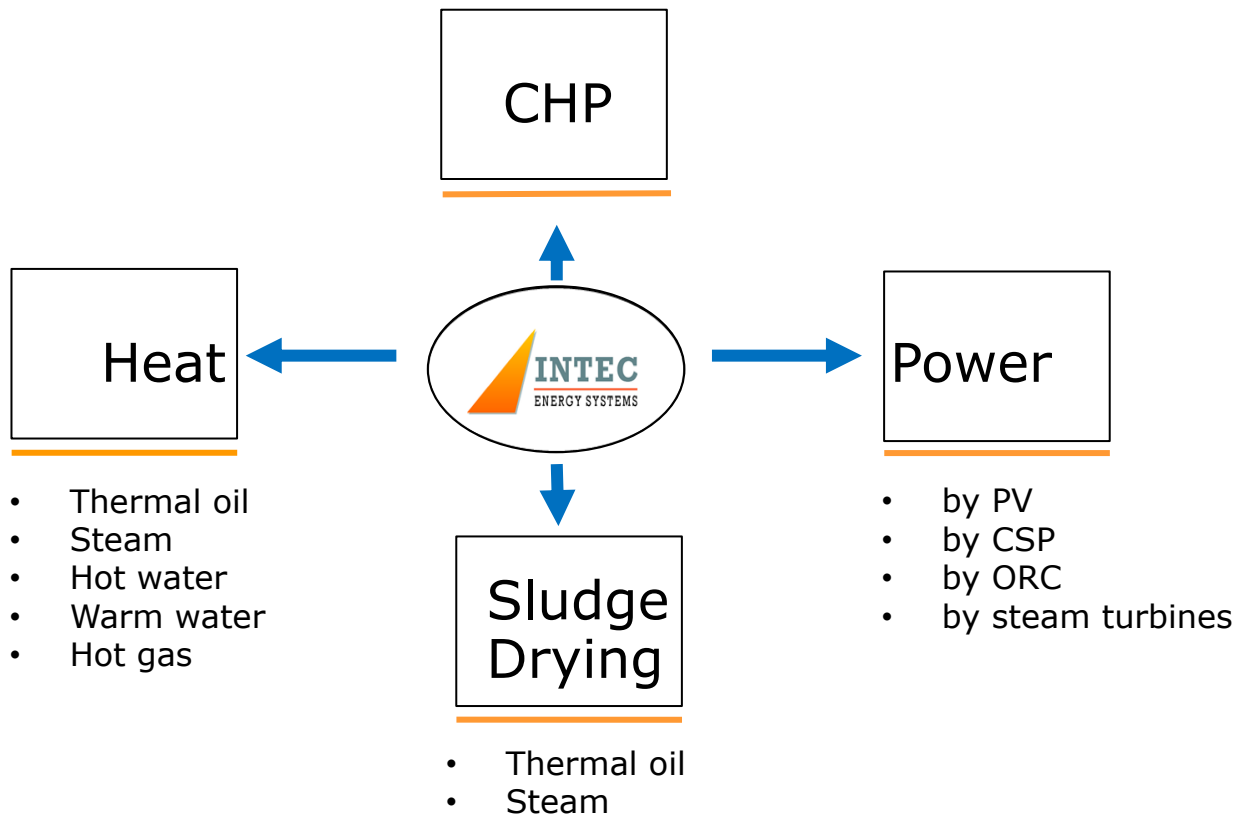
## INTEC Engineering GmbH Germany

- Founded in 1995, INTEC has developed into an internationally leading company for high temperature process heat and green power generation
- The INTEC group achieves a turnover of 25-35 million Euro p.a. generated by approx. 80 employees
- Since the beginning we have successfully expanded the network of own offices as well as representations around the world



INTEC headquarters in Bruchsal, Germany

Companies within the INTEC group are offering services and equipment for various heat and power applications



## A family of heat to power solutions

### Status Quo

- More than 2100 installations in 80 countries
- More than 5200 MW thermal energy installed
- More than 370 MW electrical energy installed





## INTEC Engineering GmbH Germany

- Experienced sales and project engineers for project development
- Design department for customized systems
- Modular systems for plant design
- Manufacturing of key components at our production facility in Bruchsal/Germany
- Supply of key components and local clients manufacturing or turn-key installations as requested by clients
- Experienced supervisors and service engineers



# INTEC Rohrtechnik GmbH

## Quality „Made in Germany“

- INTEC manufacturing takes place at our own workshop in Germany
- Production of step grates, heater coils and tube bundles, complete heaters and boilers
- Certifications according:
  - Marine industry: GL, LR, BV, RINA, DNV
  - ASME U and S stamp
  - TR TS (Russia)
  - Chinese Boiler & Pressure Vessel Manufacture Licence



# Thermal Oil Heaters

## INTEC Type: ET

Thermal oil as heat transfer medium offers the advantage that it can be operated without any pressure build-up until temperatures of 320 °C. Feed line temperature of max. 400 °C using synthetic oil or up to 550°C using molten salt can be achieved.

INTEC thermal oil heaters are characterized by the following features:

- Optimized heat transfer and high efficiency design
- Tailor-made design to individual customer requirements
- Environmental friendly operation due to low emission values
- High operational reliability
- Low operating costs
- Long service life



# Thermal Oil Heaters

## vertical or horizontal design

- Range of capacity: 50 to 30,000 kW
- Fired by natural gas or fuel oil
- High fuel efficiency up to 95 %
- Air pre-heater, stack optionally
- Easy maintenance
- Safe design and operation
- Up firing option





# Electrical Heaters

**INTEC Type: ETE**

- Range of capacity: 20 to 15,000 kW
- Available as pre-mounted units



# Waste Heat Boilers

**INTEC Type: ETA**

Heat recovery boilers using the energy of flue gases to heat up liquid heat transfer medium or steam.

Available as:

- One pass radiation heater
- One pass convection heater in tube bundle design
- Three pass heater
- One pass heater with multiple concentric coils



# High Pressure Steam Boilers

**INTEC Type : iNOOK**

## Natural circulation boiler

- High pressure boiler for closed circuits
- Up to 10 t/h, 100 barg
- Fired by natural gas or fuel oil



## Steam Generators

- Indirect, thermal oil heated steam generators
- Capacity up to 40 t/h of saturated steam
- Pressure up to 60 bar
- Easy regulation
- Operation without permanent attendance (no boiler man)
- Complete systems with water treatment equipment





# Air Preheaters

- For heat recovery from flue gas
- Preheating of combustion air
- Stainless steel execution possible
- Cross-counter flow for improved efficiency



## Secondary Control Circuits

- Secondary control circuits for heating and cooling processes
- Precise control of heat transfer to consumer
- Delivery as completely preassembled unit with pumps and accessories as option
- Low loads and forces on pump through fixed point construction



# Solid Fuel Firing Systems

## Reciprocating step grate

- Step grate or fluidized bed design
- Capacity up to 100 MW
- Reliable operation with high availability
- Low emission values for CO and NOx
- High efficiency
- Automatic fuel feeding and de-ashing
- Operation with “low quality fuel” or high moisture up to 180 % o.d.b.
- Burning solid wastes like bark, chips, wood waste, off-cuts, trimmings, production waste, sanderdust and even critical fuels such as rice husks, cotton stalks, sunflower seeds etc.



# Solid Fuel Firing Systems

## Fluidised bed combustion

- Fluidised bed combustion with controlled ash recirculation
- Capacity up to 50 MW
- Ash cooling heat exchanger positioned outside of combustion area
- Automatic fuel feeding and de-ashing
- Reliable operation with high availability
- Low emission values for CO and NOx
- High efficiency
- Waste heat recovery media: thermal oil, steam, hot water
- Burning solid wastes like biomass, coal, sewer sludge, production waste





## Energy plants

- Complete energy plants for particleboard, MDF or OSB production with heat transfer by thermal oil, steam or hot gas

Capacity range: up to 100 MW

- Fuels like bark, wood chips, production waste, fines, sanding dust, saw dust, rice husk, empty fruit bunches and other biomass fuels.  
Other fuels like coal, natural gas or fuel oil may be used additionally
- Low emissions, modular design, high reliability



## Power and co-generation plants with biomass

- Complete systems for power plants, output up to 20 MWe
- Fuels like bark, wood chips, production waste, rice husks, other biomass fuels, coal, municipal waste, RDF, sewage sludge may be used
- High degree of local manufacturing is possible



# Power plants with Organic Rankine Cycle

- Offered by INTEC GMK GmbH in Germany

**INDUCAL®**

Waste heat recovery



**GEOCAL®**

Geothermal



**ECOCAL®**

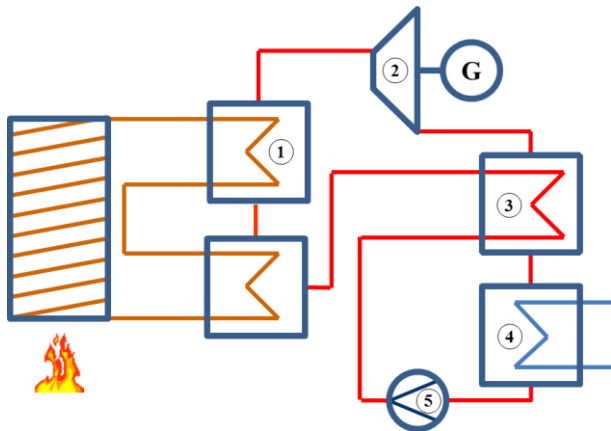
Biomass



# Power plants with Organic Rankine Cycle

## ECOCAL ORC-Module

- Power generation based on biomass firing systems
- Process temperature up to 320°C





# Power plants with Organic Rankine Cycle

## INDUCAL ORC-Module

- High temperature application: usage of waste heat energy from industrial or biogas process;  
process temperature up to 330°C
- Low temperature application: usage of warm water waste streams from industry;  
process temperature up to 100°C



# Power plants with Organic Rankine Cycle

## GEOCAL ORC-Module

- Power generation based on geothermal heat sources
- Process temperature up to 110°C hot water





## Thermal Sewage Sludge Utilisation

- Sewage sludge dryers and incinerators:  
Contact dryer for sanitizing, drying and increasing the calorific value of municipal and industrial sewage sludge, wet fractions, oil sludge, fermentation residues and water sediments
- Dryer operation with hot oil or steam

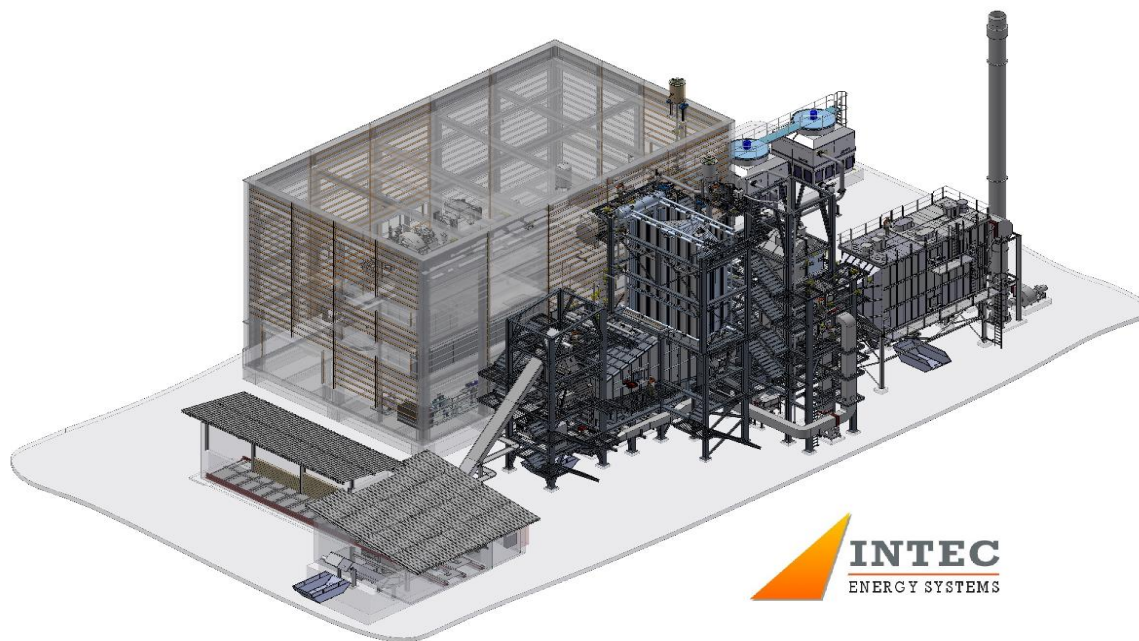




# INTEC Group

## REFERENCES

### 10 MWe Power Generation Plant in Abashiri/Hokkaido



# INTEC Group

## REFERENCES

**RDF fluidised bed combustion (FBC) system for steam and power production**



 **KOLON INDUSTRIES**

**Total output:** 15,5 MWth

**Fuel:** RDF

**Installation:** Incheon / South Korea

**Customer:** Municipality Incheon

# INTEC Group

## REFERENCES

### Wood waste fired hot gas generator with thermal oil heating system and steam generation



**Firing Capacity:** 60 MW  
Step grate firing: 45 MW,  
Sander/screen dust: 19 MW,  
Thermal Oil heater: 25 MW,  
Indirect steam generator: 15 MW,  
Hot gas: 34 MW  
**Installation:** Spain  
**Customer:** Kronospan (Unopan)

# INTEC Group

## REFERENCES

### Recycled waste wood fired incinerator for steam and power production (CHP)



**Richi** Weiningen

**Firing Capacity step grate:** 16,5 MW  
20 t/h steam @32 bar and 380°C  
3,2 Mwe1 Power Production  
12 MW for green house and building heating  
**Installation:** Zürich, Switzerland  
**Customer:** Richi Weiningen



# INTEC Group

## REFERENCES

**Co-generation plant with rice husk combustion  
in cooperation with LAWI-Engineering GmbH**



### BUAYAI BIO POWER

**Firing Capacity:** 30 MW  
Electrical output: 6 Mwe,  
Steam for rice mill production  
(paddy dryers etc.)  
Fuel: Rice husk  
**Installation:** Thailand  
**Customer:** Buayai Bio Power

# INTEC Group

## REFERENCES

### Hybrid solar-biomass plant in Spain (worldwide the only one in commercial scale)



**Firing Capacity:** 2 x 25 MW (biomass),  
6 MW Gas fired Thermal Oil Heater

Electrical net Output: 22,5 Mwe  
Yearly Power Production: 98.000MW  
181.000m<sup>2</sup> Collectors installed on  
700.000m<sup>2</sup> Land

**Installation:** Spain

**Customer:** Thermosolar Borges

# INTEC Group

## REFERENCES

**Coal fired fluidised bed combustion (FBC) system  
for thermal oil heating with flash tank**



**Total output:** 2 x 13,8MW (Anthracite Coal)

Thermal oil system: 2 x 11,6 MW

**Installation:** Taiwan

**Customer:** Lea Lea Synthetic Fibre

# INTEC Group

## REFERENCES

### Sewage sludge dryer and incinerator for steam and power production



**Firing Capacity:** 5,7 MWth  
1 Mwel Power Production  
Fuel: Sewage Sludge  
**Installation:** Karlsruhe, Germany  
**Customer:** City of Karlsruhe



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# The INTEC Group

