

## Energy Resources of Thar Desert



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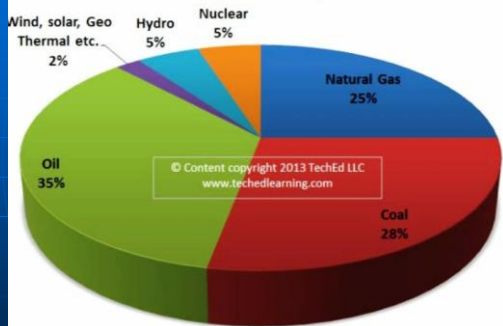


The Sun is the supreme source of the energy



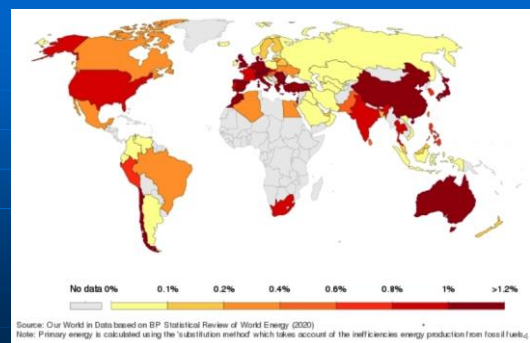
2

## World's Energy Consumption (Approximation)

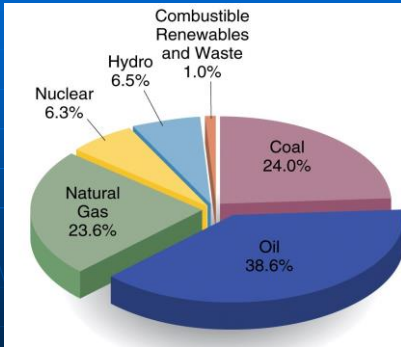


3

## Energy Production from Fossil fuel



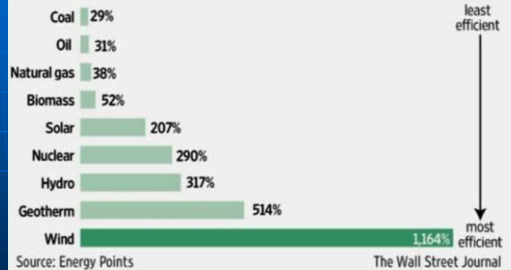
## World Energy Type Usage Today



5

## Energy Efficiency

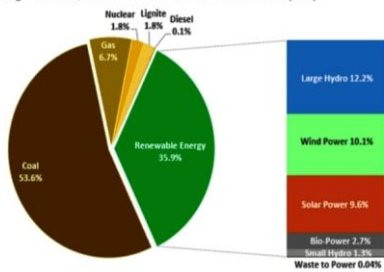
Percentage of energy input retained when converting fuel to electricity



6

## India - Cumulative Installed Power Capacity Mix (%)

Renewables (including Large Hydro) comprise ~35.5% of India's total installed capacity, with solar accounting for ~9.6%. Among renewables, solar accounts for ~26.7% of the installed capacity



Data from CEA, MNRE, Mercom India Solar Project Tracker (Installed Capacity as on 31 Dec 2019) Source: Mercom India Research

7



## Bioenergy:

Covers organic, non-fossil material of biological origin which may be used as fuel for heat production or electricity generation. This includes Wood, Wood Waste, Other Solid Waste, Charcoal, Biogas Liquid Befouls, Municipal Waste

8



### **Ocean Energy:**

- Mechanical energy derived from tidal movement, wave motion or ocean current and exploited for electricity generation. developments in **wave energy** due to the increased focus on climate change include, technological developments in Scotland, Australia, Denmark and the USA, and a high potential for energy supply - wave energy

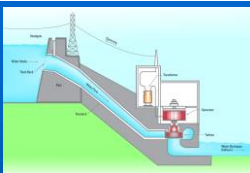
9



### **Geothermal Energy:**

Available as heat emitted from within the earth's crust, usually in the form of hot water or steam. It is exploited at suitable sites for electricity generation after transformation or directly as heat for district heating, agriculture, etc

10



### **Hydropower :**

Potential and kinetic energy of water converted into electricity in hydroelectric plants. It includes large as well as small hydro, regardless of the size of the plants.

11



### **Solar Energy:**

radiation exploited for hot water production and electricity generation. Does not account for passive solar energy for the direct heating, cooling and lighting of dwellings or other .

Raising the contribution of solar and other renewable resources to 50% of total primary energy supply by 2050

12



### Wind energy:

Kinetic energy of wind exploited for electricity generation in wind turbines

13



COAL



NATURAL GAS



OIL

FOSSIL FUELS  
85% of the world's commercial energy

14

## Unconventional Power Resources:

### Nuclear Power Sources of Rajasthan

#### Nuclear Power Plants in Rajasthan

- Rajasthan Atomic Power Station, Rawatbhata ( 1180 MW)

15

## Nuclear Power



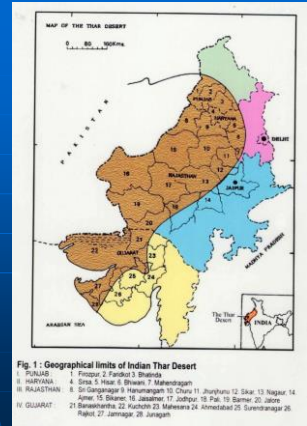
16

## Rajasthan



17

## Thar Desert



18

## Area occupied in various districts and states

State	Area in sq km	Concerned districts
GUJARAT	62,180	Entire : Kutch Part : Banaskantha, Mahesana, Ahmadabad, Surendranagar, Rajkot, Jamnagar & Junagarh
RAJASTHAN	196150	Entire : Ganganagar, Bikaner, Jaisalmer, Barmer, Jodhpur & Churu Part : Nagaur, Ajmer, Pali, Jalore, Jhunjhunu & Sikar
HARYANA	11,000	Part : Hissar and Mohindergarh
PUNJAB	9,000	Entire : Bhatinda and Ferozpur Part : Sangrur
<b>TOTAL</b>	<b>278,330</b>	

19

## CLIMATE OF THAR

The extreme cold and heat are special features. Temperature ranges from 0° C. to 50° C.

The rainfall is erratic and scanty.

The monsoon remains active from July to September.

The average rainfall :

Rajasthan Thar : 100 – 450 mm

Gujarat Thar : 300 – 500 mm

Punjab & Haryana Thar : 200 – 450 mm

During summer, the winds are generally violent (with 130 km/per hour), hot and scorching (*loo*) with dust. The shifting of sand dunes is very common.

The evaporation is excessive during summer.

20

## Thar A Specialized Ecoregion

Age: 1,00,000 yrs.  
Area: 3,20,000 sq. km

A Stressed Ecosystem  
Because of

### Climate

Extremes of temperature  
Erratic and deficit rainfall  
High wind velocity  
Lack of humidity  
Salinity and alkalinity  
Poor soil moisture

Dry and Arid Conditions  
Geology  
No Perennial Rivers  
Droughts & Famines

21

## Diversity Holding in the CPR's of Thar Desert

900 + Plant Species

86 + Grasses

2000 + Animal Species

32 Million Livestock

29 Million People

22

**Biodiversity Ensure  
Good Ecology**

**Which Leads To  
Good Villages Economy**

23

## Role of Thar Desert in Local Livelihoods

### Repository of

Water-Food-Fodder-Gum-Resin-Fiber  
Firewood-Fencing-Thatching-Timber  
Non-edible Oils-Dyes-Tannin-Herbal Support  
Meat-Wool-Hair-Skin-Hide-Fur-Horn-Bones-Fat  
Craft & Cottage

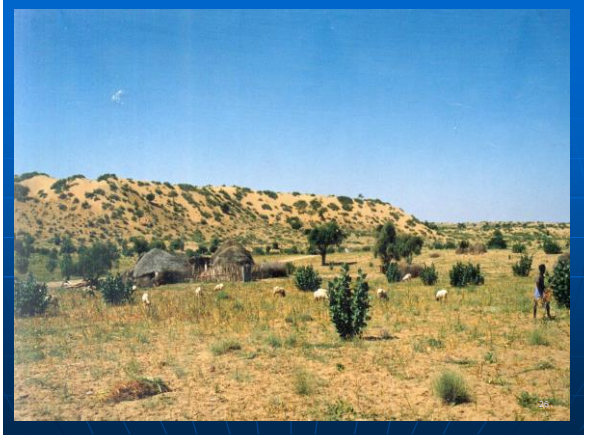
### Because of

Species Richness, Genetic Variation, Diversity

### Helped

Desert Ethos  
Peoples Science  
Oral Traditions  
Survival of People

24



### Life style

27

### Rich faunal diversity: Mammals

28

### Birds



### Biodiversity around Bishnoi Villages



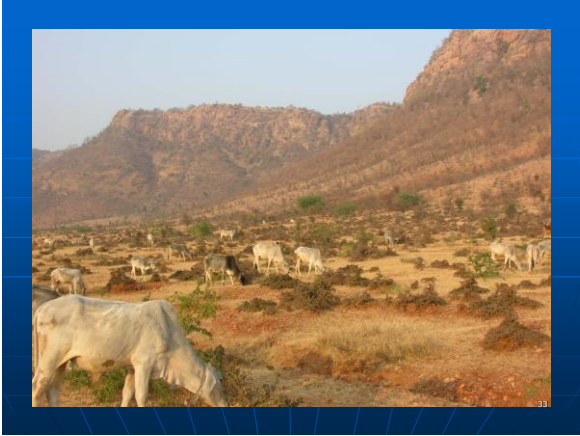
### Wildlife



### Desert Life: The most energy efficient and eco-friendly







### No cutting and Looping of Khajari tree

### Collection and preservation of natural resources

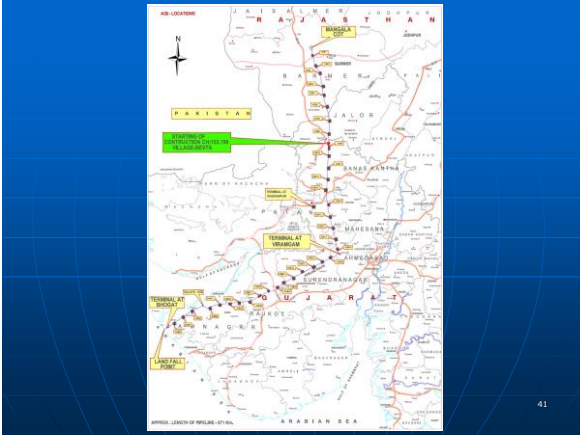
### Energy Resources in the Thar Desert

**Sources of Generation of Power:**

As on March, 2019, the installed power capacity of Rajasthan is 21,077.64 MW (Approximately 21 GW). Total increase during the year 2018-19 is 1524.87 MW. (Ref. Economic Review of Rajasthan 2018-19)

Sources of Power	Installed Capacity (in MW)	Percentage of Total
Thermal Power	11385.5	54.0%
Hydel Power	1757.95	8.3%
Gas Based	824.6	3.9%
Nuclear	456.74	2.2%
Solar	2411.7	11.4%
Wind	4159.2	19.6%
Biomass	101.95	0.5%
<b>Total</b>	<b>21077.64</b>	<b>100%</b>





# Thermal

**Thermal Power plants of Rajasthan:**

- **Suratgarh Super Thermal Power Plant** – 1500 MW (6×250 MW) – **RVUNL**
- **Kota Super Thermal Power Plant** – 1240 MW (2×110, 3×210, 2×195) – **RVUNL**
- **Chhabra Thermal Power Plant** – 2320 MW (4×250 MW) + 1320 (2×660 MW) (June 2019) – **RVUNL**
- **Kalisindh Thermal Power Station** – 600 MW (1×600 MW) – **RVUNL**
- **Girai Lignite Power Plant** – 250 MW (2×125 MW) – **RVUNL**
- **Barsingar Thermal Power Station**
- **JSW Barmer Power Station**
- **Kawal Thermal Power Station**
- **VS Lignite Power Plant**

# Thermal

**Important Facts:**

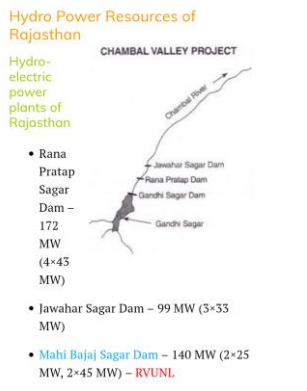
- **Chhabra Thermal:**
  - Super critical technology based Unit 5&6 came online in June 2019 – Overall Capacity 2320 MW
  - Chhabra Thermal is 1st Power Plant in Rajasthan based on this Super Critical technique
- **Future Plan:** Three projects of 2,800 MW are under progress:
  - Chhabra Thermal Power Project – 2X660MW – June 2019
  - Suratgarh Thermal Power Project – 2×660 MW
  - Ramgarh Gas Thermal Project

## Oil & Natural Gas Power Resources of Rajasthan

Recently, oil and natural gas resources have been discovered in the western part of the state. [Read: [Hydrocarbon resources of Rajasthan](#)].

**Gas power plants of Rajasthan**

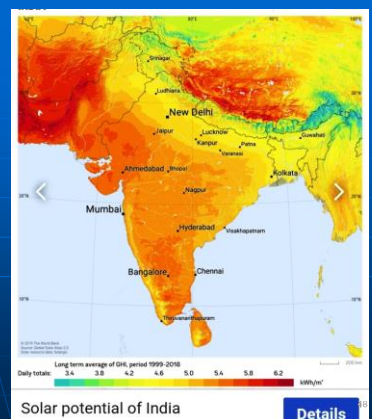
- **Dholpur Combined Cycle Power Station** – 350 MW (2×110 MW Gas Turbine, 1×110 MW Steam Turbine). – **RVUNL**
- **Ramgarh Gas Thermal Power Station** – 430 MW (1×35.5 MW GT, 1×37.5 MW GT, 1×37.5 MW ST, 1×110 MW GT, 1×50 MW ST are running) whereas 1×160 MW(110 MW GT + 50 MW ST) is under planning stage. – **RVUNL**



### Biomass Energy

The main source for biomass energy in the State of Rajasthan is Mustard Husk and Julie Flora. State Government has even issued 'Policy for Promoting Generation of Electricity from Biomass 2010' for encouraging investments in the sector. Total 13 Biomass Power Generation Plants of 120.45 MW capacity have been established till March, 2019 in the State.

### Solar Energy



### Solar Energy Resources of Rajasthan

Rajasthan shines bright on the solar map of India with 500-550 clear sunny days comparable to deserts of California, Nevada, Colorado and Arizona. Within the state the districts such as **Barmer, Bikaner, Jaisalmer, Jodhpur** are the key regions with best solar radiation. Rajasthan is endowed with two critical resources that are essential to solar power production: high level of solar radiation (6-7 kWh/ m<sup>2</sup>/ day) and large tracts of relatively flat, undeveloped land.

As per the assessment of Ministry of New and Renewable Energy (MNRE), Rajasthan has a potential of 142 GW of electricity from solar energy. Solar Power plants of 3,074 MW have been commissioned in the State upto March, 2019.( Ref- Economic Review 2018-19)

49

### solar power plant in In...

Results in English

सौर प्वावर प्लांट इन इंडिया  
हिन्दी में नवीजे



### Five largest solar power plants in India profiled

1. **Bhadla Solar Park** – 2,250MW. Claimed to be The largest solar power plant in the world, the **Bhadla Solar Park** is located in Bhadla village, in Rajasthan's Jodhpur district. ...
2. **Shakti Sthala solar power project** – 2,050MW. ...
3. **Ultra Mega Solar Park** – 1,000MW. ...
4. **Rewa Solar Power Project** – 750MW. ...
5. **Kamuthi solar power plant** – 648MW.

50

### Top 10 Rooftop Solar States by Installed Capacity in India

By Manu Tayal / Updated On Thu, May 7th, 2020

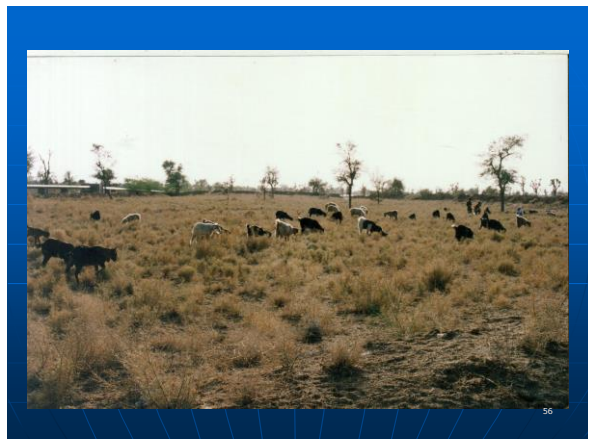
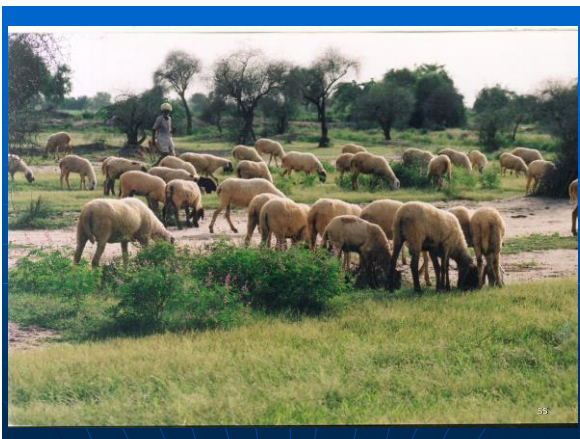


India has set one of the world's most ambitious targets of 175 gigawatts (GW) for renewable energy capacity addition by 2022, including 100 GW for solar, 60 GW for wind, 10 GW for bioenergy and 5 GW for small hydro-power. Out of the solar's 100 GW capacity, 40 GW will come from rooftop solar and 60 GW from ground-mounted solar projects. Here we look at the top ten rooftop solar states by installed capacity in the country.

51



52



## Wind Energy



57

Globally, Suzlon has installed over 17000 MW of wind power capacity in 18 countries.<sup>[30]</sup>

### India



Suzlon crossed 11,000 megawatts of cumulative installations in India.<sup>[31]</sup> Suzlon has cumulatively added over 11000 megawatts of wind power capacity for over 1,700 customers in India across 40 sites in eight States. Suzlon accounts for nearly one-third of the country's total wind installations.<sup>[32]</sup>

58

#### Wind Energy Resources of Rajasthan

Rajasthan is one of India's leading state in tapping wind energy for power generation. The wind energy potential in the State is estimated to be about 18,770 MW at 100 M hub height as per assessment of National Institute of Wind Energy (NIWE) and MNRE, GoI. A total of 4,310.50 MW wind power capacity has been established upto March, 2019 in the State. Economic Review 2018-19), Rajasthan ranks 5th in the Country in terms of installed generation Capacity.

The government has issued **POLICY FOR PROMOTING GENERATION OF ELECTRICITY FROM WIND, 2012**

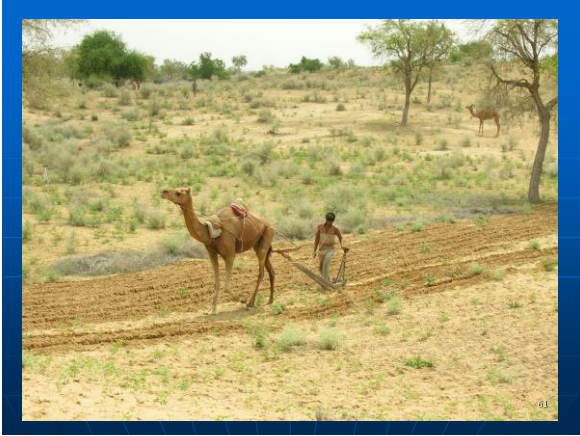
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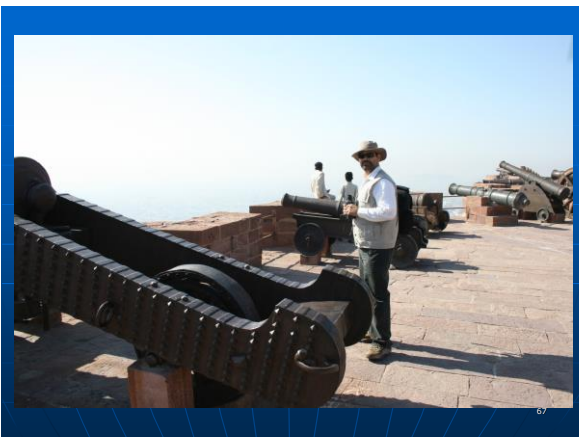
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60









69



70



71



72



### Urgent needs!

- Conservation of energy
- Management if energy
- Value of energy resources
- Value of Traditional Practices
- Education and awareness
- Policy review

75

Renewable Energy is the future!  
The only eco-friendly source!  
For Biodiversity Conservation!  
Batter Human Survival

76

**Thar Ethos Teaches Sharing  
of Resource For Survival !**

**Acknowledgement:**

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77