

TRANSPARENT ENERGY SYSTEMS PVT. LTD.

WELCOMES

all delegates

in

**Energy Management Workshop,
CPRI, Bengaluru.**



The company

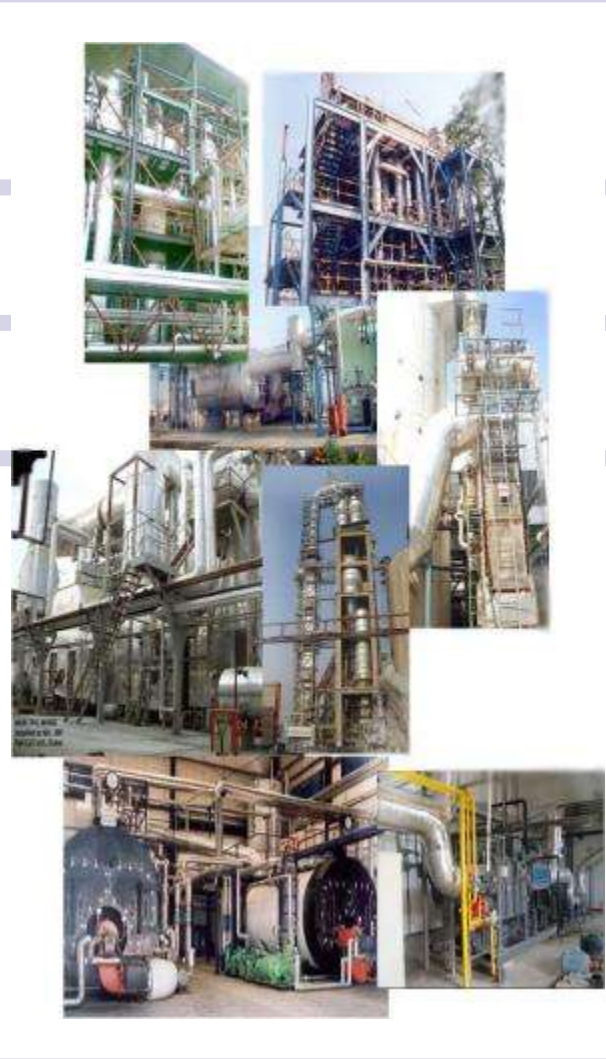
- Incorporated on 16th April, 1986 as Vapor Energy Machines Pvt. Ltd.
- Renamed on 18th December 1995 as Transparent Energy Systems Pvt. Ltd..
- Technology leaders in business groups
- Resource conservation through energy efficiency
- Patented products & services
- Holder of S & U stamps from ASME and R stamp from NB

Business groups



1	Waste Heat Recovery Systems	www.heatrecovery-system.com
2	Waste Heat driven Power Plants	www.heatrecovery-system.com
3	Co-generation Systems	www.tesplcogen.com
4	Ammonia Absorption Refrigeration Plants	www.tesplaarp.com
5	Power Boilers	www.tespowerboilers.com
6	Combustion Turbine Inlet Air Cooling Systems	www.turbineaircooling.com
7	Rankine Cycle Power Plants	www.rankineplant.com

Business groups (cont'd)



8	Air Cooled condensers & Coolers	www.tespl.com
9	Process Boilers & Heaters	www.tesprocessboilers.com
10	Biomass Gasification Plants.	www.bmethanation.com
11	Lithium Bromide Absorption Chillers	www.tespl.com
12	Zero Liquid Effluent Discharge Plants	www.zldplants.com
13	Waste Incineration fired Power Plants	www.mswcombustion.com ; www.mswuse.com
14	Energy & Water Conservation Consultancy.	www.tespl.com

Business alliances & collaborations



Mattes Engineering GmbH, Germany – *Since 1994*
Technical collaboration and know-how transfer agreement for
Ammonia Absorption Refrigeration Plants (AARP)
www.mattes-int.com



LaMont-Kessel GmbH & CO., Germany – *Since 2007*
Technology licensing and know-how transfer agreement for
boiler capacities up to 300 TPH.
www.lamont-services.com



Bioenergie Beratung Bornim GmbH, Germany – *Since 2007*
Technology licensing and know-how transfer agreement for
wet & dry fermentation of solid, semi solid & liquid
biomasses, bio-diesel and ethanol production technologies.
www.b3-bornim.de

Business alliances & collaborations (cont'd)



Jiangsu Shuangliang Air-conditioning Equipment Co. Ltd.,
China – *Since 2004*
Co-operation agreement for application engineering, sales
and service of LiBr Absorption Chillers.
www.shuangliang.com



Shandong Qingneng Thermal Power Equipment Co., Ltd.,
China – *Since 2006*
Co-operation agreement for application engineering, sales
and service of Steam Turbines with subsidiary of TESPL.
www.qnpower.com



The Cool Solutions Company, USA
Co-operation understanding for wide range of engineering
services.
www.coolsolutionsco.com

Business groups

1. Waste Heat Recovery Systems

Sources of waste heat

- Hot waste gases from
 - Cement Plants
 - Steel Melting Furnaces
 - Industrial Furnaces
 - Incinerators
 - Process Waste Gas
- Exhaust gas from Gas Turbines
- Exhaust gas from Engine Generators
 - Heavy Fuel Oil fired
 - High Speed Diesel fired
 - Natural Gas fired
- Jacket Water from Engine Generators

Waste Heat Recovery Systems (cont'd)



Hot waste gases from Glass Furnace

Exhaust gas from Gas Turbine



Waste Heat Recovery Systems (cont'd)

Exhaust gas from Engine Generators



WHRB for 3 X 1 MW HSD fired engine



WHRB for 2 X 1 MW gas fired engines



WHRB for 3.8 MW HFO fired engine

Waste Heat Recovery Systems (cont'd)

Jacket Water heat recovery from Engine Generator set



WHRB on 6.7 MW gas fired engine



2. Waste Heat driven Power Plants



Exhaust gases from

- Cement Plants
- Float Glass Plants
- Gas Turbines
- Engines
- Steel melting furnaces
- Other metallurgical furnaces
- Incinerators
- Process waste gases

Waste Heat driven Power Plants (cont'd)

- 1.2 MW gross power
- Exhaust gas from float glass furnace
- Furnace capacity - 700 TPD
- Air cooled condensing



- 1.4 MW gross power
- Exhaust gas from 3 X 6 MW Gas Engine generators
- Air cooled condensing



Waste Heat driven Power Plants (cont'd)

- 2.3 MW gross power
- Exhaust gas from Cement Plant
- Plant capacity – 1700 TPD
- Water cooled condensing



Waste Heat driven Power Plants (cont'd)

- 5 MW gross power in Cement Plant
- Exhaust gas from pre heater only
- Plant capacity – 3000 TPD
- Water cooled condensing



- 4 MW gross power in Cement Plant
- Exhaust gas from clinker cooler only
- Plant capacity – 7500 TPD
- Air cooled condensing

Waste Heat driven Power Plants (cont'd)



- 13.2 MW gross power
- Exhaust gas from Pre heater & Clinker Cooler both.
- Plant capacity : 3000 TPD X 2 Nos.
- Air cooled condensing
(Project under execution)

3. Co-generation Systems

- Combined generation of

Power

Heat

Refrigeration & Chilling

Evaporation & Drying

- Fuels & Energy Sources

Coal

Biomass / Agro residue

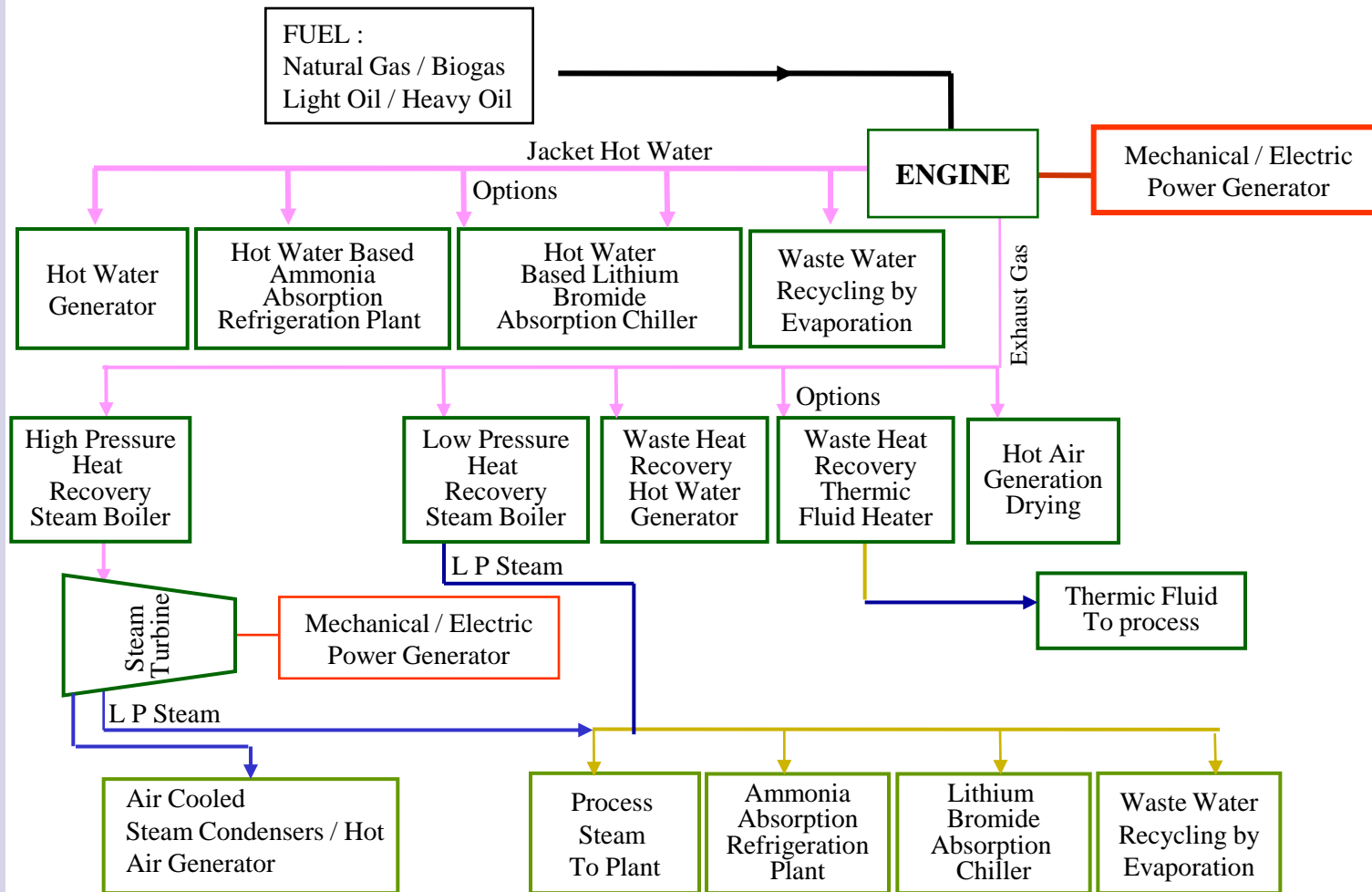
HFO / LDO / HSD / NG

Bio gas

Process waste gas

Co-generation Systems (cont'd)

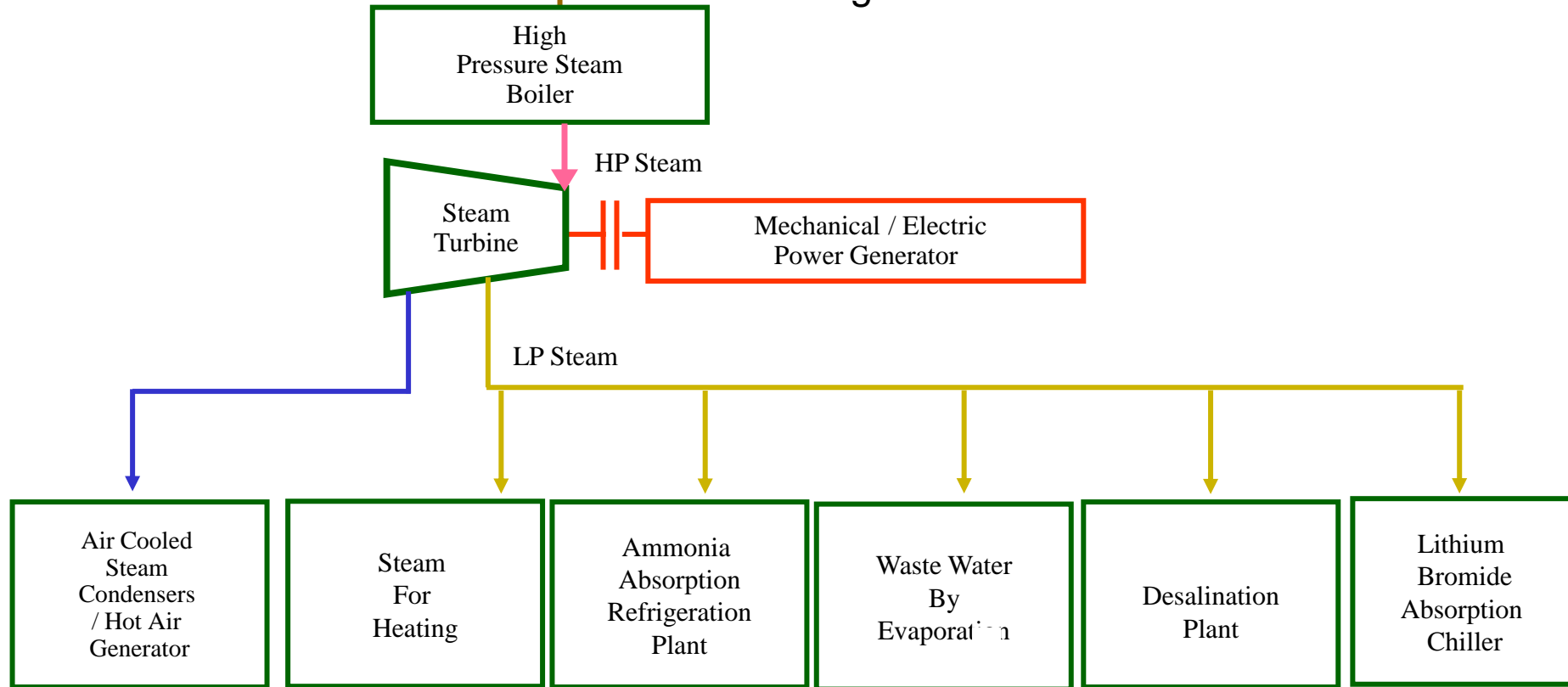
Engine based Otto / Diesel cycle co-generation



Co-generation Systems (cont'd)

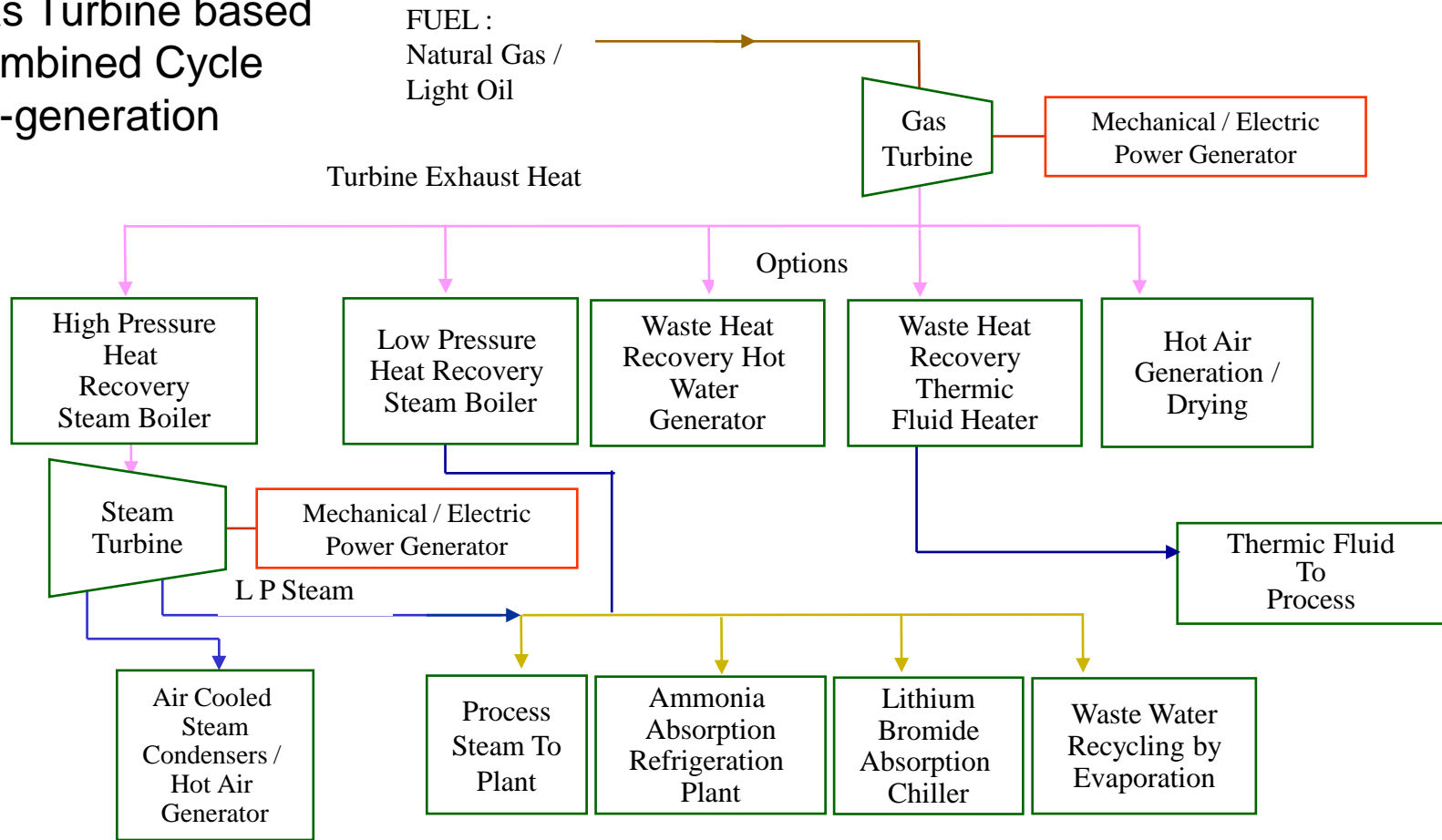
FUEL :
 Biomass, Agrofuels, Coal,
 Heavy Oil,
 Natural Gas.

Steam Turbine based Rankine Cycle Co-generation



Co-generation Systems (cont'd)

Gas Turbine based Combined Cycle Co-generation



Co-generation Systems (cont'd)



Engine based Co-generation

Gas Turbine based Co-generation



4. Ammonia Absorption Refrigeration Plants

- Technical collaboration and know-how transfer agreement with Mattes Engineering GmbH, Germany

- Operates on low grade energy sources

Steam

Hot Water

Hot Oil

Fuel fired

- Wide operating range

+5 to -60 Deg. C

- Ammonia is an Eco – Friendly refrigerant

- High reliability and low maintenance

- Long life – At least 25 years

Ammonia Absorption Refrigeration Plants (cont'd)



- Freeze Drying
- Food Refrigeration
- Brine Cooling
- Cold Storage
- Vapor ammonia recovery in chemical processes



- Refineries
- Fertilizer Plants
- Bulk Drug Industries
- Pesticide Plants
- Chemical Plants.



- Dairies
- Ice Plants
- Ice Cream Plants
- Meat Processing
- Fish Processing

Ammonia Absorption Refrigeration Plants (cont'd)



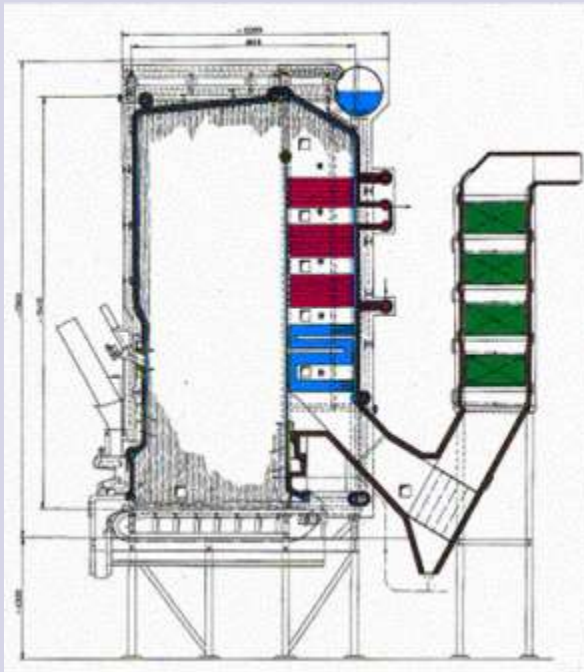
- Client : CCL Products Ltd.,
Vijaywada, AP
- Application : Coffee freeze
drying
- Brine temperature : - 54 Deg. C
- Capacity : 2100 kw

5. Power Boilers

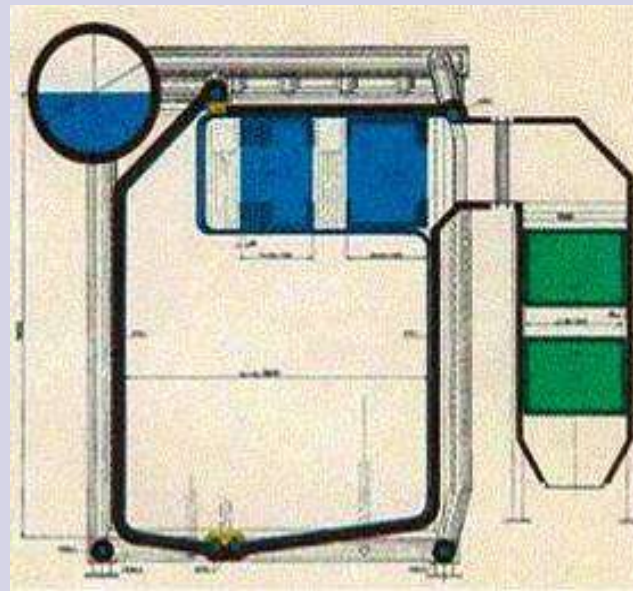
- Technology licensing and know-how transfer agreement with LaMont Kessel GmbH & Co., Germany
- Steam Boilers
 - Capacities up to 290 TPH
 - Pressures from 8 to 136 bar
 - Temperatures up to 535 C
- Thermal Oil Heaters / Hot Water Boilers
 - Capacities from 1 MW to 174 MW
- Waste Heat Recovery Boilers
- Fuel suitability
 - Fuel Oils / NG / Coal / Biomass
 - Industrial & Municipal Waste
- Over 20000 designed installations so far by LaMont.



Power Boilers (cont'd)



- Coal fired boiler
- Capacity – 100 TPH
- Pressure – 60 bar
- Temperature – 480 C



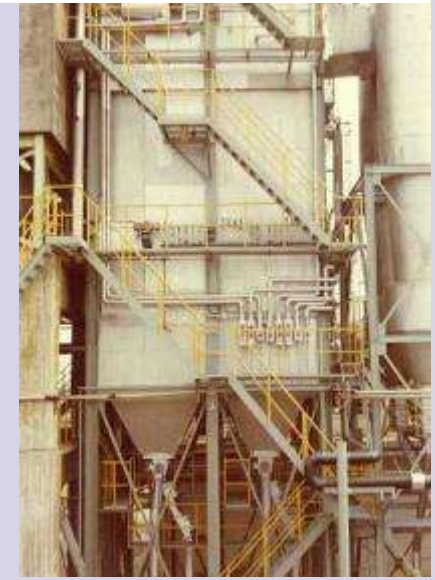
- Oil fired boiler
- Capacity – 90 TPH
- Pressure – 16 bar
- Temperature – D & S

Power Boilers (cont'd)

Horizontal compact boiler – 100 TPH



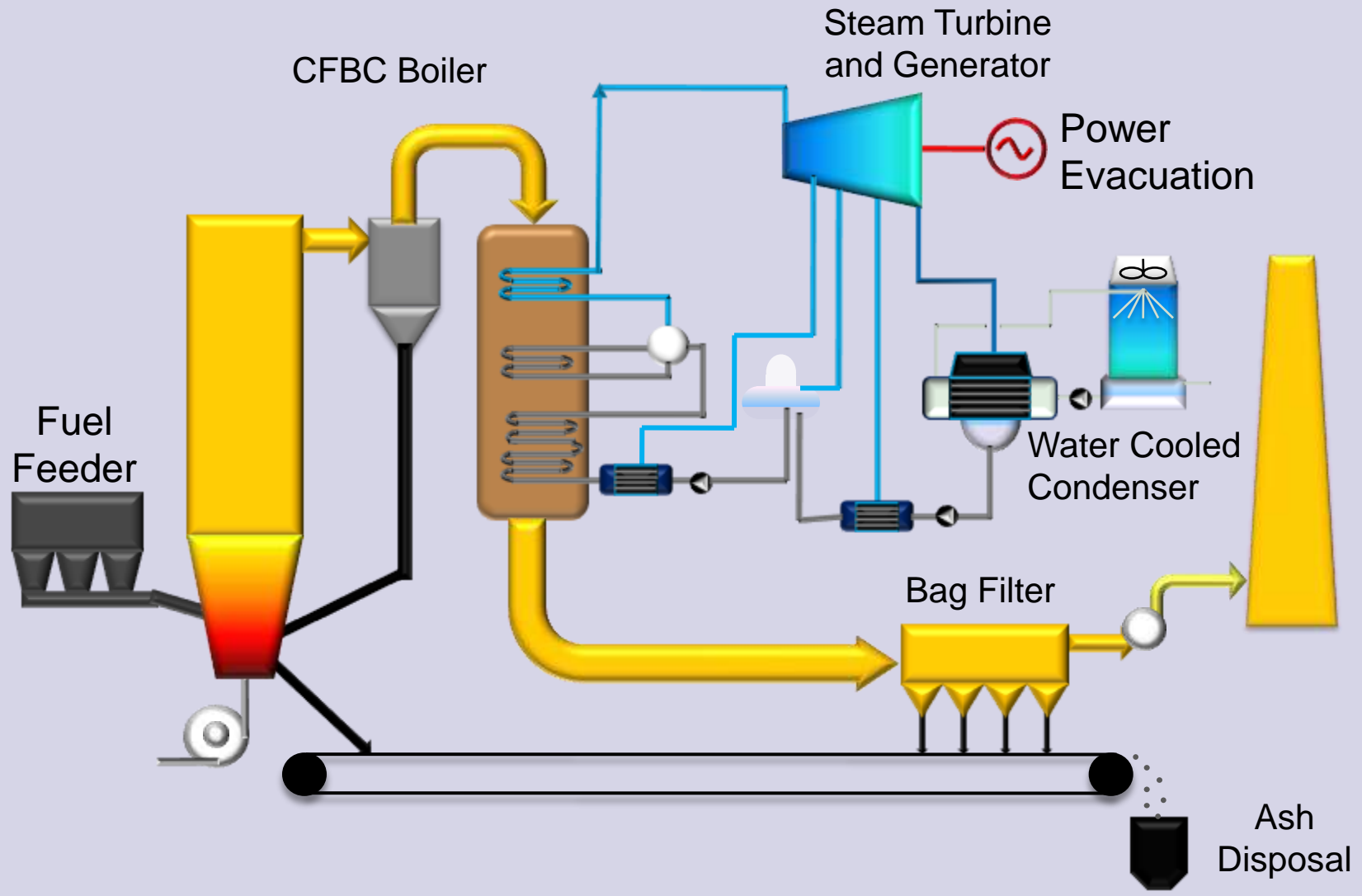
Waste Heat Recovery Boiler for
Kawasaki



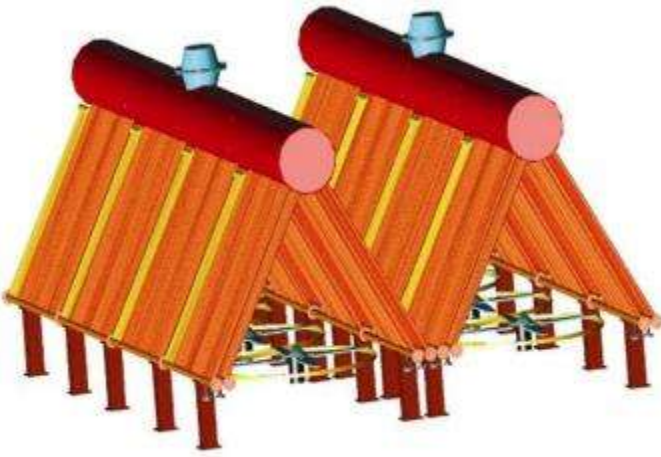
6. Rankine Cycle Power Plants

- Circulating Fluidized Bed Combustion technology
- High pressure Steam Boiler & Steam Turbine Generator package
- Capacity range – 1 MW to 50 MW
- Fuel options - Coal / Bio mass
- Condensing options – Water cooled / Air cooled

Rankine Cycle Power Plants (cont'd)



7. Air Cooled Condensers & Coolers



- Condensation & cooling of Steam, Organic Vapours, Thermal Oils, Ammonia, Refrigerants etc.
- Capacity range – 2.5 TPH to 12.5 TPH condensation in single module.
- Condensation Temperature – 20 C above dry bulb temperature
- Condensation pressure – 0.1 bar (a) to 0.2 bar (a)
- Finned Tube / Bare Tube design.
- A type / Vertical / Horizontal construction.

8. Process Boilers & Heaters

▪ Steam Boilers

- Capacities - 1 TPH to 32 TPH
- Pressures - 10.54 / 17.5 / 21 / 25 kg/cm² (g)
- Gas fired
 - STEAMSTAR-GS : 98% ± 0.5 Thermal Efficiency on NCV
 - STEAMSTAR-GH : 95% ± 1 Thermal Efficiency on NCV
- Oil fired
 - GREENSTAR-OS : 95% ± 1 Thermal Efficiency on NCV
 - GREENSTAR-OH : 93% ± 1 Thermal Efficiency on NCV
- Coal / Biomass fired
 - Capacities - 2 TPH to 50 TPH
 - Pressures - 10.54 / 17.5 / 21 / 25 kg/cm² (g)
Higher pressures available
 - TEJASWEE-S : 89% ± 1 Thermal Efficiency on NCV
 - TEJASWEE-H : 87% ± 1 Thermal Efficiency on NCV

Process Boilers & Heaters (cont'd)

- **Thermal Oil Heaters**
 - Liquid phase systems
 - Vapour phase systems
 - Capacities - 0.1 to 10 Million kcal / hr
 - Temperatures - Up to 340° C
Higher temperature available
 - Oil / Gas fired
 - FLUIDTHERM
 - Thermal Efficiency - 93% ± 1 on NCV of fuel
 - Coal / Biomass fired
 - AGROTHERM
 - Thermal Efficiency - 87% ±1 on NCV of fuel

Process Boilers & Heaters (cont'd)

▪ Hot Water Generators

- Capacities - 0.1 to 10 Million kcal / hr
- Temperatures - Up to 180° C
- Oil / Gas fired - AQUAWARM
- Thermal Efficiency - 93% ±1 on NCV of fuel
- Coal / Biomass fired – AGROWARM
- Thermal Efficiency - 87% ± 1 on NCV of fuel

▪ Hot Air Generators

- Capacities - 0.1 to 10 Million kcal / hr
- Temperatures - Direct fired - Up to 800° C
- Indirect fired - Up to 400° C
- Oil / Gas fired - AIRPACK
- Thermal Efficiency - Direct fired - 98% ± 0.5 on NCV of fuel
- Indirect fired - 93% ± 1 on NCV of fuel
- Coal / Biomass fired - AIRPACK
- Thermal Efficiency - Direct fired - 98% ± 0.5 on NCV of fuel
- Indirect fired - 87% ± 1 on NCV of fuel

Process Boilers & Heaters (cont'd)



- Steam Boilers
- Capacity : 5 TPH X 2 Nos.
- Fuel : Heavy fuel oil



- Thermal Oil Heater
- Capacity : 4 M kcal / hr
- Fuel : Heavy fuel oil



- Hot Water Generators
- Capacity : 2 M kcal / hr X 2 Nos.
- Fuel : Natural Gas

Process Boilers & Heaters (cont'd)



- Steam Boiler
- Capacity : 12 TPH
- Fuel : Bagasse briquetts



- Hot Water Generators
- Capacity : 0.6 M kcal / hr X 2 Nos.
- Fuel : Heavy Fuel Oil

9. Biomass Gasification Plants



- Technology licensing & know-how transfer agreement with Bioenergie Beratung Bornim GmbH, Germany.
<http://www.b3-bornim.de>

B³

- Generation of energy from renewable source i.e. Electricity, Steam, Hot Water, Cooling, Chilling, fuel from bio waste

- Nutrient rich bio fertilizer production as a by product

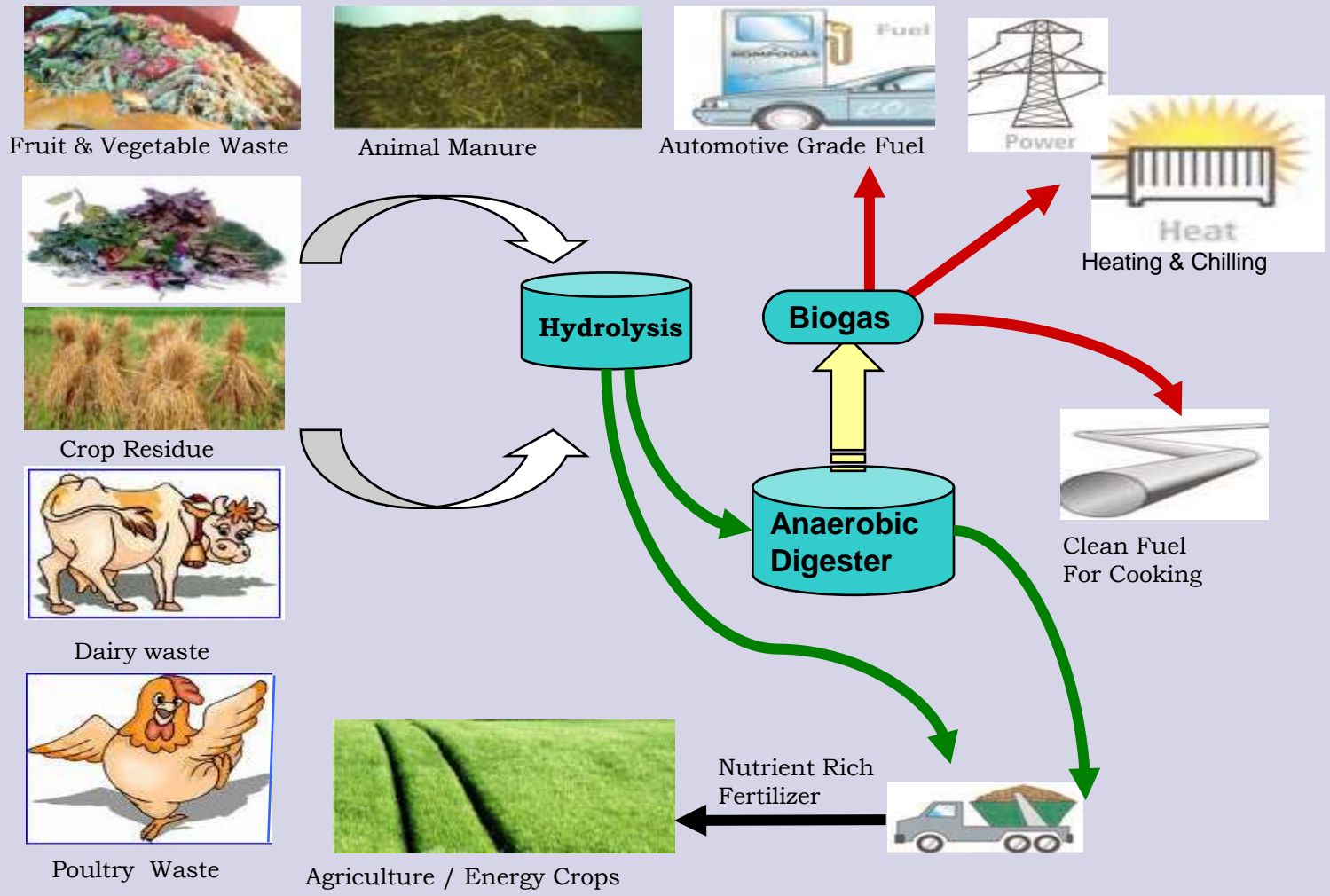
- Two Stage methanation process

- Earns carbon credits : CH₄ has 21 times global warming potential than CO₂



Biomass Gasification Plants (cont'd)

Potential biomasses



10. Lithium Bromide Absorption Chillers



- Co operation agreement with Jiangsu Shuangliang Air –conditioning Equipment Co. Ltd., China for application engineering, sales and service of Libr Chillers.
- Largest manufacturer of Libr Chillers worldwide. Over 15,000 installations so far.
- Steam operated
- Hot Water operated.
- Exhaust Gas operated.
- Direct fired.
- Highest COP
- Highest availability
- Lowest maintenance.

11. Zero Liquid Effluent Discharge Plants



- Low grade energy driven Multistage Evaporation Plants

- Can be followed by Spray Drier to make it a Zero Liquid Discharge Plant for effluent.

- High evaporation efficiencies available
 - 3 stage plant - 4.4 kg water / kg steam
 - 5 stage plant - 7 kg water / kg steam
 - 7 stage plant - 10 kg water / kg steam



- Driving source of low grade energy can be,
 - Incinerator exhaust gas
 - Furnace exhaust gas
 - Engine exhaust gas
 - Engine Jacket water

Zero Liquid Effluent Discharge Plants (cont'd)



Effluent : Polymer processing
 Solids in effluent : 0.8 %
 Feed rate : 7.5 m³ / hr
 System : Falling Film 4 stage
 Evaporator
 Dry powder generation : 60 kg / hr
 Water recycled : 7.25 m³ / hr



Effluent : Fermentation spent liquor
 Solids in effluent : 7 to 13 %
 Feed rate : 5000 kg / hr
 System : Forced Circulation single
 stage Evaporator with
 Mechanical Vapor
 Recompression
 Dry powder generation : 350 to 650 kg / hr
 Water recycled : 3500 to 4000 kg / hr

12. Waste Incineration fired Power Plants



MSW / any other waste incineration for

- Power generation
- Process steam generation
- Process hot water generation

Technology options

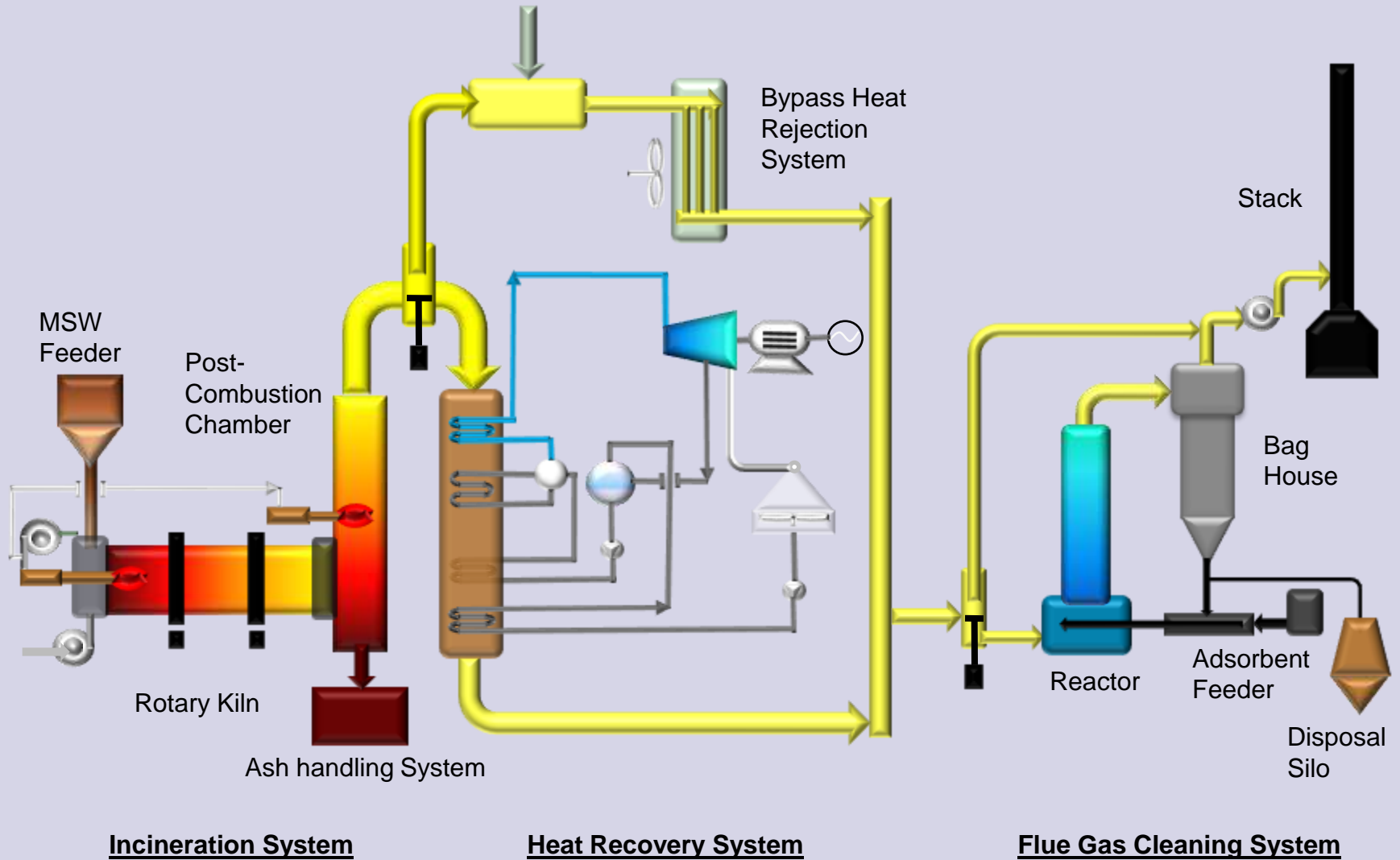
- Rotary kiln
- Travelling Grate

Designed to mass incinerate un-segregated waste with supplementary fuel firing

Engineered to meet emission norms of

- MSW rules 2000
- Directive 2000 /76 /EC

Waste Incineration fired Power Plants (cont'd)



13. Energy & Water Conservation Consultancy

- Consultancy in Energy & Water Recycling.
- Integration with process plant.
- Customized & optimal solutions.
- Green field projects as well.

Markets

Industries we serve



Cement	Dairy	Distilleries
Steel	Paper Mill	Refineries
Sugar	Ceramic	Fertilizers
Chemical & process	Food	Pesticides
Pharmaceutical	Edible oil	Breweries
Textile	Automobile	Software Parks
Hotels	Commercial complexes	Solvent Extraction

Customers

Client Base	Total Customers	500
	Overseas Customers	25
	Waste Heat Recovery	180
	Boilers & Heaters	150
	AARP	25
	Other Products	120

Partial list of domestic clients

Waste Heat Recovery Systems

- Tessitura Monti Ltd.
- Galaxy Sunfractants Ltd.
- Asahi Glass India Ltd.
- Heubach Colour Ltd.

Customers (cont'd)

Partial list of domestic clients

Waste Heat driven Power Plants

- The KCP Ltd.
- Ultratech Cement Ltd.
- Shree Cement Ltd.
- OPG Metals Pvt. Ltd.
- Saint Gobain Glass India Ltd.

Co-generation systems

- JBF Industries
- Godrej Industries Ltd.
- Warna SSK
- Hero Honda Motors Ltd.

Ammonia Absorption Refrigeration Plant

- Pepsico India Holdings Ltd.
- Asian Paints Ltd.
- Cargil Foods
- Galaxy Surfactants Ltd.

Power Boilers

- SEPCO
- Sumeet Industries Ltd.

Customers (cont'd)

Partial list of domestic clients

Process Boilers & Heaters

- Raid & Taylor,
- Gharda Chemicals Ltd.
- Alkyl Amines Chemicals Ltd
- Sun Pharmaceutical Industries Ltd.

Lilthium Bromide Absorption Chillers.

- Zee Telefilms Ltd.
- CCL Products India Ltd.
- Jindal Coca

Partial list of overseas clients

Waste Heat Recovery Systems

- Janata Jute Mills, Bangladesh
- Comfort Management, Singapore
- Acidos Minerals, Venezuela

Customers (cont'd)

Partial list of overseas clients

Co-generation systems	<ul style="list-style-type: none"> ▪ JBF RAK LLC, UAE
Process Boilers & Heaters	<ul style="list-style-type: none"> ▪ Pan Century Edible Oils SDN.BHD, Malaysia ▪ Skymoon Singapore Pte Ltd., Singapore
Ammonia Absorption Refrigeration Plant	<ul style="list-style-type: none"> ▪ Niro A/S, Denmark ▪ University of Stuttgart, Germany ▪ Mechanik Centre, Germany ▪ Pars Oil, Iran ▪ Café de Iguacu, Brazil
Zero Liquid Effluent Discharge Plants	<ul style="list-style-type: none"> ▪ A B Mauri La Nga Fermentation Company , Vietnam

Technology leadership

Coil type once through Steam Boilers of 93% thermal efficiency

Shell type fire tube Steam Boiler of 93% thermal efficiency

Shell type fire tube Steam Boiler of 95% thermal efficiency

Coil type Thermal Oil Heater of 93% thermal efficiency

Ammonia Absorption Refrigeration Plants

Fluidized Bed paint stripping system

Vertical CO-FLOW design for dust laden gases

WHR based power generation in Cement Plants

WHR based power generation in Glass Plants

Combined Cycle power generation in engine generator based IPP

Technology leadership (cont'd)

Seven Stage Falling Film Evaporator for sugar cane juice

Ammonia Absorption Refrigeration for chilled brine at - 54 C

Waste Heat Recovery in Ceramic Industry

Quintuple generation on Gas Turbine exhaust gas

Blast furnace Gas fired Steam Boiler without fuel supplement

Zero Liquid Effluent Discharge System in process industry

Manufacturing establishments



Shirwal works

50 km South of Pune,




Bhosari works

20 km North - West of Pune,

Authorizations



Authorizations cont'd



CERTIFICATE

**The Certification Body for Pressure Equipment
of TÜV NORD Systems GmbH & Co. KG**

certifies that the company

**Transparent Energy Systems Private Limited
Transparent Group
Pune, Maharashtra, India – 411 026
T-145/146/147, M.I.D.C. Bhosari**

has been verified and recognized
as welding workshop in the product range of

**Pressure Equipment, Heat Exchanger, Waste Heat
Recovery Boiler**

based on the requirements of the standard

DIN EN ISO 3834-3 (EN 729-3)

Certificate-no.: 07-202-1423 EN 2070/09


The range of validity and details of the inspection can be seen in our

Report-no.: 21703209

The company is using a quality assurance system
technical equipment, qualified personnel and procedures for joining processes
to manufacture and testing of welded products

This certificate is valid until


December 2012



Certification Body for Pressure Equipment
of TÜV NORD Systems GmbH & Co. KG
Notified Body Reg. No. 0045

TÜV NORD Systems GmbH & Co. KG - Essen Office - Certification Body for Pressure Equipment
Langemarkstr. 20 • 45141 Essen
Telephone +49 (0)201-625-2720 • Fax +49 (0)201-625-2020 • E-mail: Anhalt@tuv-nord.de

WB 16-05-01 0307-05



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according to the rules of

**AD 2000-Merkblatt HP0
inclusive of Directive 97/23/EC annex I, sec. 3.1**

Certificate-no.: 07-202-1423-HP-2070/09


The range of validity and details of the inspection can be taken from our

Report-no.: 21703209

The company has established a product-related quality system
together with personnel and equipment which assures
manufacturing and testing corresponding to the technical rules.

This certificate is valid until

December 2012



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Notified Body, Reg. No. 0045

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Langemarkstr. 20 • 45141 Essen
Telephone +49 (0)201-625-2720 • Fax +49 (0)201-625-2020 • E-mail: Anhalt@tuv-nord.de

WB 16-05-01 0307-05

Recognition

Certificate of Recognition as
In-house R & D Unit, by
Department of Scientific & Industrial Research,
Government of India.



TELEGRAM : SCINDRECH
TELEPHONE / TEL : 25922819, 25567373
25565894, 25562133
25505597, 25562144
25567134, 25567122 (EP/BANK)
FAX / PAX : 25560629, 25529745
25529738, 25519078

(By Registered Post)

No.TU-IV/2920/2009

Date: 06.10.2009

M/s Transparent Energy Systems Pvt. Ltd.
1st Floor, Pushpa Heights Blowwadi Corner,
Pune-Satara Road,
Pune - 411037

Subject: Registration of Research Institution, other than a Hospital, for the purpose of availing Customs/Central Excise duty exemption in terms of Govt. notification No.24/2007-Customs dated 01.03.2007 and Central Excise Duty Exemption in terms of Govt. notification No.16/2007-Central Excise dated 01.03.2007 as amended from time to time.

CERTIFICATE OF REGISTRATION

This is to certify that the In-house R&D unit(s) of M/s Transparent Energy Systems Pvt. Ltd. located at Shindewadi Post, Shirval, Taluka - Khandala, Dist. Satara is/are registered with the Department of Scientific & Industrial Research (DSIR) for purpose of availing customs duty exemption in term of Government Notification No.24/2007-Customs dated 01.03.2007 and Central Excise duty exemption in terms of Government Notification No.16/2007-Central Excise dated 01.03.2007, as amended from time to time. The registration is subject to terms and conditions mentioned overleaf.

This registration is valid upto 31.03.2012.


(K.V.S.P. Rao)
Scientist 'G'

ENGINE BASED CO-GENERATION FOR DAIRY INDUSTRY

Case study – 1

WASTE HEAT RECOVERY

on

ENGINE EXHAUST AND JACKET WATER

at

Shree Warana Sahakari Dudh Utpadak Prakriya Sangh Ltd. Warnanagar, Kolhapur.

Shree Warana Sahakari Dudh Utpadak Prakriya Sangh Ltd.,
Tatyasaheb Korenagar, Post Warnanagar-416113, Dist. Kolhapur (Maharashtra State)

श्री वारणा सहकारी दूध उत्पादक प्रक्रिया संघ लि., तात्यासाहेब कोरेंडनगर
पो. वारनानगर, जि. कोल्हापूर (महाराष्ट्र राज्य)

S. T. D. | 24095 Res. (Chairman) | Gram - WARANA DUDH
02328 | 24282 Res. (M. D.)
☎ | 24181 To 24187 Office | Fax No. (02328) 24188

Ref. No. WDU / Co-gen | Date :

Date: 3rd September 2007

TO WHOMSOEVER IT MAY CONCERN

We have set up a Captive Co-generation Plant of 22 MW capacity running on Heavy Oil (fuel - Generator Set (Make - Mireless Blackstone, UK) with Waste Heat Recovery system consisting of:

- Waste Heat Recovery Boiler + Economiser on engine exhaust
- Ammonia Absorbent refrigeration Plant on engine jacket cooling water To meet following utility requirement:

- Electric Power 22 MW
- Process steam 1.5 ton/hr @ 10-54bar (g) pressure
- Refrigeration 130 TR

The waste Heat Recovery System has been supplied and installed by Transparent Energy System Pvt. Ltd, Pune (TESPL) On "concept to commissioning" basis.

TESPL also involved in following activities:

- Energy modelling and system designing.
- Designing of trial Cogeneration Plant.
- Assistance in statutory clearance.

The thoroughness with which TESPL involved in designing the Co-generation system is highly appreciated.

We strongly recommend the name of Transparent Energy Systems Pvt. Ltd. for handling such Co-generation projects on "concept to commissioning basis".

We wish Transparent all success.


S. A. BUDHALE
(Sr. Engineer)


Utility of Heat : Steam Generation And Chilling

TYPE OF INDUSTRY : DAIRY

Input : Flue Gas and Jacket Water heat of Mirlees Blackston Engine.

Fuel Used - HFO

Capacity – 2.2 MWe

Output : Steam And Chilled Water

Steam - 1632 kg/hr. f&a 100

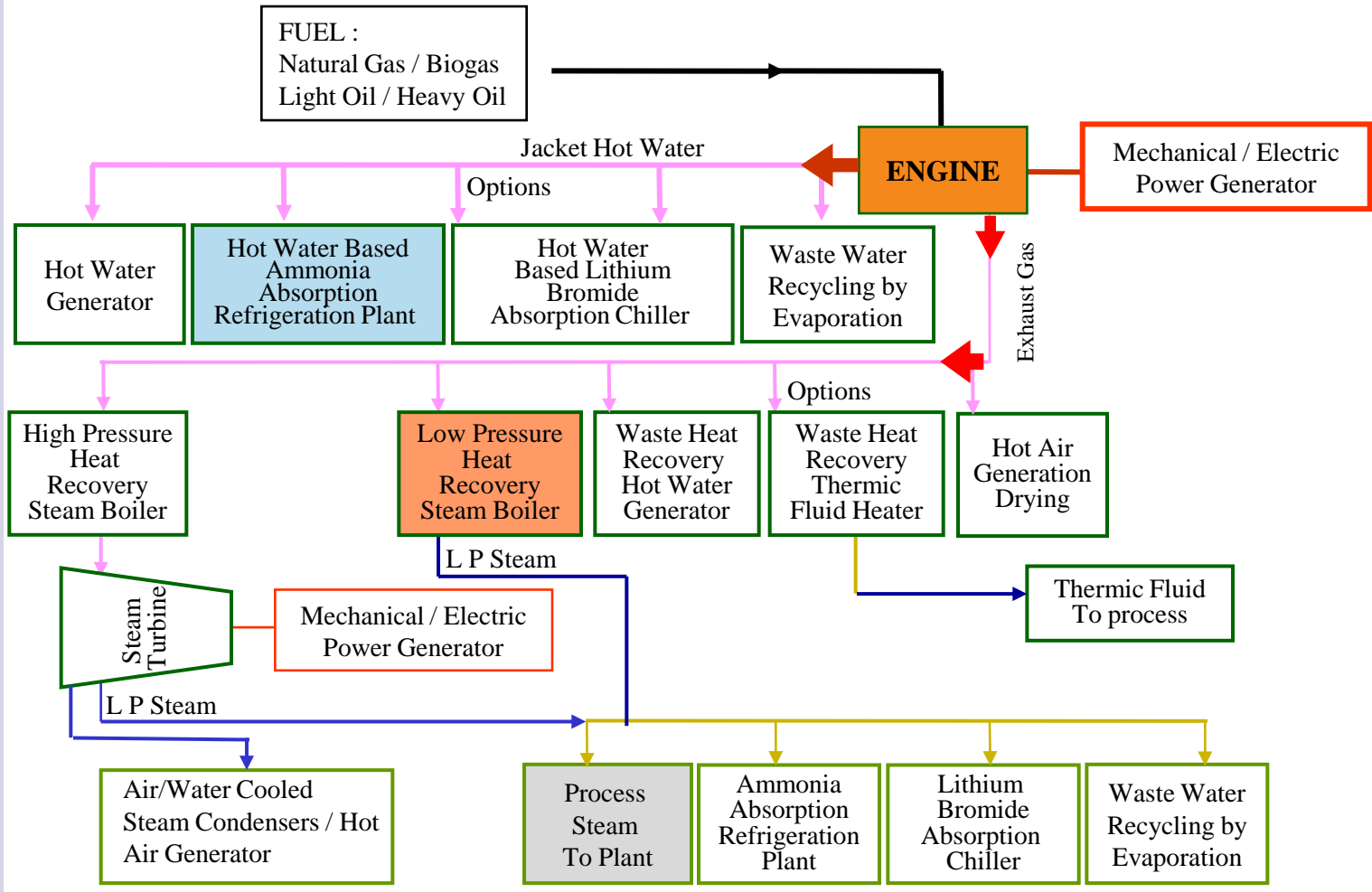
Chilled Water – 124 TR

Input :	5513 kW to Engine by Fuel Firing
Output :	2200 kW – Electricity
	1024 kW – Steam
	436 kW – Chilling
	3660 kW – Total Output
System Efficiency:	66.38 %

Case study – 1 cont'd

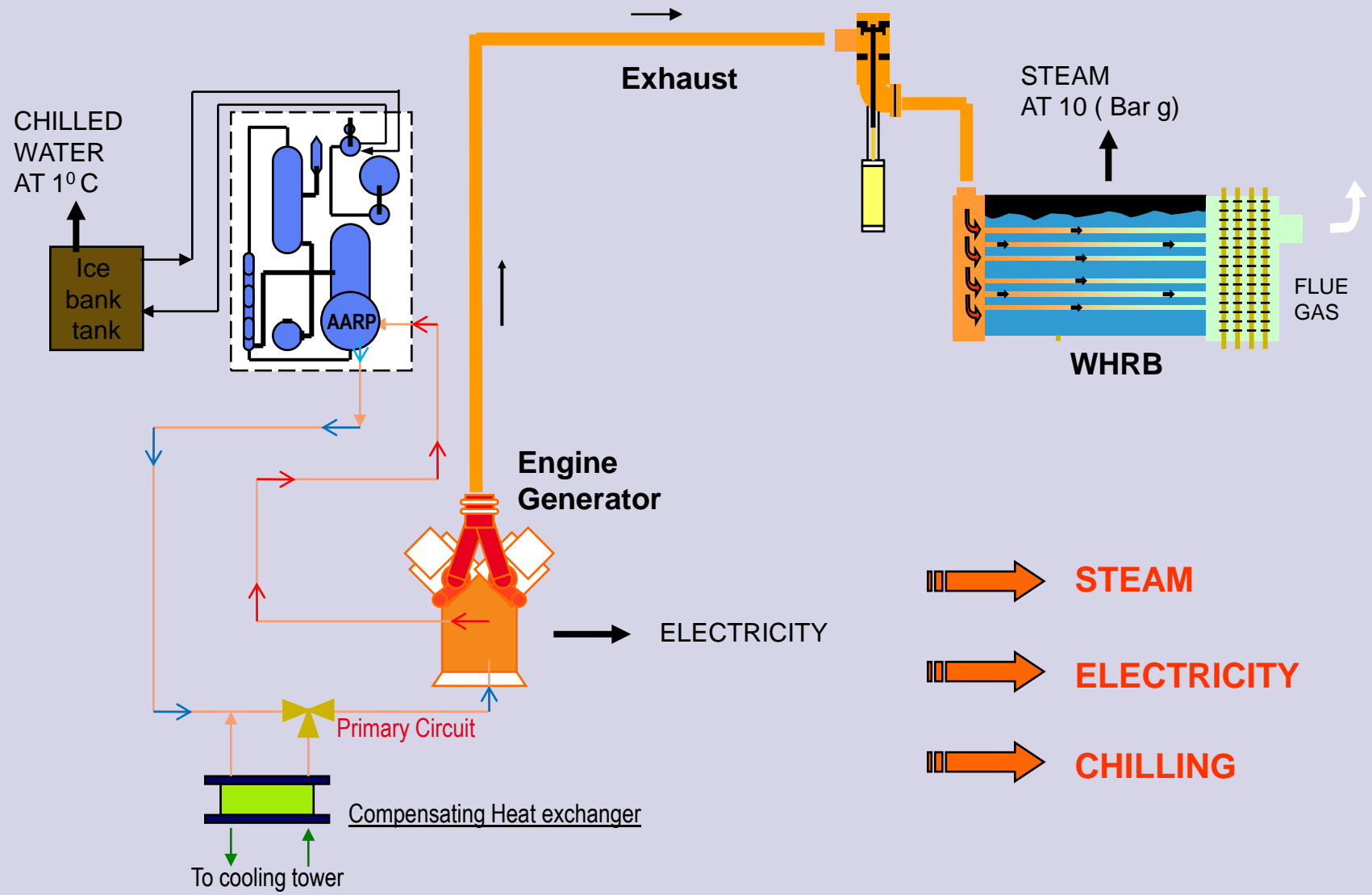
ENGINE BASED CO-GENERATION FOR DAIRY INDUSTRY

Engine based Otto / Diesel cycle co-generation



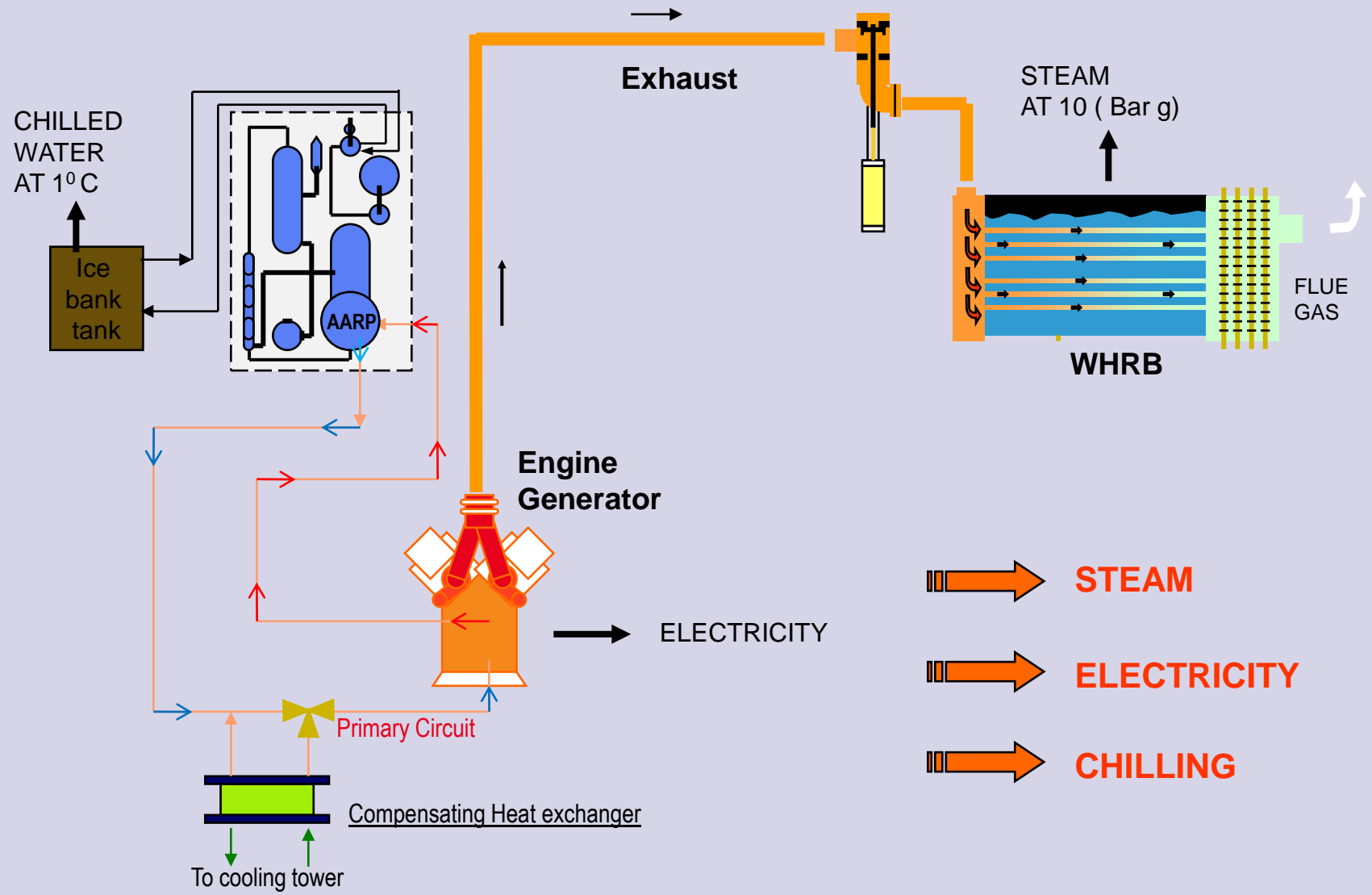
Case study – 1 cont'd

ENGINE BASED CO-GENERATION FOR DAIRY INDUSTRY



Case study – 1 cont'd

ENGINE BASED CO-GENERATION FOR DAIRY INDUSTRY



Case study – 2

STEAM TURBINE BASED COGENERATION FOR DAIRY INDUSTRY

TRANSPARENT
ENERGY SYSTEMS PRIVATE LIMITED
LOYAL TO RESOURCE CONSERVATION
ISO 9001 COMPANY



GOVIND MILK & MILK PRODUCTS PVT. LTD.

Dairy Office: Ganeshnagar, Peshwar Road, KAM, Phaltan, Dist. Satara Ph - 411602/279102/211510. Fax - 02146228925. Pune Office - 411004/21100
Email - Govindmilk@sataramail.in / Govindmilk@GMPL.com

DATE: 10/08/2007

TO WHOMEVER IT MAY CONCERN

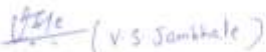
We have procured Ammonia Absorption Refrigeration Plant from M/s Transparent Energy Systems Pvt. Ltd. for our dairy.

Following are details

Model	: AK500i
Max. Refrigeration output	: 200 TR 700 kW
Ammonia Evaporation Temp.	: -15 Deg. C.
Heating Medium	: Steam (at 3.5 kg/sq.cm & 145 Deg. C)

This System is commissioned and performance trials are successfully carried out by M/S TRANSPARENT ENERGY SYSTEMS PVT. LTD. Overall performance of equipment is satisfactory. Sales after service is also very prompt.

We have no hesitations to strongly recommend M/S TRANSPARENT ENERGY SYSTEMS PVT. LTD. For such Refrigeration Plant.

 (V. S. Sambhale)

For M/s Govind Milk & Milk Products Pvt. Ltd.

WASTE HEAT RECOVERY

on

TURBINE EXHAUST STEAM

at

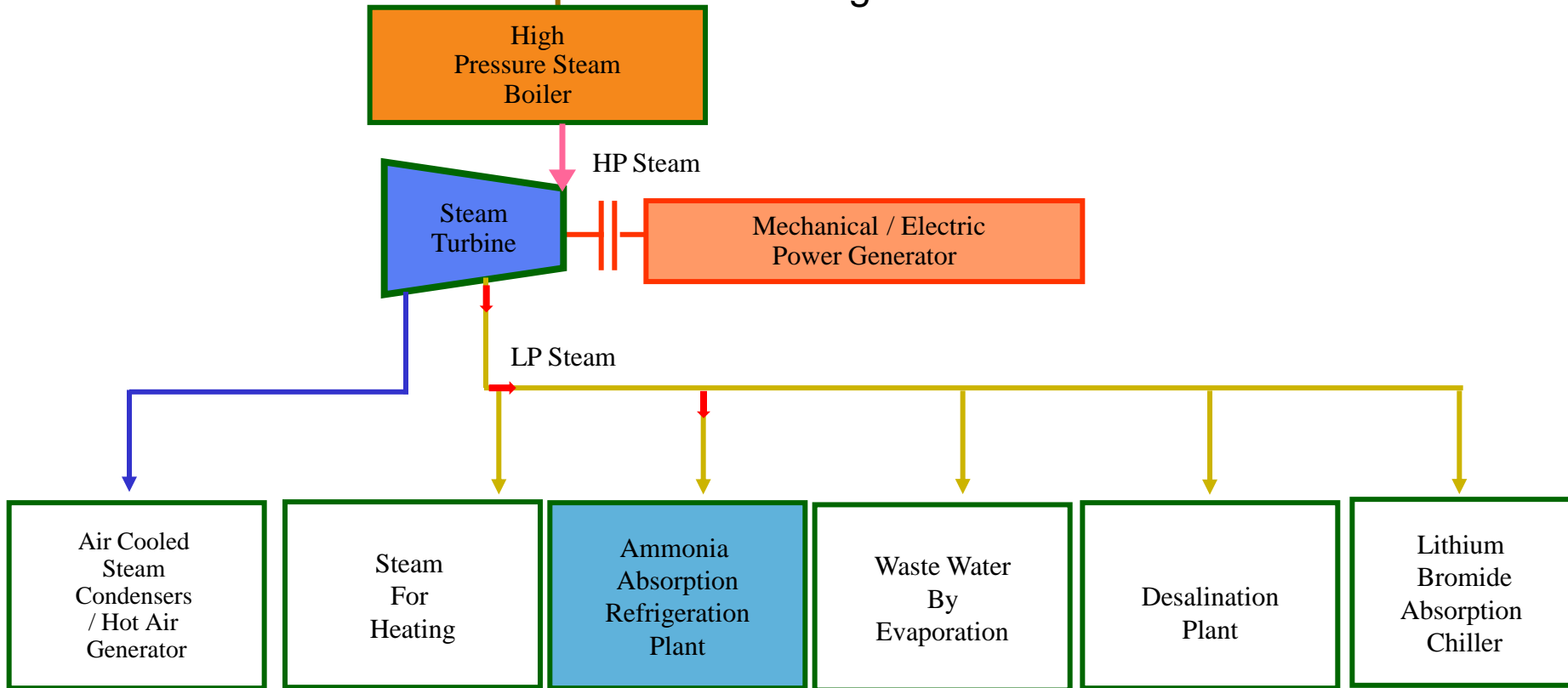
*Govind Milk & Milk Products,
Phaltan , Dist. Satara*

Case study – 2 (cont'd)

STEAM TURBINE BASED COGENERATION FOR DAIRY INDUSTRY

FUEL :
Biomass, Agrofuels, Coal,
Heavy Oil,
Natural Gas.

Steam Turbine based Rankine Cycle Co-generation



Utility of Heat : Chilled Brine and Ice Plant

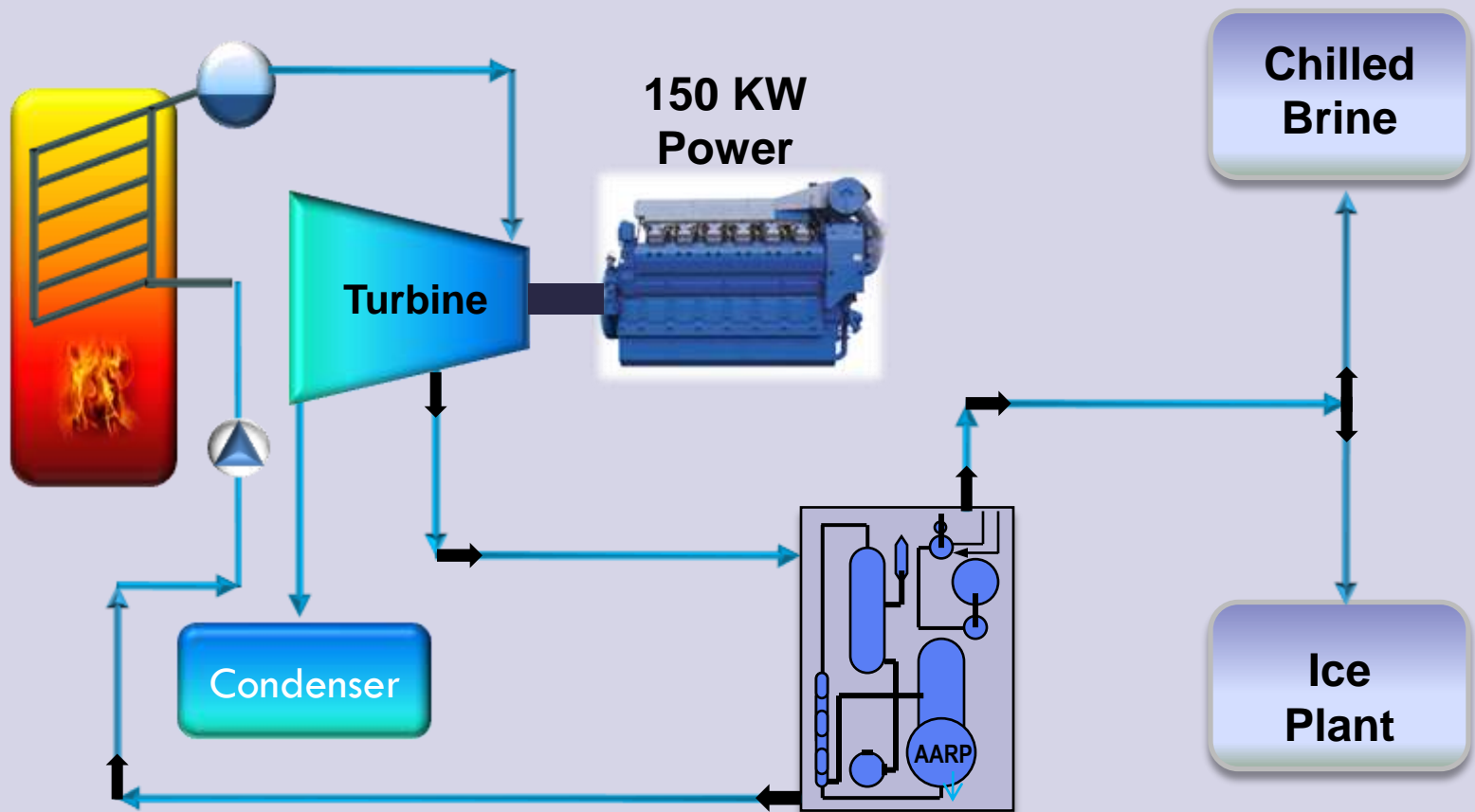
TYPE OF INDUSTRY : DAIRY

Input : Steam from Steam Turbine Generator.
4432 kW to Turbine by Fuel Fired Boiler

Output : 150 kW – Electricity
700 kW – Chilling
3312 kW – Steam to Process

Case study – 2 cont'd

STEAM TURBINE BASED COGENERATION FOR DAIRY INDUSTRY



THANK YOU



Pushpa Heights, Bibwewadi Corner, PUNE, INDIA

Tel. No. : +91 20 24211347 / 24215665

Fax : +91 20 24212533

Email : trans@pn2.vsnl.net.in, projectsales@tespl.com

Website : www.tespl.com