TECHNOLOGY FACTSHEET

MINI HYDRO-POWER[1]

Introduction

Mini- hydropower technology is the development of hydroelectric power on a scale that serves a small community or an industrial plant. The size of a mini- hydropower varies but a generating capacity of up to 277 KW.

Technology Characteristics

Mini- hydro-power is mostly of the run-of-river power plants which use the flowing water to generate electricity without the need to change the river flow. After use, the water used in mini-hydropower generation is returned to the natural course.

The amount of power that can be produced by a mini- hydropower plant is determined by the head (the height of power drop) and the flow rate. The higher the head, the smaller the flow rate needed to produce the same amount of electricity.

Mini- hydro power plants are best suited for isolated locations where there is no electricity grid. Off-grid power plants need local load controlling to stabilize frequency and voltage supply.

Country Specific Applicability and Potential

About 96 % of Kenyans do not have access to electric power as most of the population is located in isolated and remote areas that are not accessed by the national grid. Development of mini-hydropower power plants will therefore contribute to the rural electricity supply.

Kenya is endowed with a rich mini-hydropower potential of about 3,000 megawatts and only about 20 megawatts have been developed.

In Kenya mini- hydropower is especially suited to micro- enterprises especially agro- processing industries as well as to health and indoor lights.

[1] **This fact sheet has been extracted from TNA Report – Mitigation for Kenya. You can access the complete report from the TNA project website** http://tech-action.org/

Status of technology in country

Mini- hydropower plants existed in Kenya in pre- independence days but were outpaced by the diesel engine especially in maize milling and pumping water. Today improved technology makes mini- hydro economically viable in many situations.

However, the country lacks adequate capacity for installation and repairs.

Worldwide mini- hydropower generation is a mature technology that can benefit from technology developments done elsewhere. The technology has been used and installed extensively in China, Nepal and several South American countries.

Benefits to economic/social and environmental development

Expansion of mini- hydropower generation in Kenya could result in great socio- economic and environmental benefits. Mini- hydropower generation technology is by and large pollution free and ecological friendly. Mini hydros usually have minimal reservoirs and civil construction works.

They therefore have relatively low environmental impacts compared to other electricity generation technologies.

Climate change mitigation benefits

Depending on the forms of energy use the mini- hydro powered system substitutes, there will be some decrease in air pollution and greenhouse gas emissions. Mini- hydropower plants are practically carbon free. Mini-hydros can replace fossil fuel generation capacity In this regard, the mitigation potential is in the order of 13 ktCo_2/year by 2030.

Financial requirements and costs

The capital requirements for mini- hydropower plants depend on the effective head, flow rate, geological and geographical features, the equipment and the required civil engineering works. Making use of existing constructions such as weirs dams etc. can reduce environmental impacts and costs. In general, sites with low heads and high flows need greater capital outlay.