Why rail?

The three Es of shipping wind turbines by rail:

Experience

Economics

Environmental
North America Rail Network

- Over 160,000 miles of track
- Over 165,000 railroad employees
- BNSF operates more than 32,000 miles of track
- UP has 31,800 miles of track
Rail Connects the Wind Supply Chain

Vessel → Port / Domestic OEM → Transload Site → Truck

Overseas OEM → Port / Domestic OEM → Transload Site → Wind Farm
Benefits of Rail

Using rail vs. truck for long-haul shipments offers key benefits:

- No state permits required
- Available equipment and crews
- Environmentally friendly - reduced CO2 emissions
- Higher tonnage limits
- No escorts or time restrictions for movement
Carbon Savings

- Blades from Warren, MN to Plainview, TX – 1,173 highway miles
  - Rail unit train of 45 blades Vs 45 truckloads
- Estimated Rail Carbon Footprint (Metric Tons CO₂ equivalent): 9.7
- Estimated Long Haul Truck Carbon Footprint (Metric Tons CO₂ equivalent): 127.6
- Using a railcar solution instead of long haul truck reduces this shipments carbon footprint by 92%
Experienced.

Transportation Technology Services, Inc. has been providing technical support services to railcar builders, owners, shippers and railroads since 2001. We are a registered Professional Engineering company with 402 combined years of railroad experience, and 225 years of engineering experience. TTS owns more than 10 patents.

Specialized.

TTS also specializes in dimensional shipment tie down design and inspection and railcar management. TTS manages a fleet of more than 800 leased railcars and is responsible for nearly 63000 dimensional shipments a year.

Secure.

TTS is experienced in working with railroads on special cargo and handling all aspects of shipping by rail. TTS carries $10,000,000 in general liability insurance to cover the engineering and handling of cargo being shipped on rail, as well as $5,000,000 in professional liability as required by all Class 1 railroads.
Engineering

- Clearances
  - Provide consulting on specialized load measurement and tie down calculations
  - Provide rail clearance drawings
  - Obtain clearances from all class 1 railroads
- Tie down/Inspection
  - AAR certified to insure cargo is properly secured
  - Perform all BNSF inspections for cargo loaded onto 8 axle or larger HD cars
- Rail track/trace
  - Continually monitor shipment to ensure timely delivery
- GPS/Impact recording
  - Units available to monitor time & location for any impact received to the cargo
- Confidentiality
  - All services performed for a customer will remain exclusive to the client
Logistics

- Manage railcar shipments of wind power since 2001
- Involved in successful shipment of over 20,000 carloads of wind components by rail
- TTS offers management and tracking of your wind fleet of equipment
- Daily updates of all rail movements
- TTS handles billing of shipments on all class 1 railroads
- Performs mechanical inspection & provides advice in car lease negotiations
Port & Railhead Operations

- Have relationships & experience with multiple ports in the U.S.
- Supervises unloading of ships & movement to laydown yards or direct to railcar
- Performs evaluation on ports and railhead locations to determine the best candidates for rail
- TTS has handled the creation of railhead laydown yards including:
  - Ground compaction of a 12 acre facility
  - Security fencing
  - Heavy equipment delivery
  - Mobile office onsite
  - Obtaining necessary city and state permits
  - Providing trucks capable of shuttle transportation
Galveston, TX

Pier 34
Unit train capability
16’ track centers
Can clear 15’ towers on BNSF to panhandle
Sunray, Texas

Near Highways 287 & 281
18 miles northeast of Dumas
145 miles north of Plainview
Unit train capability
25+ acres of storage capacity
Backup to Plainview
Why Plainview?

- First class Economic Development team & local government
  - Cooperative venture
- Location
  - Within 75 miles of 3300MW of proposed wind farms
  - Highway 70 for east/west truck deliveries
  - I – 27 for north/south
- Availability of land
  - TTS has purchased 35 acres adjacent to rail to facilitate storage of wind components
    - 25 acres ready for wind component storage
- Rail service
  - On BNSF Railway’s Plainview subdivision
    - Capacity to add a train or two a week without creating congestion
Wind Distribution Center

Customer Requirements

- Rail location adjacent to flat compatible ground
- 10-20 acres for storage
- 6,000 feet of track
- Truck availability – deliveries are normally within 100 miles
- Highway within close proximity
- No overhead height restrictions
- Local crane, forklift and fuel availability
- Fenced, lighting & 24 hour security (If requested)
Plainview track layout

Two south tracks: 2,480’ each
Two unit train tracks: 7,850’ total
32 acres on north side, expandable to 42
10 acres on south side, expandable to 28
Nacelle & Hub train

Taken from overpass just north of Gavilon Grain in Plainview
Questions?