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STANDING COMMITTEE ON ENERGY

(2020-21)

SEVENTEENTH LOK SABHA

MINISTRY OF NEW AND RENEWABLE ENERGY

TIDAL POWER DEVELOPMENT IN INDIA

TWENTIETH REPORT



**LOK SABHA SECRETARIAT
NEW DELHI**

August, 2021/Sravana, 1943 (Saka)

TWENTIETH REPORT

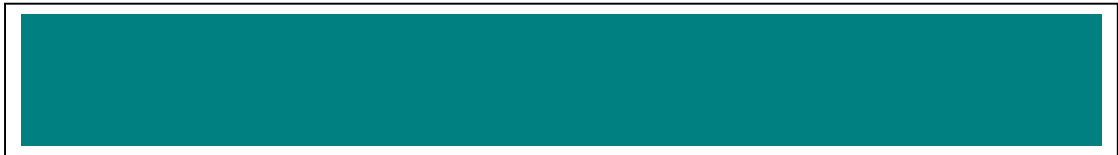
**STANDING COMMITTEE ON ENERGY
(2020-21)
(SEVENTEENTH LOK SABHA)**

MINISTRY OF NEW AND RENEWABLE ENERGY

TIDAL POWER DEVELOPMENT IN INDIA

Presented to the Lok Sabha on 5th August, 2021

Laid in the Rajya Sabha on 5th August, 2021



**LOK SABHA SECRETARIAT
NEW DELHI**

August, 2021/Sravana, 1943 (Saka)

COE NO. 337

Price: Rs.....

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Published under Rule 382 of the Rules of Procedure and Conduct of Business in Lok Sabha (Sixteenth Edition) and Printed by_____.

| REPORT | | |
|--|---|-----------------|
| CONTENTS | | |
| | | Page No. |
| | Composition of the Committee (2020-21) | 5 |
| | List of Abbreviations | 7 |
| | Introduction | 8 |
| PART -I | | |
| NARRATION ANALYSIS | | |
| I | Introductory | 9 |
| II | Harnessing of Tidal Power | 10 |
| | A. Global Scenario | |
| | B. Initiatives taken in India | |
| | C. Tidal Power Potential in India | |
| | D. Comparative Cost | |
| | E. Budgetary Allocation for R&D | |
| | F. Environmental Impact | |
| | G. Problems/Constraints in Harnessing of Tidal Power | |
| H. Future Vision | | |
| PART-II | | 18 |
| RECOMMENDATIONS/OBSERVATIONS OF THE COMMITTEE | | |
| ANNEXURES | | |
| I | Minutes of Sitting of the Committee held on 11 th February, 2021 | 22 |
| II | Minutes of Sitting of the Committee held on 4 th August, 2021 | 24 |

**COMPOSITION OF THE STANDING COMMITTEE ON ENERGY
(2020-21)**

LOK SABHA

Shri Rajiv Ranjan Singh *alias* Lalan Singh - Chairperson

2. Smt. Sajda Ahmed
3. Shri Gurjeet Singh Aujla
4. Shri Chandra Sekhar Bellana
5. Dr. A. Chellakumar
6. Shri Harish Dwivedi
7. Shri S. Gnanathiraviam
8. Shri Sanjay Haribhau Jadhav
9. Shri Kishan Kapoor
10. Shri Ramesh Chander Kaushik
11. Shri Ashok Mahadeorao Nete
12. Shri Praveen Kumar Nishad
13. Shri Parbatbhai Savabhai Patel
14. Shri Jai Prakash
15. Shri Dipsinh Shankarsinh Rathod ^
16. Shri N. Uttam Kumar Reddy
17. Shri Shivkumar Chanabasappa Udasi
18. Shri P. Velusamy
19. Shri Akhilesh Yadav
20. Vacant@
21. Vacant@

RAJYA SABHA

22. Shri Ajit Kumar Bhuyan
23. Shri T. K. S. Elangovan
24. Shri Muzibulla Khan
25. Shri Maharaja Sanajaoba Leishemba
26. Shri Jugalsinh Mathurji Lokhandwala
27. Shri Surendra Singh Nagar
28. Dr. Sudhanshu Trivedi
29. Shri K.T.S. Tulsi
30. Vacant *
31. Vacant #

SECRETARIAT

- | | | |
|----|---------------------------|---------------------|
| 1. | Shri R.C. Tiwari | Joint Secretary |
| 2. | Shri R.K. Suryanarayanan | Director |
| 3. | Shri Kulmohan Singh Arora | Additional Director |
| 4. | Ms. Deepika | Committee Officer |

^ Nominated as Member of the Committee w.e.f. 28.12.2020

@ Vacant vice Km. Shobha Karandlaje and Smt Anupriya Patel inducted in Union Council of Ministers w.e.f. 07.07.2021

** Vacant vice Shri Javed Ali Khan retired from Rajya Sabha on 25.11.2020*

Vacant since constitution of the Committee.

| LIST OF ABBREVIATIONS | |
|------------------------------|---|
| AFD | <i>Agence Française de Développement</i> |
| BE | Budget Estimates |
| Committee | Standing Committee on Energy (2020-21) |
| CRISIL | Credit Rating Information Services of India Limited |
| GW | Giga-watt |
| IIT, Chennai | Indian Institute of Technology, Chennai |
| IREDA | Indian Renewable Energy Development Agency |
| IRENA | International Renewable Energy Agency |
| LCOE | Levelized Cost of Electricity |
| Ministry | Ministry of New and Renewable Energy |
| MNRE | Ministry of New and Renewable Energy |
| MoU | Memorandum of Understanding |
| MW | Megawatt |
| OTEC | Ocean Thermal Energy Conversion |
| R&D | Research and Development |
| RE | Revised Estimates |
| RPO | Renewable Purchase Obligations |
| WBREDA | West Bengal Renewable Energy Development Agency |

INTRODUCTION

I, the Chairperson, Standing Committee on Energy, having been authorized by the Committee to present the Report on their behalf, present this Twentieth Report of the Committee on 'Tidal Power Development in India' pertaining to the Ministry of New and Renewable Energy.

2. The Committee heard views of representatives of the Ministry of New and Renewable Energy on 11th February, 2021. The Committee wish to express their thanks to the representatives of the Ministry for appearing before the Committee and furnishing the desired information in connection with the issues relating to the subject.

3. The Report was considered and adopted by the Committee at their sitting held on 4th August, 2021.

4. The Committee place on record their appreciation for the assistance rendered to them by the officials of the Lok Sabha Secretariat attached to the Committee.

5. For the facility of reference and convenience, the observations and recommendations of the Committee have been printed in bold letters in Part-II of the Report.

**New Delhi
4th August, 2021
13 Sravana, 1943 (Saka)**

**Rajiv Ranjan Singh *alias* Lalan Singh
Chairperson,
Standing Committee on Energy**

REPORT
PART I
NARRATION ANALYSIS

CHAPTER I
INTRODUCTORY

1.1 As per the Government of India' Allocation of Business Rules, 1961, the Ministry of New and Renewable Energy inter-alia has been entrusted with the subject matter pertaining to Tidal Energy.

1.2 Ocean Energy refers to all forms of renewable energy derived from the Sea. There are three main types of Ocean Energy: Wave, Tidal and Ocean-Thermal. Tidal Energy is harnessed by converting energy from natural rise and fall of ocean tides and currents to electricity. Wave Energy in the form of motion of ocean waves can be extracted using energy conversion devices. Ocean Thermal Energy Conversion (OTEC) is based on generation of electricity utilizing the temperature difference between warm surface seawater and cold seawater at around 1,000 meters depth.

1.3 All forms of Ocean Energy are at an early stage of development. Tidal Energy Projects have been deployed globally in only a few locations where there is a strong tidal resource. Wave Energy and Ocean Thermal Energy Conversion (OTEC) technologies are still at an experimental stage.

1.4 India has been playing an active role in harnessing of Renewable Energy in order to mitigate climate change. The Government has set a target to install 175 Giga-watts of Renewable power by the year 2022. However, Tidal Power has not been included in this target despite the fact that our Country is surrounded by sea on three sides and has a long coastline of around 7500 Kilometers with the estuaries and gulfs where Tidal Power can be harnessed.

CHAPTER II

HARNESSING OF TIDAL POWER

A. Global Scenario:

2.1 About the status regarding harnessing of Tidal Power in the World, the Ministry furnished the following:

“Tidal Energy represents the smallest share (approx. 535 MW) of global installed capacity of Renewable Energy. Two Tidal Energy Projects, namely the 240 MW La Rance station in France (installed in 1966) and the 254 MW Sihwa plant in South Korea (installed in 2011), constitute more than 90% of the total installed capacity of Tidal Energy. At present Tidal Energy technologies are not cost competitive and the main focus is on technology development.”

2.2 On being asked about the capital cost and tariff of 240 MW project in France and 254 MW project in South Korea, the Ministry stated as under:

“As per the report *‘Tidal Energy: Technology Brief’* published by the International Renewable Energy Agency (IRENA) in 2014, the estimated cost for 240 MW tidal power project in France and 254 MW tidal power project in South Korea were USD 817 million and USD 298 million respectively. The report also states that levelized costs of electricity (LCOE) for tidal power are in the range of EUR 0.25-0.47/kWh with the lower range LCOE estimates based on high capacity factors and low capital cost estimates.”

B. Initiatives taken in India:

2.3 Regarding efforts made in India to harness Tidal Power, the Ministry furnished the following:

“In the 1980s, Government of India initiated efforts to assess the tidal energy potential in the Country. Initial surveys suggested that the Gulf of Kambhat and the Gulf of Kutch in Gujarat and the Gangetic delta in the Sunderbans in West Bengal have tidal energy potential. Based on these surveys, two projects of 3.75 MW and 50 MW installed capacity were initiated in West Bengal and Gujarat.”

2.4 About the 3.75 MW Durgaduani Tidal Power Project in West Bengal, the Ministry stated as under:

“MNRE sanctioned a demonstration project to West Bengal Renewable Energy Development Agency (WBREDA) in October, 2007 for setting up of 3.75 MW capacity tidal energy plant at Durgaduani creek in the Sunderbans region at an estimated cost of Rs. 48 crore. An amount of Rs. 3 crore was released for this project. However, only one bid was received for the project and the project cost was placed at Rs 238 crore (i.e. Rs. 63.5 crore per MW). In view of such an exorbitant cost, the Government of West Bengal decided to drop the tidal energy project. MNRE grant was subsequently refunded by WBREDA.”

2.5 Regarding 50 MW Tidal Power Project in Gujarat, the Ministry furnished the following:

“In 2011, the Government of Gujarat signed an MoU with M/s Atlantis Resources Limited (based in United Kingdom) for carrying out studies and for implementing a 50 MW Pilot Tidal energy project in the Gulf of Kutch at Mandvi. The Government of Gujarat sanctioned Rs. 70 crore as financial assistance for the project. Meanwhile, M/s Atlantis Resources Ltd. estimated the cost of the project at Rs 750 crore (i.e. Rs. 15 crore per MW). Due to techno-economic non-viability of the project, it was dropped by the Government of Gujarat. No financial assistance was sanctioned for the project by the Government of India.”

2.6 In 2012, West Bengal Renewable Energy Development Agency (WBREDA) made more attempts to harness Tidal Power; the information in this regard as furnished by the Ministry, is given below:

“In 2012, WBREDA informed that M/s Blue Water, headquartered in the Netherlands, approached WBREDA and offered turn-key solutions for generating power from river and tidal currents. The company claimed to have over 30 years of marine engineering experience with delivering large offshore projects worldwide. According to a WBREDA report, the agency made a presentation to WBREDA where it claimed that it had designed a floating platform capable of providing easy access from water surface, and which could hold multiple tidal turbines. It was moored with anchor lines to the sea

floor, which could hold any type of turbines in any water depth. It also claimed that power cables were connected dry rather than under water thereby reducing risks and costs significantly. However, they could not submit documentary evidence in support of such projects.

In addition to above, in 2012, WBREDA also informed that M/s Hammerfest Storm-ANDRITZ Hydro approached them and claimed that they had the expertise to generate tidal energy. As per their version, the construction cost would be around Rs. 40 crore per MW which was not economically viable (in comparison, the normative cost of installation of 1 MW solar, wind, biomass, small & large hydro, and thermal power plants is Rs 3.5 crore, Rs 5.5 crore, Rs 6 crore, Rs 10-15 crore, Rs 5 crore respectively). The proposing agency also could not submit any documentary evidence about any such project, then in operation.”

2.7 On being queried about reasons for not being able to make any technological breakthrough even after about 40 years as the Government initiated efforts to assess and harness tidal power in 1980s, the Ministry stated as under:

“Globally, tidal energy is not cost competitive and is still at a nascent development stage. Efforts to set up tidal power projects in India could not succeed primarily due to techno-economic considerations.”

2.8 About the status of Tidal Power in India, the Secretary, Ministry of New and Renewable Energy, stated during the sitting of the Committee, as under:

“We have not seen any projects in the tidal power in the country and the primary reason for that is the high capital cost. Two State Governments initiated two projects which did not come off for this very reason. As far as international data is concerned, the share of tidal power in total renewable energy installed capacity is very, very slow.

C. Tidal Power Potential in India:

2.9 The Ministry stated that the Indian Institute of Technology, Chennai in association with Credit Rating Information Services of India Limited (CRISIL) conducted a study on ‘Tidal & Wave Energy in India: Survey on the Potential &

Proposition of a Roadmap’ in December 2014. The study was funded by *Agence Française de Développement (AFD)* and Indian Renewable Energy Development Agency Limited (IREDA) as part of Memorandum of Understanding (MoU) between IREDA and MNRE. As per this study, the estimated theoretical tidal power potential in India is around 12,455 MW. The most attractive locations are the Gulf of Khambhat and the Gulf of Kutch on the west coast. The Ganges Delta in the Sunderbans in West Bengal also has good locations for small scale tidal power development.

2.10 The state-wise estimated theoretical potential of tidal power, as furnished by the Ministry is given below:

| State | Estimated Theoretical Potential of Tidal Power (MW) |
|----------------|--|
| Gujarat | 10,425 |
| West Bengal | 900 |
| Odisha | 400 |
| Tamil Nadu | 230 |
| Maharashtra | 200 |
| Andhra Pradesh | 100 |
| Karnataka | 100 |
| Kerala | 100 |
| Total | 12,455 |

2.11 On being asked about the exploitable potential of tidal power in the Country, the Ministry stated as under:

“Estimation of tidal energy potential in the country at this juncture is purely theoretical. Estimating the exploitable potential is fraught with a number of barriers that include disproportionately high cost and adverse environmental impacts that have not yet been fully documented.”

2.12 When asked about the potential of Wave Power and Ocean-Thermal Energy Conversion (OTEC) in the Country, the Ministry stated that the potential of OTEC has not been estimated. The estimated theoretical potential of Wave Power is given below:

| State | Estimated Theoretical Potential of Wave Power (MW) |
|----------------|---|
| Gujarat | 4100 |
| Maharashtra | 8100 |
| Kerala | 4900 |
| Tamil Nadu | 10600 |
| Andhra Pradesh | 6900 |
| Orissa | 600 |
| Karnataka | 6100 |
| Total | 41,300 |

2.13 When asked about the roadmap for harnessing Tidal Power that was proposed in IIT-CRISIL Study, the Ministry furnished the following:

“The IIT, Chennai and CRISIL study has identified financial, technological, environmental and other risks associated with tidal energy. The roadmap has set a goal of commercial tidal energy projects by the year 2030.”

2.14 About action-taken on the IIT-CRISIL Study, the representative of the Ministry stated during the sitting of the Committee as under:

“We have a Report which was published in 2014; we can relook at the data validity, based on which we can put up a small report to our Ministry on the viability front and what sort of initiatives can be taken to make it more acceptable in terms of its economics.”

D. Comparative Cost:

2.15 On being asked about capital cost for setting up of Tidal Power plants and how does it compare with capital cost of Solar, Wind, Bio, Small Hydro, Large Hydro and thermal Power plants, the Ministry stated as under:

“The Capital cost for a tidal energy project is site specific. In regards to two projects attempted in India the capital cost was in the range of Rs 15 - 60 crore per MW at the prevailing price. In comparison, the normative cost of installation of 1 MW solar, wind , biomass , small & large hydro and thermal power plants is Rs 3.5 crore, Rs 5.5 crore, Rs 6 crore, Rs 10-15 crore, Rs 5 crore respectively.”

E. Budgetary Allocation for R&D:

2.16 During examination of Demands of Grants (2021-22), the Ministry furnished the following with respect to budgetary allocation and actual expenditure incurred on research, design and development in New & Renewable Energy during the last three years:

| Year | Budget Estimate (BE) | Revised Estimate (RE) | Amount in crores |
|---------|----------------------|-----------------------|--------------------------------|
| | | | Expenditure |
| 2017-18 | 144.00 | 81.00 | 52.98 |
| 2018-19 | 94.00 | 43.00 | 25.43 |
| 2019-20 | 60.00 | 15.00 | 15.00 |
| 2020-21 | 20.00 | 49.00* | 17.60 (till January, 2021) |

*RE-2020-21 was enhanced due to committed liabilities in R&D projects and fund will available in last week of March, 2021.

2.17 On being queried about the progress made in Research and Development (R&D) regarding development of Tidal Power and funds earmarked and spent in this regard, the Ministry stated as under:

“The research and development (R&D) budget of the Ministry is a composite one without specific allocation to different new and renewable energy technologies. Further, since no viable tidal energy project was received, no R&D funds have been spent on tidal energy.”

2.18 The Ministry stated that at present, the Government of India has no plan to set up any dedicated institution for research in tidal power.

2.19 Further explaining about the lack of Research in Tidal Power Sector, the Secretary, Ministry of New and Renewable Energy, stated the following during the sitting of the Committee:

“I will have to find out whether other institutions are relevant and can be assigned this task under the Ministry of Earth Sciences..... We can get in touch with that institute and see how we can further research in this area. We can also fund research activities under our R&D programme. We can even call for proposals for research. But we will have to examine and see what is worth investing in.”

F. Environmental Impact:

2.20 When asked whether the Government has conducted any study for assessment of environmental impact of Tidal Power Plant, the Ministry stated as under:

“No such study has been conducted. If tidal energy projects approach techno-economic viability, its environmental and ecological impact would be examined.”

G. Problems/Constraints in Harnessing of Tidal Power:

2.21 About problems being faced in harnessing of Tidal Power, the Ministry furnished the following:

“Harnessing tidal power entails heavy cost with associated environmental problems. A barrage across an estuary is expensive to build and environmentally impacts a very wide area which may be affected for many miles upstream and downstream. Many birds that rely on the tide uncovering the mud flats for feeding could be affected. Further, damages like reduced flushing and erosion can change the vegetation of the area and disrupt the ecological balance.”

H. Future Vision:

2.22 Efforts to set up even tidal energy pilot projects in the country have not been successful. Notwithstanding, on August 22, 2019, the Ministry issued a notification clarifying that energy produced using various forms of ocean energy such as tidal, wave, ocean thermal energy conversion, etc. shall be considered as Renewable Energy and shall be eligible for meeting non-solar Renewable Purchase Obligations (RPO).

2.23 When asked about the rationale behind making tidal power eligible for non-solar Renewable Purchase Obligation in 2019 when we have not been able to harness any tidal power till date, the Ministry furnished the following:

“The notification of 2019, regarding eligibility of various forms of ocean energy for meeting non-solar Renewable Purchase Obligations, was in response to inquiries from industry. The inclusion was made to take care of the possibility that projects for producing such energy might be set up.”

2.24 On being asked if the Ministry is planning to include tidal power in the enhanced target of having 450 GW of renewable energy by 2030, the Ministry stated as under:

“All sources of renewable energy, including tidal power, will be considered in the deployment targets for 2030.”

PART -II

OBSERVATIONS/RECOMMENDATIONS OF THE COMMITTEE

ASSESSMENT OF EXPLOITABLE POTENTIAL

1. The Committee note that there are three main types of Ocean Energy; Wave, Tidal and Ocean-Thermal. The estimated potential of tidal and wave power in India are 12,455 MW and 41,300 MW respectively, while the potential for Ocean-Thermal has not been estimated till date. The Ministry has submitted that the estimated potential of tidal and wave power is purely theoretical and does not necessarily constitute practically exploitable potential. The Committee feel that as a first step, there is a need to find out the actual exploitable potential of tidal, wave and ocean-thermal power in the Country. The Committee, therefore recommend that the Ministry should get the potential of tidal, wave and ocean-thermal power reassessed in order to explore the practically exploitable potential.

COST OF TIDAL POWER PLANT

2. The Committee note that two tidal power projects of 3.75 MW and 50 MW installed capacity were initiated in the years 2007 and 2011 in the states of West Bengal and Gujarat respectively. However, both these projects were dropped because of exorbitant cost. In the case of 3.75 MW Durgaduani Tidal Power Project in West Bengal, the project cost was placed at Rs. 238 crore i.e. Rs. 63.50 crore per MW and in the case of 50 MW Tidal Power Project at the Gulf of Kutch in Gujarat, the estimated cost of the project was placed at Rs. 750 crore i.e. Rs. 15 crore per MW. The Ministry has also submitted that the normative cost of installation of 1 MW Solar, Wind, Biomass, Hydro and Thermal Power Plant is Rs. 3.5 crore, Rs. 5.5 crore, Rs. 6 crore, Rs. 10-15 crore, Rs. 5 crore respectively.

The Committee feel that comparing the project cost of Tidal Power that was arrived at around ten years back with the present project cost of Solar, Wind, Hydro etc is not justified. The cost of tidal power may have come down in the last ten years as is the case with other Renewable Energy like Solar Power. The Committee, therefore recommend that the Ministry needs to reassess the cost of Tidal Power in India in order to consider its economic viability and benefits in a longer time span.

SETTING UP OF DEMONSTRATION/PILOT TIDAL POWER PROJECT

3. The Committee note that India has been playing an active role in harnessing of Renewable Energy in order to mitigate climate change as the Government has set a target to install 175 Giga-watts of Renewable power by the year 2022. However, tidal power has not been included in this target despite the fact that our Country is surrounded by sea on three sides and has a long coastline of around 7500 Kilometers with the estuaries and gulfs where tidal power can be harnessed. However, the Ministry has submitted that all sources of renewable energy, including tidal power will be considered in the deployment targets for 2030. Further, the Study ‘Tidal and Wave Energy in India – Survey on potential and proposition of Roadmap’ conducted by Indian Institute of Technology, Chennai in association with Credit Rating Information Services of India Limited (CRISIL) and funded by Indian Renewable Energy Development Agency Limited (IREDA), has suggested a roadmap with a goal to set up commercial tidal power projects by the year 2030. Also on August 22, 2019, the Ministry issued a notification clarifying that energy produced using various forms of ocean energy such as tidal, wave, ocean thermal energy conversion, etc. shall be eligible for meeting non-solar Renewable Purchase Obligations (RPO). As per the Ministry, this notification was in response to inquiries from industry and the inclusion was made to provide scope for tidal power projects. The

Committee therefore desire that the Ministry must actively follow-upon this notification through appropriate incentives so that the Country can have commercial tidal power projects by the year 2030. While the decision to make tidal power eligible for meeting Renewable Purchase Obligations is noteworthy, the Ministry can not rest at that and it needs to actively participate in the process. The Committee, therefore recommend that the Ministry should set up one demonstration/pilot tidal power project in the Country at the most favourable cost-effective location like Gulf of Kutch considering that the capital cost of a tidal power project is site specific. The Committee would also like to be apprised about the follow-up action taken by the Government on the findings of the Study ‘Tidal and Wave Energy in India - Survey on potential and proposition of Roadmap’.

ENVIRONMENTAL IMPACT OF TIDAL POWER PLANT

4. The Committee also note that no study has been conducted for assessment of environmental and ecological impact of a tidal power plant. The Ministry has submitted in this regard that a barrage across an estuary may environmentally impact a very wide area ranging for many miles upstream and downstream. The Committee are of the opinion that while seeking to harness the potential of tidal power, there is also a need to pragmatically assess environmental impact and ecological sustainability of tidal power plants. The Ministry may also evaluate global experience in this regard; particularly the two projects installed in France and South Korea, which at present constitute 90 % of the installed capacity of tidal power in the World.

R&D IN TIDAL POWER SECTOR

5. The Committee note that the Ministry has not spent any funds on development of tidal power so far. During the examination of Demands for Grants (2021-22) of the Ministry, the Committee had observed that the funds allocated to the Ministry for R&D in Renewable Energy Sector as a whole had been drastically reduced at the time of Revised Estimates and the Ministry could not utilize even the reduced amount since atleast 2017-18. The Committee, therefore recommend that the Ministry instead of curtailing R&D, should enhance its support significantly, particularly for un-harnessed sources like tidal power, which can go a long way in realizing the vast potential of Renewable Energy in the Country.

New Delhi
4th August, 2021
13 Sravana, 1943 (Saka)

Rajiv Ranjan Singh *alias* Lalan Singh
Chairperson,
Standing Committee on Energy

STANDING COMMITTEE ON ENERGY

MINUTES OF THE FOURTH SITTING OF THE STANDING COMMITTEE ON ENERGY (2020-21) HELD ON 11th FEBRUARY, 2021 IN COMMITTEE ROOM NO. '3', PARLIAMENT HOUSE ANNEXE EXTENSION, NEW DELHI

The Committee met from 1430 hrs. to 1500 hrs.

LOK SABHA

Shri Rajiv Ranjan Singh alias Lalan Singh - Chairperson

2. Shri Harish Dwivedi
3. Shri S. Gnanathiraviam
4. Shri Kishan Kapoor
5. Km. Shobha Karandlaje
6. Shri Ramesh Chander Kaushik
7. Smt. Anupriya Patel
8. Shri Parbatbhai Savabhai Patel
9. Shri Dipsinh Shankarsinh Rathod
10. Shri N. Uttam Kumar Reddy
11. Shri Shivkumar Chanabasappa Udasi

RAJYA SABHA

12. Shri T.K.S. Elangovan
13. Shri Muzibulla Khan
14. Shri Maharaja Sanajaoba Leishemba
15. Shri Jugalsinh Mathurji Lokhandwala

SECRETARIAT

1. Shri R.C. Tiwari - Joint Secretary
2. Shri R.K. Suryanarayanan - Director
3. Shri Kulmohan Singh Arora - Additional Director

LIST OF WITNESSES

MINISTRY OF NEW AND RENEWABLE ENERGY

- | | |
|---------------------------------|----------------------|
| 1. Shri Indu Shekhar Chaturvedi | Secretary |
| 2. Shri Aniruddha Kumar | Additional Secretary |
| 3. Dr. P.C. Maithani | Scientist – G |
| 4. Shri Pradip Kumar Das | CMD, IREDA |

2. At the outset, the Hon'ble Chairperson welcomed the Members of the Committee and the representatives of the Ministry of New and Renewable Energy and informed them about the agenda of the sitting. The Chairperson also apprised them about the provision of Direction 55(1) of the Directions by the Speaker.

3. During the discussion, a presentation was made on the subject 'Tidal Power Development in India' which, inter-alia, covered Types of Ocean Energy, Indian Scenario regarding Development of Tidal Power, Study by IIT, Chennai and CRISIL, Problems being faced in exploitation of Tidal Energy, Status and Future Prospects, etc.

4. The Ministry informed the Committee that harnessing of tidal energy entails high cost, its technology is in developmental stage and currently it is not ready for commercial deployment. The Committee suggested that the Ministry may focus on R&D in this sector and explore the harness-able potential strictly keeping in view economic viability and ecological sustainability.

The Committee then adjourned.

STANDING COMMITTEE ON ENERGY

MINUTES OF THE TWELFTH SITTING OF THE STANDING COMMITTEE ON ENERGY (2020-21) HELD ON 4th AUGUST, 2021 IN ROOM No. '111', PARLIAMENT HOUSE ANNEXE EXTENSION, NEW DELHI

The Committee met from 1500 hrs. to 1545 hrs.

LOK SABHA

Shri Rajiv Ranjan Singh alias Lalan Singh - Chairperson

2. Shri Gurjeet Singh Aujla
3. Shri Chandra Sekhar Bellana
4. Shri Harish Dwivedi
5. Shri S. Gnanathiraviam
6. Shri Sanjay Haribhau Jadhav
7. Shri Kishan Kapoor
8. Shri Ramesh Chander Kaushik
9. Shri Parbatbhai Savabhai Patel
10. Shri Dipsinh Shankarsinh Rathod
11. Shri N. Uttam Kumar Reddy
12. Shri Shivkumar Chanabasappa Udasi
13. Shri P. Velusamy

RAJYA SABHA

14. Shri Muzibulla Khan
15. Shri Maharaja Sanajaoba Leishemba
16. Shri Jugalsinh Lokhandwala
17. Dr. Sudhanshu Trivedi
18. Shri K.T.S. Tulsi

SECRETARIAT

1. Shri R.C. Tiwari - Joint Secretary
2. Shri R.K. Suryanarayanan - Director
3. Shri Kumohan Singh Arora - Additional Director

2. At the outset, the Chairperson welcomed the Members and apprised them about the agenda of the sitting. The Committee then took up the following draft Reports for consideration and adoption:-

- a) Development of Coal Blocks allocated to Power Sector Companies.
- b) Delay in execution/completion of Power Projects by power sector companies.
- c) Tidal Power Development in India.

3. After discussing the contents of the Reports, the Committee adopted the aforementioned draft Reports without any amendment/modification. The Committee also authorized the Chairperson to finalize the above-mentioned Reports and present the same to both the Houses of Parliament in the current Monsoon Session.

The Committee then adjourned.