

(GLOBAL INVITATION FOR EXPRESSION OF INTEREST)

NTPC Limited

(A Government of India Enterprise)



Invites

Expression of Interest

(EOI)

From

Indian/ Global Companies /their Consortium/ Affiliates/ Representatives

For Setting Up

ISTS Connected 50MW Concentrated Solar Power (CSP) Project with Thermal Energy Storage System (TESS) for 8 hours operation during peak hours & non-solar hours on Build Own Operate (B-O-O) basis.

DOCUMENTS OF EoI

This EOI document comprises of the following sections:

- i Section I : EoI Information
- ii Section II : Introduction
- iii Section III : Instructions to the Applicants
- iv Section IV : Consideration of Response
- v Section V : Application Form and Annexures

Section – I

EOI Information

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DETAILED NOTICE INVITING EXPRESSION OF INTEREST (Eoi)

Eoi No. NTPC/RE/Eoi-CSP/2023-24

Date: 30.03.2024

- 1.0** NTPC is Inviting an Expression of Interest from Indian/ Foreign Companies/ their Consortium/ Affiliates/ Representatives for Setting up ISTS Connected 50MW (net at ex-bus) Concentrated Solar Power (CSP) Project with Thermal Energy Storage System (TESS) for 8 hours operation during peak hours & non-solar hours on Build Own Operate (B-O-O) basis.
- 2.0** TESS shall be discharged to cater power requirements either during two (2) power block at full capacity (50MW) or at partial load distributed in entire period of non-solar hours.
- 3.0** Applicant shall supply 50MW renewable energy power, keeping the annual availability of minimum 70% during 8 hours of peak demand & non-Solar hours of contracted capacity in MW.
- 4.0** Applicant shall only be allowed to use concentrated solar power (CSP) for charging of the thermal energy storage system (TESS).

5.0 DOWNLOAD AND TIMELINES FOR SUBMISSION OF EOI

- a) Interested APPLICANTs may download the documents of Eoi free of cost from www.ntpctender.com or <http://eprocurementpc.nic.in>
- b) Last date for queries/ seeking clarifications : 24.04.2024
- c) Last date for submission of Eoi : 09.05.2024
- d) Date of opening of Eoi response : 14.05.2024
- e) **Response Validity** : **6 months from the last date for EOI Submission**

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5.0 NTPC encourages submission of Eoi in soft copy. For consideration of Eoi, APPLICANTS are required to e-mail softcopy of Eoi, completed in all respect, through e-mail mentioned hereunder.

Email: abhishekkumar02@ntpc.co.in / jkmukhatyar01@ntpc.co.in

6.0 NTPC shall not be liable for any postal/ Mail delivery issue delays whatsoever in receipt of EOI documents and EOI received after the stipulated date and time shall not be entertained. EOIs submitted without supporting document will summarily be rejected.

9.0 NTPC reserves the right to reject or accept any or all applications, cancel/withdraw the Eoi process without assigning any reason whatsoever and in such case, APPLICANT shall not have any claim arising out of such action. NTPC bears no responsibility or liability of any kind in reference to the Eoi.

10.0 The purpose of inviting this EOI is to identify prospective bidders/developers for development of CSP & TESS project.

11.0 The responses received against this EOI shall be used/evaluated by NTPC or any of its group companies. Further, based on the responses against this EOI, NTPC or any of its group companies may invite the bids on open tender basis or limited tender amongst the agencies from which the responses will be received.

Section – II

Introduction

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1.0 About NTPC:

- i. NTPC Limited (www.ntpc.co.in) is India's largest power generation company with roots planted way back in 1975 to accelerate power development in India. According to Platts, it is the world's second largest Independent Power Producer (IPP) (2019). With a market capitalization of approx. 2.22 trillion, the company is listed on the Indian stock exchange.
- ii. The total installed capacity of the company is 75,418 MW (including JVs) own stations include 27 coals based, 7 gas based, 1 Hydro, 1 Wind, 15 Solar PV and 1 Small hydro plant; NTPC Limited generates approximately 400 billion units of electricity per year through its network. Furthermore, NTPC intends to reach capacity of 130 GW by 2032. The capacity will have a diversified fuel mix and by 2032, non-fossil fuel-based generation capacity shall make up nearly 30% of NTPC's portfolio.
- iii. NTPC Limited has reported a total income INR 1779.77 billion (21.6 billion USD) in the financial year 2022-23. NTPC group achieved a net profit of INR 171.21 billion (2.08 billion USD) in the financial year 2022-23 and has been consistently paying dividends to its shareholders.

2.0 INTENT OF THE EXPRESSION OF INTEREST (EOI)

- i. Concentrated solar power (CSP) is an advanced technology which uses solar irradiation (DNI) to drive utility-scale steam turbines, and heating & cooling systems. Globally, CSP is a proven technology and its integration with Thermal Energy Storage System (TESS) offers various range of benefits that can complement other Energy storage options.
- ii. Recognizing the benefits of CSP as brought out above, Concentrated Solar Power (CSP) with Thermal energy storage system (TESS) can be innovative solution to supply firm & dispatchable RE power including peak demand/ non-Solar hours. Considering this, NTPC is inviting an Expression of Interest from Indian/ Foreign Companies/ their Consortium/ Affiliates/ Representatives for setting up ISTS Connected 50MW (net at ex- bus) Concentrated Solar Power (CSP) Project with Thermal Energy Storage System (TESS) for 8 hours operation during peak hours & non-solar hours on Build Own Operate (B-O-O) basis.

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- iii. The interested applicants will submit the technical data/ information, guarantee parameters, the total estimated project cost and other information as sought in Section-V.
- iv. Based on techno-commercial analysis of the responses in the EOI and further discussions with interested parties, if it is found commercially feasible, NTPC may proceed for further power purchase agreement (PPA) for a period of 25 years / may not proceed with any project at this stage.
- v. NTPC reserves the right to proceed for further power purchase agreement (PPA) either on nomination basis or through Request for Proposal (RFP) process amongst the shortlisted parties identified through this EOI Process.
- vi. The Applicants may express their interest in respect of their offerings along with other inputs as indicated in relevant Annexures/formats.
- vii. The major roles and responsibilities of the applicant under the project shall be as follows:

a) Applicant/ CSP Power Generator's Scope:

- Identify & develop the land for setting up complete CSP project(s).
- Arranging required statutory clearance.
- The project(s) shall be grid connected, arranging grid connection approval, end-to-end grid connection.
- Developing required infrastructure facilities and common facilities like roads, electrical infrastructure incl. auxiliary power, water supply network, drainage, common area lighting, security fencing etc.
- Acquiring Environmental clearance, Consent to Establish and Consent to Operate including treatment/ control measures for effluents/air quality.
- Responsible for entire project operations including sourcing/ procurement/ storage of raw materials and shipment of products.
- Responsible for sourcing external services.
- Operation and Maintenance of grid connected RE projects for the stipulated time periods.

b) NTPC Scope:

- NTPC or any of its group companies may float tender for selection of developer for supply of RE power from ISTS connected CSP power project.

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- NTPC or any of its group companies may Evaluate bids, issue letter of award to successful bidders, sign power purchase agreement (PPA) and back-to-back power sale agreement (PSA) with interested and procurers.

The Applicants may express their interest in respect of their offerings along with other inputs as indicated in relevant Annexures /formats.

The response(s) received in the EOI will be utilized by NTPC or its any group companies for:

- Provision for green power from RE project.
- Identification of Interested Developers/Technology suppliers/EPC players.
- Finalizing commercial agreements with identified prospectors.

Section – III

Instructions to the Applicants

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1.0 The Applicants should note that:

- a) Language of the responses to Eol or any query/clarifications/correspondences shall be in English only.
- b) For expression of interest, the Application Form and Annexures given in Section-V shall be duly filled and sent to NTPC by the APPLICANT in soft copy.
- c) Applicants should go through Section-I and Section-II thoroughly before filling and submitting the application form and annexures in Section-V.
- d) Applicants shall mention the name and contact details of two people, with their full address, phone number and email id.
- e) NTPC or any of its group companies may, at its sole discretion, ask for additional information/ documents and/ or seek clarifications from the Applicant(s) after the Deadline for submission of response, inter alia, for the purpose of removal of inconsistencies or infirmities in their responses.

2.0 Enquiries and clarifications

Any clarifications on the Eol may be sought to the following via e-mail:

To:

Abhishek Kumar, DY. General Manager, RE – C&M, Email: Abhishekkumar02@ntpc.co.in
Japan Mukhatyar , Executive , RE – Solar Thermal , Email: jkmukhatyar01@ntpc.co.in

3.0 Corrigendum

At any time before the last date of submission of Eols, NTPC or any of its group companies may, for any reason, whether at its own initiative or in response to a clarification requested by an Applicant, modify the Eol document. The amendment will be posted on the website and will be binding on the Applicants and the Applicant will give due consideration to the same, while they submit their Eols, and would invariably enclose documents/ information, as required, on account of the amendment, as a part of the Eol. NTPC or any of its group companies may, at its discretion, extend the deadline for the submission of Eols.

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4.0 Preparation of the response to Eol

The application of Eol consists of the Annexure -1,2,3 & 4 as per the format given in Section-V.

5.0 Validity of the responses

The Applicant shall submit the responses which shall remain valid up to six (6) months after the response Deadline ("Response Validity"). NTPC reserves the right to reject any response which does not meet the aforementioned validity requirement.

NTPC or any of its group companies may solicit the Applicant's consent for an extension of the period of validity of the response. The request and the response in this regard shall be in writing. In the event any Applicant refuses to extend its response validity as requested by NTPC, NTPC shall terminate processing of such Applicant's responses. An Applicant accepting NTPC request for validity extension shall not be permitted to modify its response.

6.0 Submission of the response to Eol

The responses to the Eol are to be submitted in soft copy via e-mail in prescribed format.

To : abhishekkumar02@ntpc.co.in , jkmukhatyar01@ntpc.co.in

Ref. Eol No. _____ **Dt** _____

Due Date of Opening:

Submitted to:

Name, designation & address of the concerned officer at NTPC.

Submitted by:

Name, address & contact no. of the Applicant

All the pages of the response should be duly stamped and signed by the authorized signatory.

The responses to the Eol should be submitted within the Deadline at the address provided in Section-I of this Eol.

7.0 Opening of the response to Eoi

The response to the EOI shall be opened as per the time schedule 1500 Hrs. at the date as mentioned in Section-I and will be communicated to the Applicants through e-procurement portal.

In the event of any of the above dates falling on a day which is not a working day, or which is a public holiday, the responses shall be opened on the next working day at the same venue & time.

8.0 Costs and expenses towards response to Eoi

The Applicants shall be responsible for all the costs associated with the preparation of the response and participation in discussions and finalization & execution of the documents related with this Eoi, NTPC shall not be responsible in any way for such costs, regardless of the conduct or outcome of this short-listing/ selection process.

9.0 Confidentiality

The Applicants undertake to hold in confidence this EOI and any document related or pursuant to this EOI and not to disclose the terms & conditions of the transaction contemplated hereby to third parties, except:

- a) To their professional advisors.
- b) To their officers, contractors, employees, agents or representatives, financiers, who need to have access to such information for the proper performance of their activities.
- c) Disclosures are required under the applicable law, without the prior written consent of the other parties of the concerned agreements.

Provided that the Applicant(s) agrees and acknowledges that NTPC or any of its group companies may at any time disclose the terms and conditions of this EOI and any document related or pursuant to this EOI to any person, to the extent stipulated under the applicable law.

10.0 Disclaimer

This Expression of Interest (EOI) has been prepared by NTPC for response from Indian/ Global companies for Setting up ISTS Connected 50MW (net at ex- bus) Concentrated Solar Power (CSP) Project with Thermal Energy Storage System (TESS) for 8 hours operation during peak hours & non-solar hours on Build Own Operate (B-O-O) basis.

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In submitting and expressed EOI in the response to this EOI document, the Applicants certify that it understands, accepts, and agrees to the disclaimers on this page. Nothing contained in any other provision of the EOI, nor any statements made orally or in writing by any person or party shall have the effect of negating or superseding any of the disclaimers set forth herewith.

Section – IV

Consideration of Response

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1.0 Responsiveness check

The responses submitted by Applicants shall be scrutinized and may be rejected in following conditions-to establish interest in setting up ISTS Connected 50MW (net at ex-bus) Concentrated Solar Power (CSP) Project with Thermal Energy Storage System (TESS) for 8 hours operation during peak hours & non-solar hours on Build Own Operate (B-O-O) basis.

Responses shall be deemed non-responsive for following reasons:

- a. Responses that are incomplete, i.e., not accompanied by any of the applicable formats inter alia covering letter, power of attorney, applicable undertakings, provided in more details at annexure in Section-V.
- b. Responses not signed by authorized signatory and / or stamped in the manner indicated in this Eol;
- c. Material inconsistencies in the information/ documents submitted by the Applicant.
- d. An Applicant submitting more than one response to this Eol either itself or through an affiliate or subsidiary company.
- e. Response validity being less than that required as per Clause 5 of section-III of this Eol.
- f. Response being conditional in nature.
- g. Response not received by the response Deadline.
- h. Response having Conflict of Interest.
- i. Applicant delaying in submission of additional information or clarifications sought by NTPC, as applicable.

All bids that shall meet the responsive check requirements set out above in this section of the Eol document shall be considered as responsive. In case of non-submission of relevant details as above, the responses may be considered as "non-responsive", at the sole discretion of NTPC and will not be considered further.

Section – V

Application Form & Annexures

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Annexure-1

FORMAT FOR COVERING LETTER CUM UNDERTAKING

(The covering letter should be on the Letter Head of the Applicant)

Date : _____

Place : _____

To,

.....

Sub.: (INVITATION FOR EXPRESSION OF INTEREST)

Ref.: Eol No. _____, dated _____ (the "Eol")

Dear Sir,

We, the undersigned [insert name of the "Applicant"] having read, examined, and understood in detail the **(INVITATION FOR EXPRESSION OF INTEREST)**.

We confirm that neither we nor any of our Parent Company/ Affiliate/ Ultimate Parent Company has submitted a response other than this response directly or indirectly in response to the aforesaid Eol.

1. We give our unconditional acceptance to the Eol, issued by NTPC, as amended. In token of our acceptance to the Eol, the same have been signed & stamped by us and enclosed to the response. We hereby confirm that the provisions of the Eol shall be binding on us.
2. We have submitted our response strictly as per the provisions and formats of the Eol, without any deviations, conditions and without mentioning any assumptions or notes.
3. We hereby unconditionally and irrevocably agree and accept that the decision made by NTPC in respect of any matter regarding or arising out of the Eol shall be binding on us. We hereby expressly waive any and all claims in respect of Eol process. We confirm that there are no litigations or disputes against us, which materially affect our ability to participate or function under the obligations with regard to Eol.
4. Details of the contact person are furnished as below:

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Name:

Designation:

Address:

Contact numbers:

email id:

5. We are enclosing herewith the entire response containing duly signed formats in electronic format sent via email to abhishekkumar02@ntpc.co.in / jkmukhatyar01@ntpc.co.in as per the Eol for consideration.
6. It is confirmed that our response is consistent with all the requirements of submission as stated in the Eol and subsequent communications from NTPC, if any.
7. The information submitted in our response is complete, strictly as per the requirements stipulated in the Eol and is correct to the best of our knowledge and understanding. We would be solely responsible for any errors or omissions in our response.
8. We confirm that all the terms and conditions of our response are valid for acceptance for a period of six (6) months from the response Deadline.
9. We confirm that we have not taken any deviation so as to be deemed "**non-Responsive**" as stipulated in Section-IV of this Eol.
10. We understand that you are not bound to accept any response you receive.
11. We declare that our firm is neither put on Holiday or Blacklisted by any Government/PSU/Private Firm or Financial Institution.

We remain,
Yours sincerely

(Name, Designation and Signature of Authorized Person in whose name Power of Attorney is issued)

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Annexure-2

Information to be submitted by Applicant.

1. Name of the Company/ Lead Partner of Consortium/ Affiliates/ Representatives:
(strike out whichever is not applicable)
2. Legal status of the Company/ Lead Partner of Consortium/ Affiliates/ Representatives:
3. Brief description of the Company/ Lead Partner of Consortium/ Affiliates/ Representatives including details of its business groups/subsidiaries:
4. Existing footprints in RE business – Locations, Capacity
5. Date of Incorporation:
6. Date of commencement of the Business:
7. Full address including Telephone nos. /Fax nos.:
 - a. Registered Office:
 - b. Head Office:
 - c. Address for communication:
 - d. Contact Details:
 - e. Office address in India, if any:
8. Collaborations/tie-ups with manufacturer (if applicable),
9. Details of Indian parties, if any for installation, supply, Services
10. Documents to be enclosed:

Technical Credentials - Relevant Technology, Experience/Reference List of projects, Copies of LoAs/PPAs/commissioning certificate, Engineering Strengths, collaborations/tie-ups with technology supplier/EPC/Developers (if applicable), quality accreditations, etc.

Financial Credentials – Copies of Audited Financial statements (Annual Report) for last Five (5) years.

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11. Any other documents considered relevant.

(Sign & Company Seal)
Authorized signatory

Annexure-3

1. Technical information to be Submitted by the Applicant:

Applicant shall duly provide the following information.

I. About the proposed configuration of RE project(s), Technology & technology Provider

Applicant shall fill in the required details and attach relevant documents as per Table - 1(A) &(B) and Table-2 of Annexure-4.

II. About the Reference plant

Applicants shall fill in the required details and attach relevant documents as per CI No-8 of Annexure-2 above. The required details shall be filled in Table-1(C) of Annexure-4.

2. Investment & Scope of Supply:

Estimated total capital investment with cost breakup of all major components along with scope of supply and services, inclusions, exclusions, terminal points and tentative timeline of the project shall be furnished in Table-3 of Annexure- 4.

Note: Applicant shall mention budgetary cost equipment supply for Indian item and imported item separately.

3. Project Timeline:

Applicant shall mention project completion period from award of job till Commissioning and Test Run with necessary details.

4. Validity:

The applicant is requested to mention the validity of the proposal submitted.

(Note: Documents in support of meeting the respective requirement shall be submitted by the Applicant. In case of collaboration, both organizational details shall be submitted)

(Sign & Company Seal)
Authorized signatory

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Annexure-4

Table-1
Applicant Proposal & Experience Details

Sl. No.	Description	Applicant to fill
(A) About the Technology Provider		
1	Type of technology proposed by Applicant	
2	Whether the Technology is owned by Applicant	Yes/No
a)	If no, Name of Technology owner/ developer/ IP Owner/designer of these technology	
b)	Registered office of Technology owner/developer/ IP Owner/designer	
c)	Whether Applicant has technology tie up/ collaboration with Technology owner/ developer/ IP Owner/designer	Yes/No (Attached copy of Technology tie up/ collaboration agreement)
d)	Validity period of agreement	
(B) Details of reference Installations		
1	Name of project where Applicant/ Its Collaborator/ associate installed / have installed CSP & TESS system	
2	Name and address of owner of the system	
3	Capacity of plant (MW)	
4	Technology used	
5	Daily Operating hours of plant	
6	Is plant with energy storage?	(Yes/No)
7	Type of Energy Storage & capacity (MWhr thermal)	
8	Design parameters of Steam at turbine inlet	
9	Date of award	
10	Date of commissioning	

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11	If installation not yet completed, Present status and date of expected completion	
12	Scope of work of Applicant (Furnish copy of LOA)	
13	Equipment wise Break up and major operating conditions/parameters, input requirements (power consumption etc.), start-up time,	
14	List of other utilities with quantity	
15	List of equipment and capacity/rating including handling, conveying, and processing system	
16	Land Footprint (enclose Layout Plan)	

Table 2

Proposed Project Configuration Details

S No	Item Description	(To be filled)
1	Type of CSP Technology Proposed	
2	Minimum Declared Annual CUF (%) of Project	
3	Minimum Average Annual Availability	
4	LCoE (INR/Kwh) for PPA period (25 years)	
5	Net power output at Ex-bus (MW)	50
6	Gross Power Output at generator terminal (MW)	
7	Auxiliary Power consumption (MW)	
8	Total Solar field Area (m2)	
9	Total Project Land Area (Acres)	
10	Proposed Location	
11	Design DNI considered	
12	Type of Thermal Energy Storage System(s)	
13	Discharge Capacity of TESS (MWh thermal)	
14	Rated Discharge rate of TESS with duration	
15	Max discharge rate of TESS with duration	

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16	Min discharge rate of TESS with duration	
17	Discharge parameter of steam from TESS (pressure, temperature, flow rate)	
18	Round trip efficiency of TESS	
19	Self-Discharge for the period of 24 hours (%)	
20	Turbine Inlet parameters of steam (temperature, pressure, flow rate)	
21	Turbine Exhaust steam parameters (temperature, pressure)	
22	Turbine cycle heat rate	
23	Condenser pressure	
24	Total make up water requirement in turbine cycle (m ³ /hr)	
25	Turbine Start up time	
26	Min load on which turbine can run	
27	Turbine ramp-up & ramp down rate	
28	P&ID of turbine cycle	
29	Total condenser cooling water requirement	
30	Detailed write up of the proposed CSP & TESS technology including basic principle, major operating conditions/parameters, input requirements (Auxiliary power consumption etc.), startup time, safety, and shutdown procedure etc.	
31	Schematic diagram of CSP plant, thermal energy storage system, and Power generation unit	
32	Overall Plant Efficiency	
33	Estimated water consumption/requirement	
34	Types of effluents and treatment before exhaust/discharge:	
35	Any other relevant details which applicant would like to highlight about its technology (as applicable)	

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Table -3

Capital Cost

A	Capital Cost	
1	Capital Cost of Solar Block	
	i. Solar mirrors & receiver ii. Solar mirrors & receiver iii. Solar mirrors & receiver	
2	Capital Cost Power Block (Turbine and Auxiliaries)	
3	Capital Cost of Thermal Energy Storage (TESS)	
4	Capital Cost of Balance of Plant (BoP)	
5	Civil Cost	
6	Any Other Cost	
7	Total Cost	
B	Timelines for completion of Grid – connected CSP Project(s)	
C	Cost wise Percentage (%) of imported components	
D	Cost wise Percentage (%) of local Contents	

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Annexure - 5

Additional data for 50MW (net) CSP + 8 Hours TESS considering daytime generation and 8 hours during peak demand & non-solar hours.

Table -1

S No	Item Description	(To be filled)
1	Type of CSP Technology Proposed	
2	Minimum Declared Annual CUF (%) of Project	
3	Minimum Average Annual Availability	
4	LCoE (INR/Kwh) for PPA period (25 years)	
5	Net power output at Ex-bus (MW)	50
6	Gross Power Output at generator terminal (MW)	
7	Auxiliary Power consumption (MW)	
8	Total Solar field Area (m2)	
9	Total Project Land Area (Acres)	
10	Proposed Location	
11	Design DNI considered	
12	Type of Thermal Energy Storage System(s)	
13	Discharge Capacity of TESS (MWh thermal)	
14	Rated Discharge rate of TESS with duration	
15	Max discharge rate of TESS with duration	
16	Min discharge rate of TESS with duration	
17	Discharge parameter of steam from TESS (pressure, temperature, flow rate)	
18	Round trip efficiency of TESS	
19	Self-Discharge for the period of 24 hours (%)	
20	Turbine Inlet parameters of steam (temperature, pressure, flow rate)	
21	Turbine Exhaust steam parameters (temperature, pressure)	
22	Turbine cycle heat rate	
23	Condenser pressure	
24	Total make up water requirement in turbine cycle	

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	(m ³ /hr)	
25	Turbine Start up time	
26	Min load on which turbine can run	
27	Turbine ramp-up & ramp down rate	
28	P&ID of turbine cycle	
29	Total condenser cooling water requirement	
30	Detailed write up of the proposed CSP & TESS technology including basic principle, major operating conditions/parameters, input requirements (Auxiliary power consumption etc.), startup time, safety, and shutdown procedure etc.	
31	Schematic diagram of CSP plant, thermal energy storage system, and Power generation unit	
32	Overall Plant Efficiency	
33	Estimated water consumption/requirement	
34	Types of effluents and treatment before exhaust/discharge:	
35	Any other relevant details which applicant would like to highlight about its technology (as applicable)	

Table- 2

A	Capital Cost	
1	Capital Cost of Solar Block	
	i. Solar mirrors & receiver ii. Solar mirrors & receiver iii. Solar mirrors & receiver	
2	Capital Cost Power Block (Turbine and Auxiliaries)	
3	Capital Cost of Thermal Energy Storage (TESS)	
4	Capital Cost of Balance of Plant (BoP)	
5	Civil Cost	

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6	Any Other Cost	
7	Total Cost	
B	Timelines for completion of Grid – connected CSP Project(s)	
C	Cost wise Percentage (%) of imported components	
D	Cost wise Percentage (%) of local Contents	