

**MINUTES OF THE 90th MEETING OF THE FORUM OF
REGULATORS (FOR)**

Venue	: CERC, New Delhi
Date /Day	: 05.04.2024, Friday
Time	: 10:30 AM
List of participants	: Annexure-I

Chairperson, FOR/CERC, extended a warm welcome to all the Members to the 90th meeting of the FOR. He informed the members about the important issues to be discussed during the meeting, which included the budget provisions for the current financial year, along with references received from the members of the FOR. He also welcomed the newly appointed Chairpersons of Haryana ERC and Bihar ERC, who were attending the FOR meeting for the first time after taking charge in their respective ERCs. Additionally, he informed that Chairperson, Meghalaya ERC, Chairperson, Jharkhand ERC and Member (Law), CERC, would be demitting office before the next FOR meeting and thanked them for their valuable contributions in the meetings of the Forum.

Thereafter, the Forum took up the agenda items for discussion.

AGENDA ITEM 1: CONFIRMATION OF:

a) MINUTES OF THE 89TH FOR MEETING HELD ON 17TH JANUARY 2024

1. The Forum was briefed on the actions taken on the decisions made during the 89th FOR meeting. The Forum was further informed about the reference received from PSERC regarding the amendment to para no. 12 of Agenda Item No. 2 of the circulated minutes, which highlighted the procedure for implementation of the Uniform Renewable Energy Tariff. The said para stated that

“Discoms are required to first obtain approval from State Commissions for procuring RE power from the Central Pool at URET. Following approval, they will request the intermediary agency to procure RE power on behalf of the Discom. The intermediary agency will invite bids for selecting the RE generators through the competitive bidding

process and thereafter sign individual PPA with the selected RE generator at the awarded price, which in turn shall be adopted by the Appropriate Commission.”

After discussion, it was decided to amend para 12 of Agenda No. 2 of the 89th meeting as under: -

*“The Forum deliberated on the scheme and observed that the intermediary agency could be SECI or NVVNL (to be notified by MoP), who shall be procuring renewable (RE) power on behalf of the Discoms. Hence, Discoms are required first to obtain approval from State Commissions for procuring renewable (RE) power from the Central Pool at URET. Following approval, they shall request the intermediary agency to procure RE power. The intermediary agency will invite bids for selecting the RE generators through the competitive bidding process and thereafter sign individual PPA **which requires approval of the Appropriate Commission**. Subsequently, the PSA will be signed between the intermediary agency and Discoms at a dynamic tariff, which shall be computed by Grid India every month. There was a general understanding that tariffs for renewable sources may be reduced further in the future, and as new generators will get added to the Central Pool, the URET, being the weighted average of tariffs of all generators, shall gradually reduce.”*

2. Subject to the above, the Forum confirmed the minutes of the 89th meeting.

b) SPECIAL FOR MEETING HELD ON 8th FEBRUARY 2024

3. The Forum was also briefed on the action taken on the decision points reached during the Special Meeting of FOR held on 8th February 2024. In this matter, the members were further informed that a reference was received from KERC for amendment to para 10 of Agenda Item No. 2(b), wherein they suggested adding the criteria on shareholding in addition to the consumption criteria.

4. Based on the discussion, the Forum confirmed the minutes with para no. 10 of Agenda Item No. 2(b) to be read as provided below:

*“The members were also of the view that since the Hon’ble Supreme Court, in its order, has illustrated the formula for consumption up to 51% by the captive users **and having a shareholding of 26%**, the same principle can be extrapolated where the actual consumption by the captive users is more than 51% **and shareholding of captive users is***

more than 26%.”

AGENDA ITEM 2: ACCOUNTS RELATED ITEMS

(a): BUDGET FOR FY 2024-25.

5. Jt Chief (RA), CERC, apprised the Forum of the salient features of the FOR Budget for the F.Y. 2024-2025.

6. The Members were also apprised that as on 31st March, 2024, Rs.2.13 crore (on cash basis) will be the available funds/reserves for utilisation during the F.Y. 2024-2025 and Rs.2.22 crore (on cash basis) will be the available funds/reserves for utilisation during the F.Y. 2025-2026. However, considering the increasing trend in expenditure, there would be a need to increase the membership fee of FOR w.e.f. F.Y. 2025-2026.

7. After discussion, the Members approved the Budget of FOR for the F.Y. 2024-2025 with the following directions :

- i) With regard to the study tour of Secretaries of SERCs, the foreign component can be organised in Spain.
- ii) With regard to the study tour of Chairpersons in the future, premium class air tickets may be booked for shorter distance to economise the cost of tours.
- iii) As regards the increase in the membership fee of FOR for the F.Y. 2025-26, a mid-term review can be undertaken by FOR Sectt. for further approval of the Forum.

(B): RE-APPOINTMENT OF AUDITOR FOR THE F.Y. 2023-2024.

8. The Members duly approved the re-appointment of the Auditor (i.e., 2nd year of its tenure) for conducting the statutory audit of FOR for the F.Y. 2023-2024.

(C): RE-APPOINTMENT OF TAX CONSULTANT FOR FILING THE INCOME TAX RETURN, CONDUCTING THE TAX AUDIT & FILING THE TAX AUDIT REPORT FOR THE F.Y. 2023-2024

9. The Members duly approved the re-appointment of the Tax Consultant (i.e., the 2nd year of its tenure) for conducting its assignments for the F.Y. 2023-2024.

(D): APPOINTMENT OF GST CONSULTANT FOR FILING THE GST RETURNS FOR THE F.Y. 2024-2025.

10. The Forum was apprised regarding the completion of the 3-year term of the GST Consultant (viz M/s Sharma Kathuria & Co., Chartered Accountants, New Delhi). Further, the Members were also apprised that FOR Secretariat has initiated the due process to appoint a new GST Consultant (a CA Firm empanelled with the C&AG of India), for a maximum term of 3 years, starting from the F.Y. 2024-2025.

AGENDA ITEM 3: REFERENCE FROM SERCS

(A): FOR STUDY TOUR FOR CHAIRPERSONS OF SERCS -REFERENCE FROM KSERC AND OERC

11. The Forum was apprised about the references received from Kerala SERC and Odisha ERC nominating their Members to the study tour being organised for the Chairpersons of ERCs in Italy during April 2024 and sought a decision of the Forum in this matter.

12. After deliberation of the proposal, the Forum **noted that the** planned study tour was specifically for the Chairpersons of SERCs **and that**, in accordance with **the** decisions taken in previous FOR meetings, there are separate overseas study tour programs organised for the Members of the ERCs every alternate year. As such, the proposals from KSERC and OERC were not agreed to.

(B): DISCUSSION ON FOR'S "MODEL REGULATIONS FOR RESOURCE ADEQUACY FRAMEWORK" CONSIDERING UNIFORM RETAIL SUPPLY TARIFF FOR THE STATE WITH MULTIPLE DISTRIBUTION LICENSEES AND OPEN ACCESS CONSUMERS HAVING CONTRACT DEMAND WITH DISTRIBUTION LICENSEE- REFERENCE FROM KERC.

13. Chairperson, KERC informed the Forum that in States with multiple DISCOMs, the retail tariff is made uniform across the State by changing the power allocation amongst these discoms. He suggested including such a provision in the Model Resource Adequacy Regulations. He also suggested that there was a need to define the manner of accounting of the Contracted Demand (CD) of Open Access Consumers who source their own power in the Distribution licensee's Resource Adequacy Plan.

14. Chief (RA), CERC underlined that the purpose of Resource Adequacy is least-cost power procurement, which is a task to be undertaken by the Discoms or the Common Procurer for the State as a whole. He also informed that Tariff determination is an accounting practice and is different from RA planning. As such, the SERCs may follow the existing tariff determination process without any changes in the Model RA Regulations.

15. The members also highlighted that Open Access power is to be discounted in the RA plan preparation for the Discoms as its power is not being sourced by the Open Access consumer. However, the quantum of standby power, which the open access consumers may request for, needs to be factored in.

16. After deliberation, the members noted that the issues need detailed analysis and discussion and hence, the same may again be taken up for discussion in the WG on RE policy for suitable recommendations.

(C): COMPUTATION OF ADDITIONAL SURCHARGE – NEED FOR COMMON METHODOLOGY-REFERENCE FROM KERC

17. The Forum was apprised of the reference received from KERC, regarding the necessity to establish a standardised methodology for determining the additional surcharge (AS) being levied on Open Access Consumers. This request stemmed from the inconsistency in formulae/ approaches across SERCs for the computation of AS, resulting in variations from one State to another.

18. Chief (RA), CERC referenced the Ministry of Power (MOP) Rules, which stipulate that the per unit AS should not exceed the per unit fixed cost of the Power Purchase Cost (PPC) of the concerned Discom. It was opined that SERCs may determine AS by calculating the fixed cost component of the PPC without factoring in the renewable sources which has a single part tariff.

19. Following deliberations, it was decided that the matter be discussed in detail in the FOR WG on Harmonization of Rules.

(D): POSTING OF CPES OFFICERS IN BERC ON DEPUTATION TO ADDRESS

THE ISSUE OF LACK OF MAN POWER- REFERENCE FROM BERC

20. The members were briefed about the reference received from BERC wherein they have highlighted the acute shortage of technical officers being faced by the SERC, leading to constraints in the effective management of their operations. Through the reference, BERC suggested the Forum to discuss the matter and request CEA to consider posting of officers on deputation to BERC.

21. The FOR Secretariat apprised the Forum about the discussion of the Forum on the same matter during its 85th Meeting held on 18.04.2023, wherein the Forum had agreed that the ERCs are the appointing authorities in respect of their staff and that officials from CPES may apply for positions in ERCs when applications are called for and their selection will be decided on merit and as per the need of the ERCs.

22. After discussion, the Forum concluded that recruitment (direct/ contractual or deputation) could be undertaken by the SERCs through open advertisement, as this process allows for a broader pool of candidates for selection. Therefore, encadrement may not be necessary. However, the CPES officials may be encouraged to apply for positions in ERCs when applications are announced, and their selection will be based on merit and requirements of the ERCs.

AGENDA ITEM 4: WITHDRAWAL FROM REGULATORY WEBTOOL - REFERENCE FROM IIT-K

23. The Forum was briefed about the reference received from IIT-K regarding withdrawal from the task of development and maintenance of the Regulatory Web Tool. IIT-K has informed the Secretariat that the task involves a lot of manpower as coordination with SERCs is required frequently for maintaining and updating the tool. Hence, IIT- K has requested FOR to identify an alternative agency for the updation and maintenance of the Regulatory Web Tool, which IITK would hand hold for the continuation of the Regulatory tool.

24. The Forum was also apprised that the funding for this tool was from the MoP funds, and Rs. 1.008 crore was already approved by FOR for this assignment. A provision of the same amount is also made in the budget of the current financial year.

25. Following discussion, the Forum decided that as IIT-K is exiting from the task, FOR

Secretariat may hire individual consultants, may be 2 in number, for carrying out the task, or may invite bids from consulting firms. The decision in this matter may be taken by the Chairperson, FOR/CERC. Chairperson, FOR/CERC emphasized the importance of evaluating the effectiveness of the webtool and the ways in which it can be put to use.

AGENDA ITEM NO 5: CONCENTRATED SOLAR POWER PLANTS WITH STORAGE AND PUMPED STORAGE PLANTS - PRESENTATION BY TERI

26. The representatives of TERI made the presentation (**Annexure – II**) detailing the cases for PSP and CSP. The members were informed that the cost of installation of CSP has reduced substantially and the levelized cost of per unit generation has come down from approx. 38 cents to 11 cents. It was suggested to develop Solar Parks for CSP plants based on identified sites with optimum Direct Normal Irradiation (DNI) based on satellite & ground-based measurements and suggested phased (20 to 50 MW, 50 to 100 MW, and Above 100 MW) bidding for developing confidence of bidders and stakeholders. It was also suggested that the bidding parameter may be a Tariffbased on capacity and no. of hours of operation to deliver power, and the window for bidding may be of the order of 180 days to provide bidders enough time to decide technology and optimal capacity. TERI also requested the Forum to undertake a closer look at the technology and generic tariff aspects for the promotion of CSP and PSP technologies.

27. Discussing the presentation, the members informed that in the recent past, UP has signed a MoU with developers for the development of 13,000 MW of PSP in the Mirzapur and Sonbhadra districts of the State. It was also highlighted that the GST being levied in India on the PSP may be a bottleneck in the development of generation plants. The members suggested that TERI should approach Central Water Commission to undertake an assessment of water-bearing capacity of various probable locations and other aspects on an pan India basis to identify appropriate locations for the development of PSP along with the capacity that can be installed there. Further, providing all the clearances for the site for the development of the plants, in line with the process carried out for ultra-mega plants in the past, would streamline and expedite the process of establishment of PSP plants. The members shared the view that the process for according approval required for the establishment of a generation plant may be further simplified to encourage investors.

28. The members also appreciated that CSP Technology is picking up in India. However, it was opined that cost economics may still need to be established.

ANY OTHER ITEM WITH THE PERMISSION OF CHAIR

a) GST ON LICENCE FEE/PETITION FEE / ERC:

29. Some of the Forum members informed about the notice/summons received from the Goods & Taxes Department regarding the payment of GST on the license fee/petition fee, effective from July 1st, 2017, potentially involving interest arrears. A few members informed the attendees that they had obtained a Stay Order from the High Court on this matter. The members suggested that they may move the Hon'ble Supreme Court regarding the matter, but since all SERCs and CERC had not received notice yet, they may wait till receipt of the same.

30. After deliberation, the Forum decided that SERCs that have already received notice or received a Stay Order from the High Court may forward the references to the FOR Sectt. for further consolidation and circulation of the same to all SERCs for their reference and future course of action at their end.

b) VENUE OF NEXT FOR MEETING

31. Chairperson, MERC offered to host the next meeting of the Forum in Pune, Maharashtra, on 8th June 2024, which was accepted by the Forum

CONCLUSION

32. Chairperson, FOR/ CERC felicitated Shri P. W. Ingty, Chairperson, MSERC, who will be demitting office on 10th May 2024, Justice (Shri) Amitav Kumar Gupta, Chairperson, JSERC, who will be demitting office on 30th May 2024 and Shri P. K. Singh, Member (Law), CERC, who shall be demitting office on 19th May 2024. He also requested the three members to deliver their parting address.

33. Delivering his address, Shri Ingty, Chairperson, MSERC expressed that he cherished his learning experience gained during the association with the Forum and thanked all the members for their affection, support, and cooperation received during his four and half years of association. He also appreciated the study tours that have helped to enrich his knowledge of the sector besides giving him exposure to different cultures, traditions, and value systems.

34. Justice Gupta, Chairperson, JSERC, expressed his pleasure to be a part of the Forum. He thanked all the members for helping him understand the intricacies and technicalities of the power system, which helped him transition from his earlier assignment as an adjudicator to a regulator.

35. Shri Singh, Member (Law), CERC, shared his feelings and expressed his joy to be in the company of the members of the Forum. He stated that he learnt from each of the members and thanked each of the members for supporting him.

36. Thereafter, Chairperson, FOR/ CERC, thanked Shri Ingt, Justice Gupta and Shri Singh for their contribution to the overall development of the Forum and for the contribution they have made during the discussion, which has enriched the knowledge of all the members. On behalf of all the members, he thanked them and wished them the very best in their future endeavours.

VOTE OF THANKS

37. Delivering his vote of thanks, Secretary, FOR/ CERC, thanked all the members for their presence and contribution during the meeting wherein discussions were held on many important topics which are necessary for taking forward the activities of the FOR. Secretary FOR/ CERC also informed the members that CERC would be shifting to its new office in Nauroji Nagar, New Delhi shortly and expressed his happiness to host future FOR meetings in the new office premises. He thanked the Chairperson, FOR/ CERC, for guiding the Forum and for building a consensus on various issues for effective decision-making, which is very difficult in such a diverse forum. He also thanked all the members for very good camaraderie and decisiveness which has helped the Forum to decide on all the discussion points through consensus only. He also expressed his gratitude to the staff of FOR, who have put a lot of efforts into organize this meeting.

/ ANNEXURE – I /

LIST OF PARTICIPANTS OF THE
90TH MEETING OF THE FORUM OF REGULATORS (“FOR”)
HELD ON FRIDAY, THE 05TH APRIL, 2024.
CERC, NEW DELHI (INDIA)

S. No.	NAME	ERC
01.	Shri Jishnu Barua Chairperson	CERC/FOR – in Chair.
02.	Justice (Shri) C.V. Nagarjuna Reddy Chairperson	APERC
03.	Shri R.K. Joshi Chairperson	APSERC
04.	Shri Kumar Sanjay Krishna Chairperson	AERC
05.	Shri Amir Subhani Chairperson	BERC
06.	Shri Hemant Verma Chairperson	CSERC
07.	Shri Anil Mukim Chairperson	GERC
08.	Shri Nand Lal Sharma Chairperson	HERC
09.	Shri D.K. Sharma Chairperson	HPERC
10.	Justice (Shri) Amitav Kumar Gupta Chairperson	JSERC
11.	Shri Lokesh Dutt Jha Chairperson	JERC for UTs of J&K and Ladakh
12.	Shri P. Ravi Kumar Chairperson	KERC

13.	Shri S.P.S. Parihar Chairperson	MPERC
14.	Shri Sanjay Kumar Chairperson	MERC
15.	Shri P.W. Ingty Chairperson	MSERC
16.	Shri Khose Sale Chairperson-cum-Member	NERC
17.	Shri Viswajeet Khanna Chairperson	PSERC
18.	Dr. B.N. Sharma Chairperson	RERC
19.	Shri K.B. Kunwar Chairperson	SSERC
20.	Shri M. Chandrasekar Chairperson	TNERC
21.	Shri D. Radhakrishna Chairperson	TERC
22.	Shri Arvind Kumar Chairperson	UPERC
23.	Dr. M.V. Rao Chairperson	WBERC
24.	Shri Gajendra Mohapatra Chairperson In-charge	OERC
25.	Ms. Jyoti Prasad Member	JERC for State of Goa & UTs
26.	Shri Benjamin L. Tlumtea Member	JERC for M & M
27.	Shri B. Pradeep Member	KSERC
28.	Shri M.D. Manohar Raju Member	TSERC
29.	Shri Madan Lal Prasad Member	UERC
30.	Shri Harpreet Singh Pruthi Secretary	CERC/FOR
31.	Dr. Sushanta Kumar Chatterjee Chief (Regulatory Affairs)	CERC
SPECIAL INVITEES		

ERC		
32.	Shri Pravas Kumar Singh Member	CERC
33.	Shri Awdhesh Kumar Yadav Chief (Engg.)	CERC
34.	Shri Rajeev Pushkarna Chief (Fin.)	CERC
35.	Dr. (Ms.) Yogieta S. Mehra Chief (Eco.)	CERC
FOR SECRETARIAT		
36.	Ms. Rashmi S. Nair Jt. Chief (RA)	CERC
37.	Ms. Sukanya Mandal Assistant Secretary	FOR
38.	Shri Ravindra Kadam Sr. Adv. (RE)	CERC
39.	Shri Sauarabh P.R.O. (RA)	CERC
40.	Ms. Jijnasa Behra RO	FOR
41.	Shri Sushil Kumar Arora Administrative Officer	CERC
42.	Mr. Nilesh Diwan Accounts Officer	CERC
43.	Shri Davinder Kumar Technical Officer (IT)	FOR
44.	Shri Aman Raj Research Associate	CERC
45.	Ms. Medhavi Sarraf Research Associate	CERC
OTHERS / GUESTS		
46.	Shri Jiwesh Nandan Distinguished Fellow	TERI
47.	Shri A.K. Saxena Sr. Fellow & Sr. Director	TERI

48.	Shri Rohin Mazumdar Consultant	TERI
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Energy Storage – Critical for integrating increasing quantum of renewables

Presentation to Forum of Regulators

New Delhi
5 April 2024




Contents

1. Critical need for storage and their priority in India
2. Way forward to accelerate development of
 - ❖ Pumped Storage Plants (PSP)
 - ❖ Concentrated Solar Power (CSP) Plants
3. Case for CSP plants in India
4. CSP : Global scenario & trend

Energy Storage : Critical element for integrating increasing quantum of renewables

Presented to FoR on 3 February 2023 at Gandhinagar



DISCUSSION PAPER

ROADMAP TO
INDIA'S 2030
DECARBONIZATION
TARGET

- Implement large scale storage projects
 - ❖ Pumped Storage Plants (PSP)
 - ❖ Concentrated Solar Power (CSP) plants with storage
 - ❖ Other storage options
 - Battery energy storage systems
 - Hydrogen energy storage technologies

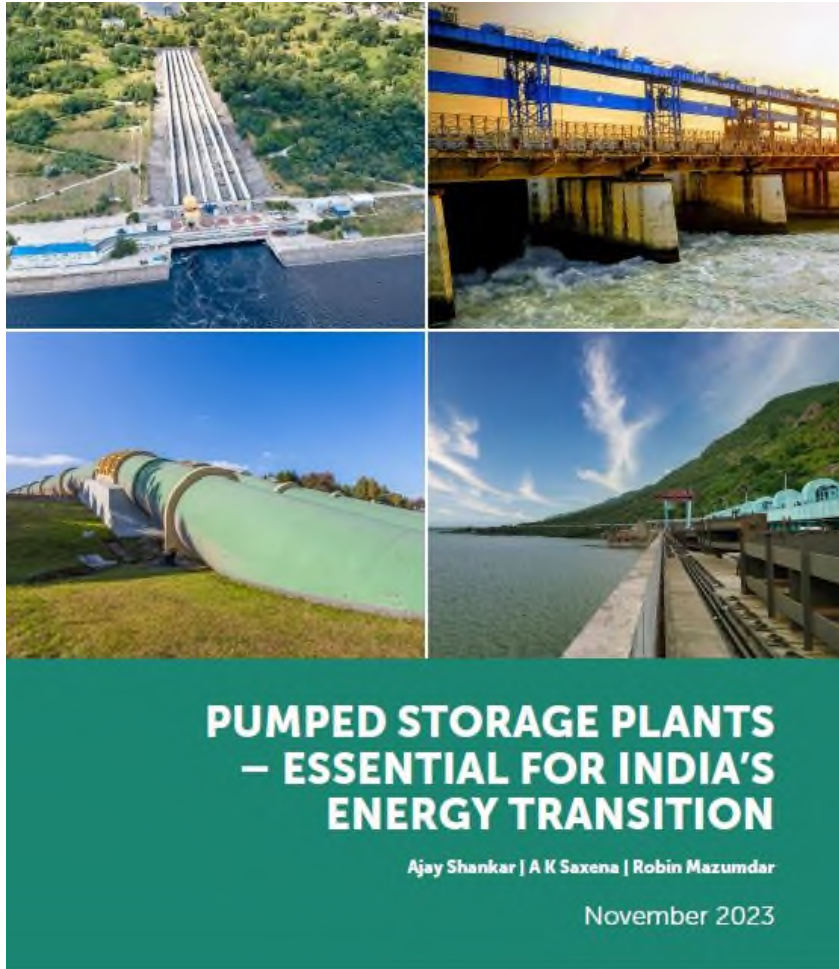
TERI, July 2022

Large scale storage: Critical need & priority

- Large solar power deployment : 365 GW by 2031-32 *
- This needs 74 GW by 2031-32 of Energy Storage *
- Pumped storage hydro – logical first choice in India
 - On-river:
 - Mature technology
 - Operational experience
 - Grid management
 - Off-river:
 - Wider choice for sites
 - Lower cost
 - Shorter construction period
- CSP with storage - next choice – sustainable option + declining costs

* CEA, National Electricity Plan, 2023

Way forward to accelerate development of PSPs in the country



- ❖ Identification of sites
- ❖ Project preparation
- ❖ Project implementation
- ❖ Bidding parameters

<https://www.teriin.org/project/pumped-storage-plants-essential-indias-energy-transition#:~:text=Pumped%20Storage%20Hydropower%20is%20a,to%20be%20about%20103%20GW>

Way forward to accelerate development of PSPs in the country

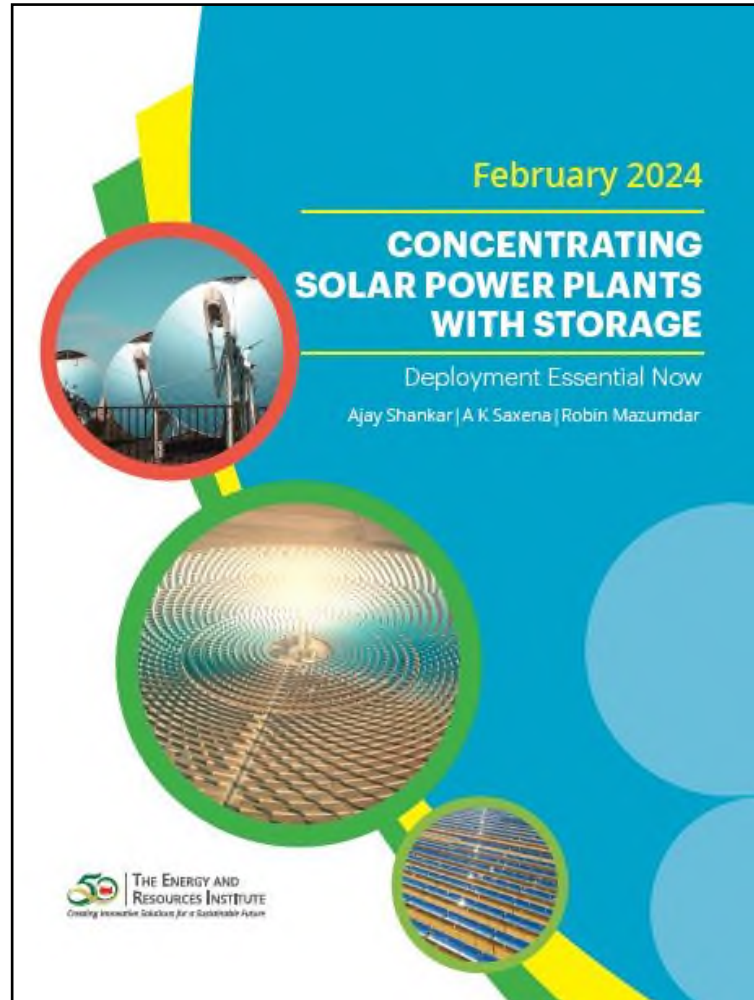
S. No.	Particulars	On-River	Off-River
1.	Identification of sites	<input type="checkbox"/> Feasibility of creating reservoir in the existing hydro power stations <input type="checkbox"/> Ranking of Sites <ul style="list-style-type: none"> ○ Least Cost/MW ○ Minimal environmental impact ○ Minimal R&R requirement 	<input type="checkbox"/> Satellite imagery, drone-based survey minimal environmental impact <input type="checkbox"/> Utilization of exhausted mines
2	Project preparation	By creating project specific SPVs with revolving fund (UMPP model)	By Developer
3	Project implementation	<input type="checkbox"/> Initial thrust through PSUs <input type="checkbox"/> Competitive bidding <input type="checkbox"/> Bids be invited after <ul style="list-style-type: none"> ○ Firming up project details ○ DPR clearance by CEA ○ Environmental clearance by MoEFCC 	<input type="checkbox"/> Freedom to developers to identify sites for development <input type="checkbox"/> Adequate time be given to bidders for selection of site, technology and optimal capacity <input type="checkbox"/> May be treated like a RE project (not a conventional hydro project)
4	Bidding parameters	<ul style="list-style-type: none"> ○ Capacity charge (Rs./MW/month or year) <ul style="list-style-type: none"> • capacity despatchable at the command of DISCOMs; • reduced risk perception >> better price discovery ○ Energy charge (Rs./kWh) 	

PSH projects : A snapshot

S. No.	Project	State	Capacity (MW)	Actual/ Expected Commissioning	Project cost (Rs. Crore)
1	Purulia Pumped Storage Hydro (PSH) Project	West Bengal	4x225=900	2008	2,953
2	Ghatghar PSH Project	Maharashtra	2x125=250	2008	1,564
3	Tehri PSH Project	Uttarakhand	4x250=1,000	2024	4,826
4	Pinnapuram PSH Project	Andhra Pradesh	4x240+2x120 = 1200	2024	5,468
5	Turga PSH Project	West Bengal	4x250=1,000	2028-29	4,800
6	Kurukutti PSH Project	Andhra Pradesh	5x240=1,200	2028	4,766
7	MP30 Gandhi Sagar PSH Project	Madhya Pradesh	5x240+2x120=1,440	2024	6,991

Source: TERI Report on PSP, 2023

Way forward to accelerate development of CSP plants in the country



- Identification of sites
- Implementation
- Bidding parameters
- Case for India
- Global scenario & trend

<https://www.teriin.org/policy-brief/concentrating-solar-power-plants-storage-deployment-essential-now#:~:text=The%20paper%20spelt%20out%20that,of%20500%20GW%20by%202030>

Concentrated solar power plants with storage (1/2)

- ❑ Identification of new sites
 - Developing Solar Parks for CSP plants based on identified sites with optimum DNI based on satellite & ground-based measurements

- ❑ Implementation
 - Learning from bidding done under National Solar Mission and experience from global CSP development and declining cost

 - Phased bidding for developing confidence of bidders and stakeholders
 - 20 to 50 MW >>>>
 - 50 to 100 MW >>>>
 - Above 100 MW

- ❑ Bidding parameters
 - ❖ Tariff based on capacity and no. of hours of operation to deliver power
 - ❖ Bidding time of the order of 180 days to provide bidders enough time to decide technology and optimal capacity

Concentrated solar power plants with storage (2/2)

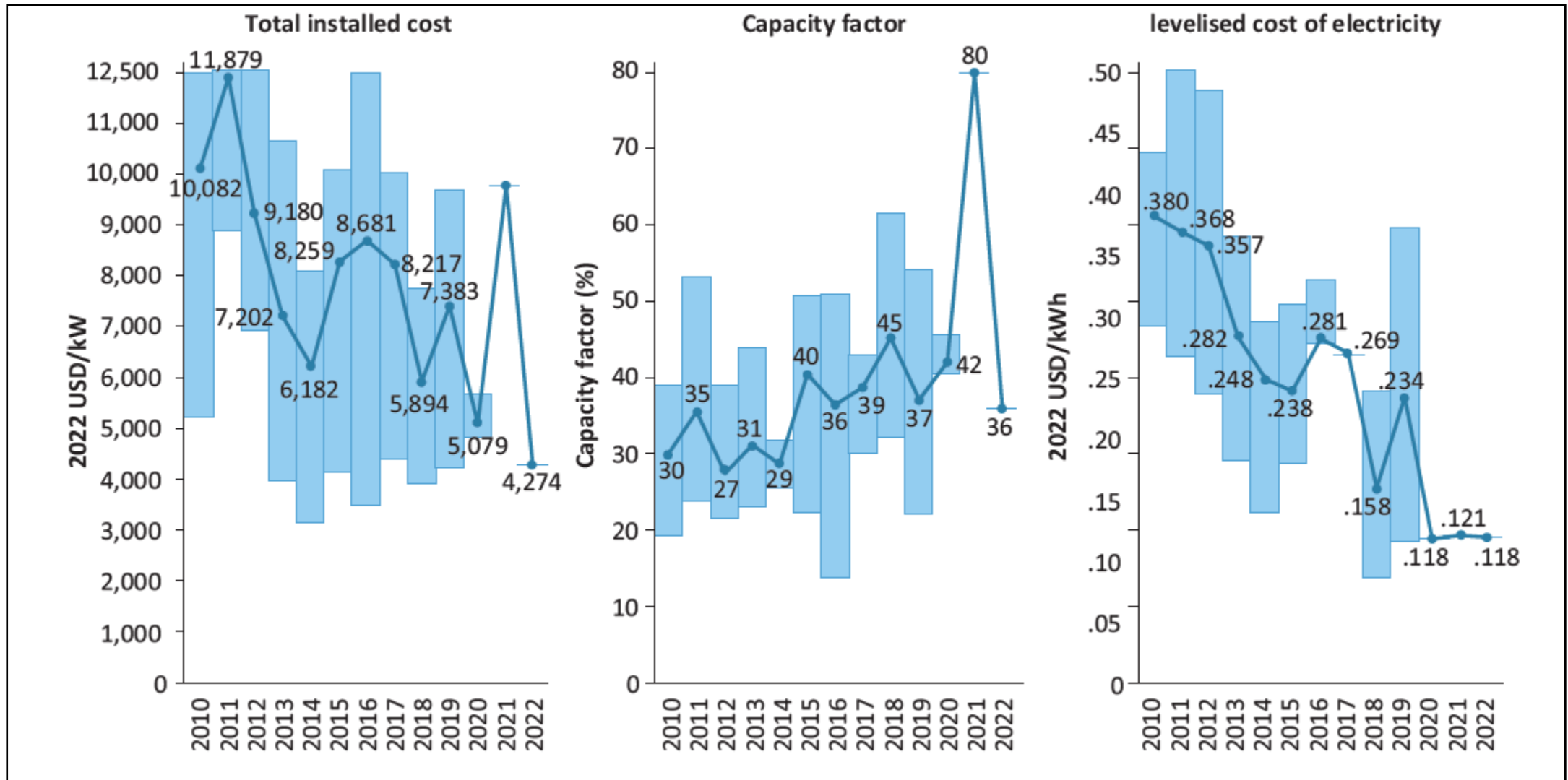
❖ Case for CSP plants in India

- Vast solar potential; provides a relatively continuous source of electricity for longer hours as compared to solar PV and wind
- Two CSP plants - Godawari Green Energy Ltd. (50 MW) & Megha Solar Plant (50 MW) - commissioned during 2013-14 under NSM are operating in the country
- Competitive bidding in a phased manner > >>> lower tariff
- With scaling up of CSP capacity in future, need for new fossil fuel based thermal stations would reduce
- Domestic manufacturing of CSP components can further lower tariff of power from CSP plants

❖ Global scenario

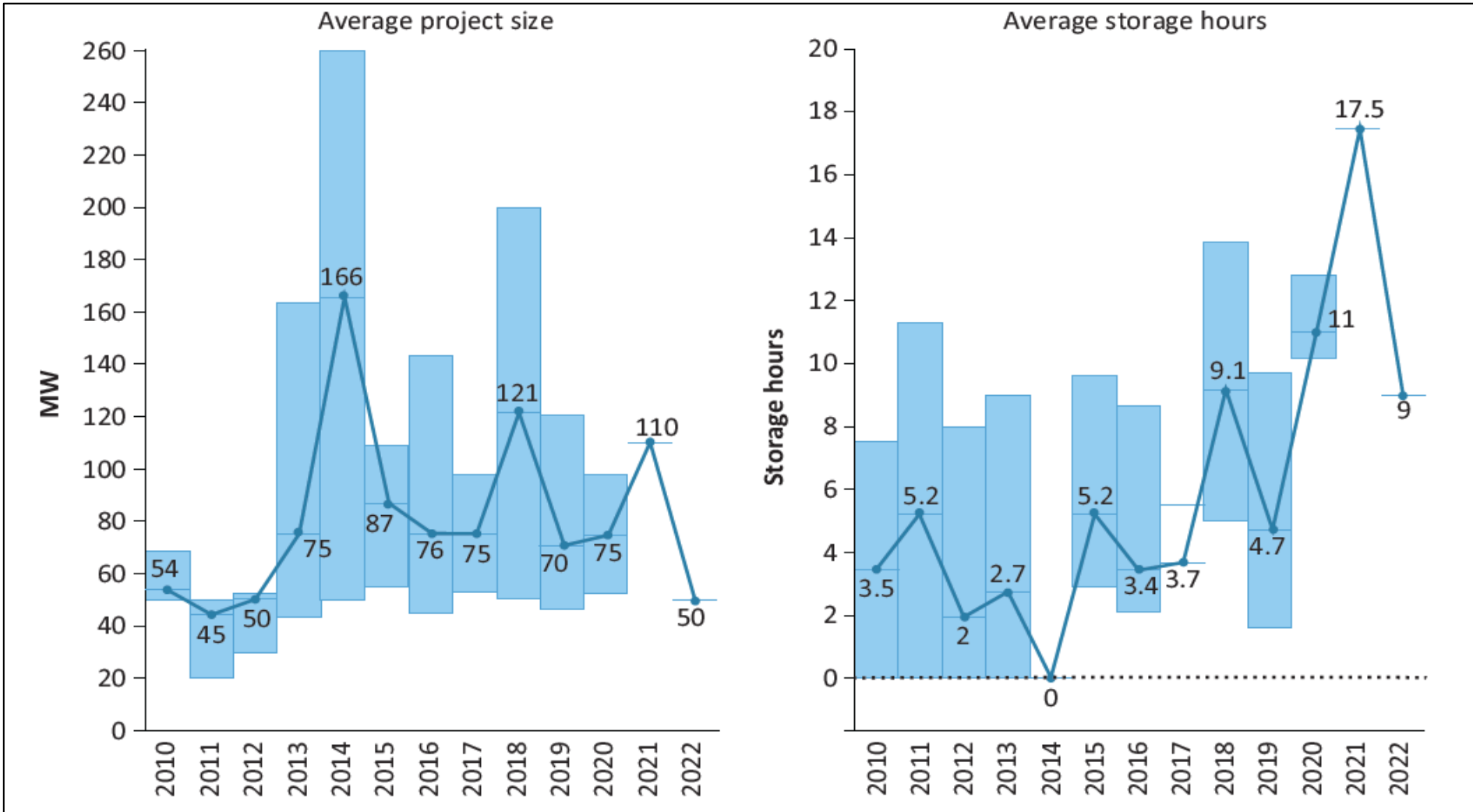
- Marked improvement in installed costs, storage hours, capacity utilization factor and levelised cost since 2010 

CSP : Global scenario & trend (1/2)



Source : Renewable Power Generation Cost, IRENA, 2023

CSP : Global scenario & trend (2/2)



Source : Renewable Power Generation Cost, IRENA, 2023

Other key references of TERI on Energy Transition

Renewable Power Pathways: Modelling the integration of wind and solar in India by 2030

<https://www.teriin.org/sites/default/files/2020-07/Renewable-Power-Pathways-Report.pdf>

Low carbon pathways for Madhya Pradesh

<https://teriin.org/sites/default/files/files/Low Carbon Pathways Final Report.pdf>

India's Electricity Transition Pathways to 2050: Scenarios and insights

[Power Sector 2050-Report.pdf \(teriin.org\)](#)



<https://www.teriin.org/>