

persuasive measures will always be there.

[*Translation*]

SHRI CHINMAYANAND SWAMI: Sir, I would like to inform the hon. Minister of an incident that took place while I was travelling from Trivandrum to Delhi on 4th February. An air-hostess was offering a lighter to a gentleman for lighting a cigarette. I have written to the hon. Minister regarding these things but have not received any reply so far. Is there any serious proposal to take steps in this direction?

(*English*)

SHRI M. O. H. FAROOK: We have not received any letter. If he can give the details of it, we will enquire into the matter.

(*Translation*)

SHRI CHINMAYANAND SWAMI: Secondly, it was said that there is no ban on consumption of liquor by the passengers during flights. I would like to know from the hon. Minister that when consumption of liquor at public places is banned then what category does the aircraft fall under? If a passenger consumes liquor on board and then misbehaves in his state of inebriation, would that not be objectionable? Will consumption of liquor be banned on board to prevent such eventualities?

(*English*)

SHRI M. O. H. FAROOK: In the international flights, it is being allowed by the airlines, but in the local flights, some people bring their liquor and take it. If they misbehave with others, then there are other provisions to tackle them. But there is no such case now.

Power Generation Through Wind

*349. SHRI HARISINH CHAVDA: Will the Minister of POWER AND NON-CONVENTIONAL ENERGY SOURCES be pleased to state:

(a) whether the project for power generation through wind is underway;

(b) if so, the places where this project is proposed to be set up together with the expenditure involved and the quantity of power proposed to be generated therefrom;

(c) whether the cost of power generation through this method is cheaper than other means; and

(d) if so, the details thereof?

THE MINISTER OF STATE OF THE MINISTRY OF NON-CONVENTIONAL ENERGY SOURCES (SHRI KALP NATH RAI): (a) to (d). A statement is laid on the Table of the House.

STATEMENT

(a) and (b). Yes, Sir. The Wind Power Programme was started in 1985-86 with the first wind farm projects being commissioned in January, 1986. The wind farm programme is implemented through State agencies as demonstration projects on the basis of suitable wind speeds, recorded and analysed as part of the wind survey programme. In addition, a few private entrepreneurs have also put up grid-connected wind electric generators, utilizing the tax benefits made available by the Central Government and the facilities offered by the State Electricity Boards to wheel, bank and buy surplus energy. Loans at concessional rate of interest are also available to private entrepreneurs through the Indian Renewable Energy Development Agency (IREDA). Apart from clusters of wind electric generators known as wind farms, individual grid-connected machines are also installed in locations where sufficient land is not available for wind farm projects. As on 31.12.1991, a total capacity of 38.3 MW commissioned and connected to the respective State grids, which includes 5 MW private sector projects. In addition, wind electric generators of a total capacity of about 25MW are under installation in various parts of the country, including 7 MW in the private sector.

The State-wise details of wind power capacity are as follows:

<i>State</i>	<i>Total Capacity (MW)</i>	
	<i>Completed</i>	<i>Under Installation</i>
1. Tamil Nadu	19.24	12.22
2. Gujarat	14.74	4.25
3. Maharashtra	1.19	1.50
4. Andhra Pradesh	0.55	2.50
5. Karnataka	0.55	2.00
6. Kerala	0.10	2.00
7. Orissa	1.19	-
8. Madhya Pradesh	0.64	-
9. Goa	0.11	-
Total	38.31	24.47

The capital cost of wind power projects on an average comes to about Rs. 3.0 crores per MW. At a good windy site, of annual mean speed not less 6 metres/second, over 2 million kwh of electricity will be generated per MW of installed capacity .

(c) and (d). The cost of wind power generation depends on factors like location, wind regime, type and size of wind laster generators, grid conditions and scale of projects. The average cost of generation is in the range of Rs. 2.00 - 2.25 per kwh. The average costal generation for new 210/250 MW thermal plants located away from coal-fields comes to Rs. 1.70 - 1.90 per kwh; for a 0.5/1.0 MW diesel power plant, the cost of generation is Rs. 1.80 - 1.90 per kwh.

It is relevant to note that the cost of generation in the case of diesel sets and thermal plants will continue to increase owing to increases in the cost of inputs. No such increase will take place in case of wind power throughout the life of the equipment. Thus, the relative position of wind power

improves over the years. Other advantages are modularity and short gestation enabling quwick capacity addition. Wind power generation is also environmentally benign and does not involve additional cost for pollution control as for conventional power projects. The disadvantage of wind power is that the generation is intermittent, depending on wind availability whereas in a hydel or thermal plant, power availability is continuous.

[*Translation*]

SHRI HARISINH CHAVDA: Sir, the hon. Minister's reply implies that over 1/3rd of the electricity produced in the country through wind generation comes from Gujarat. I would like to know the number of proposals sent in by the Gujarat Government , the numLer of them approved and the time by which the rest are likely to be approved?

SHRI KALP NATH RAI: Sir, the generation of energy through wind has been started from 1985-86. At present wind energy is being used to produce 38 MW of electricity

and another 24 MW will be produced very soon. We have placed much emphasis on this programme. The Government is trying to generate electricity through wind energy in the coastal states of Gujarat, Tamil Nadu, Andhra Pradesh, Orissa etc.

SHRI HARISINH CHAVDA: Sir, my question to the hon. Minister is regarding the number of projects sought to be approved by the Gujarat Government the number of such projects already approved and the time by which the rest are likely to be approved?

MR. SPEAKER: A specific notice will be needed for that. Please put some other question. The answer to that question will be given in writing. Kindly ask a question that is relevant to the entire country.

SHRI HARISINH CHAVDA: Sir, Banaskantha is my constituency. It is situated near the Rann of Kutch where the wind speed is very high. May I know from the hon. Minister if steps would be taken to set up plants based on wind energy in areas like Banaskantha?

SHRI KALP NATH RAI: Sir, a survey has been conducted all over India with regard to generation of wind energy and this survey was conducted by the Tata Institute. According to the findings of the survey, the country has a capacity of generating 20,000 megawatts of wind energy and the maximum capacity is in Gujarat and Madras area. As the hon. Member knows the place called Lama in Gujarat. 10 MW of wind energy is being generated there and this has been connected to the State Electricity Board. Private industries have also been invited in this sector. The Government is making efforts but it has limited resources at its disposal. It involves more expenditure than thermal or hydro power generation. So we are conducting a demonstration throughout the country so that private industry is also attracted to this sector.

[English]

SHRI A. CHAIRLES: It is the general impression that the cost of production of

wind energy is the cheapest. But in answer to part (c) and (d) of the question, it is stated that the average cost of generation of wind energy is Rs. 2/- to Rs. 2.25 per kw.

May I know from the hon. Minister whether the cost of production of wind energy per kw is arrived at by taking into consideration only the cost of installation charges?

Will the cost of production of wind energy be the cheapest if we take into consideration the recurring expenditure which will be very low in course of time?

If so, wherever there is no possibility of having thermal or diesel or hydro-electric projects, the possibility of generation of wind energy should be considered and steps should be taken for installation of more such wind energy projects.

[Translation]

SHRI KALP NATH RAI: Sir, I agree with the hon. Member that the recurring expenditure on wind energy will be very low in course of time but the initial expenditure is quite high. In case of generation of thermal energy, its input-costs consisting of fuel, oil and transportation of coal keeps increasing. As a result of technological research, the input cost in future would be nil. With the result that as compared to thermal and hydro energy, wind energy will be cheaper in future.

SHRI MANORANJAN BHAKTA: Sir, the hon. Minister said that this facility can be available in coastal areas. In the Andaman & Nicobar Island ... the cost of power generation with diesel increases because over Rs. 3/- per unit is spent in power generation. Is there any proposal to generate wind energy in the Andaman & Nicobar island as the wind speed is very high there?

SHRI KALP NATH RAI: Sir, the hon. Minister wants to know the possibility of generating wind energy in the Andaman & Nicobar Islands and Lakshadweep where the wind velocity is 6 metres per second. The

possibility of generation of electricity through wind energy, mini-hydro and micro-hydro in Andaman-Nicobar is being seriously considered and we shall give priority to the project within our plants.

SHRI BRISHIN PATEL: Sir, May I know from the hon. Minister the comparative cost of 38.31 MW of electricity generated through wind energy and 38.31 MW generated through a diesel plant?

MR. SPEAKER: This question will mislead the entire House. This is the initial expenditure.

SHRI KALP NATH RAI: Sir, at present the expenditure on generating electricity through wind energy is nearly Rs. 2.75 crore per megawatt.

[English]

Power Generation in Eastern Region

*350. **SHRI ZAINAL ABEDIN:** Will the Minister of POWER AND NON-CONVENTIONAL ENERGY SOURCES be pleased to state:

(a) whether the percentage ratio of participation of the Union Government in generating power in the Eastern region is much lower as compared to the Northern and Western regions;

(b) if so, the reasons therefor; and

(c) the steps proposed to be taken to enhance the same?

THE MINISTER OF STATE OF THE MINISTRY OF POWER AND NON-CONVENTIONAL ENERGY SOURCES (SHRI KALP NATH RAI): (a) to (c). Out of the total installed generating capacities in the Eastern, Northern and Western Regions, the Central Sector Generating units account for 29.85%, 31.43% and 18.89% respectively as on 31.3.1991. The ratio of central sector generation in the Eastern Region compares favourably with the Northern and is higher

than the Western Region.

SHRI ZAINAL ABEDIN: Sir, the hon. Minister has stated in his answer that the ratio of Central-sector generation in the Eastern Region compares favourably with the Northern Region and is higher than the Western Region. But, in 1951, just before the advent of our Planning process, the Eastern Region in general and West Bengal in particular had the highest capacity of power generation. This region has now come down to the lowest position. In 1991, out of the 66,000 MW capacity, West Bengal has only 3000 MW and the Eastern Region as a whole has 9000 MW capacity. So, may I request the hon. Minister to give details of the investment made by the Central Government in different Plan periods date-wise and Central-Sector generating station-wise?

SHRI KALP NATH RAI: The hon. Member has asked as question about shortage of power generation in the Eastern Region. But I want to tell the hon. Member that today the shortage of energy in the Eastern Region is 15 per cent and the peak demand shortage is 20 per cent. Regarding the question why there is the problem of shortage in the Eastern Zone, I want to tell the hon. Members that there are several reasons for that. One, now the Plant Load Factor in the Eastern Region, in all the States, is the lowest. But there is a question: What is the existing capacity today? In Bihar, it is only 20 per cent. In Bengal, the State Electricity Board's Plant Load Factor is 19 per cent; in Orissa, it is 37 per cent. I now come to the question of what is the existing capacity today. In the Eastern Region, how to use maximum capacity and how to increase the Plant Load Factor is the question. Only by doing this, the problem of energy shortage can be solved. I want to tell the hon. Member that the Central sector is giving priority for power generation in the Eastern region. Now there is a Talcher Project with 3000 megawatt capacity in Orissa. The Farakka Project with 21,000 megawatt capacity super thermal power station is under construction in Bengal. There is a Kehalgaon project with 2000 megawatt capacity power generation