

Louisiana Offshore Wind Energy



W.E.S.T.

Wind Energy Systems Technologies, LLC

New Iberia, Louisiana, USA

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W.E.S.T.

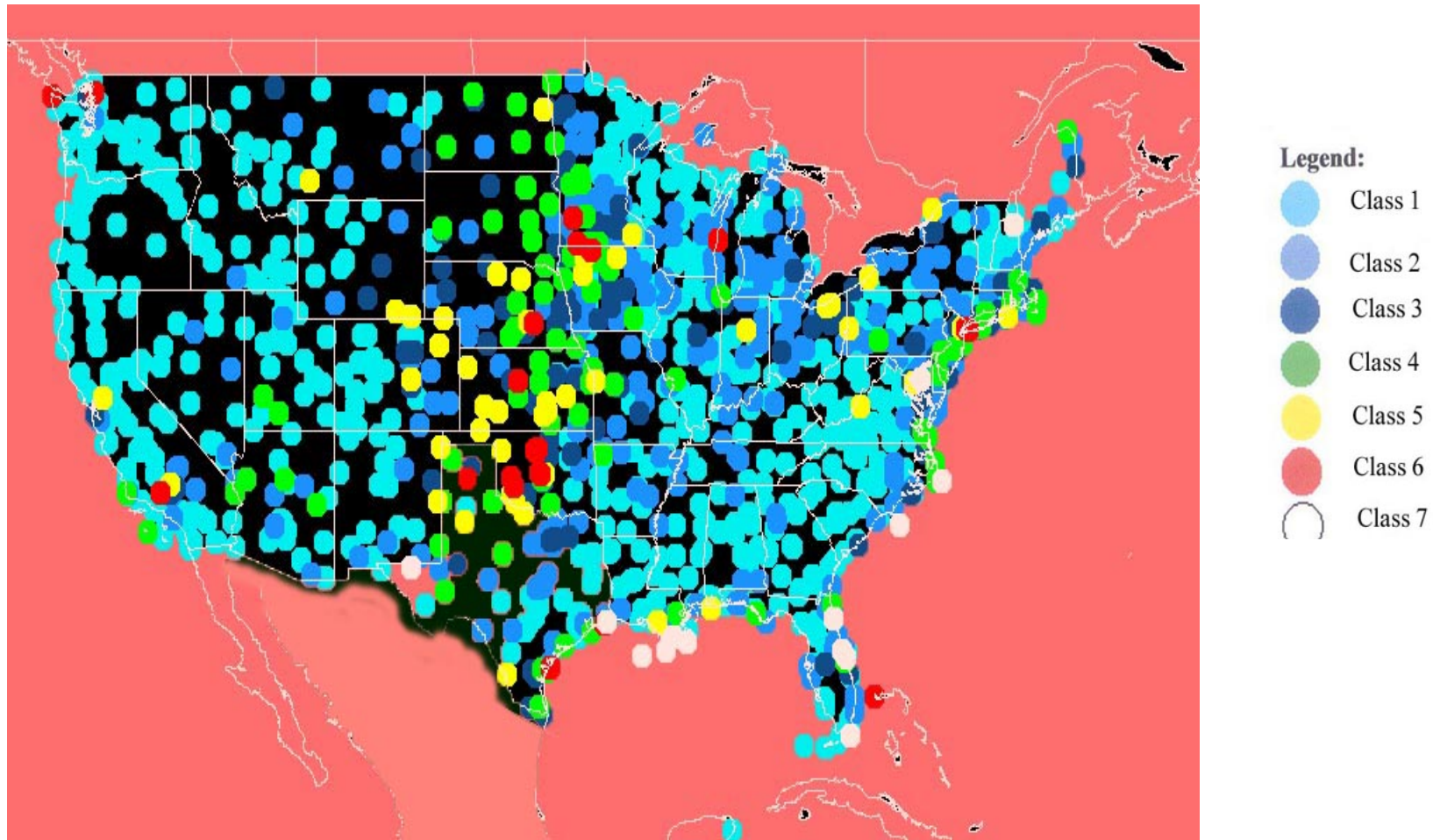
Wind

- Mankind has harvested the wind for at least 5,000 years.
- Wind has been responsible for the development of our world in many aspects. The migration of the human race, trade, culture, and world exploration are but a few.
- Wind is predictable.
- Wind is environmentally friendly.
- Wind is a renewable energy source.
- Wind can be converted into electrical energy efficiently.
- Wind is found world wide onshore and offshore.

Offshore Wind Farm



Louisiana Offshore Wind Asset



Illustrations of Onshore and Offshore Wind Velocities

Louisiana has Class 7 winds offshore and the highest wind capacities in United States waters. Class 7 winds = 9.4 meters per second

World Wind Energy Being Produced and Projections

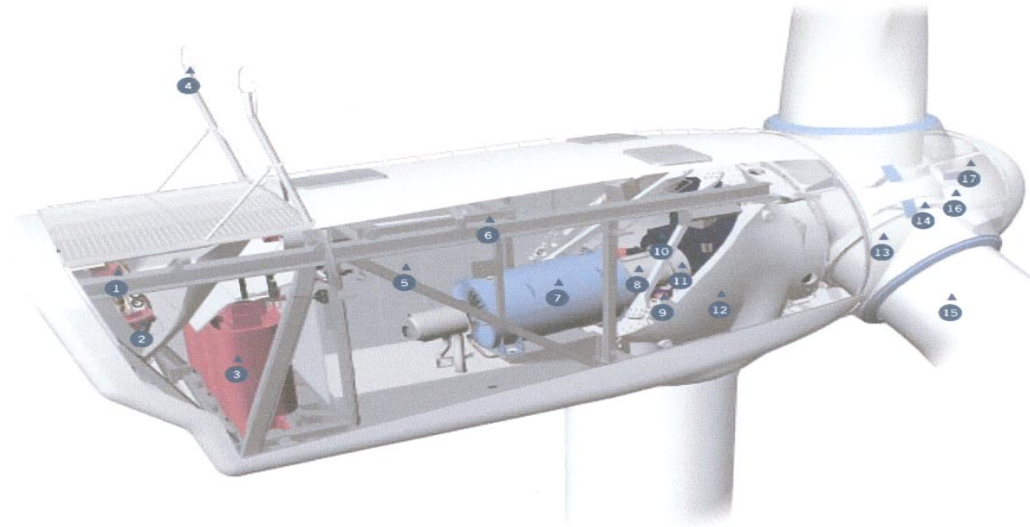
	Year 2004	Year 2020
Offshore (World)	15,120 MW	70,000 MW
United States (Offshore)	Zero	N/A

United States falls short of offshore wind power development compared to world activity



Method of Wind Energy Conversion

Wind can be converted directly to electrical power via wind turbines.

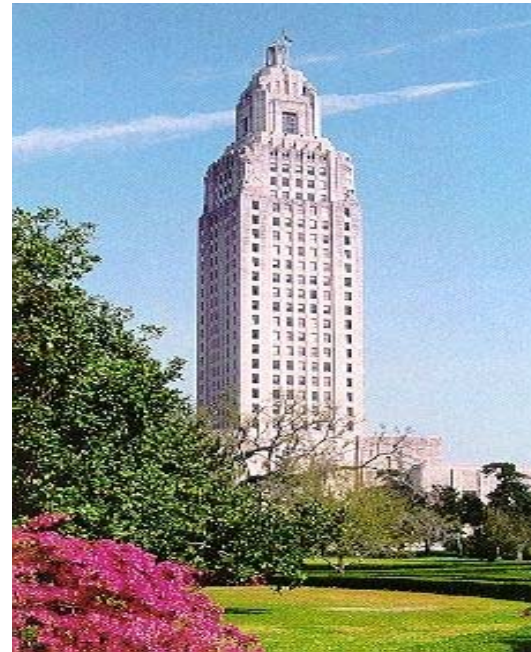
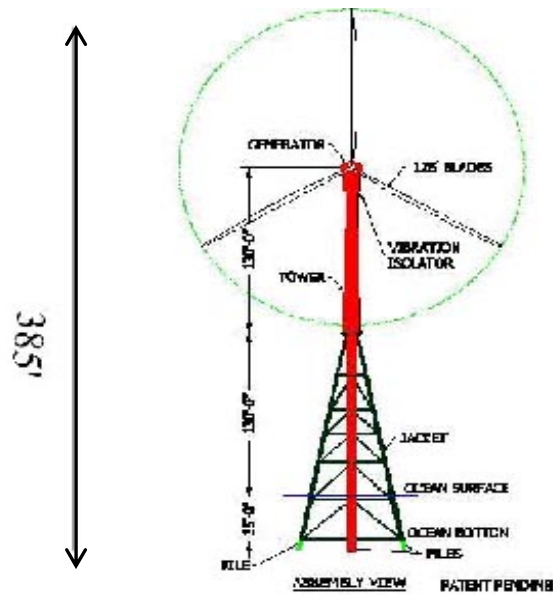


- | | | | |
|-------------------------------------|----------------------------|-----------------------|-------------------|
| 1 Oil cooler | 6 Service crane | 11 Parking brake | 16 Pitch cylinder |
| 2 Generator cooler | 7 Variable speed generator | 12 Machine foundation | 17 Hub controller |
| 3 Transformer | 8 Composite disc coupling | 13 Blade bearing | |
| 4 Ultrasonic wind sensors | 9 Yaw gears | 14 Blade hub | |
| 5 VMP-Top controller with converter | 10 Gearbox | 15 Blade | |

Typical detail of 3.0 MW wind turbine

Electrical power is generated by the rotation of blades due to the wind velocity.

Relative Size of Modern Wind Tower System



3.0 MW unit mounted onto support tower

Louisiana State Capital Building



Advantages of Offshore Wind Power

- Visual intrusiveness and noise are minor issues.
- Wind patterns are more uniform at sea than on land.
- Wind speed offshore are higher than onshore.
- Space is not an issue offshore.
- Costly onshore locations are not an issue offshore.

World Offshore Projects (Planned or Under Construction)

Country	Power Capacity
Belgium	644 MW
Denmark	649 MW
Finland	240 MW
France	100 MW
★ Germany	6.5 GW
Ireland	2 GW
Netherlands	219 MW
Poland	183 MW
Spain	250 MW
Sweden	114 MW
United Kingdom	2 GW
Total Europe	14 GW
Projects rest of world	1120 MW

At present the United States does not have any offshore wind farms

Louisiana Oil and Gas Offshore Infrastructure

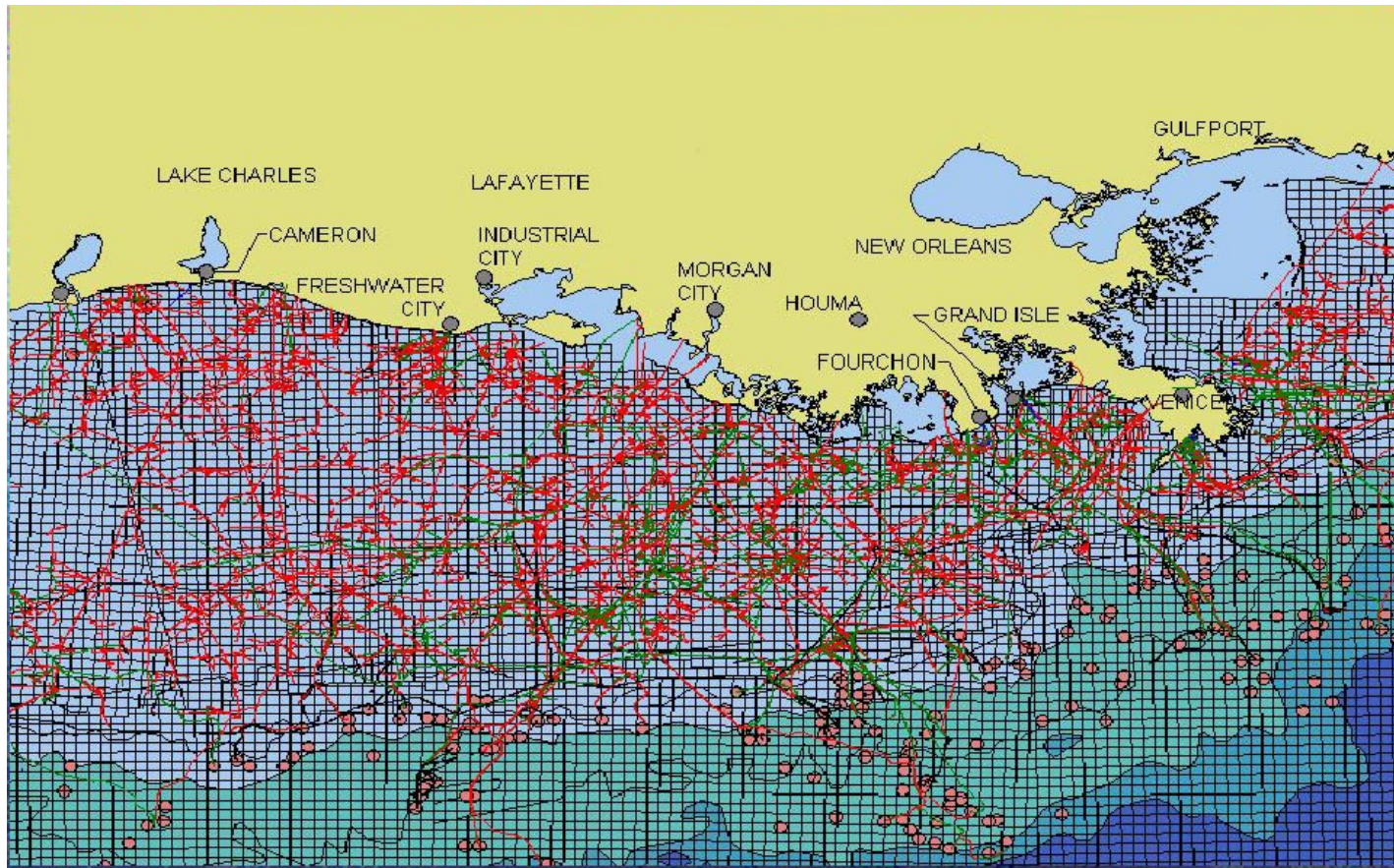


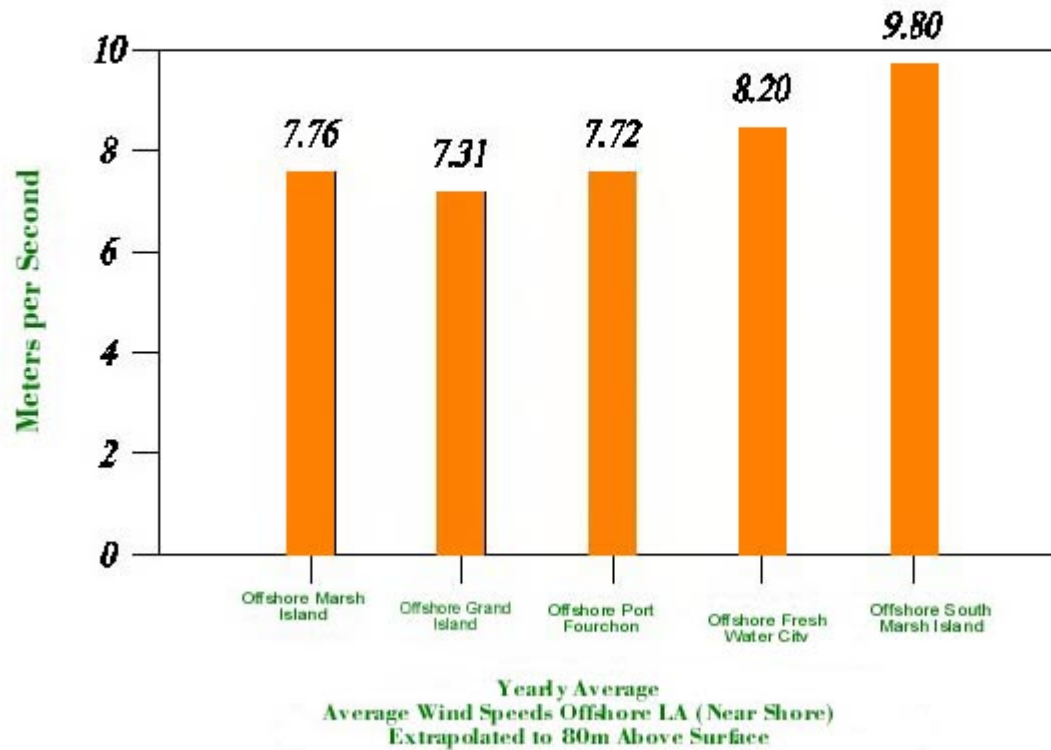
Illustration of platforms and pipelines

5,200 Platforms

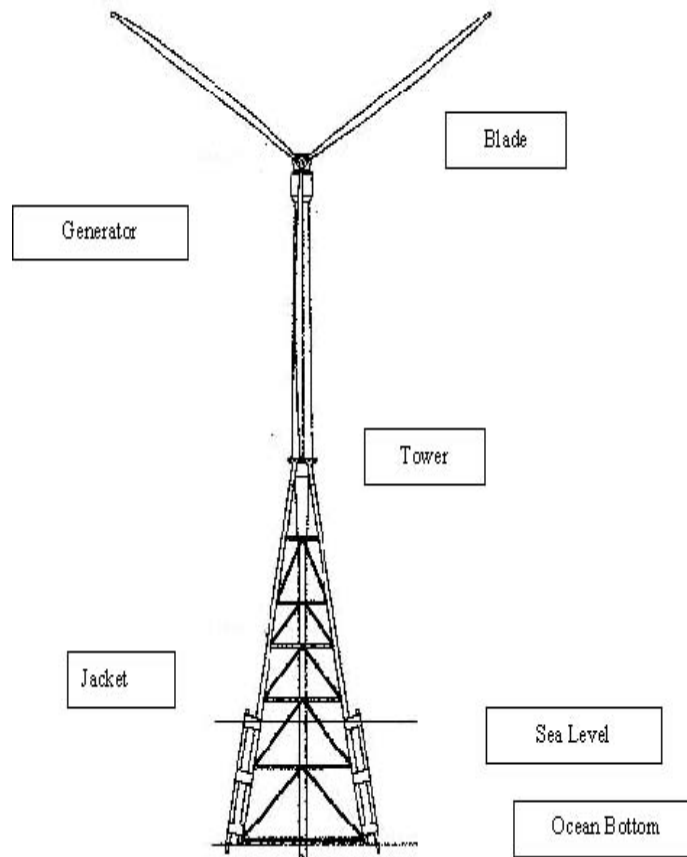
37,500 Producing Oil & Gas Wells

W.E.S.T.

Specific Louisiana Offshore Wind Velocities

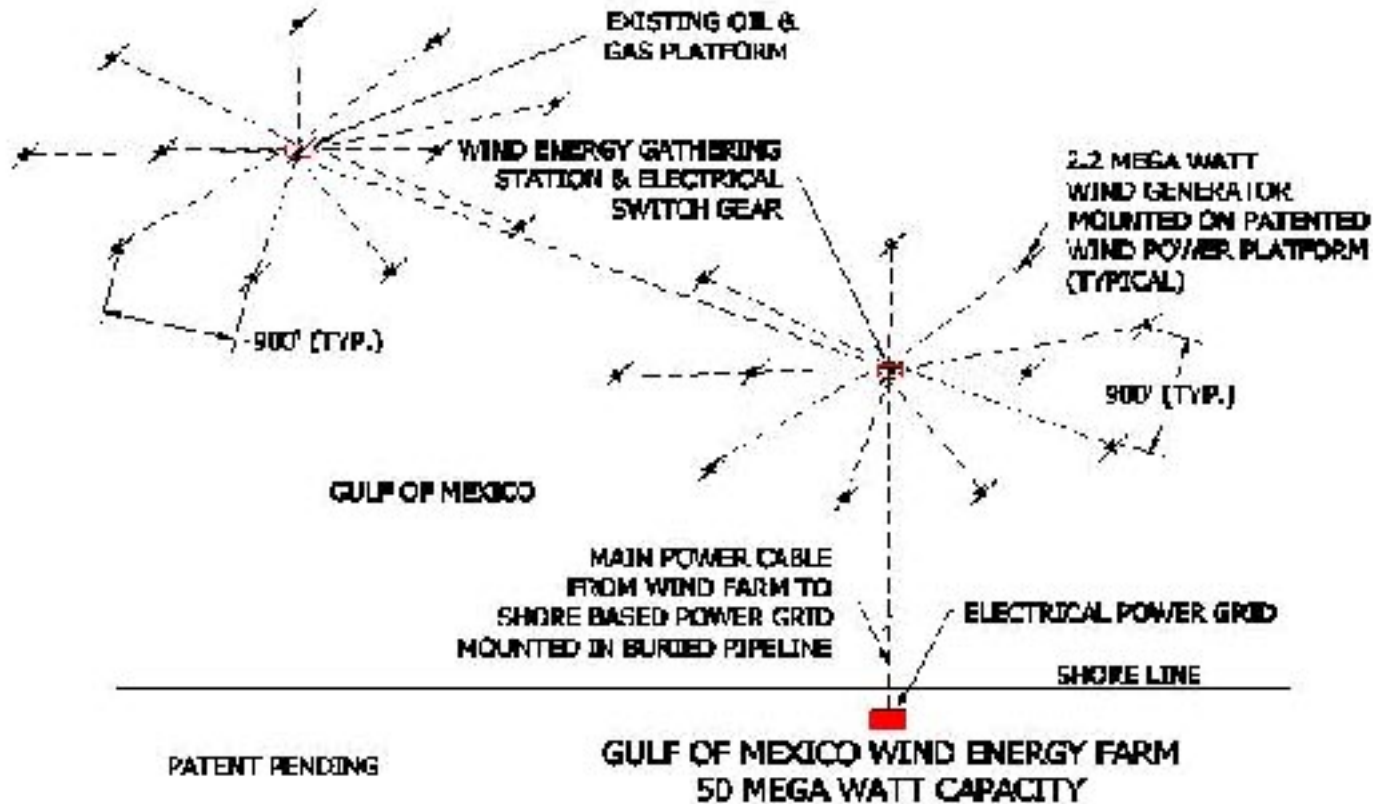


Conversion of Oil and Gas Platform for Wind Turbine Foundation



W.E.S.T. Offshore Wind Farm

50 MW Power Capacity



W.E.S.T., LLC Wind Farm Sanctuaries

The following areas are being requested by W.E.S.T., LLC for the installation of wind farms in Louisiana State waters.

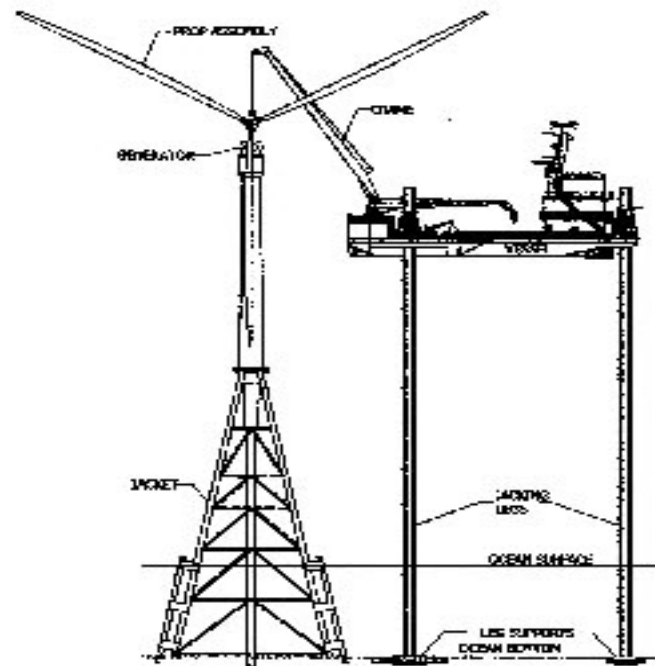
Area	Zone
1	Burns Point Area
2	South Marsh Island Area
3	Vermilion Area
4	West Cameron Area
5	South Timbalier Area
6	Bay Marchand Area
7	Port Fourchon Area
8	Grand Island Area
9	West Delta Area
10	Brenton Sound Area
11	Chandelier Island Area

Louisiana Asset Regarding Labor, Equipment and Construction Power

Louisiana has the infrastructure to support the offshore wind industry in place.

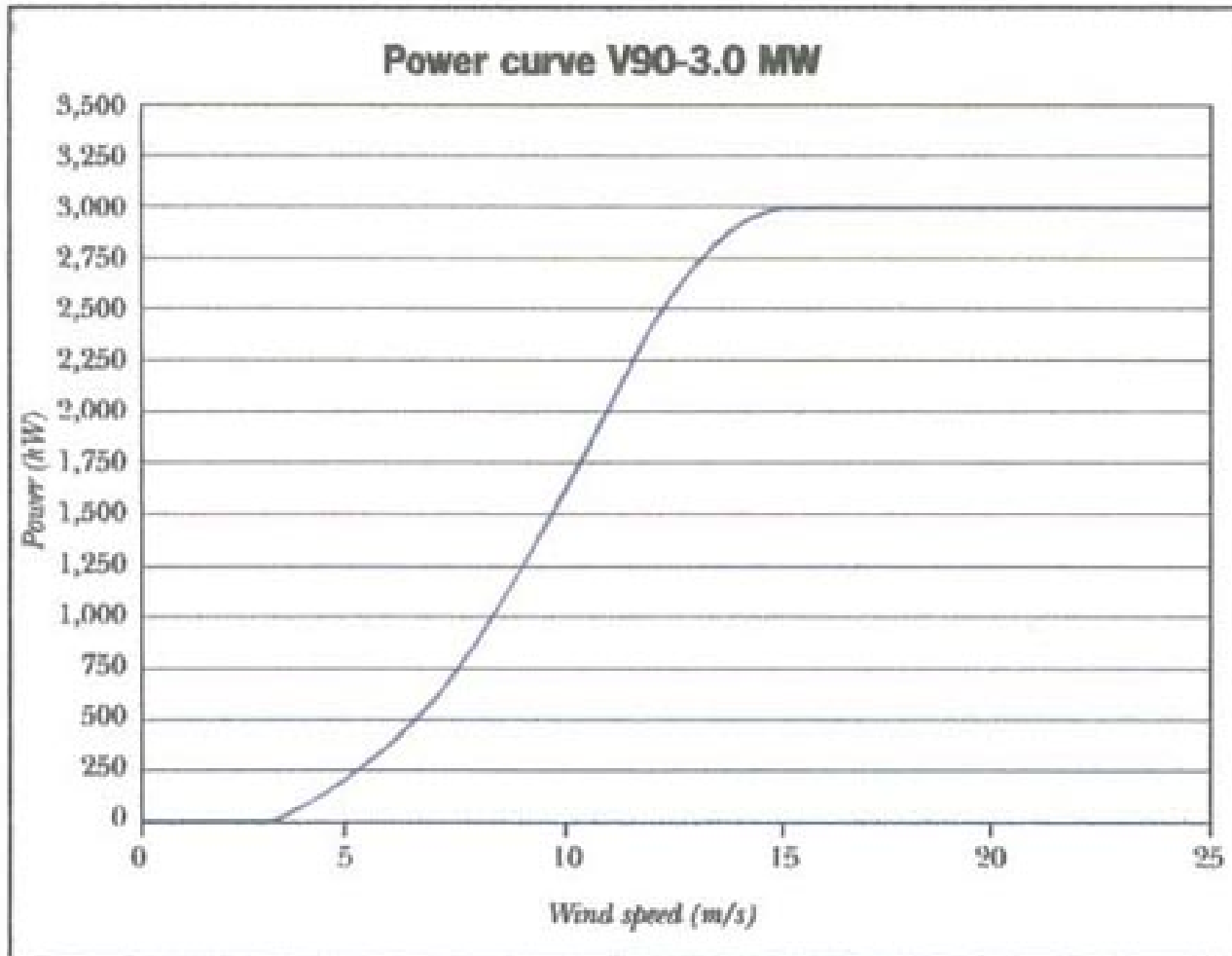
- Fabrication yards
- Marine equipment
- Survey
- Design and Engineering
- Trained installation personnel
- Trained electrical and instrumentation personnel
- 50 years of platform and pipeline experience
- Structures which have withstood a number of hurricanes

Typical Installation of Wind Generators By Use of a Marine Liftboat



Liftboats have been developed and used only in Northern Gulf of Mexico waters.

3.0 MW Wind Generator Power Curve

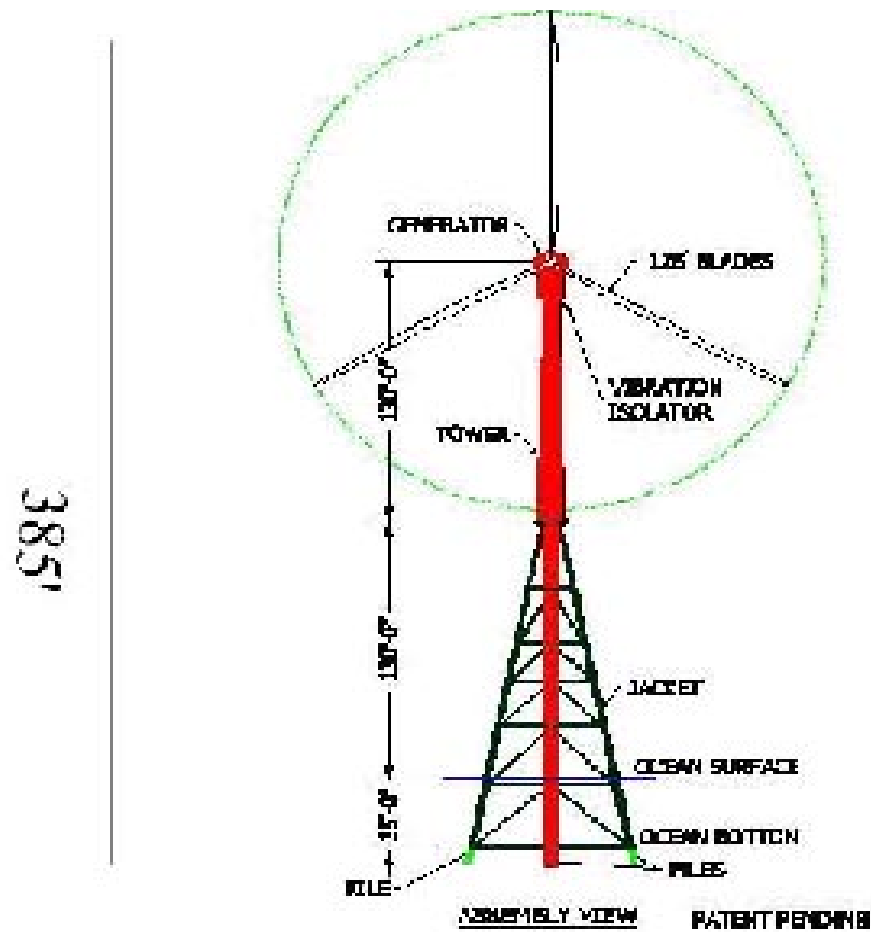


50 MW Wind Farm Cost

Engineering, Planning & Project Management	2,800,000
Survey & Soil Borings	285,000
Jacket, Pilings & Vertical Extensions	14,300,000
Wind Turbines & Towers	46,650,000
Jacket, Vertical Extension installation	680,000
Tower installation	310,000
Wind Turbine installation	125,000
Offshore Gathering Cable	1,700,000
Offshore Switch Gear	625,000
Trunk Line Cable	8,600,000
Onshore Switching Gear & Metering	680,000
Total	76,455,000

Project total \$76,455,000 U.S. Dollars—

W.E.S.T., LLC Patented Wind Machine



Conclusion

- Louisiana offshore has adequate wind capacity to efficiently provide electrical power.
- Louisiana offshore has thousands of offshore structures which can be employed for the mounting of wind generators.
- Decommissioned oil and gas pipelines can be employed regarding the sub bottom electrical cable installation.
- Louisiana has a trained workforce to design, build and maintain offshore wind farms.
- Wind energy offshore can provide thousands of jobs within the State of Louisiana.
- Wind generators, tower foundations and cable construction can be provided within Louisiana.



Causes of Bird Fatalities

Number per 10,000 fatalities

