2.0 Methodology

The TAPs were developed based on the logical framework analysis. Logical Framework Analysis (LFA) is used in the design, monitoring and evaluation of development projects. LFA describes different types of events that take place as a project is being formulated and implemented, strategic objectives and strategies, project activities and outputs, means of verification, responsible actors, timeframe and estimated budget.

3.0 TECHNOLOGY ACTION PLANS FOR PRIORITIZED TECHNOLOGY

3.1 Geothermal for Electricity Generation

Geothermal energy is thermal energy generated and stored in the earth. This energy can be used to generate electricity using technologies such as dry steam power plants, flash steam power plants and binary cycle power plants.

Geothermal uses no fuel, and is therefore immune to fuel cost fluctuations. Geothermal electricity production has been successfully developed in regions with hydrothermal manifestations (e.g., geysers and hot springs). For example the rift valley where Kenya is currently producing electricity around 250 MW. Zambia lies in the rift valley and has similar manifestations like Kenya and therefore has good potential which warrants serious investigations. Geothermal power is a stable source of energy as it is independent of weather circumstances. It is therefore a reliable source of energy and commonly has a high capacity factor of between 70 and 90% of installed capacity, which makes it applicable for both base and peak load. Geothermal power production has the environmental benefit of being a relatively clean. The contribution to greenhouse gas emission reduction from geothermal

The SNDP recognizes that dependence on hydro electricity alone, currently standing at 99.0%, is risky since hydro power is vulnerable to climate change and associated hazard, and hence the need to formulate mitigation measures through diversification of the energy mix such as geothermal energy. The target for diffusion of geothermal technology aims at developing a framework to support exploration and development of geothermal, and development of 20MW geothermal plant for electricity generation. Installation for such a plant will contribute to avoidance of 140, 000 tonnes of GHG emissions per annum using the SAPP interconnected system as a baseline.

Strategic Objective	Deployment of geothermal for electricity generation				
Strategies	Output		Responsibility	Timeframe	Budget(Estimated Budget)US$
	Objective verifiable activity	Means of verification	Key actors		
Development of framework for	Devise framework and mechanism for provision of financing to support	Financing to support exploration phase identified	DOE, REA, ZDA, private sector, Bilateral and	24 months	50,000

provision of financing for geothermal exploration	completion of exploration works to include: Identification, hydrochemistry, geophysics, interpretation and exploration.		Multilateral organizations		
	Provide the same as above to support pre-production drilling at identified promising sites.	Pre-production drilling of identified site completed.			
Capacity development on specialized skills on geothermal exploration and development.	Develop capacity in identification, hydrochemistry, geophysics, remote sensing and interpretation of results for geothermal exploration and development for future works	Capacity developed in exploration techniques for participation in future works	DoE, Geological department, NISIR, UNZA, private sector	36 months	200,000
	Develop capacity in exploration, ,pre-production and production wells drilling specific for geothermal development	Capacity developed in drilling for exploration, pre-production and production wells development.			
Formulation of support policies through provision of fiscal incentives and public finance.	Undertake a study to develop a portfolio of support policies(grants, rebates, tax credit, equity investment and feed in tariff) to leverage relatively higher tariffs from geothermal electricity production	A range of support policies to leverage relatively higher tariffs from geothermal electricity production developed	Ministry of Mines, Energy and Water Development, Ministry of Finance, ZDA, consultants and stakeholders	12 months	50,000
	Consultations with stakeholders aimed at selecting appropriate and suitable support polices for geothermal exploration and development.	Appropriate and suitable support policies selected for implementation			
Establishment of appropriate legal and regulatory framework for geothermal exploration and development.	Undertake a study for establishing Institutional framework for supervision and financing of geothermal exploratory activities.	Institutional framework for supervision and financing of geothermal exploratory activities recommended	Ministry of Mines, Energy and Water Development, Geological department, UNZA, private sector	12 months	50,000
	Consultations with stakeholders for establishing a suitable institutional arrangement for supervision and financing of geothermal exploratory activities.	Institutional framework for supervision and financing of geothermal exploratory activities agreed upon for implementation			

Various actors will have different roles in relation to the strategic objectives and related activities requiring attention