

No. 238/75/2017-Wind
Government of India
Ministry of New & Renewable Energy
CGO Complex, Block No.14, Lodhi Road, New Delhi – 110003

Dated: 13th November, 2020

Office Memorandum

Subject: Concept note for development of wind park / wind solar hybrid park – reg.

The undersigned is directed to forward herewith a concept note on 'Development of Wind Parks / Wind-solar Hybrid Parks', for stakeholders' consultation.

2. It is requested to go through the concept note and comments on the same may kindly be sent to this Ministry (Email: rahul.mnre@gov.in) within 15 days, latest by 28th November 2020.
3. This issue with approval of Competent Authority.

Encl: As above.



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To,

1. Secretary, Ministry of Power (MoP)
2. Chairman, Central Electricity Authority (CEA)
3. Secretary, Central Electricity Regulatory Commission (CERC)
4. Principal Secretary (Energy) of States of Andhra Pradesh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu and Telangana.
5. State Nodal Agencies (SNAs) of States of Andhra Pradesh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu and Telangana.
6. DISCOMs of States of Andhra Pradesh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu and Telangana.
7. Secretary, SERCs of States of Andhra Pradesh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu and Telangana.
8. Associations of wind power developers (IWTMA / IWPA / InWEA / WIPPA)
9. NIC/ IT Division – with a request to upload it on MNRE's website

**Ministry of New and Renewable Energy
Wind Energy Division**

Concept Note on Development of Wind Parks/ Wind-Solar Hybrid Park

1. Background

India is blessed with abundant renewable energy resources like wind & solar and these energy sources are emerging as an alternative to the conventional sources of energy to meet the requirements of the country. The estimated solar power potential is 749 GW and wind power potential of the country is 695 GW at 120 meter above ground level. Unlike solar resource, wind resource is mainly concentrated in the states of Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu.

The Government has adopted transparent competitive bidding process for large scale wind, solar and wind-solar hybrid power projects and has issued guidelines for the same. Accordingly, projects of more than 11 GW wind power and 1.44 GW wind-solar hybrid power have been awarded through transparent competitive bidding process. While the bidding has resulted in competitive tariffs which are much lower than traditional Feed-in Tariffs, on the other hand a number of projects have been delayed due to land, NoCs and transmission related issues. These challenges and uncertainties have raised the concerned of investors in the sector. Further, while solar power project is commissioned on contiguous land, the wind power project requires scattered land on footprint basis which not only increases the transmission cost but also increase the possibility of land related issues.

In order to overcome these challenges and to speed up the installation of wind power projects, the scheme for “Development of Wind Parks/ Wind-Solar Hybrid Park” is proposed. The Park will be a concentrated zone of development of Wind/ Wind-Solar Hybrid power projects and will provide an area that is well characterized, with proper infrastructure including evacuation facilities in place and where the risk of the projects can be minimized. Wind Energy Park will provide a plug and play solution (availability of land, transmission, necessary infrastructure and necessary approvals) to the investors for installing wind/ wind-solar power projects.

2. Proposal

The probable sites for the development of wind or wind-solar hybrid power projects have been identified with the help of National Institute of Wind Energy (NIWE) on the basis of availability of mainly wind resource and suitability of land for wind power projects. If the site is found to be suitable for solar power project also, the park developer may consider developing Wind – Solar Hybrid Power Park. The identified sites would be circulated to concerned state governments for their consent on development of park. The state

government would designate park developer and the designated park developer would undertake the development of park including DPR preparation, land, transmission infrastructure, etc.

3. Benefits

This will pace up the deployment of wind power projects in the country and will help DISCOMs to fulfill non-solar RPOs at competitive rates. The major uncertainties of wind power project developer, such as land, transmission, clearances, etc., would be minimized, which would not only reduce the commissioning time of wind power projects but also lead to competitive tariffs.

4. Proposed sites for Wind Park/ Wind-Solar Hybrid Park Development

The suitable sites for Wind Park/ Wind-Solar Hybrid Park development have been identified by the NIWE on the basis of following criteria:

- i. Wind Potential area with more than 30% CUF at 120 m hub height is considered.
- ii. Unsuitable area for wind farm development such as protected areas, airports, etc., were excluded along with land area with elevation more than 1500m and slope more than 20 degree (except roads, railway lines and rivers).
- iii. The installed wind turbines have been excluded
- iv. Considering the wake impact of neighboring wind turbines, ideally, only 5 MW can be installed per sq.km of land (100 Hectares of land). However, land for the wind turbines can be procured on foot-print basis. Hence, for the development of 5 MW of wind power project, only 5% to 6% of the land acquisition (i.e. around 5 Hectares instead of entire 100 Hectares of land) is required for the project on foot-print basis.

The proposed sites for Wind Parks/ Wind-Solar Hybrid Park Development are as under:

State	Site	District	Area (sq. km) available	Average Wind Speed (m/s)	CUF (%) P50	Average WPD (W/Sq.m)	Installable Potential (MW) [assuming 5 MW / sq.km]	Land to be procured / allotted for Wind Energy Park Development (Sq. km)
Tamil Nadu	A	Tirunelveli	68	7.326	36.348	572.730	340	3.4
	B	Tuticorin	169	6.998	35.146	305.284	845	8.4
	C	Coimbatore & partially Palakkad (Kerala)	351	8.588	40.802	558.989	1755	17.6

	D	Tiruchirappalli & Perambalur	547	7.093	34.878	444.800	2735	27.3
Andhra Pradesh	E	Tumakuru & Anantapur	1055	7.307	36.309	334.628	5275	52.7
Karnataka	F	Chitradurga & Davangere	640	7.132	34.263	369.945	3200	32.0
	G	Bellary & Davangere	924	7.139	34.705	335.037	4620	46.2
	H	Chitradurga	269	7.153	34.886	309.581	1345	13.4
	I	Chitradurga & Davangere	380	7.194	35.142	335.889	1900	19.0
Gujarat	J	Junagadh & Porbandar	2900	7.017	35.315	385.530	14500	145.0
	K	Kutch	771	7.329	38.039	337.750	3855	38.6
	L	Kutch	680	7.510	39.367	371.885	3400	34.0
	M	Kutch	590	7.434	38.805	372.130	2950	29.5
	N	Kutch	308	7.297	37.513	358.508	1540	15.4
Rajasthan	O	Barmer	265	6.50	30.375	289.84	1325	13.25
	P	Barmer	109	6.52	30.470	286.69	545	5.45
Madhya Pradesh	Q	West Nimar	220	6.91	31.647	400.90	1100	11.00
Telangana	R	Ranga Reddy	346	7.14	31.273	299.65	1730	17.30
	S	Ranga Reddy	197	6.61	32.190	268.43	985	9.85
Total (MW)							53945	

The above mentioned list is indicative / suggestive only. States may also decide to develop Wind Parks/ Wind-Solar Hybrid Park at other feasible locations, if any.

These sites are preliminary and the actual area/ location may vary in Detailed Project Report (DPR) depending upon the availability of land and resource. Further, the new sites may also be identified and proposed by state government or NIWE.

5. Capacity

The capacity of each park should generally be 500 MW and more, however parks of lower capacity may also be developed depending upon the availability of land and resource. In any case, the capacity of each park shall not be less than 50 MW. Park developers may also be allowed to pool small investor into the single park.

6. Role of State Government

The role of state government or its designated agency is as under:

- i. To select park developer
- ii. Facilitate the park developer in acquisition/ leasehold of the identified site.

- iii. Facilitate in obtaining all statutory clearances

If the power generated in the park (full or partial) is exported to other state, then the state government or its designated agency will be entitled for a facilitation charge @ 5 paisa per unit of electricity exported to other state from project developer.

7. Park Developer

The wind park developers will be implementing agency for developing and maintaining the park. The park developer may be either of the following:

- i. Any agency of state government
- ii. Any agency of central government
- iii. Joint venture or Special Purpose Vehicle (SPV) of (i) and (ii)
- iv. Private developer

In case of (i) to (iii) above, the state government may designate the park developer on nomination basis. While in case of (iv) above (i.e. Private Developer), the state government shall select the developer through transparent competitive bidding, for which the state government would develop transparent guidelines consisting of financial and technical aspects for selection of private park developer. However, a model guideline with major provisions will be issued by the Central Government.

8. Responsibilities of Park Developer

The park developer will undertake following activities:

- i. To prepare Detailed Project Report
- ii. Acquire/leasehold/possess land for Park
- iii. Obtain statutory and non-statutory clearances
- iv. Obtain connectivity from CTU/STU
- v. Develop internal power evacuation system, draw transmission line up to nearest CTU/STU substation,
- vi. Create necessary infrastructure like water, roads, drainage etc.
- vii. Development of land (leveling, etc.) for making site ready to use.
- viii. Coordination with central and state government Ministries/ Departments

9. Scope of DPR

The DPR shall cover all the aspects related to the development of park, such as technical, economical, environmental and social aspects. The broad scope of DPR shall include the followings:

- i. Identification of site/ land,
- ii. Feedback from farmers regarding acquisition/ lease,
- iii. Feasibility of DLC rate or any other rate in case of acquisition,
- iv. Resource assessment,
- v. Micrositing of wind turbines (and solar plant in case of hybrid),
- vi. Capacity of park
- vii. Detailed layout of the internal transmission system and transmission line up to nearest CTU/STU substation
- viii. Detailed layout for road and drainage systems,
- ix. Estimation of RoW issues,
- x. Statutory & non statutory clearances required,
- xi. Cost estimation of park development.

10. Central Financial Assistance

The Ministry will provide following central financial assistance to the park developer:

- a. CFA @Rs 25 Lakh per Park to park developer for DPR preparation
- b. CFA @Rs 20 Lakh per MW or 30% of the park development cost to park developer, whichever is lower.

11. Financial Model

The park development cost includes cost of land, basic civil & electrical infrastructure, transmission infrastructure, contingency and overhead charges. The park developer will recover the project cost, maintenance cost and profit margin through CFA, one time registration charges and per unit generation charges from project developer.

In case the designated park developer is central or state government agency or joint venture of these agencies, then the park development cost, will be recovered in following manner:

- a. Park developer may charge the remaining park development cost from project developer as registration charges on pro-rata basis (Rs/MW). Further, the park developer will charge maintenance cost and profit margin through a fixed per unit charge on the sale of electricity.

OR

- b. Park developer may charge the a portion of remaining park development cost (not less than 30% of total project cost) from project developer as registration charges on pro-rata basis (Rs/MW). Further, the park developer will charge remaining project cost, maintenance cost and profit margin through a fixed per unit charge on the sale of electricity.

In case the designated park developer is private developer, then the park development cost, will be recovered in following manner:

- a. Park developer may charge the remaining park development cost from project developer as registration charges on pro-rata basis (Rs/MW). Further, the park developer will charge maintenance cost and profit margin through a fixed per unit charge on the sale of electricity.

Both the estimated registration (Rs/ MW) and per unit (Rs/ unit) charges shall be declared by park developer on the basis of estimated cost as per DPR. The actual total project cost is to be authenticated by a joint committee of central and state government after completion of park development. Based on the project cost, the same committee will also declare actual registration (Rs/ MW) and per unit (Rs/ unit) charges.

12. Power Purchase Agreement

The project developer installing wind or wind solar hybrid power project may enter into power purchase agreement with DISCOMs or intermediary procurer or bulk consumer.

13. Transmission and evacuation of Power

The park developer will set up the one or more pooling station inside the park and will also draw transmission line to transmit power to nearest substation of CTU or STU, as the case may be. The CFA grant can be used for installing both internal and external transmission system. For connectivity, the relevant regulations and orders of central/ state government and CERC/SERC will be applicable.

80°0'0"E

> 35% CUF (After Unsuitable Area Exclusion)



20°0'0"N

20°0'0"N

Polygon	Area (Sq.km)	Districts
E	1055	Tumakuru, Anantapur

Legend

-  Wind Park Area
-  State Boundary
-  > 35% CUF

0 55 110 220 330 440 Kilometers

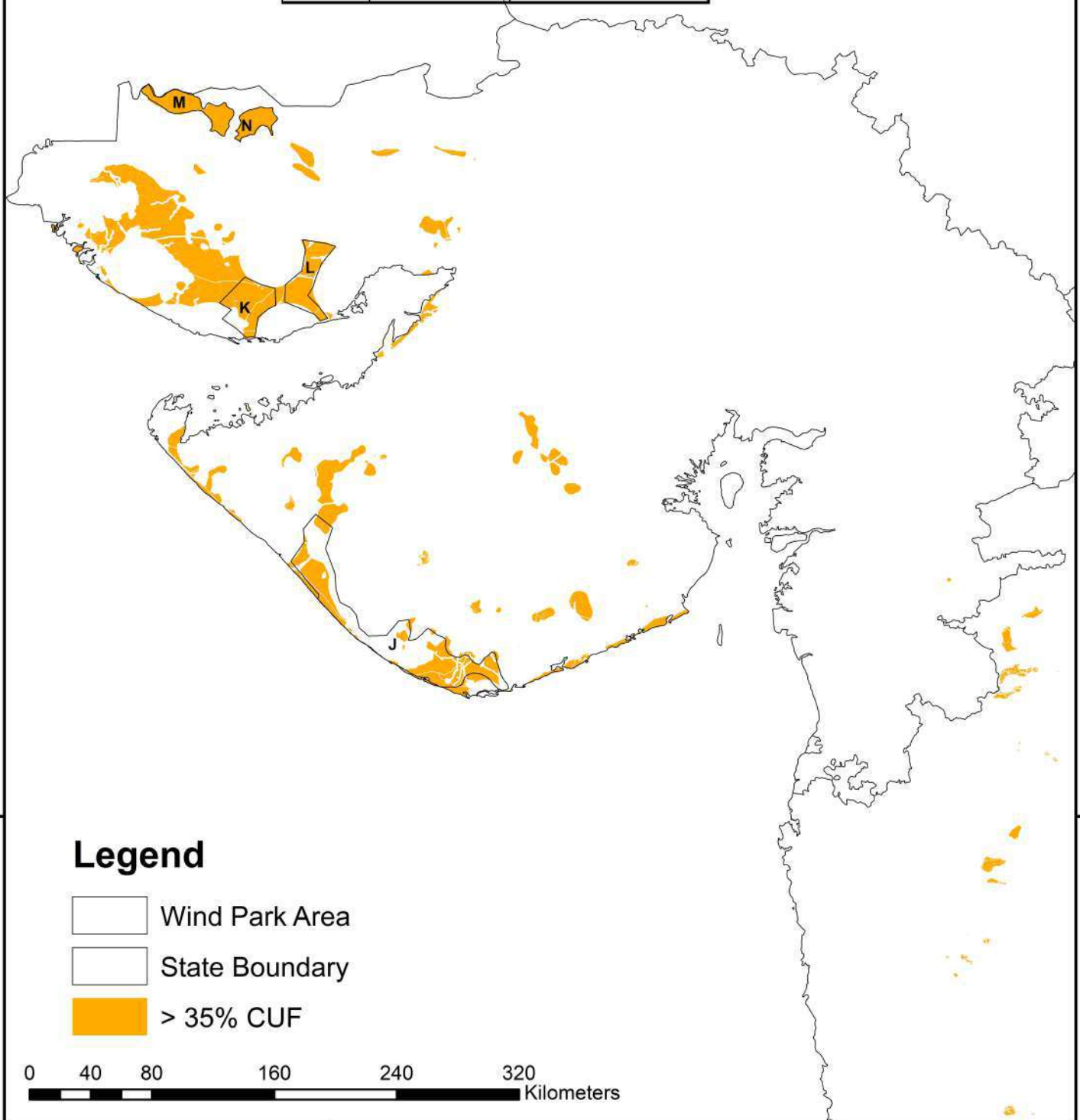
80°0'0"E

70°0'0"E

> 35% CUF (After Unsuitable Area Exclusion)



Polygon	Area (Sq.km)	Districts
J	2900	Junagadh, Porbandar
K	771	Kutch
L	680	Kutch
M	590	Kutch
N	308	Kutch



20°0'0"N

Legend

-  Wind Park Area
-  State Boundary
-  > 35% CUF

0 40 80 160 240 320 Kilometers

20°0'0"N

70°0'0"E

> 35% CUF (After Unsuitable Area Exclusion)

Polygon	Area (Sq.km)	Districts
F	640	Chitradurga,Davanagere
G	924	Bellary,Davanagere
H	269	Chitradurga
I	380	Chitradurga,Davanagere



Legend

-  Wind Park Area
-  State Boundary
-  > 35% CUF

0 35 70 140 210 280 Kilometers

80°0'0"E

> 35% CUF (After Unsuitable Area Exclusion)



Polygon	Area (Sq.km)	Districts
A	68	Tirunelveli, Thoothukudi
B	169	Thoothukudi
C	351	Coimbatore, Palakkad
D	547	Tiruchirappalli, Perambalur

D

C

A

B

Legend

-  Wind Park Area
-  State Boundary
-  > 35% CUF

0 25 50 100 150 200 Kilometers

80°0'0"E

10°0'0"N

10°0'0"N

> 30% CUF (After Unsuitable Area Exclusion)



Madhya Pradesh

Wind Park	Area (Sq.km)	Districts
Q	220	West Nimar

Legend

-  State Boundary
-  Wind Park Area
-  >30% CUF

0 30 60 120
Kilometers

> 30% CUF (After Unsuitable Area Exclusion)



Rajasthan

Wind Park	Area(Sq.km)	Districts
O	265	Barmer
P	109	Barmer

Legend

-  State Boundary
-  Wind Park Area
-  >30% CUF

0 20 40 80
Kilometers

> 30% CUF (After Unsuitable Area Exclusion)



Telangana

Wind Park	Area(Sq.km)	Districts
R	346	Ranga Reddi
S	197	Ranga Reddi

Legend

-  State Boundary
-  Wind Park Area
-  >30% CUF

0 30 60 120
Kilometers