RENEWABLE ENERGY

ENERGY CONSULTANCY

Renewable Energy Consultancy Services

Preparation of Detailed Project Report highlighting the feasibility of wind & Solar PV Projects

Feasibility of Repowering existing wind turbines with new generation energy efficient turbines

www.divinitasenergy.com

Divinitas

YOUR RELIABLE ENERGY PARTNER

Divinitas believe in realization of our customer's energy needs and offers taylor made comprehensive energy solutions and ensures ;

Optimal usage of energy at the works through comprehensive energy audits & implementation services.

A platform for sale & purchase of power at an attractive tariff.

Project Management Consultancy services-For establishing Renewable Power projects with higher ROI

Performance enhancement studies of Wind & Solar Power Plants.

Our unique ESCO Model ensures guaranteed energy savings to our customers without any upfront investment towards Energy Audit fee or implementation of energy savings proposals.

Divinitas Energy Consultancy's key offerings:

Comprehensive Energy Audit & Implementation

Energy Audit & Implementation at our cost under the unique ESCO Model

Turn key Renewable energy Solutions –Inclusive of Project Management Consultancy (PMC) services,

Performance enhancement studies of Wind & Solar Power Plants

Offer a platform for Sale & Purchase of Renewable Power under Open Access

Comprehensive Energy Audit

DIVINITAS ENERGY CONSULTANTS-Your Reliable Energy Partner:

Who we are?

DIVINITAS ENERGY CONSULTANTS is a top notch energy consultancy firm promoted by a team of professionals with a collective 30+ Years of experience in Renewable energy sector. The core team of DIVINITAS possesses a collective experience and expertise of executing 4000+MW Renewable Power Projects(Wind & Solar) and 100Energy Audit assignments.

Who we are?

DIVINITAS offers comprehensive energy solution ranging from Design, Supply, Installation & commis -sioning of Renewable energy projects & Energy Efficiency optimisation studies.

Key services offered by DIVINITAS includes

DIVINITAS offers comprehensive energy solution ranging from Design, Supply, Installation & commis -sioning of Renewable energy projects & Energy Efficiency optimisation studies.

- RENEWABLE POWER PROJECT MANAGEMENT CONSULTANCY(PMC)
- PREPARATION & SUBMISSION OF WIND & SOLAR POWER PROJECT VIABILITY STUDY REPORTS & BANKABLE PROPOSALS
- DEVELOPMENT OF WIND & SOLAR PARKS WITH POWER EVACUATION FEASABILITY
- DESIGN, SUPPLY INSTALLATION & COMMISSIONING OF WIND & SOLAR POWER PROJECTS ON A TURNKEY BASIS
- TECHNICA CONDITIONAL ASSESMENT OF WIND TURBINES & PERFORMANCE EVALUATION OF SOLAR PARKS USING DRONES
- OFFER A PLATFORM TO C&I SECTOR AND TO IPPS - FOR SALE & PURCHASE OF RENEWABLE POWER
- PERMITS & APPROVALS FROM DISCOMS, CEIG FOR PROJECTS UNDER OPEN ACCESS AS WELL PTCC APPROVALS FOR SECI PROJECTS

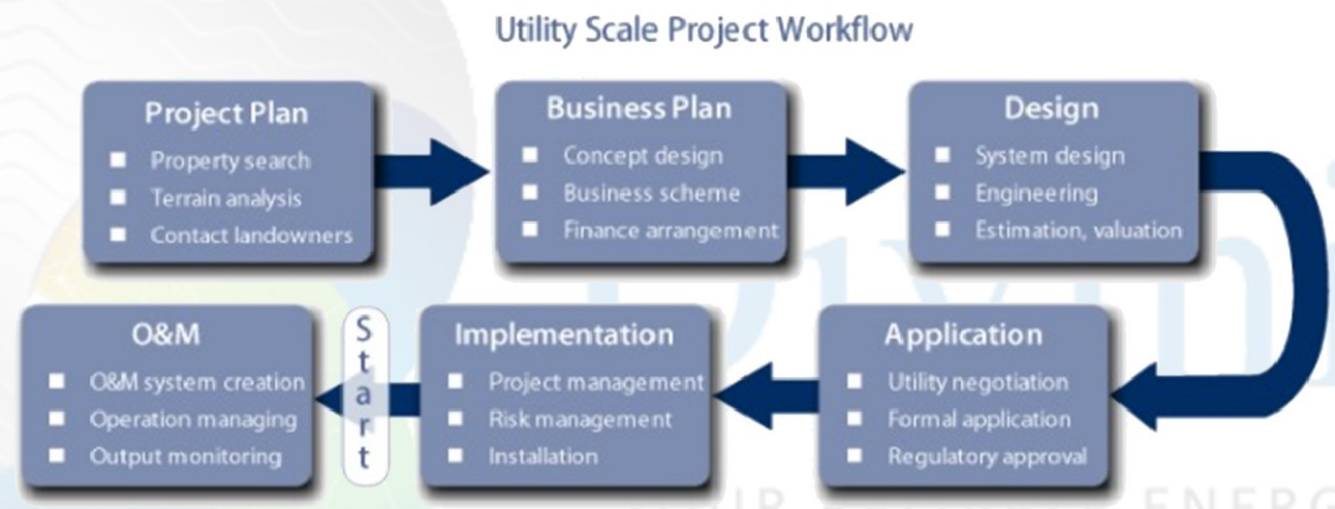
RENEWABLE POWER PROJECT MANAGEMENT CONSULTANCY(PMC) SERVICES

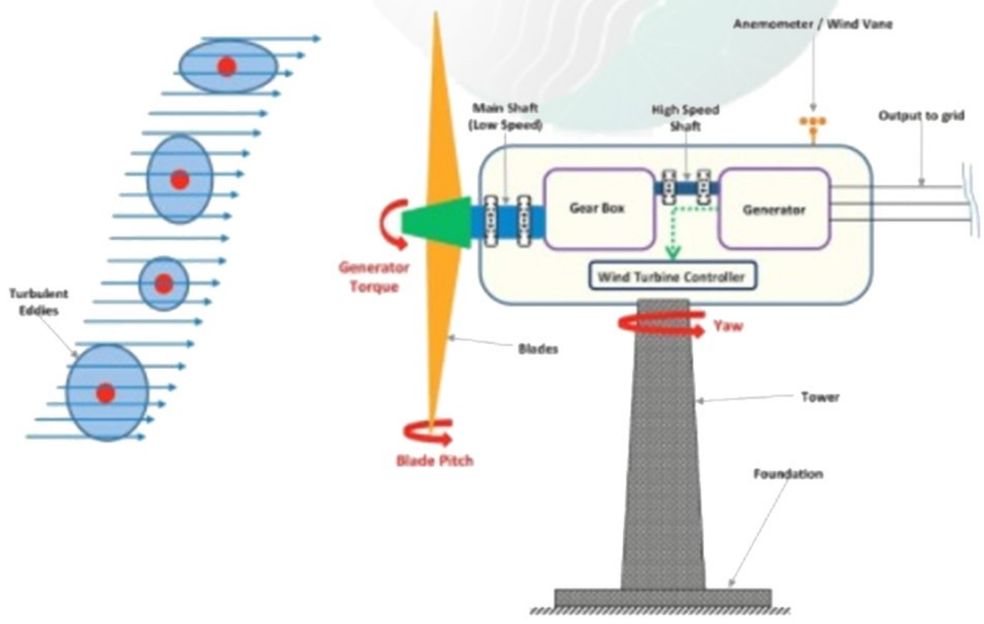
Divinitas Energy Consultants is a top-notch Renewable energy consultancy firm promoted by a team of professionals with a collective experience of more than 50 years in Design and construction of Renewable Energy projects.

The core team of DIVINITAS has an experience of executing more than 4500 MW of renewable energy projects (Wind & Solar).

We offer Renewable Power Project Management Consultancy services (PMC)services and broadly cover the following core areas:

- Pre-Feasibility Advisory Services
- Site selection, Micro sitting, WRA & Solar Resource assessment
- Selection of suitable Wind Turbines for the project
- Design & Detailed Engineering Services (Civil, Mechanical, Structural & Electrical equipment)
- Design of Pooling Sub-Stations &EHV Transmission lines
- Feasibility of Re-Powering old turbines with New generation Energy efficient wind turbines
- Engineering Procurement Construction Management services (EPCM)
- Request for Proposal (RFP)/Tender Document preparation &Review





BROADER SCOPE

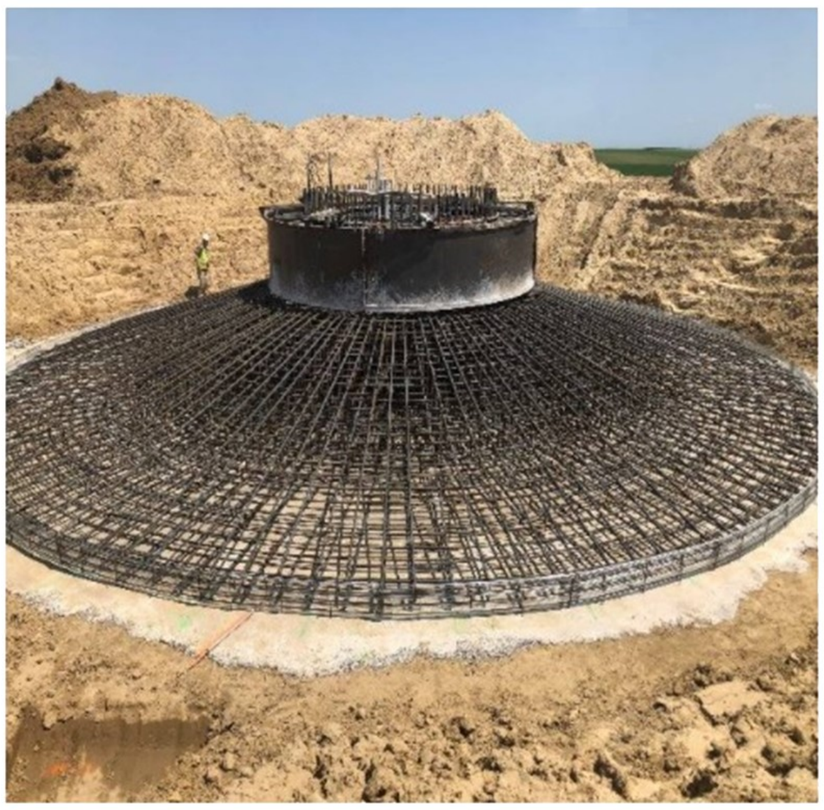
- Pre-Feasibility Advisory Services Site selection, Micro sitting, WRA assessment
- Selection of suitable Wind Turbines for the project
- Design & Detailed Engineering Services (Civil, Mechanical, Structural & Electrical equipment)
- Design of Pooling Sub-Stations &EHV Transmission lines
- Feasibility of Re-Powering old turbines with New generation Energy efficient wind turbines
- Engineering Procurement Construction Management services (EPCM)
- Request for Proposal (RFP)/Tender

WIND POWER -ENERGY YIELD ASSESMENT

- Wind Resource analysis & selection of wind turbine based on the Wind class at the site
- Metrological data analysis
- Uncertainty Analysis-P50, P75 and P90 production forecasts.
- Micro siting of wind turbine locations Internal and Peripheral Road Cross Section.

CIVIL & INFRASTRUCTURE DESIGN

- Wind Turbine Foundation and Construction drawings MCR and Switchyard Equipment/Pooling SS Layout,
- LT, HT and Communication Cable Sizing Calculations
- LT, HT and Communication Cable Schedule Auxiliary Single Line Diagram for Inverter, MCR and Switchyard
- Auxiliary Trafo, Battery and UPS Sizing Calculation
- MCR, Switchyard, Transformer Yard Earthing Calculation, Route map & Design of EHV Line



PROJECT MANAGEMENT CONSULTANCY SERVICES - SOLAR

- Site Survey - Detailed assessment of site solar energy resource and energy yield prediction
- Collection, verification and evaluation of solar radiation resource data and local meteorological data .
- Energy yield estimation based on analysis of direct and diffuse solar radiation, seasonal and daily characteristic, load factor.
- Site Survey - Detailed assessment of site solar energy resource and energy yield prediction.
- Energy yield estimation based on direct and diffuse solar radiation, seasonal and daily characteristic.
- Wind load analysis of structure and determination of optimal tilt angle.
- Submission of preliminary Feasibility Report

DETAILED ENGINEERING, PROCUREMENT & CONSTRUCTION

Detailed engineering consisting of Solar energy simulation /Module array layouts/Transmission layouts/Foundation drgs/

Submission of BOM & Layouts and DC/AC Drawings, MMS Design Inclusive of STADDPRO Report / PV Syst Report / Helioscope Report

Preliminary layout of the grid connected solar plant as per MNRE specifications including all civil, structural, electrical & all related works.

Technology &Vendor selection, Submission of detailed Bill of materials for the entire project with cost/Make/Specifications

LAND & POWER EVACUATION INFRASTRUCTURE

- Identification of Potential land parcels with Power evacuation feasibility Co-ordination for aggregation of land .
- Co-ordination with the concerned to obtain Load flow flow /Power evacuation approval 33KV/110KV Transmission line survey, HT Yard ,33KV Transmission Line design.
- Coordination for obtaining NOC/commissioning clearance from the DISCOM Co-ordination for obtaining safety certificate from CEIG
- Preparation of RFP documents with technical specifications, standard bill of materials (BOM)

Our Renewable energy team is all equipped to offer its clients total solutions pertaining to their Renewable energy requirement that includes :

PLATFORM FOR PURCHASE OF POWER

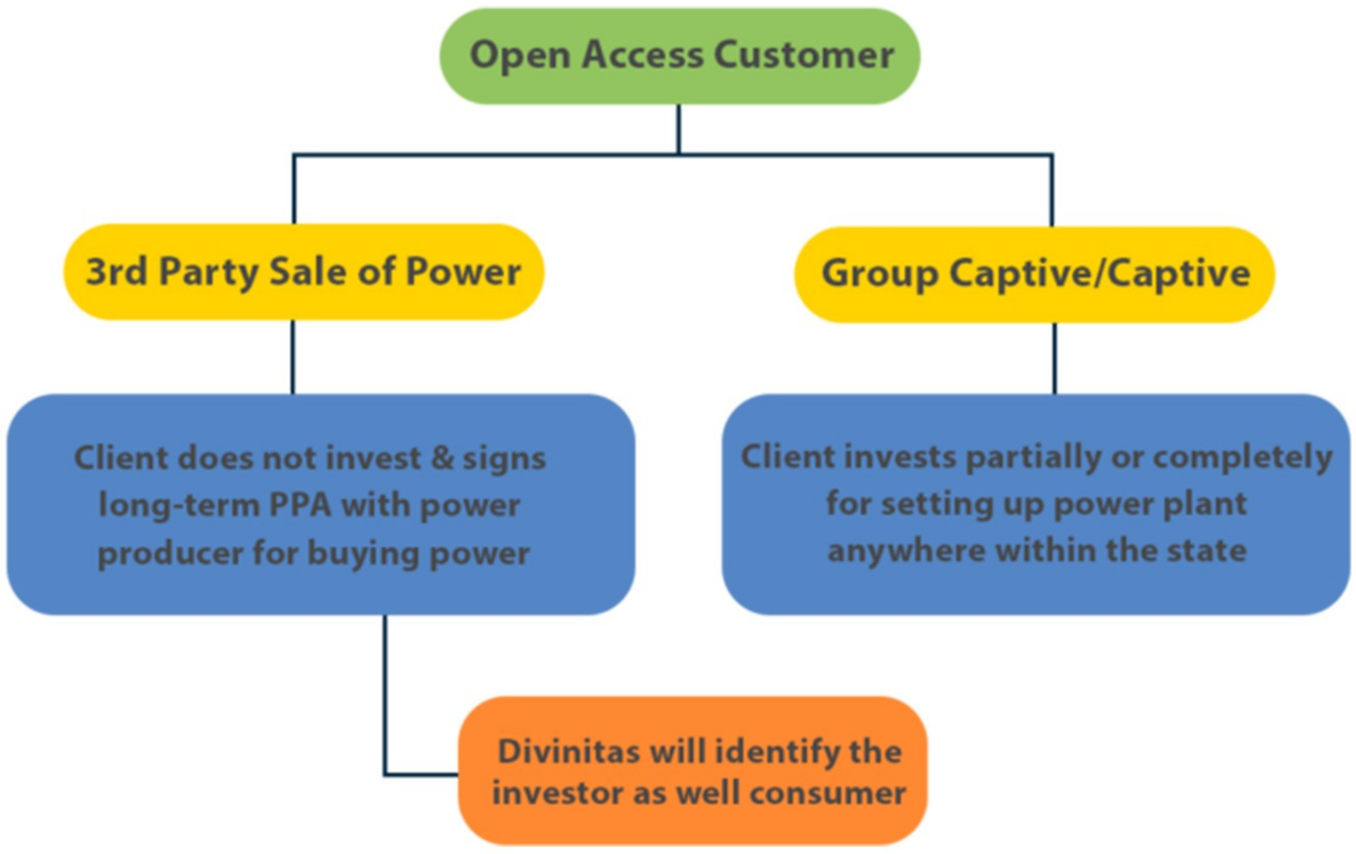
DIVINITAS ENERGY CONSULTANTS is the authorised channel partner of many leading Independent Power Producers (IPPs) and cater to the Green Power requirement of C&I segment from the Wind &Solar power plants installed by the IPPs across the country.

We at DIVITAS offer an exclusive platform and facilitate in purchase of power from multiple sources of energy viz. Wind, Solar or Thermal energy at a tariff lower than the prevailing DISCOM Tariff.

We are well connected with many leading Independent Power Producers, HNI and can act as a conduit to ensure procurement of power at a lower tariff under group captive or 3rd party sale of power mode. We also extend our support in liasioning with DISCOM for execution of PPAs.

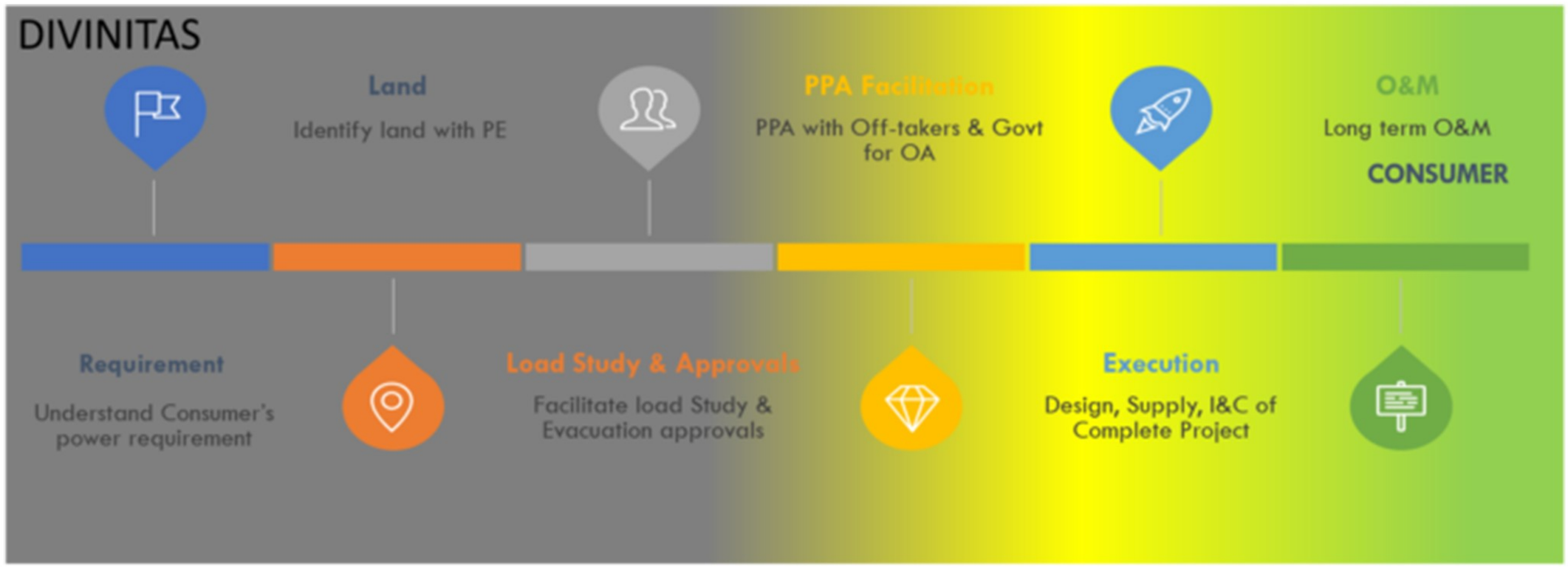
DIVINITAS ENERGY CONSULTANTS is the authorised channel partner of many leading Independent Power Producers (IPPs) and cater to the Green Power requirement of C&I segment from the Wind &Solar power plants installed by the IPPs across the country

PURCHASE OF POWER UNDER CAPTIVE, GROUP CAPTIVE AND THIRD PARTY SALES OF POWER MODE



SALES AND PURCHASE OF SOLAR POWER UNDER OPEN ACCESS

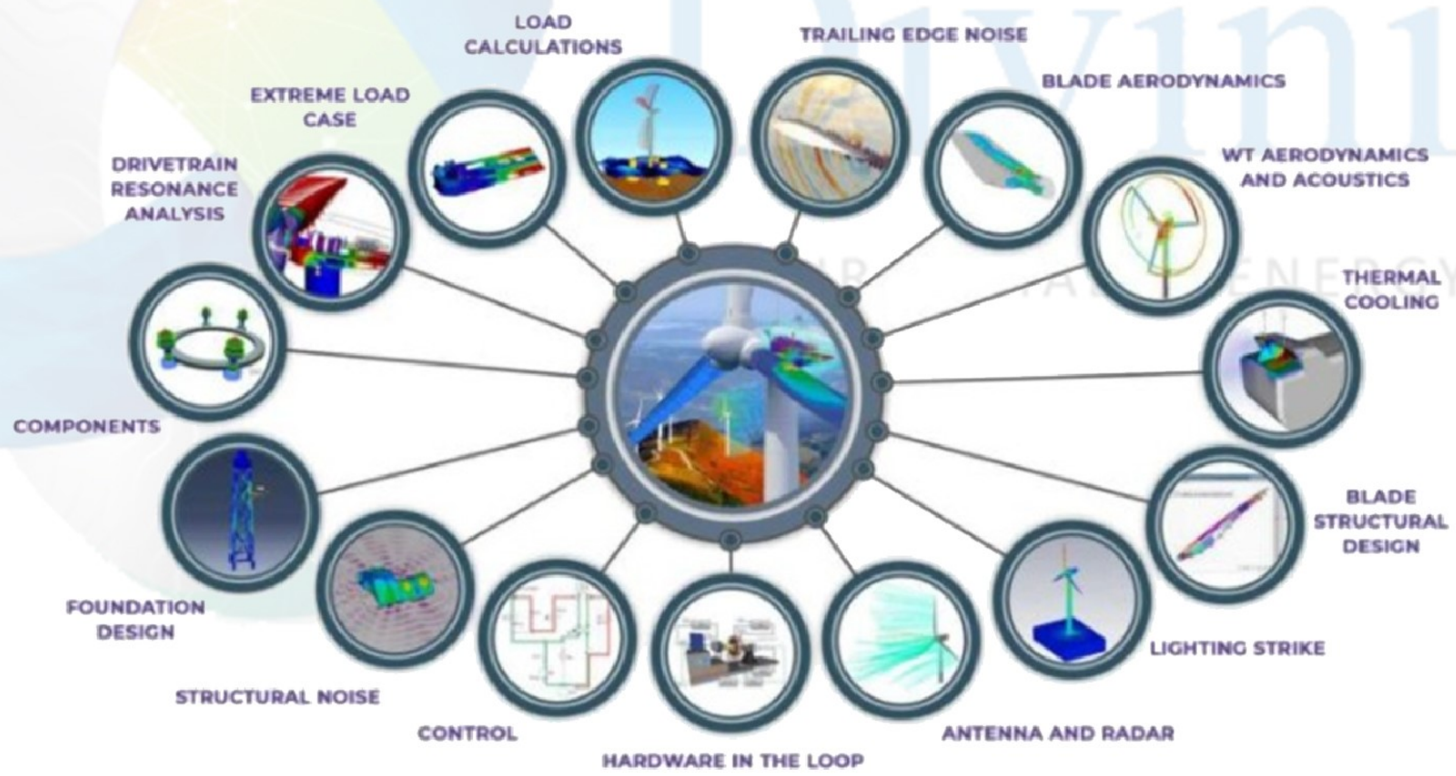
Divinitas will identify the potential investor and solar power off taker. Divinitas apart from offering EPC services will also facilitate with all the stake holders for executing energy wheeling agreement with the DISCOM.

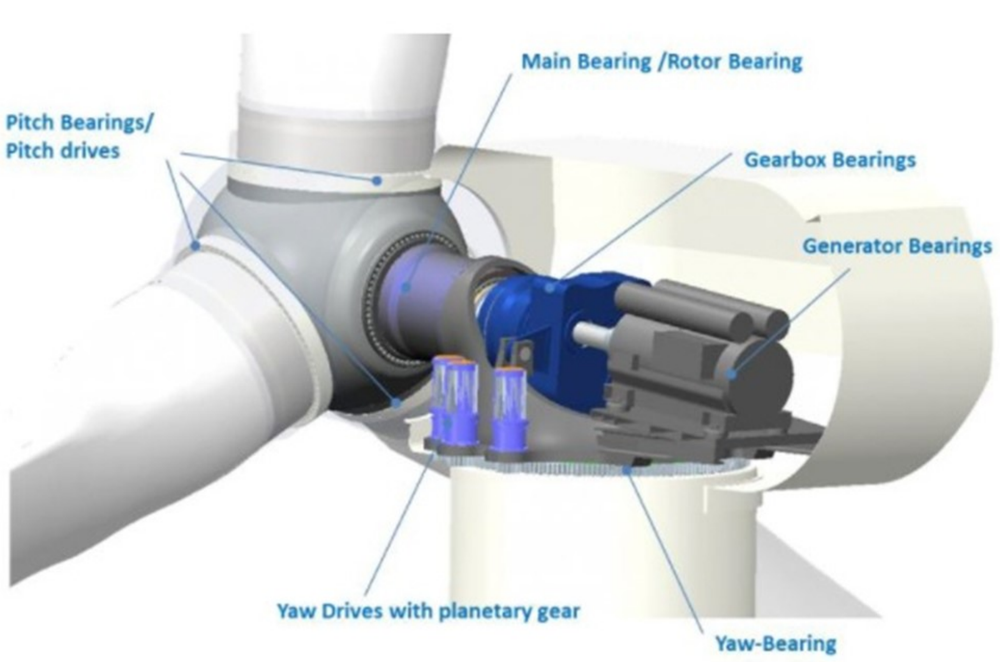


WIND & SOLAR POWER PLANT MONITORING SERVICES

TECHNICAL CONDITIONAL ASSESMENT OF WIND TURBINES

We at Divinitas Energy Consultants offer our wind turbine consultancy services of Multi Make/Model and rating Wind Turbine Generators (WTG) ranging from 230KW to 2.10MW Turbines.

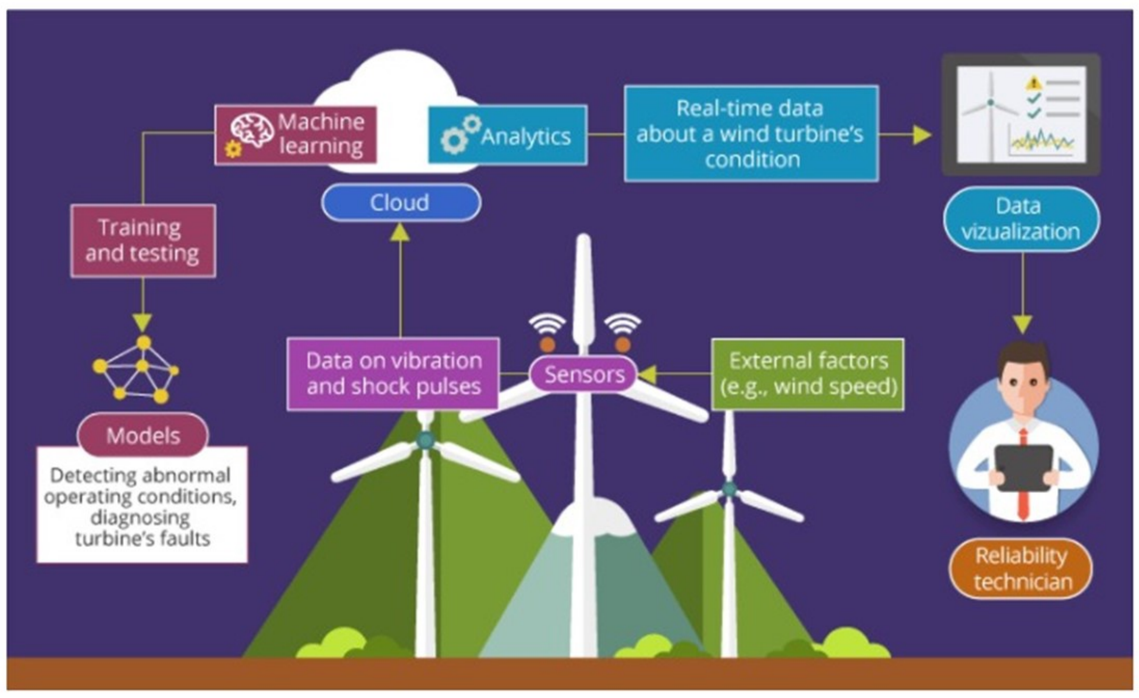




- Gear Box Inspection -Endoscopy study
- Vibration analysis, Condition Monitoring
- Blade Inspection using Drones Thermography study of Generator, Control Panels, Power Factor panels Ultrasonic Inspection of Pitch ,Yaw and Main bearings
- Pitch & Yaw alignment and possibilities for fine tuning the alignments
- Analysis of Historical Wind power generation, Turbine availability &Grid availability data
- Critical analysis of historical Break down records of Individual Turbines
- Pitch & Yaw alignment and possibilities for fine tuning the alignments
- Visual Inspection of Turbine and its components

WTG on-site Services

- WTG Annual maintenance (AMC, AOMC, COAMC etc.)
- Gearbox/Generator rection/de-erection
- Rotor erection/de-erection Blade retrofit work
- Transformer oil filtration and service
- Power curve analysis, SCADA installation
- Data Analytics for Wind-farm performance
- Wind turbine generation forecasting
- Civil works (Survey of Land, Painting for structures, control room etc.)



PERFORMANCE EVALUATION OF SOLAR POWER PLANTS

DIVINITAS ENERGY CONSULTANTS has tied up Vyom Energy Ltd,UK providing Aerial Surveys, Thermal (InfraRed) and Visual Inspections of large Solar Power Plants, Power Transmission / Distribution Towers, Chimney stack metal thickness Measurement using NDT UT probe and Stockpile Calculations using industry's recent technologies in IR and RGB cameras and multirotor Drones.
Apart from the above services, we also provides IV Curve Testing, Insulation Testing & Ground Bonding tests.

Detailed inspection of Modules using Drones fitted with Higher resolution Infrared Cameras to ascertain the following:

- Damage to glass , Panel Insulation
- Bubbles/ Moisture Intrusion, Metallic Frame Corrosions, Hotspots, Cell/Multi-cell failure
- Defective/ damaged bypass diode
- Module mismatch ,Partial Shading
- Dirt/Droppings , Interconnection faults
- Junction Box and String Combiner Box Failures, Damaged or loose fuse, circuit breaker, or switching elements
- Damaged or loose fuse, circuit breaker, or switching elements
- PID (Potential Induced Degradation

IV Curve testing-To ascertain the following:

- To assess quality of installation and power performance of PV modules/strings
- Shape of I-V curve of modules/strings are used to analyze the root cause of underperformance
- Estimation of Inverter efficiency, over all system losses
- PV Syst Simulation at site conditions
- Assessment of existing O&M Practices, Monitoring system in place

Comprehensive Energy Audit-Methodology

We at DIVINITAS adopt multipronged methodology which are conducted in phases as mentioned below

I.Pre-Audit Phase

- Familiarization of process & Plant activities • Firsthand observation of plant activities and practices
- Macro data collection • Resource mobilization -Instruments & Energy Audit team

II.Audit Phase

- Collection of historical energy consumption, Process flow & Utility diagrams
- Carry out system/equipment specific trials, surveys with specific objectives

Key Focus Areas during detailed Energy Audit

Electrical Distribution System:

Maximum demand control, PF Improvement, Harmonic study, estimation of line losses.

Electric Motors:

Study of electric motors to identify grossly underloaded motors for possible replacement & improved controls, possibility for retrofitting with energy efficient motors.

Rotary Equipment:

Detailed study with a view to optimise flow, pressure, design modification to reduce losses, appropriate impeller sizing and reduction of throttling losses, feasibility for employing VFDs.

Compressed Air System:

Brief study with an objective to optimise air pressure, cut leakages, improve efficiency, usage of energy efficient air dryers and rise in compressor control practices and selection of energy efficient compressors.

Lighting:

Inflation of illuminance in work area & feeder voltage, usage of high efficacy lamps, gears and lucent.

Boilers & Steam Distribution Systems:

Inflation of excess combustion Air, better instrumentation & control, heat recovery, reduction in heat loss.

Heat exchangers& Dryers:

Identification of fouled heat exchanger, reduce demand for utilities like steam, chilled water& brine.
Recycling waste heat & employing new design &technologies.

Phase III: Identification & Development of Energy conservation proposals

During this phase, we consolidate all the survey results, ideas conceived and after lot of brain storming start constructing specific energy conservation proposals based on technical & commercial feasibility

Phase IV: Report Submission and presentation to the top management

We present the documented comprehensive energy audit report to the top management and highlight the key findings. We always make it a point to the top management to form an exclusive team for imple menting the identified energy savings proposals and insist upon a representative from the top manage ment to be part of the implementation team.

V.Post Audit Phase- Implementation & Follow up

During this phase ,we co-ordinate with our clients to ensure implementation of energy audit proposals and focus on the following :

- Devise the schedule and prioritise the identified energy savings opportunities for implementation.

Extend technical support during implementation which includes identification of suitable technological partners in the event of any retrofitting or design modifications. Follow-up visits at regular intervals for reviewing the progress of implementation and the actual energy savings realised by our clients on implementation.

Performance Monitoring of key equipment and systems

Divinitas's Monitoring division offers the below mentioned services which the industries need it on a regular basis

HUMIDIFICATION PLANT PERFORMANCE OPTIMISATION

Major Coverage of our exclusive HVAC System study are:

Heat load estimation and supply of optimal quantity of supply air, return air so as to maintain desired %RH & no of air changes.

- Estimation of static pressure drop, efficiency across the air washer, supply air, return air systems and to suggest measurers to minimise the losses and thereby effect significant power savings.
- Possibilities for Automation and installation of Variable Frequency drives.

HARMONIC STUDY

We carry out Harmonic studies to determine harmonic distortion levels and filtering requirements within a facility and to determine if harmonic voltages and currents are at acceptable levels and the main objectives of the study are :

- Avoid damage due to excessive harmonic currents in transformers and capacitor banks.
- Ensure electronic equipment do not malfunction due to excessive harmonic voltage distortion.
- Satisfy the utility's voltage and current harmonic distortion requirements.

COMPRESSED AIR SYSTEM STUDY

DIVINITAS conduct a detailed energy assessment of the compressed air system for energy efficiency opportunities and the key focus areas of the study are:

- Estimation of efficiency and air leakage in the system
- Minimization of pressure drop across the distribution system and ensure proper pipe sizing
- Option for maximizing allowable pressure dew point at air intake and reduction of air inlet temperature
- Feasibility for installation of VFDs

THERMOGRAPHY STUDY

Divinitas carry out Harmonic studies to determine harmonic distortion levels and filtering requirements within a facility and to determine if harmonic voltages and currents are at acceptable levels.

The main objectives of the study are :

- Avoid damage due to excessive harmonic currents in transformers and capacitor banks.
- Ensure electronic equipment do not malfunction due to excessive harmonic voltage distortion.
- Satisfy the utility's voltage and current harmonic distortion requirements

CONTACT US

FLAT NO : 4B, BLOCK NO : 2,
CEEBROS ORCHID APTS,
VELACHERY MAIN ROAD,
CHENNAI, TAMIL NADU – 600042

+91 - 9842022539

csb@divinitasenergy.com

WWW.DIVINITASENERGY.COM