

Thermal Power Plant in India

A thermal power plant is used to generate electricity. It uses a heat energy that is converted into electrical energy by burning a fuel. Fuel such as coal is burnt to produce a very high temperature which converts water into steam in a boiler. After that, high-pressure steam is passed on to create a force on the turbine that causes it to rotate at high speed.

Thermal power plants are the backbone of a country that helps to generate megawatts of energy to sustain the rapid growth of urbanization and industrialization. Such energy is crucial to generate and supplying electric power as it can respond to the demand for power to generate larger output. More than half of the total electricity demand is met through thermal power plants.

Types of Thermal Power Plants

Thermal Power plants need fuel to generate electricity. The commercial use of the power plants is constructed on a large scale and designed for consistent operations. The different types of thermal power plants in India as well as around the world are as follows:

- Coal-Fired
- Gas
- Diesel or Liquid fuel
- Geothermal
- Biomass
- Waste Material

Factors used to Determine Location of Thermal Power Plant

A thermal power plant produces electricity using steam. Therefore, the location of the power plant should be in a place where there is the availability of resources that are needed to generate electricity, such as fuel, raw materials, etc. The selection of sites for nuclear power plants is made by considering socio-economic and engineering factors that affect the site, construction and operation of such facilities. We have listed down some of the important factors that influence the location of thermal power plants.

- Terrain
- Availability of Fuel, such as Coal
- Availability of Water
- Proximity to population centres
- Availability of raw materials and supplies
- Transportation facilities
- Manpower supply
- Infrastructure
- Size of the site

List of Thermal Power Plants in India - State Wise

Thermal power plants are located in various states of India. The following table provides you with the state-wise list which will help students to find out the location of major thermal power plants in india.

List of Thermal Power Plants in India
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State	Thermal Power Plant
Rajasthan	Anta Thermal Power Station Rajwest Lignite Power Plant Suratgarh Super Thermal Power Station VS Lignite Power Plant Barsingsar Lignite Power Plant Chhabra Thermal Power Plant Giral Lignite Thermal Power Station
West Bengal	Kolaghat Thermal Power Station Bakreswar Thermal Power Station Bandel Thermal Power Station Mejia Thermal Power Station Durgapur Thermal Power Plant Durgapur Thermal Power Station Farakka Super Thermal Power Station Sagardighi Thermal Power Station Santaldih Thermal Power Station
Odisha	Talcher Super Thermal Power Station Vedanta Aluminum Company Captive Power Plant IB Thermal Power Plant Jharsuguda Thermal Power Plant Hirakud Captive Power Plant
Tamil Nadu	Mettur Thermal Power Station Neyveli Thermal Power Station Ennore Thermal Power Station North Chennai Thermal Power Station Tuticorin Thermal Power Station

Uttar Pradesh	<p>Anpara Thermal Power Station Obra Thermal Power Station Auraiya Thermal Power Station Feroz Gandhi Unchahar Thermal Power Plant Harduaganj Thermal Power Station National Capital Thermal Power Plant Panki Thermal Power Station Pariccha Thermal Power Station Rihand Thermal Power Station Rosa Thermal Power Station Singrauli Super Thermal Power Station Tanda Thermal Power Plant</p>
Punjab	<p>Guru Hargobind Thermal Power Plant Guru Gobind Super Thermal Power Station</p>
Maharashtra	<p>Amravati Thermal Power Plant Koradi Thermal Power Station Nashik Thermal Power Station Paras Thermal Power Station Parli Thermal Power Station Bhusawal Thermal Power Station Chandrapur Super Thermal Power Plant Khaperkheda Thermal Power Station Tirora Thermal Power Plant Trombay Thermal Power Station</p>
Madhya Pradesh	<p>Dada Dhuniwale Thermal Power Station Sanjay Gandhi Thermal Power Station Sant Singaji Thermal Power Plant Amarkantak Thermal Power Station Satpura Thermal Power Station Vindhyachal Super Thermal Power Station</p>
Karnataka	<p>Bellary Thermal Power Station Raichur Super Thermal Power Station Udupi Thermal Power Plant</p>
Jharkhand	<p>Bokaro Thermal Power Station Chandrapura Thermal Power Station Patratu Thermal Power Station</p>

Haryana	Gorakhpur Atomic Super Thermal Power Station Deenbandhu Chottu Ram Super Thermal Power Station
Gujarat	Kawas Thermal Power Station Kutch Lignite Thermal Power Station Mundra Thermal Power Plant Sabarmati Thermal Power Station Sikka Thermal Power Station Gandhinagar Thermal Power Station Jhanor-Gandhar Thermal Power Station Surat Lignite Thermal Power Station Ukai Thermal Power Station Wanakbori Thermal Power Station
Delhi	Badarpur Thermal Power Plant Indraprastha Power Station Rajghat Power Station
Chattisgarh	Bhilai Expansion Power Plant Korba Super Thermal Power Plant Sipat Thermal Power Plant Dr Shyama Prakash Mukharjee Thermal Power Plant Hasdeo Thermal Power Station Jindal Megha Thermal Power Plant
Bihar	Kahalgaon Super Thermal Power Station Muzaffarpur Thermal Power Plant Barh Super Thermal Power Station Barauni Thermal Power Station Nabinagar Super Thermal Power Station
Andhra Pradesh	Sri Damodaram Sanjeeviah Thermal Power Station NTPC Ramagundam Simhadri Super Thermal Power Plant Dr Narla Taatarao Thermal Power Station

Major Thermal Power Plants in India

More than 71% of India's electricity is generated through these plants where the contribution of coal-based ones is 85%. The major thermal power plants in India are coal-fired plants. Five of them are owned and operated by the state fund of the National Thermal Power Corporation. Below is the list of the largest thermal power plants in India.

Vindhyachal Thermal Power Station, Madhya Pradesh:

The Vindhyachal Power Station is the biggest thermal power plant in India at present. This power plant is found in the Singrauli district of Madhya Pradesh and runs on coal. Vindhyachal Thermal Power Plant is owned and operated by the govt. owned PSU, NTPC, with a capacity of 4,760 MW. The coal used in it is mined from the NCL-operated Nigahi mine, while the water is from the discharge canal of Singrauli Super Thermal Power Station. This plant began its construction in 1982, and its first unit was commissioned in 1987.

Mundra Thermal Power Station, Gujarat:

Mundra Thermal Power Station is India's second-biggest thermal power plant in India which is in the Kutch district of Gujarat. It is a coal-based plant for which the coal is imported from Bunyu, which is in Indonesia. It is India's 2nd largest power plant and the world's 11th-largest single-location coal-based plant. The power generation capacity of this plant is 4,620MW. Adani Power is its owner. This power plant has 9 generating units. The first unit of Mundra Thermal Power Plant was commissioned in 2009 for the first time, while the last was in 2012.

Sasan Ultra Mega Power Plant, Madhya Pradesh:

Sasan Ultra Mega power plant has an installed capacity of 3,960MW with an installed capacity of 3,960MW. It is a coal-based power plant whose owner and operator is Reliance Power. It is situated in the Sasan village, which is in Madhya Pradesh. Sasan Ultra Mega Power Plant is currently the 4th largest thermal power plant in India. It was first commissioned in 2015 for the first time. The electricity generated from this plant is supplied to seven states of India.

Tiroda Thermal Power Plant, Maharashtra:

The Tiroda thermal power plant has an installed capacity of 3,300MW. It is a coal-based power plant located in Maharashtra and operated by Adani Power. The water is drawn Wainganga River. In 2012, its first plant was commissioned, while the last was in October. This power plant uses supercritical technology to supply electricity. Tiroda thermal power plant also achieved the feat of the highest plant loader factor of 90.84% for its full operation in the year 2015-2016.

Talcher Super Thermal Power Station, Odisha:

The Talcher Super Thermal Power Station is owned and operated by NTPC. It is a coal-fired power plant in India found in the Angul district of Odisha and is the first plant to have an installed capacity generation of 300MW. This plant has a total of six 500 MW units. In the year 1995, Talcher Super Thermal Power Plant's first unit was commissioned. On the hand, its last unit started operating in 2005. The electricity generated from this plant is supplied to West Bengal, Telangana, Odisha, Karnataka, Andhra Pradesh and Bihar.

List of Major Thermal Power Plant Operators in India

Thermal power plants are operated both privately and through the government. There are 9 major thermal power plant operators in India that we have listed below.

S.No.	Name of the Operator
1	National Thermal Power Corporation (NTPC)

2	National Hydroelectric Power Corporation (NHPC)
3	Rural Electrification Corporation (REC)
4	North Eastern Electric Power Corporation (NEEPCO)
5	Power Finance Corporation (PFC)
6	Power Grid Corporation of India (POWER GRID)
7	SJVN – A Mini Ratna Company
8	THDC India Limited
9	Power System Operation Corporation Limited (POSOCO)

Advantages and Disadvantages of Thermal Power Plants

The modern civilization sustains on electricity. With the rapid increase in population and modernisation happening across the globe, power generation has become vital. Thus, for general electricity, thermal power plants are used, which contributes to a major part of the electrical consumption that is done today. However, with a dozen of advantages of using thermal power plants, there are some disadvantages too. Below we have mentioned the merit and demerits of using thermal power plants.

Advantages of Thermal Power Plants

The use of thermal power plants has proved to be a milestone for the modern world. With rapid industrialization happening in and around the world, thermal power has been put to good use. So, we have listed some of the advantages of thermal power plants below.

- They are cost-effective.
- They require less amount to set it up as compared to other power plants.
- A huge amount of power is generated.
- Thermal power plants are a reliable source of energy to handle future power demands.
- The technology for thermal power generation is well-established and easily accessible.
- The cost of fuel in generating electricity through these plants is less as compared to gas.

Disadvantages of Thermal Power Plant

Thermal Power plants have been a game changer for modern society. However, one has to bear the huge cost of maintenance, and the efficiency of machines to name a few. The disadvantages of using thermal power plants in India are as follows:

- As these plants require the use of exhaustible resources, therefore, it can cause depletion of these fossil fuels.
- The cost of maintaining and operating the plant is high as the machines and equipment in them require skilled people to handle them efficiently.
- High volume of water is needed to produce steam that can drive the turbines to produce electricity.
- The overall efficiency of thermal plants is low. Several coal-based thermal plants use outdated technology that lacks the chance of upgradation.