SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

Accredited by NBA-AICTE and Accredited by NAAC – UGC with A+ Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE NAME: 19EEO305 /Renewable Energy Generation Technology

IV YEAR / VII SEMESTER

UNIT 4- BIOMASS AND HYDRO ENERGY

Topic 6 – Cogeneration plant

SUCCESSFUL STUDENT

Positive Attitude

Professionally Groomed

Socially Interactive

Technically Skillful

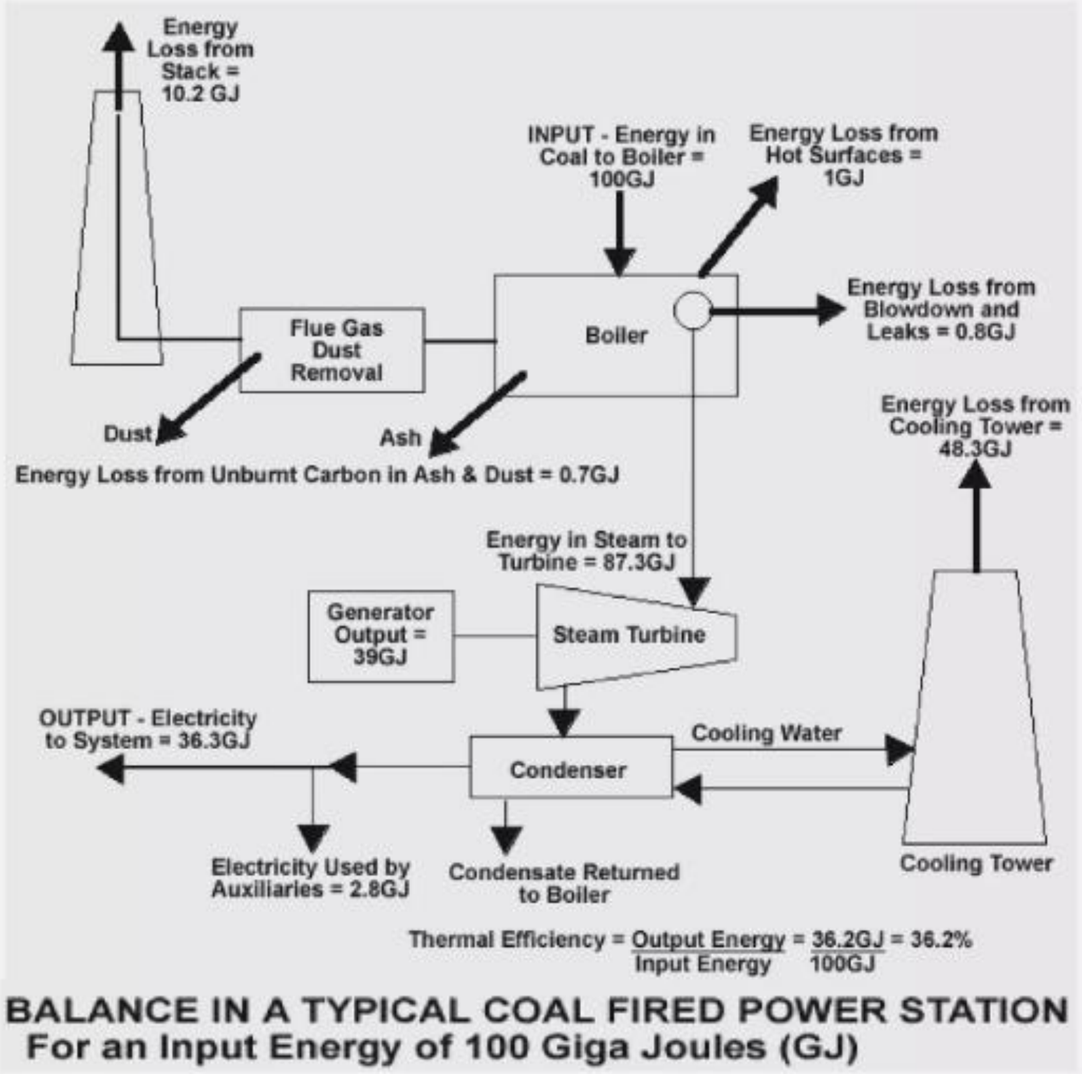
COGENERATION

- Cogeneration is the **simultaneous production of power and heat**, with a view to the practical application of both products.
- **Cogeneration or Combined Heat and Power (CHP)** is defined as the **sequential generation of two different forms of useful energy from a single primary energy source**, typically mechanical energy and thermal energy.
- **Mechanical energy may be used either to drive an generator for producing electricity, or rotating equipment such as motor, compressor, pump or fan** for delivering various services.
- **Thermal energy can be used either for direct process applications** or for indirectly producing steam, hot water, hot air for dryer or chilled water for process cooling.
- The overall **efficiency of energy use in cogeneration mode can be up to 85 per cent** and above in some cases.

NEED FOR COGENERATION

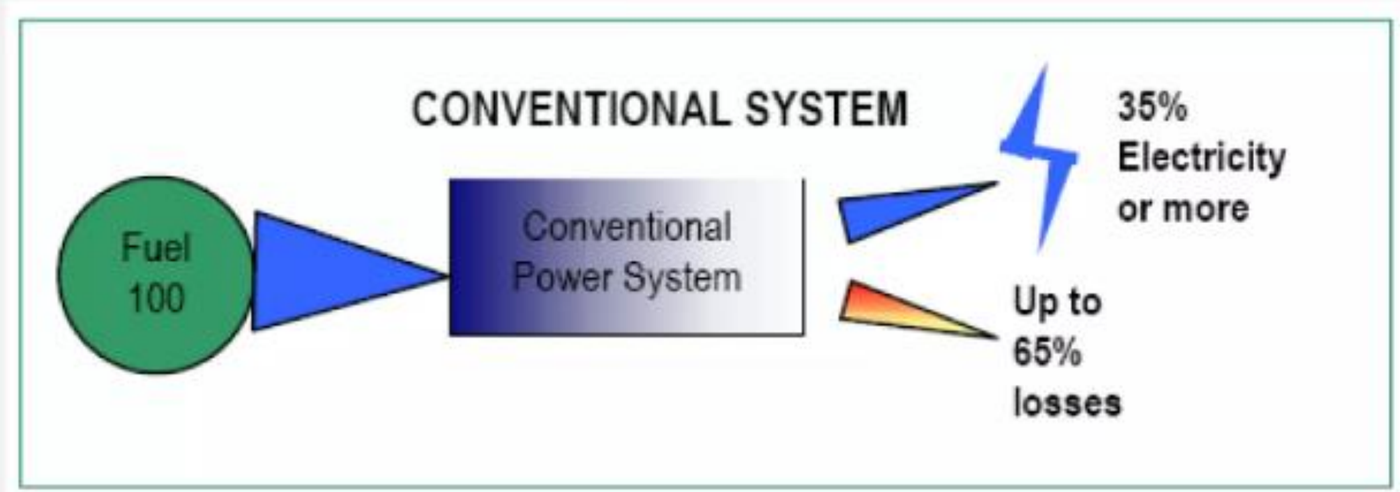
- **Thermal power plants are a major source of electricity** supply in India.
- In conventional power plant, **efficiency is only 35% and remaining 65% of energy is lost.**
- The **major source of loss in the conversion process is the heat rejected** to the surrounding water or air due to the inherent constraints.
- Also further **losses of around 10-15% are associated with the transmission and distribution** of electricity in the electrical grid.

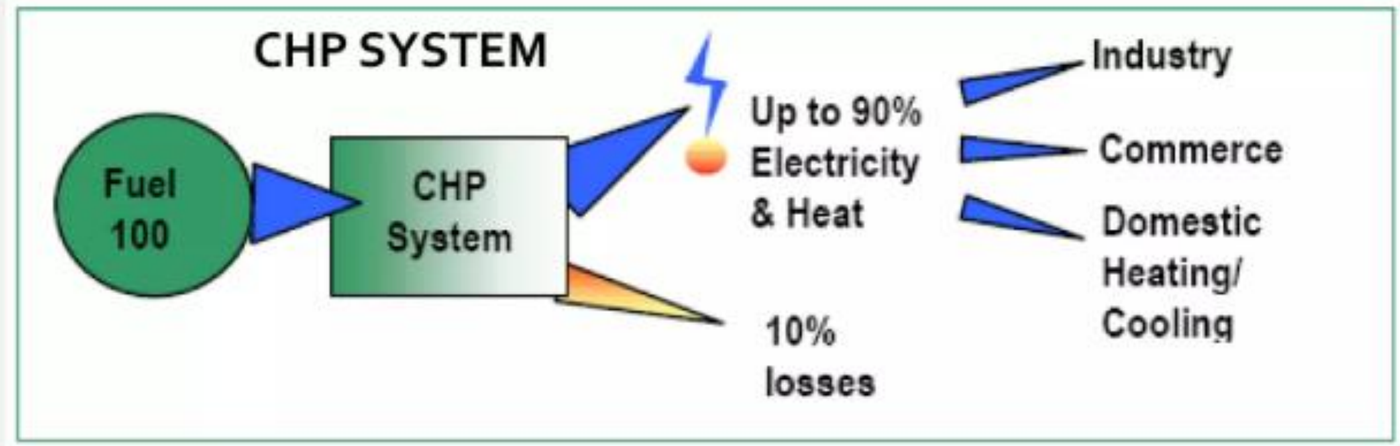
NEED FOR COGENERATION



BALANCE IN A TYPICAL COAL FIRED POWER STATION
For an Input Energy of 100 Giga Joules (GJ)

NEED FOR COGENERATION





APPLICATIONS

- In recent years cogeneration has become an attractive and practical proposition for a wide range of applications.
  - These include the process industries
  - Pharmaceuticals
  - paper and board industries
  - Brewing
  - Ceramics, brick and cement industry
  - food, textile, minerals etc.
  - commercial and public sector buildings (hotels, hospitals, leisure centres, swimming pools, universities, airports, offices, barracks(lodgings/housings/ quarters), etc.) and district heating schemes

ASSESSMENT

REFERENCE

Reference Book:

1. S.P. Sukhatme, ‘Solar Energy’, Tata McGraw Hill Publishing Company Ltd., New Delhi, 1997. (UNIT II)

2. G.N. Tiwari, ‘Solar Energy – Fundamentals Design, Modelling and applications’, Narosa Publishing House, New Delhi, 2002. (UNIT II)

3. S.M. Muyeen,” Wind Energy Conversion Systems: Technology and Trends”, Springer 2012. [UNIT III]

Text Book:

1. G.D. Rai, ‘Non Conventional Energy Sources’, Khanna Publishers, New Delhi, 2006. (UNIT I - V)

2. D.P.Kothari, K.C.Singal and Rakesh Ranjan,”Renewable energy sources and Emerging Technologies”, PHI Pvt. Ltd., 2009. (UNIT I-V)

THANK YOU!!