1.0 Introduction

Following the newspaper article on PanAfrican Paper Mill’s (PPM’s) plan to develop a cogeneration plant, the AFREPREN/FWD Cogen for Africa contacted the senior management of PPM and organized a mission to assess PPM’s cogen plans as well as discuss possible collaboration between their project and the cogen project.

Eight senior officials from PanAfrican Paper Mills including the CEO, the Technical Director, the Forestry Director and other senior engineers met with the Cogen Team (comprising of Stephen Karekezi, John Kimani, Waeni Kithyoma and Nicholas Owino). This is a brief report of the meeting proceedings.

2.0 Key Discussion Points

Brief on the Company

Pan African Paper Mills Ltd (PPM) is a joint Venture initiative of the Kenya Government, the International Finance Corporation (IFC) and the Birla Group of India. It is one of the 13 companies currently operating in the paper and pulp industry in Kenya and is the only one licensed to process paper directly from trees / wood. The rest of the companies use waste paper and purchased pulp as raw material.

PPM’s wood supply is predominantly from Government-owned tree plantations; purchased pulp and waste paper augments fiber supply. The company has a long-standing license agreement with the Government of Kenya to extract timber on a sustainable basis for the manufacture of pulp and paper. The Government has overall responsibility for plantation management, including the replanting of trees.

PPM currently harvests wood under a Government concession from tracts covering a total of 32,000 hectares. The company is presently consuming wood from about 1,250 hectares annually, which is still below the allowable harvesting area of 1,500 hectares per annum. The factory has a capacity of processing 400 tonnes of wood per day including wood from out growers supplied from a catchment area of 100kms radius.

PPM produces the following grades of paper.

- packaging material
- writing paper
- printing and newsprint
The planned Cogeneration Project

The company has a total power demand of 18MW and currently generates 6MW from both biomass (tree back, black liquor and bagasse – imports 100 tonnes/day of bagasse from the neighboring West Kenya Sugar Factory) and heavy fuel oil. The difference (12 MW) is imported from the Kenya Power and Lighting Company (KPLC).

The pulp and paper making process is an energy intensive area and requires high quantities of steam (90 tonnes of steam, 42 bars at 400°C) and power. The current electricity bill of the company is 80 million KES per month. The company has installed 5 boilers to generate the required steam of which 2 are biomass boilers, 2 are thermal boilers using heavy fuel oil (HFO) supplemented by one multi-fuel boiler that can burn both biomass and fossil fuel.

Summary of Boilers at PPM:
1. Boiler 1 – wood back boiler – generates around 6-8 tonnes of steam/hour
2. Boiler 2 – multi-fuel boiler – generates around 20 tonnes of steam/hour
3. Boiler 3&4 – Thermal Boiler – consumes fuel oil to generate steam
4. Boiler 5 – uses pure black liquor

PPM’s boilers can deliver high, medium and low pressure steam. The high pressure steam is used in power generation. The medium pressure steam is used in processing (heating the pulp etc) and the low pressure steam is used for drying.

Due to the high oil prices and since the factory does not have a direct source of biomass fuel to run its boilers for generating power (timber is their raw material for producing pulp and paper and over 80% of it is used in the process), the management is actively looking for biomass sources that they could use to generate steam and electricity to run the plant.

The company has already undertaken a technical pre-feasibility study for a cogeneration plant but the numbers would need to be revisited since the study is about 2-3 years old. The pre-feasibility study was mainly based on using wood chips (including setting up a wood chipping plant), and was funded by IFC. The proposed cogen project is expected to initially produce power for internal consumption by the factory, with possibility of exporting to the grid at a later stage.

A wood-chips fired boiler of 110 tonnes steam capacity would require approximately 300,000 tonnes of wood which in turn require up to 30,000 hectares of forest plantation. The fuel for the planned project is not assured as the company is still pursuing various options for the biomass feedstock. Therefore, a detailed survey of the biomass requirement and sources to ensure supply of biomass for the proposed 20-25MW biomass cogen plant is one of the major requirements. There is need to have a long term assured supply of biomass to ensure viability of the cogeneration project.
PPM has submitted an application for 8,000 hectares of the Turbo forest to the Government of Kenya in 2005 within the forest reserve area. The application has not been approved but the senior officials of the company are optimistic that the Government of Kenya will approval the application. The delay in approval could be due to the fact that the Government of Kenya is still working on the subsidiary legislation on the new Forestry Act before they approve any applications (recent media reports reconfirmed the Government’s commitment to providing PPM with the required forest acreage)

Other feedstock assessments that the company has undertaken include the option of getting bagasse from sugar factories for the cogen plant but this did not appear viable as the sugar factories either have insignificant left over bagasse or the distance is too far. Below is a summary of the sugar factories around PPM who have been approached for purchase of bagasse and the status:

- Nzoia – has no excess bagasse
- Mumias – has no excess bagasse
- Chemelil – has excess bagasse but distance from PPM is too far
- Muhoroni – has excess bagasse but distance from PPM is too far
- West Kenya – expanding and intends to build a cogen plant hence likely to have no excess bagasse in the near future.

Another area explored is the use of Papyrus in Yalla swamp. There is enough of papyrus in the swamp and the calorific value is attractive but the economics of transporting the fuel needs further analysis.

The factory also started a farmers’ forestry programme in 2005 where, farmers are provided with subsidized seedlings and technical services by the company, to grow trees. Currently 3,000 farmers covering 4,000 hectares have been supported and PPM plans to establish 8,000 hectares of social forestry areas. The seedlings are sold to the farmers at subsidized rates of KES 3 instead of the market rate of KES 15 per seedling. The company is careful not to enter into long term formal agreements with the farmers as they might perceive it as being given conditions and they might opt out of the programme, which happened in a previous programme. This approach has encouraged many farmers to join the programme. The factory pays KES 1700/tonne for the timber, which is paid on delivery. The company’s strategic plan is to grow this programme to between 8,000 - 10,000 hectares.

The AFREPREN/FWD Cogen for Africa Project team suggested that the idea of getting support from the AfDB for the Kenya Forestry Service to manage forests. Other donor agencies that have shown interest in assisting Kenya Forest Service include the Swedish and the Finnish Governments.

The company is interested in contracting an expert to carry out a biomass feedstock assessment, which is within the mandate of the AFREPREN/FWD Cogen for Africa project. The AFREPREN/FWD Cogen for Africa project could also assist in drafting the ToR for this study as well as partially financing the follow-up full feasibility Cogen study.
Below is a breakdown of the planned stages of activities for the cogen plant

1. Biomass assessment (3 – 6 months)
2. Technical assessment - Full Feasibility Study (6 months – 1 year)
3. Investment and implementation (1-2 years)

**Next Steps**

- Pan Paper Mills to send AFREPREN/FWD a formal request for support to be presented to the Project Steering Committee (PSC) composed of UNEP, African Development Bank (AfDB) and AFREPREN/FWD.
- Pan Paper Mills to send AFREPREN/FWD ToRs for expansion of its cogeneration investment, biomass supply and any previous documents on the proposed Cogen project.
- AFREPREN/FWD in consultation with PPM to expand ToR and submit request to PSC for approval