

# ANDHRA PRADESH WIND-SOLAR HYBRID POWER POLICY – 2018, Dated: 03.01.2019

| Sl. No. | Description                         | Summary   |
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| 1.      | <b>Control/Review Period</b>        | 5-Years<br>The Wind Solar Hybrid Projects that are commissioned during the operative period shall be eligible for the incentives declared under this policy, for a period of 10 years from the date of commissioning.   |
| 2.      | <b>Objectives</b>                   | <ol style="list-style-type: none"> <li>1. The main objective of the Policy is to provide a framework for promotion of large grid connected wind-solar PV systems for optimal and efficient utilization of transmission infrastructure and land, reducing the variability in renewable power generation and thus achieving better grid stability.</li> <li>2. Optimal utilization of transmission infrastructure being built by State Utility to evacuate renewable power.</li> <li>3. Policy aims to encourage new technologies, methods and way-outs involving combined operation of wind and solar PV plants, and other emerging technologies like energy storage systems.</li> <li>4. Target to procure the Contracted capacity of 5,000 MW at desired CUF under this policy in next 5 years or till such time a new policy is issued, as per power and energy requirements including time/season of procurement of distribution companies.</li> </ol>   |
| 3.      | <b>Wind-Solar Hybrid System</b>     | <ol style="list-style-type: none"> <li>1. In case of fixed speed wind turbines connected to grid using an induction generator, the integration can be on the HT side at the AC output bus. However, in case of variable speed wind turbines deploying inverters for connecting the generator to the grid, the wind and solar PV system can be connected to the intermediate DC bus of the AC-DC-AC converter.</li> <li>2. In Case of Wind –Solar Hybrid Project(s), both Wind and Solar project(s) should connect to grid in the same region at 132 KV and above either through individual or common pooling station. Such project(s) must give the common scheduling and forecasting for the Wind and Solar Project(s) and further at any point of time should not exceed the PE capacity allocated jointly between Wind and Solar Project(s).</li> <li>3. A wind-solar plant will be recognized as Hybrid Plant if the rated power capacity of one resource is at least 25% of the rated power capacity of other resource. Further, each 1 MW of <b>contracted</b> Wind Solar Hybrid Project shall achieve a minimum CUF of 40%. In case of projects which achieve higher CUF shall be given preference.</li> </ol> |
| 4.      | <b>Implementation Strategy</b>      | <p><b>Strategic Configurations:-</b></p> <ul style="list-style-type: none"> <li>• <b>Wind-Solar Hybrid- AC integration:</b><br/>In this configuration, the AC output of both the wind and solar system is integrated either at LT side or at HT side. In the later case, both systems use separate step-up transformer and HT output of both the systems is connected to common AC Bus-bar or at interconnection point.</li> <li>• <b>Wind-Solar Hybrid- DC integration:</b><br/>DC integration is possible in case of variable speed drive wind turbines using converter inverter. In this configuration the DC output of the both the wind and solar PV plant is connected to a common DC bus and a common invertors suitable for combined output AC capacity is used to convert this DC power in to AC power.</li> </ul>   |
|         | <b>New wind-solar hybrid plants</b> | <p>New wind-solar hybrid projects shall be encouraged with following provisions:</p> <ul style="list-style-type: none"> <li>• The hybrid power generated from the wind-solar hybrid project may be used for (a) captive purpose; (b) sale to third party through open access; (c) sale to the distribution company (ies) either at project specific tariff determined by</li> </ul>   |

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|           |   | <p>the APERC or at tariff discovered through transparent bidding process; or (d) sale to the distribution company (ies) at APPC under REC mechanism and avail RECs.</p> <ul style="list-style-type: none"> <li>Parameters that may be considered for bidding could be capacity delivered at grid interface point, effective CUF and unit price of electricity.</li> <li>The power procured from the hybrid project may be used for fulfilment of solar RPO and non-solar RPO in the proportion of rated capacity of solar and wind power in the hybrid plant respectively.</li> </ul>  |
|           | <b>Hybridization of existing Wind/Solar PV plants</b> | <p>Existing wind or solar power projects, willing to install solar PV plant or WTGs respectively to avail benefit of hybrid project, may be allowed to do so with following Conditions:</p> <ol style="list-style-type: none"> <li>No additional connectivity/transmission capacity charges shall be levied by the respective transmission entity for hybridisation at existing wind/solar PV plants if already granted transmission connectivity/ access is being used.</li> <li>In case capacity margins are available at the receiving transmission sub-station of respective transmission entity, at which the existing wind/solar projects is connected, additional transmission capacity/access may be allowed subject to its technical feasibility.</li> <li>In case of AC integration assessment of solar and wind power injected from the hybrid project in to the grid will be worked out by apportioning the reading of main meter installed at the receiving station on the basis of readings of ABT meters installed on LT or HT side of the wind and solar PV plant as the case may be.</li> <li>The additional solar/wind power generated from the hybrid project may be used for: <ul style="list-style-type: none"> <li>captive purpose; (b) sale to third party through open access; (c) sale to the distribution company (ies) either at project specific tariff determined by the APERC or at tariff discovered through transparent bidding process; and (d) sale to the distribution company (ies) at APPC under REC mechanism and avail RECs.</li> <li>For bidding purpose, State or Central entities may bid for hybridization of existing projects connected to InSTS or ISTS as the case may be.</li> </ul> </li> <li>The additional solar/wind power procured from hybrid project shall be used for fulfilment of solar/non-solar RPO as the case may be.</li> </ol> |
|           | <b>Energy Banking and Drawal</b>                      | <ol style="list-style-type: none"> <li>Banking charges shall be adjusted in kind @ 5% of the energy delivered at the point of drawal. The banking year shall be from April to March.</li> <li>Energy settlement shall be done on monthly basis.</li> <li>The unutilized banked energy shall be considered as deemed purchase by Discoms at 75% of the Average Pooled Power Purchase Cost as determined by the APERC for the applicable year. The payment for the deemed purchase of un-utilized banked energy shall be capped to 10% of the total banked energy during the applicable year.</li> </ol>   |
|           | <b>Energy Storage</b>                                 | <ol style="list-style-type: none"> <li>Any Energy storage technologies like Mechanical, Chemical, Compressed Air, Hydrogen, Pumped Storage, etc may be added to the hybrid project <ul style="list-style-type: none"> <li>to reduce the variability of output power from wind solar hybrid plant;</li> <li>providing higher energy output for a given capacity (bid/ sanctioned capacity) at delivery point, by installing additional capacity of wind and solar power in a wind solar hybrid plant; and</li> <li>ensuring availability of firm power for a particular period.</li> </ul> </li> <li>Bidding factors for wind solar hybrid plants with storage may include minimum firm power output throughout the day or for defined hours during the day, extent of variability allowed in output power, unit price of electricity, etc.</li> </ol>  |
| <b>5.</b> | <b>Round The Clock Power</b>                          | <p>The projects for delivery of power Round The Clock (RTC) by adopting Wind-Solar Hybrid Projects with</p> <ul style="list-style-type: none"> <li>Energy Storage Systems</li> <li>Bundling with Clean Resources like Gas,</li> </ul>  |

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|     |   | <ul style="list-style-type: none"> <li>Flexibility by balancing with power generated by APGENCO or Independent Power Producers (IPPs), will be given priority for off taking of power by APDISCOMs or APGENCO, PE connectivity by APTRANSCO and issuing various clearances and facilities including "MUST RUN STATUS"</li> <li>For Round The Clock (RTC) power by Wind-Solar Hybrid projects, at least 51% of the energy requirement should be from the Renewable Energy projects (Solar/Wind).</li> </ul>  |
| 6.  | <b>Incentives</b>                                     | <ol style="list-style-type: none"> <li>The Government intends to promote wind turbine and solar manufacturing facilities that can contribute towards wind and solar sector development in the State and create employment opportunities.</li> <li>In case of utilization of power for captive use or third party sale, preference will be given for extending energy banking facility based on feasibility and prior approval of APTRANSCO/APDISCOMs.</li> <li>Transmission and Distribution charges shall be exempted upto 50% of the applicable charges for wheeling of power generated from new Wind-Solar Hybrid Power Projects within the State.</li> <li>There will be no transmission charges for connectivity to the nearest Central Transmission Utility (CTU) via State Transmission Utility (STU) network for inter-state wheeling of power subject to the consent of APERC.</li> <li>The unutilized banked energy shall be considered as deemed purchase by Discoms at 75% of the Average Pooled Power Purchase Cost as determined by the APERC for the applicable year.</li> <li>Energy settlement shall be done on monthly basis. The payment for the deemed purchase of un-utilized banked energy shall be capped to 10% of the total banked energy during the applicable year.</li> </ol> |
| 7.  | <b>Electricity Duty</b>                               | 50% of applicable Electricity duty shall be exempted for captive consumption, sale to DISCOMs and third party sale provided the source of power is from wind - solar hybrid power projects set up within the State.   |
| 8.  | <b>Cross Subsidy Surcharge</b>                        | 50% of the Cross subsidy surcharge shall be paid for third party sale provided the source of power is from Wind- Solar Hybrid Power Projects setup within the State.  |
| 9.  | <b>Supervision charges</b>                            | Exempted  |
| 10. | <b>Deemed Public Private Partnership (PPP) Status</b> | Deemed PPP status shall be provided for projects coming up as wind-solar hybrid power projects as per this policy.  |
| 11. | <b>Non Agriculture Status</b>                         | Deemed Non-Agricultural (NA) status for the land where wind-solar hybrid power projects will be accorded, on payment of applicable statutory fees.  |
| 12. | <b>Pollution Clearance</b>                            | Exempted  |
| 13. | <b>Must run status</b>                                | All Wind- Solar hybrid power projects shall be treated as "MUST RUN" power plants and shall not be subjected to 'Merit Order Despatch (MOD) principles'   |
| 14. | <b>Nodal Agency</b>                                   | New and Renewable Energy Development Corporation of A.P. Ltd (NREDCAP)  |