

### **3.3. Energy Resources Development and Utilization**

Energy sector is the engine that drives the economic development of a country. It is the key input for technological, industrial, social and economic development of a nation. A rising energy demand, in the face of increasing oil price, natural gas and coal together with environmental concerns in terms of greenhouse gas emission and global warming; lack of alternative energy which has brought deforestation, land degradation and food insecurity in Ethiopia; all these have led to the search of a new technological way of energy utilization. There is a general acceptance for the need to diversify energy supply for confronting these challenges by developing advanced, cleaner, more efficient, and cost-effective renewable energy technologies, including superior and cleaner fossil fuel technologies. Priority research areas are:

- The integration of wind energy conversion systems into electricity transmission networks;
- The design and implementation of small to medium-scale wind turbines for use in remote locations;
- Photovoltaics and Energy Storage;
- Control system of small-scale off-grid power generation;
- Design model stoves for improvement and minimization of energy usage;
- Method of optimum utilization of available and future energy resources;
- Materials Science for solar panel and wind turbines;
- Biogas Technology: Pyrolysis and Gasification process;
- Biofuels Technologies: Improvement and optimization of existing technologies;
- Synthesis of catalyst for methanation of CO<sub>2</sub> as alternative routes to store and transport renewable energy sources.