Agenda

- Introduction WireCo WorldGroup
- Renewable Energy Challenges – Our path
- Current Renewable Energy Research Projects
- LankoFirst Fast Rope Connector
- Renewable Energy Challenges : conclusion
Leading Global Producer with Broad Product Offering

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Percentage of Sales</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wire Rope</td>
<td>46%</td>
<td>Large diameter, highly engineered rope used in mining, oil and gas, and infrastructure end markets.</td>
</tr>
<tr>
<td>Synthetic Products</td>
<td>24%</td>
<td>Highly engineered, made-to-order synthetic ropes and technical products that have strength characteristics of steel but weigh significantly less.</td>
</tr>
<tr>
<td>EM Cable</td>
<td>5%</td>
<td>Special type of highly engineered wire rope that has strength characteristics and electrical signal conducting capabilities.</td>
</tr>
<tr>
<td>Specialty Wire</td>
<td>17%</td>
<td>Array of engineered specialty wire products used in general industrial end markets.</td>
</tr>
<tr>
<td>Engineered Products</td>
<td>8%</td>
<td>Highly engineered plastic molding from recycled materials used in a variety of industrial, structural and oil and gas applications.</td>
</tr>
</tbody>
</table>
Global Manufacturing Footprint

Manufacturing facilities

**North America**
- United States (7)
- Mexico (2)

**South America**
- Brazil (1)
- Mexico (2)

**Europe**
- France (1)
- Germany (2)
- Greece (1) (Joint Venture)
- Netherlands (2)
- Poland (1)
- Portugal (6)

**Asia**
- China (1) (Joint Venture)
- India (1) (Joint Venture)

Global Manufacturing Capacity

**Wire**
- U.S. 75,000
- Poland 120,000
- Mexico 163,000
- China 50,000

**Rope and Engineered Products**
- U.S. 89,000
- Mexico 30,000
- Eastern Europe 30,000
- Southern Europe 75,000
- Northern Europe 76,000

Global Capacity:
- Wire: 408,000 Tons
- Rope and Engineered Products: 330,000 Tons
Renewable Energy Mooring Challenges

Based on our proven knowledge on Deep Water Mooring Ropes

We keep on developing R&D projects specifically driven for Renewable Energy.

- Wave/Tidal Energy Converters (WEC/TEC)
- Offshore Wind farms
- Other specialities
Mooring Systems for FPSO’s/ SPAR’s, Semi-Submersibles & FDPSO
Multi-functional thethers for airborne wind energy converters

- **HAWE**: High Altitude Wind Energy
- **Airborne module** (lifted by Magnus-effect) driving ground-based generator through rope
- **Goal**: development of high strength, low weight multi-functional rope tether
- **Status**: finalization end 2014
- **Royal Lankhorst Euronete Group full project participant**
Mooring ropes for wave energy converters

- MARINET Marine Renewables Infrastructure Network
- EU FP-7 sponsored network to enhance integration and utilisation of marine renewable energy research infrastructures and expertise
- Lankhorst-Euronete awarded access to:
  - South West Mooring Test Facility
  - Dynamic Marine Component Tester
- Aim: research and development of fiber mooring ropes for wave energy converters
- Status: Field tests ended. D-Max modeling
- Completion: End 2014
LankoFirst: Fast Rope Connector

- Patent pending rope connector offering:
  - Significant decreases in installation time
  - Smaller & lighter connector than plate links and thimbles
  - Safer & ergonomic working conditions for crew on deck

- Integrated with the spliced rope during rope manufacture, ensuring the quality of the splice

- Available for rope-to-rope and rope-to-chain
Although technical solutions are available, there are some challenges:

- Codes & Standards
- Wide range of solutions
- Selecting projects and partners to support (too many options)
- Identifying who will comply with complex Governmental Renewable Energy programs.
Thank you for your attention