

REALISATION OF THE POTENTIAL FOR COGENERATION

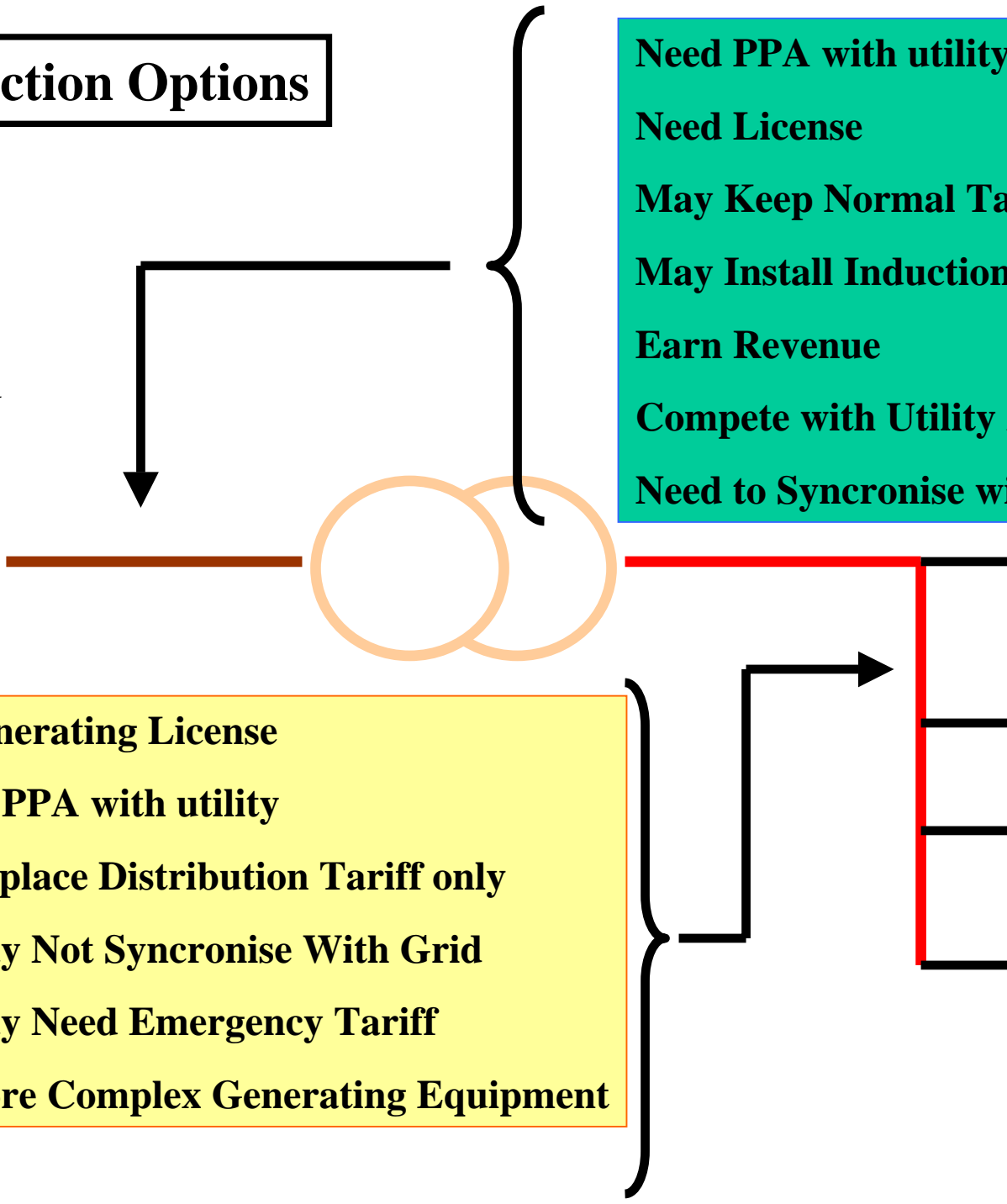
Connection Options

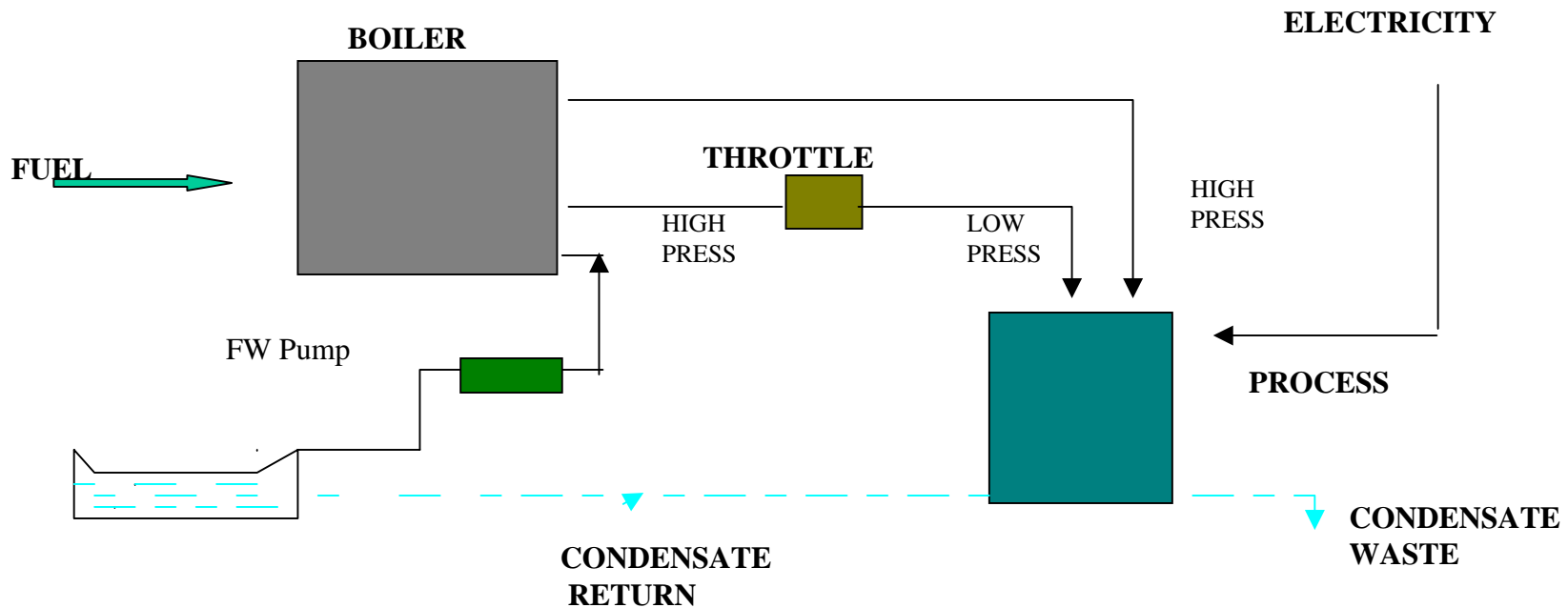
Grid

- Need PPA with utility**
- Need License**
- May Keep Normal Tariff**
- May Install Induction Machine**
- Earn Revenue**
- Compete with Utility Alternative**
- Need to Synchronise with Grid**

- Generating License**
- No PPA with utility**
- Displace Distribution Tariff only**
- May Not Synchronise With Grid**
- May Need Emergency Tariff**
- More Complex Generating Equipment**

Local Supply

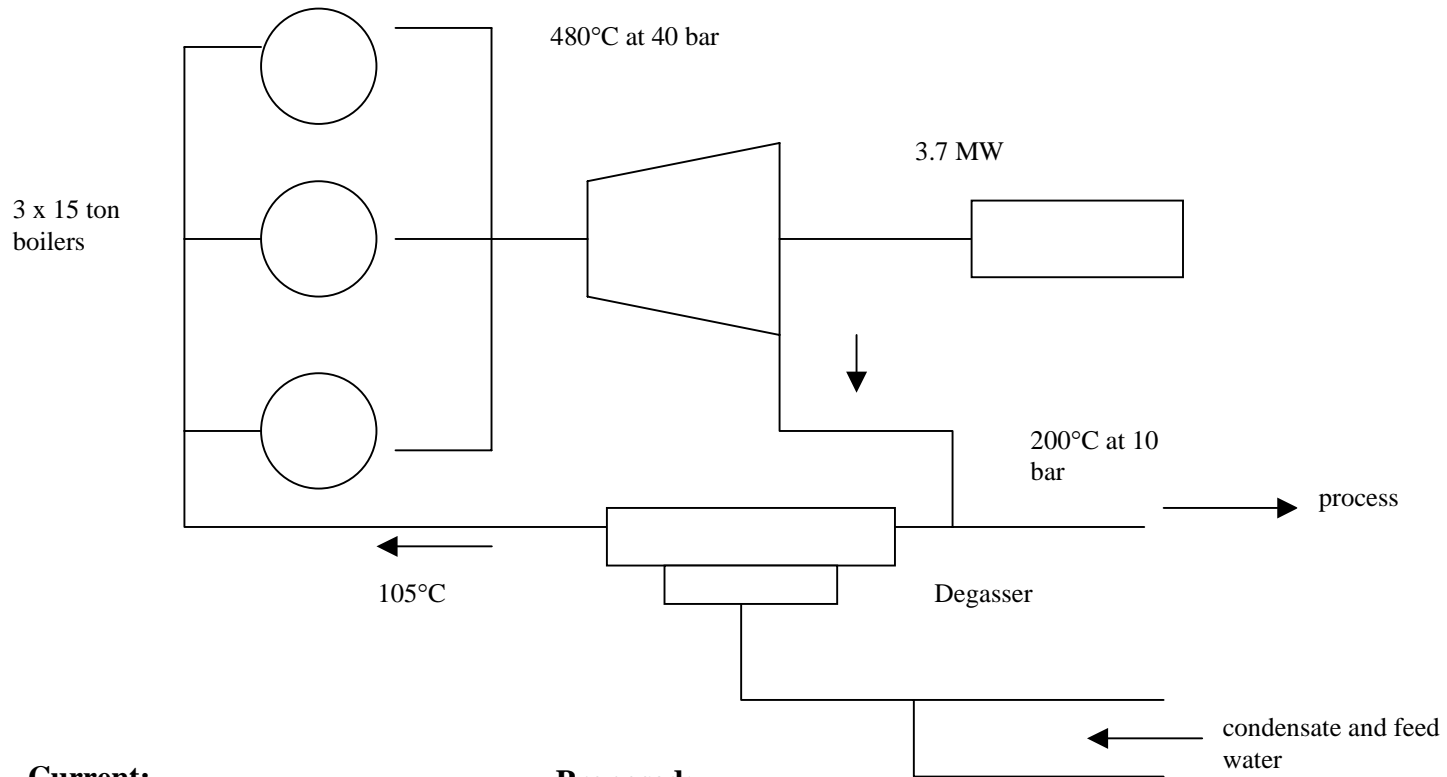




EFFICIENCY IMPROVEMENT OPTIONS

- HIGH PRESSURE BOILER. ≥ 40 BAR.
- REPLACE THROTTLING VALVE WITH BACK PRESSURE TURBINE - COGENERATION
- DISPLACE GRID ELECTRICITY.
- RETURN MORE CONDENSATE.
- IMPROVE BOILER EFFICIENCY.
- IMPROVE FUEL CONDITIONS.
- IMPROVE PROCESS.

EXAMPLE COAL FIRED COGEN PROPOSAL



Current;

65 ton coal per day
200 deg C, 10 bar steam
74% boiler efficiency
29 yr boilers
Wet fuel
Condensate return

Proposed;

65 ton coal per day
480 deg C 40 bar primary steam
200 deg C 10 bar exhaust steam
Dry Fuel
3.7 MW electricity
≥80% boiler efficiency
15000 ton CO₂/yr saved

EXAMPLE WOOD WASTE COGENERATION PLANT

INPUT;

105 0000 ton wood waste per year

3MW generating unit

Switchgear

Grid connection

MODE OF OPERATION;

Grid connected

Supply sawmill with electricity and steam

Sell excess electricity to grid

Purchase emergency power from grid

REQUIREMENTS;

Engineering design

Financial analysis

PPA

Financing Plan

License

Capital

Technology supply

Installation and operation

**POTENTIAL ELECTRICITY EXPORT (GWh)
FROM SUGAR MILLS IN EAST AND SOUTHERN AFRICA**

Country & Units	Annual Cane Production x10⁶	Continuous Power @ 50 kWh/TC	Firm Power @ 44 bars & 80kWh/TC	Firm Power @ 82 bars 110 kWh/TC
South Africa				
14 Units	22.94	1147	1835.2	2523.4
Swaziland				
3 Units	8.86	443	708.8	974.6
Malawi				
2 Units	4.08	204	326.4	448.8
Zimbabwe				
2 Units	9.02	451	721.6	992.2
Mozambique				
1 Unit	0.55	27.5	44.0	60.5
Kenya				
1 Unit	4.50	225.0	360.0	495.0
Grand Total	49.95	2497.5	3996	5494.5

SOURCE: Dr K Deepchand, Mauritius Sugar Authority, AFREPREN, 2000.