

SUPEREFFICIENT CO-GENERATION SYSTEMS

TRANSPARENT
ENERGY SYSTEMS PRIVATE LIMITED
LOYAL TO RESOURCE CONSERVATION



Features

- Highest overall efficiencies upto 93%.
- Reduces Energy Costs.
- Improves Productivity & quality.
- Saves Water.
- Earns Carbon Credits.
- Reduces CO₂ Emissions.
- Supports sustainable development initiatives.
- Improves customer confidence.



Combined Generation of :

- ❖ Power
- ❖ Heat
- ❖ Refrigeration / Chilling
- ❖ Water Recycling Plants / Desalination Plants by multistage evaporation.
- ❖ Evaporation & Drying.

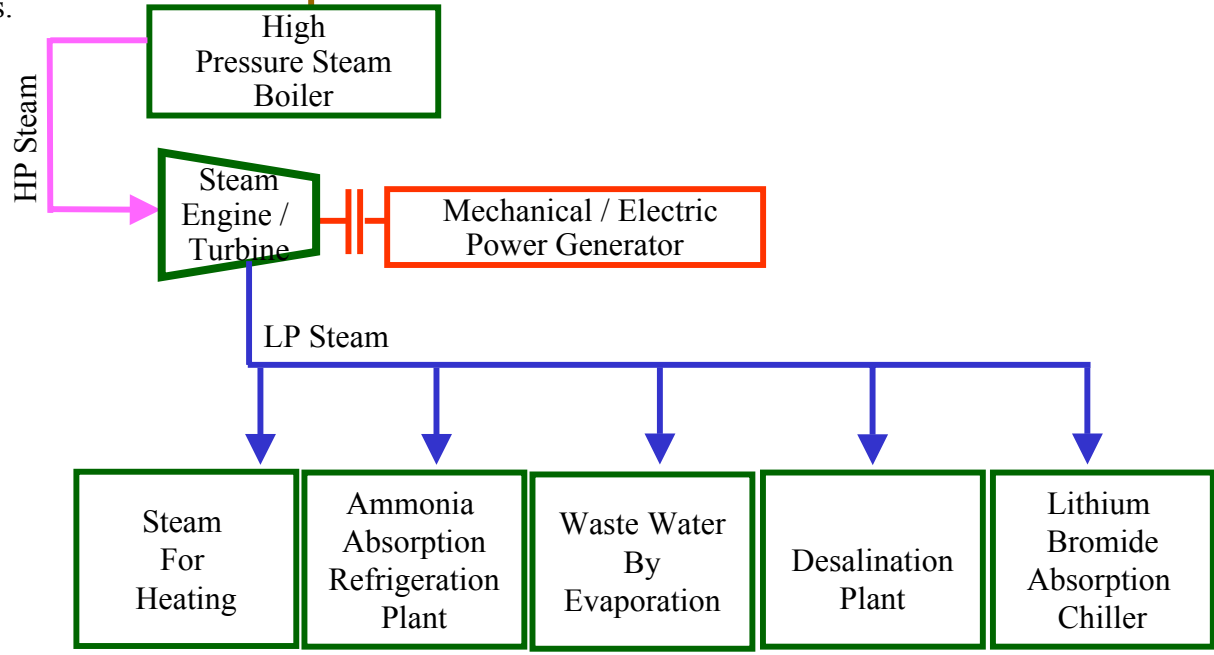
Fuels & Energy Sources.

- ❖ Natural Gas
- ❖ Heavy Fuel Oil
- ❖ Biogas
- ❖ HSD / Kerosene / LDO
- ❖ Biomass / Agro Fuels
- ❖ Coal
- ❖ Process Waste Heat

COGENERATION ALTERNATIVES

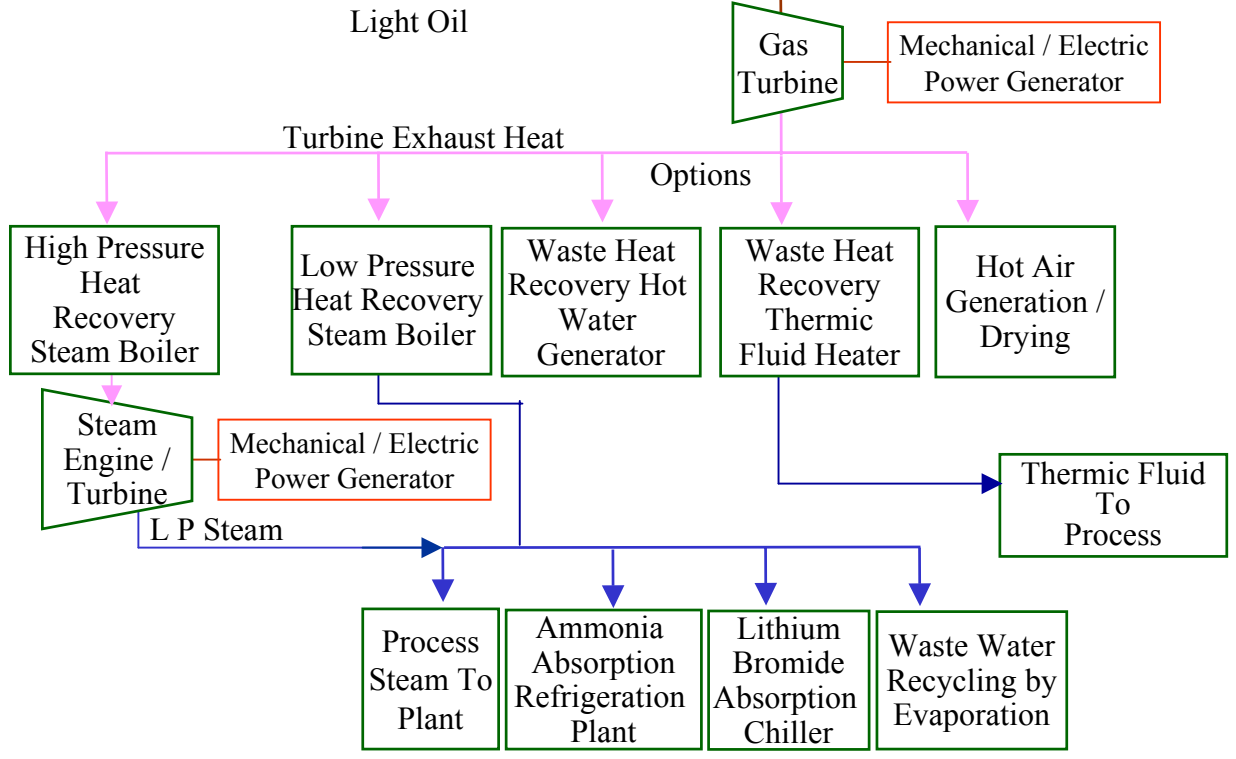
STEAM ENGINE / STEAM TURBINE BASED RANKINE CYCLE CO-GENERATION

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



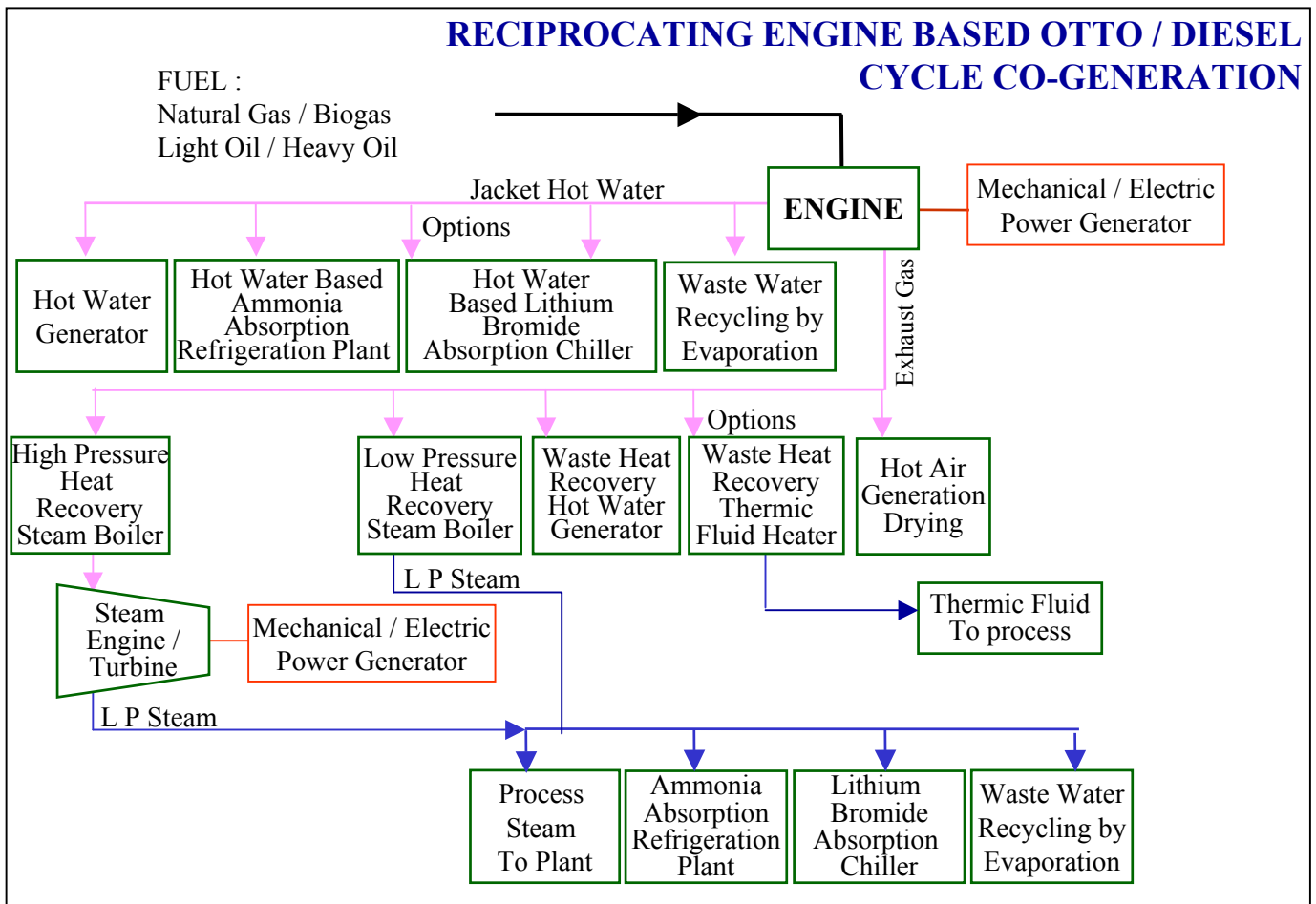
GAS TURBINE BASED COMBINED CYCLE CO-GENERATION

FUEL :
Natural Gas /
Light Oil



COGENERATION DIAGRAM

COGENERATION DIAGRAM



Services offered by Transparent

- ◆ Optimum system design.
- ◆ Preparation of DPR.
- ◆ Detailed engineering of system & hook up.
- ◆ Stage inspection of equipments as per Quality Control Plan.
- ◆ Project co-ordination.
- ◆ Final inspection & testing of equipments.
- ◆ Inspection of site activities.
- ◆ Pre-commissioning inspection & certification.
- ◆ Inspection of documents.
- ◆ Final commissioning & performance testing.
- ◆ Manpower training and recruitment.
- ◆ Organization and management development.

Captive Cogeneration

Cogeneration involving simultaneous generation of multiple useful energy sources viz. power, heat, refrigeration / cooling, water recycling, Evaporation and Drying.

Industries go for Captive Cogeneration due to following principle reasons.

- a) To reduce power and other energy costs.
- b) To improve productivity and reduce costs of production through reliable uninterrupted availability of quality power from Cogeneration plant.
- c) Cogeneration system helps to locate manufacturing facility in remote low cost areas.
- d) Improves energy efficiency, and reduces CO₂ emissions therefore it supports sustainable development initiatives.
- e) The system collects carbon credits which can be traded to earn revenue.
- f) Due to uninterrupted power supply it improves working conditions of employees raising their motivation. This indirectly benefits in higher and better quality production.
- g) Cogeneration System saves water consumption & water costs.
- h) Improves brand image and social standing.

Transparent co-generation systems are specially designed to suit each individual application, to cater to its peculiar energy demand pattern.

Transparent Cogeneration Systems would see accelerating demand on account of rapid deregularisation of electricity markets worldwide.

Distributed Cogeneration

It is now worldwide trend to take recourse to “**Distributed Generation**” in preference to the large interconnected networks.

This concept called Distributed Cogeneration Systems (DCS) has gained tremendous importance world wide and particularly in North America and Europe due to following reasons.

- 1) DCS enables multiple sources of revenue earnings e.g. in addition to power the project can sell steam, refrigeration, recycled water, desalinated water etc.
- 2) Multiple sources of revenue are vitally important for power projects particularly operating on costly petroleum fuels. In DCS cost of fuel gets distributed on all these energies making the tariff of each of these energies more reasonable and therefore attractive for the purchaser.
- 3) Biomass based cogeneration projects are renewable energy projects. Biomass based cogeneration systems reduce NOx emissions due to reduced flame temperatures in boilers.
- 4) All cogeneration projects are classified under “sustainable development initiatives”, as they help reduce CO₂ emissions and earn carbon credits. Trading of carbon credit is going to be a real phenomenon in very near future. These projects being clean energy initiatives, help restore already offbalanced ecological equilibrium.
- 5) Cogeneration projects are also water saving projects. This is because heat from exhaust steam of steam turbine is not directly rejected in cooling tower but it is either sold to consumers or used for driving Ammonia Absorption Refrigeration Plant (AARP) which in turn can drive Cold Storages, Ice plants, AARP has one unique feature that it can be aircooled and therefore the feasibility and location of the project doesn't critically depend on availability of water.

TYPICAL APPLICATIONS

Dairy	Edible Oil Industry
Paper Mill	Distilleries
Textile Industry	Wood & Timber
Software Park	Rice Mills
Hotel	Automobiles
Ceramic Industry	Solvent Extraction Plants
Commercial Complex	Refineries
Chemical & Process Industry	Fertilizer
Food Industry	Pesticides
Sugar Industry	Breweries
Five Star Industrial Estate	Sugar Mill
Cement Industry	Waste to Energy Plants
Steel Industry	Refuse Incineration Plants
Residential Complex	Biomethanation of Waste

Transparent cogeneration systems involve following components:

H. P. Boiler	Transparent Make
Waste Heat Recovery Boiler	Transparent Make
Ammonia Absorption Refrigeration Plants	Transparent Make with know-how from Mattes AG, Germany
Waste Water Recycling Plants	Transparent Make
Multistage Evaporators	Transparent Make
Dryers	Transparent Make
Flue Gas Diverter valve	Transparent Make
Steam Engine Genset	Transparent Make with Engine from Spillingwerk Germany
Piping & Instrumentation	Engineered by Transparent
Gas Reciprocating Engine Genset	Sourced
Heavy Oil Reciprocating Engine Genset	Sourced
Gas Turbine Genset	Sourced
HSD Reciprocating Engine Genset	Sourced
Steam Turbine Genset	Sourced
LiBr Absorption Chiller	Sourced

Transparent Group of Companies

Transparent group companies, are technology leaders working in the field of Co-generation Systems, Ammonia Absorption Refrigeration Plants (AARP), Energy Conservation Contracts, Water Recycling Plants. Superefficient Boilers, Heat Recovery Systems, Pollution control, Drying Plants etc.

Business groups, Products & Systems

Transparent Energy Systems Private Limited

Our company was incorporated on 16th April, 1986 with the name of Vapor Energy Machines Private Limited. The first commercial production was started in January, 1988. The name of the company was changed from Vapor Energy Machines Private Limited to Transparent Energy Systems Private Limited on 18th December, 1995.

1. Co-generation Systems - www.tesplcogen.com

Cogeneration Systems involving combined generation of

- Power
- Heat
- Refrigeration / Chilling
- Water Recycling / Desalination by multistage evaporation.

Fuels and energy sources for Cogeneration.

- Natural Gas
- Heavy Fuel Oil (HFO)
- Coal
- Process Waste Heat
- Biogas
- HSD / Kerosene / LDO
- Biomass

Types of Cogeneration Systems

- Steam Engine / Turbine Based Co-generation
- Reciprocating Engine Generator Based Co-generation
- Gas Turbine Based Co-generation

Type of Industries

- Dairies
- Paper Mills
- Textile Industries
- Software Parks
- Chemicals & Process Industries
- Hotels
- Ceramic Industries
- Commercial Complexes
- Sugar Industries
- Residential Complexes
- Food Industries
- Cement
- Steel
- Five Star Industrial Estate

2. Ammonia Absorption Refrigeration Plants- www.tesplaarp.com

- Refrigerant Evaporators
- Refrigerant Circulation Systems
- Air Handling Units
- Accessories
- Flash Vessels
- Ammonia Vaporizers
- Turnkey Refrigeration Contracts.

3. Heat Recovery Systems – www.heatrecovery-system.com

Waste Heat Recovery Boilers - Finned Tube - Water Tube - Smoke Tube

Waste Heat Recovery Thermic Fluid Heaters

Heat Recovery & Efficiency improvement Retrofits

- Combustion Air Preheater
- Economisers (Smoke tube / water tube / finned tube type)
- Condensate Recovery Systems
- Blow Down Heat Recovery Systems
- Flash Steam Recovery Systems

4. Boilers & Heaters – www.tespl.com

- 96% Superefficient Oil / Gas Fuelled Boilers
- 93% Superefficient Thermic Fluid Heaters / Hot Air Generators
- 89% Superefficient Agrofuelled / Coal Fired Boilers.
- Superefficient High Pressure steam Boilers, (Oil / Gas / Coal / Biomass Fired) for Cogeneration application

5. Energy Conservation Projects – www.tespl.com

Conservation of Electrical heating to Steam / Thermic Fluid / Hot Water Heating

6. Water Treatment Plants & Other Accessories – www.tespl.com

- Feed Water Deaerators
- Pressure Reducing Station
- Water Softners
- High / Low pressure chemical dosing systems
- Demineralising Plants
- Structural / Self supported / Guyrope supported Steel Chimney / Stacks
- Sand Filters
- Fuel Storage & Handling Systems.
- Activated Carbon Filters
- Moisture Separators

Transparent Technologies Private Limited

7. Evaporation, Water Recycling & zero effluent discharge plants – www.waterrecyclingplant.com

Hot Water / Steam Driven Multistage Evaporators for continuous water distillation, desalination, product concentration & crystallization.

- Falling Film Evaporators
- Rising Film Evaporators
- Plate Evaporators
- Fluidized Bed evaporators
- Natural Circulation Evaporators
- Forced Circulation Evaporators
- Counterflow Evaporators
- Assisted Circulation Evaporators
- Agitated Evaporators
- Spiral Tube Evaporators

8. Dryers – www.ttplpune.com

- Spray Dryers
- Fluid Bed Dryers / Coolers / Agglomerators
- Fluidized Bed Incinerators / Calciners
- Flash Dryers
- Paddle Dryers / Vacuum Paddle Dryers
- Dry Powder Mixing Systems and Granulators
- Spray Coolers
- Spray Reactors cum Dryers
- Disintegrators & Pulverisers
- Fluidized Bed / Spray Dryers
- Homogenizers and Dispersion Mills

9. Pollution Control Group – www.air-pollutioncontrol.com

Incinerators

- Spray Dryer cum Combustion Chamber Incinerators
- Fluidized Bed Incinerators for Liquids and Solids & Gases
- Packaged Fixed Grate Incinerators for Solids
- Liquid / Gas Incinerators
- Fluidized Bed Paint Stripping Systems for Paint Coating

Air Pollution Control

- Cyclone / Multicones
- Bag Filters
- Wet / Venturi Scrubbers
- Mechanical Dust Collectors
- Flue Gas Desulphurisation Plants