

ABSTRACT

In this Thesis, we have tried to develop a simplified model of an optimum energy mix by considering three forms of thermal power generation i.e. oil, coal, and gas. The investment planning horizon for optimal investment is considered to be ten years and the life of a plant is taken to be thirty years. The least-cost optimization model is applied. The model minimizes a cost function that is a sum of various costs including Investment cost, O&M, and CO₂ costs, and fuel cost by satisfying reliable energy supply, emission, and import constraints. Besides, the seasonal variation of the hydel plants is also considered. Optimization is performed through the linear programming framework. The model concludes that with the restriction on import and emission, investment in oil should not be made while the share of coal should be reduced over time. However, after introducing hydel - which unlike base-load generation, varies by season- the model suggests investing in small scale hydel plants.