**Ecolite Energy** is a private energy company which runs a thermal power plant in **Nizamgarh** region of Uttar Pradesh. The company has been facing huge commercial losses mainly because of electricity theft. The problem of electricity theft has been rampant in the region for quite some time now. Also the company has been served a notice by Environment Protection Committee (EPC) of the state government regarding its excessive release of air pollutants.

Therefore the company has setup a special committee to look into these matters and provide technically viable, energy efficient, and economically feasible solutions.

The specifics of the problems are as follows:

1. **ELECTRICITY THEFT PROBLEM**

* The theft of electricity from distribution lines affects quality of supply, electrical load on the generating station and tariff imposed on electricity consumed by genuine customers.
* The problem is of prime importance as the company emphasises to conserve the interest of consumers by providing quality electricity at affordable tariff.

**Design a electricity theft detection system which can accurately pinpoint the location of theft , so that the necessary action can be taken and it can be minimized.**

1. **AIR POLLUTANT PROBLEM**

* Flue gases emitted by Thermal power plants cause rapid depletion of ozone gas thereby resulting in global warming and other harmful effects.
* These gases must not be released into the atmosphere without proper treatment.

**Suggest ways for the treatment of flue gases before releasing them so that their harmful effects on the atmosphere can be minimised.**

The solution must have the following features:

* A theft alarm when theft is detected in any section of the distribution line and mechanism to indicate the place of theft.
* Flue gas treatment should take into account different gases released during combustion of coal like oxides of sulphur and CO2 and suggest specific ways for the treatment of the same.
* It would be advantageous if sustainability is kept in mind.
* The system should be cost efficient.