IWRM- WATER CONFERENCE

CHALLENGES IN HYDRO-POWER PRODUCTION IN RWANDA

Presenter: **Eng. Jean Claude KALISA**

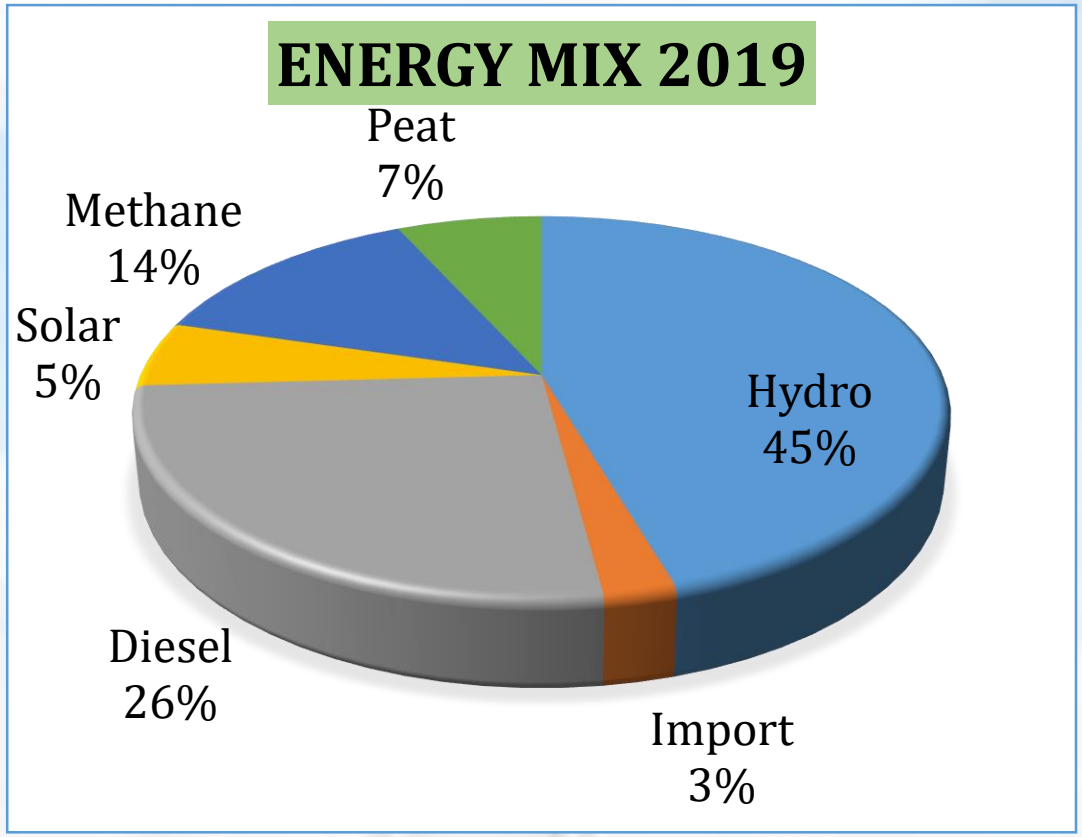
Managing Director _ EUCL/Subsidiary of REG

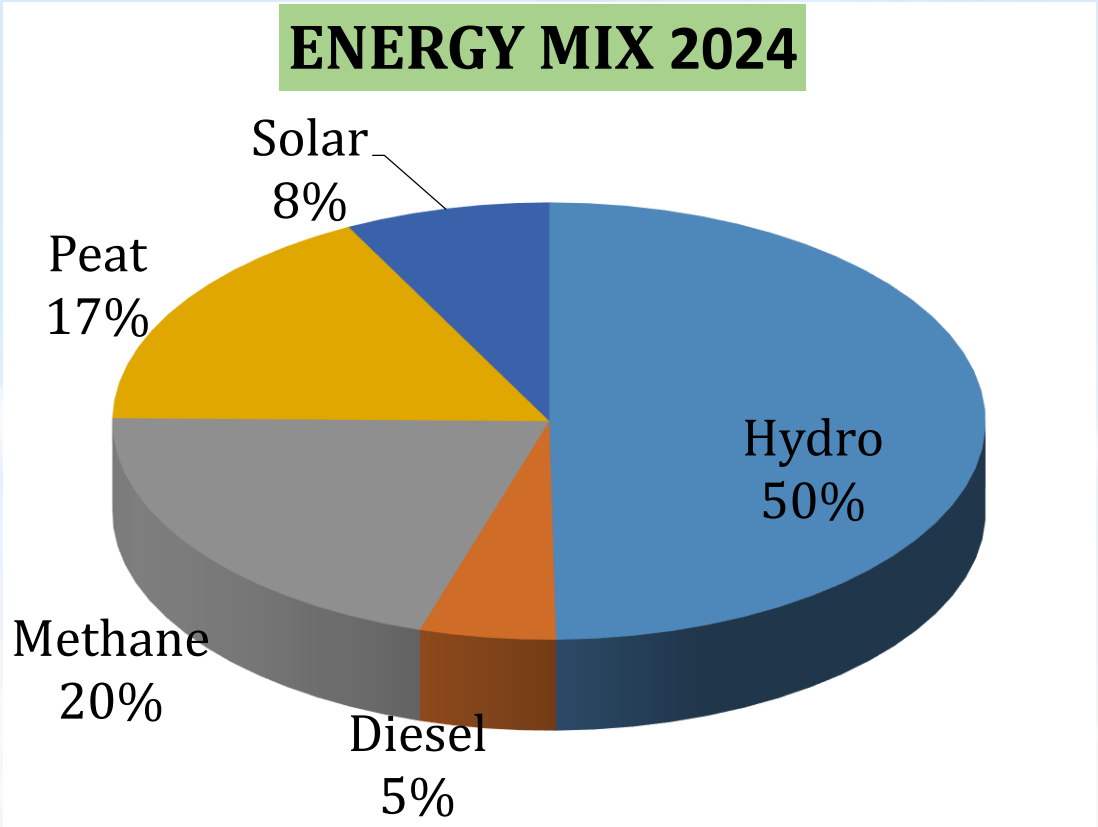
Date: 21st March 2019

PRESENTATION CONTENTS

1. Overview of Energy Mix in Rwanda
2. Challenges in hydropower Production in Rwanda
   - 2.1. High cost of generation
   - 2.2. Siltation
   - 2.3. Low water level during dry seasons
   - 2.4. Impact of siltation on power production
3. Mitigation measures

1. OVERVIEW OF ENERGY MIX IN RWANDA





- Installed capacity: currently 221MW, and 563 MW by 2024
- Hydro-power is the main power source for the country's energy mix.
- Target is to reduce diesel power plants to a status of emergency sources, restricted to only 5%

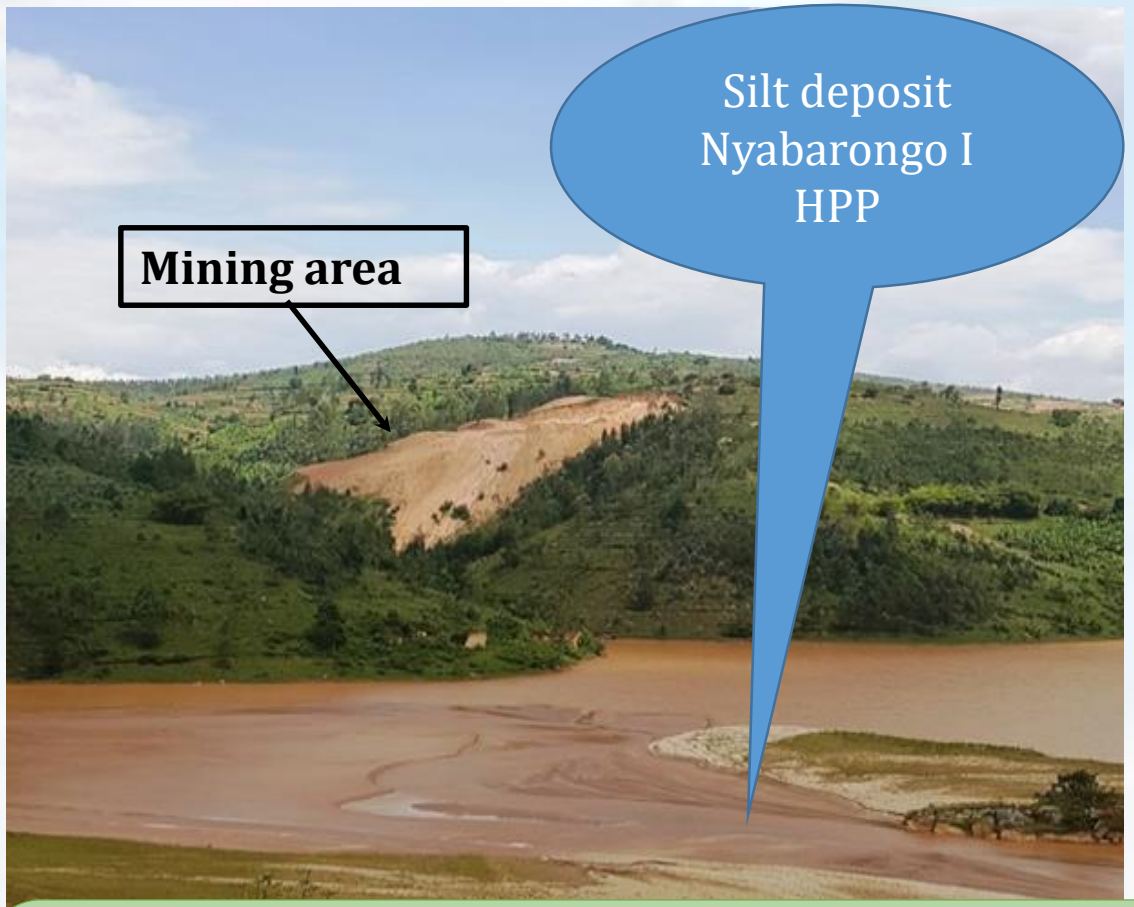
2. CHALLENGES IN HYDROPOWER PRODUCTION IN RWANDA

2.1. High cost of generation

- High Cost of generation due to the smaller sizes of potential hydropower resources
- The average cost of generation targeted is less than 10 Cents, the cost of micro hydro plants cannot attract industries
- Big plants from other sources (methane, peat,…) are required to dilute the generation cost

2. CHALLENGES IN HYDROPOWER PRODUCTION IN RWANDA

2.2. Siltation and Debris deposits

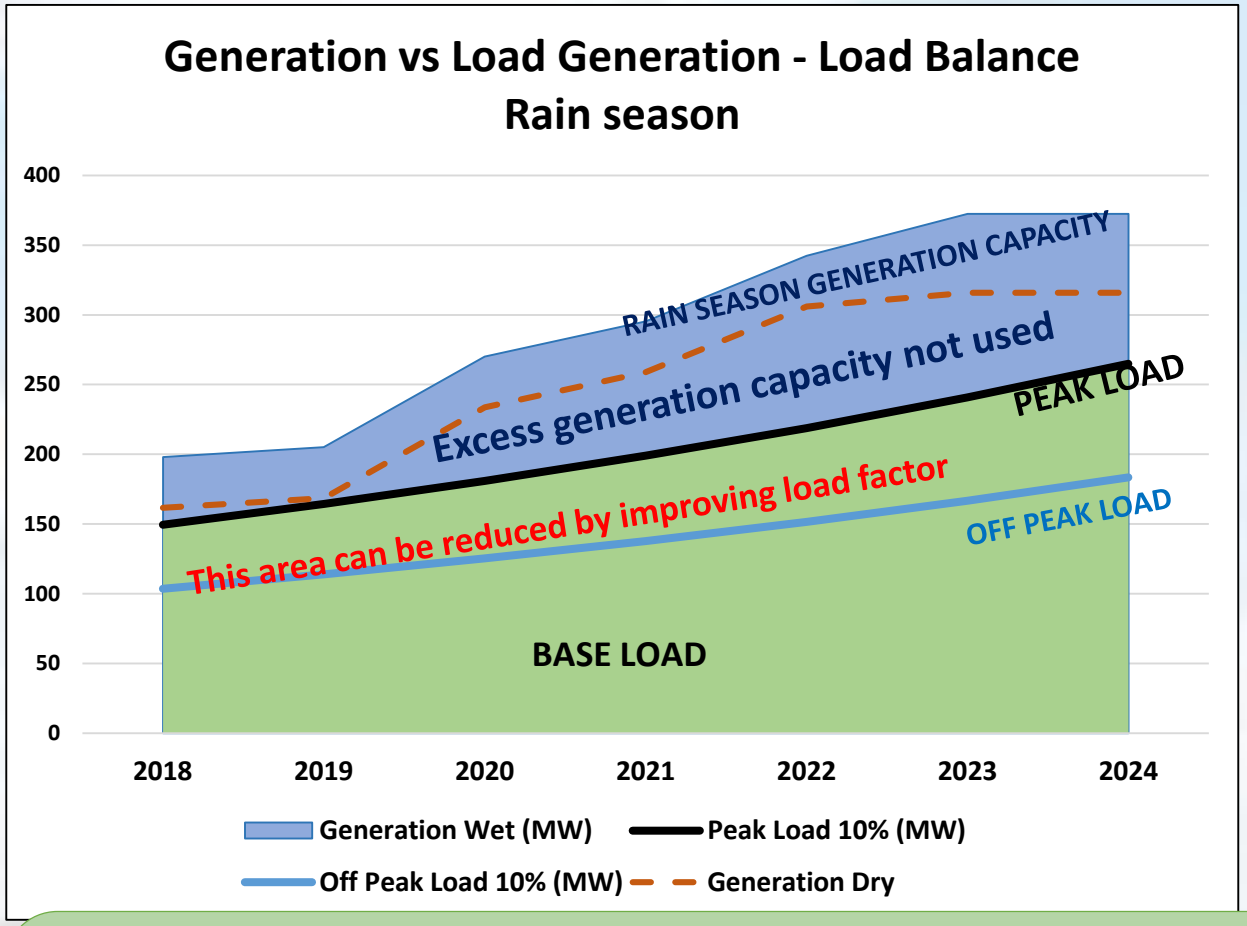


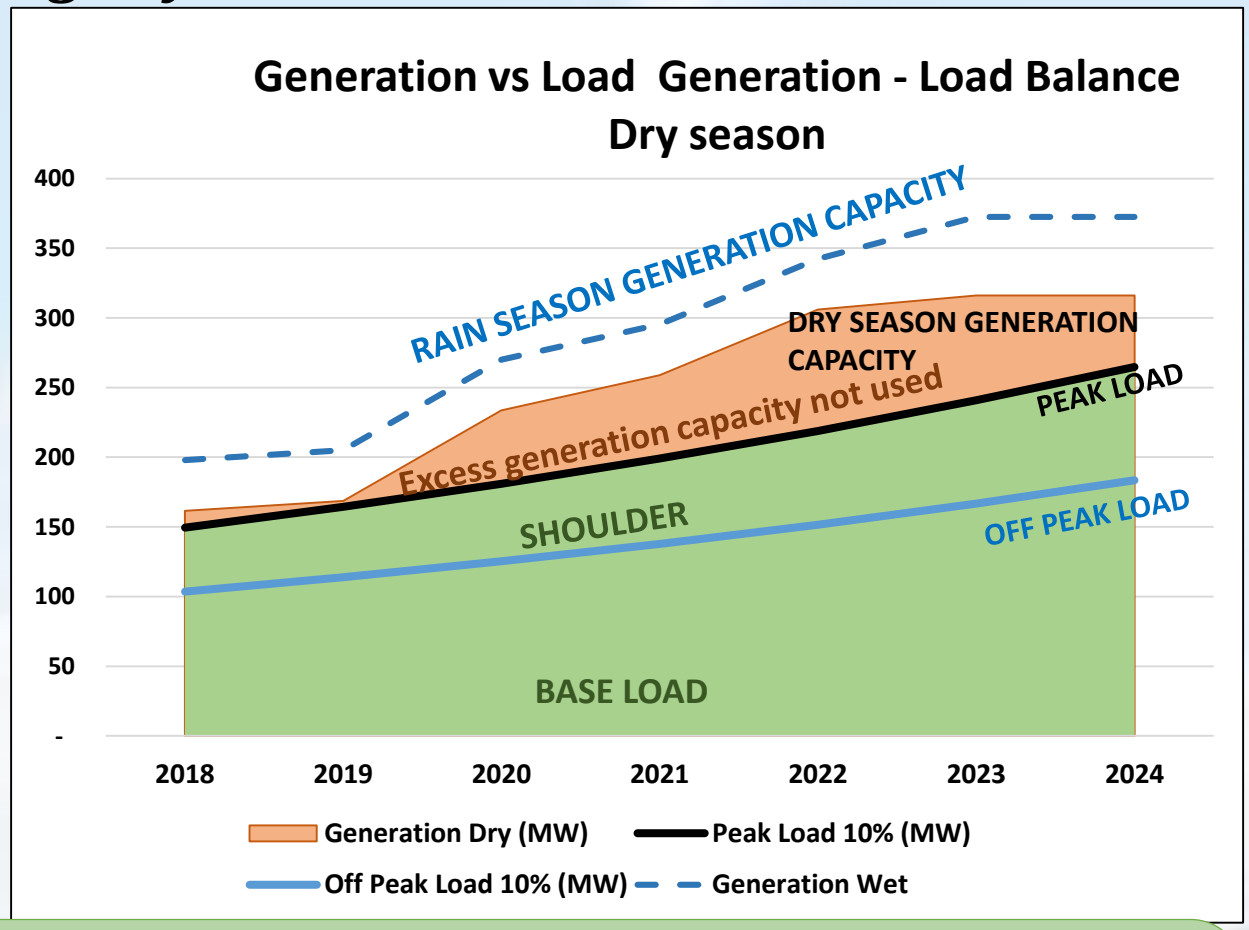
The main challenge in hydro generation is the siltation into the river catchments of the power plants

- Human activities (agriculture, mining, keeping livestock, deforestations, etc.) on upstream river catchments.
- Effect of Climate change (unexpected floods)

2. CHALLENGES IN HYDROPOWER PRODUCTION IN RWANDA

2.3. Low water level during dry seasons





- During dry season the hydro generation drops by 30%
- During dry season the hydro generation is substituted by diesel generation at higher tariff

2. CHALLENGES IN HYDROPOWER PRODUCTION IN RWANDA

2.4. Impact of siltation on power production

- ✓ Loss of reservoir storage capacity results into reduction in power production forcing to run expensive fuel to generate electricity
- ✓ The stability of the dam caused by Excessive accumulation of the silt into reservoir produces structure damages for the dam
- ✓ Loss of investment from shortening the life span of plant equipment (turbine, penstock, gates, etc)
- ✓ Reducing plant (machines) efficiency, and increasing operation & maintenance costs due to unplanned plant shutdowns

3. Mitigation measures

- Efficient use of natural resources (land, water, forest, etc.);
- Landscape protection to contain land sliding and erosion;
- Proper river bank and catchment protection;
- Regular Sediment management (flushing, dredging);
- Monitoring on regular basis the silt accumulation into reservoir;
- Study to analyse the current status of silt accumulation into reservoirs, and forecast its evolution, impacts (costs) over the life span of plants facilities.

THANK YOU