Siemens
Wind Power Division

“PLM as a business process transition tool – from technical implementation to business process re-engineering”

PLM Nordic 2012
Recognized Leader with 30 Years of Experience in the Wind Industry

Siemens Product Portfolio Track Record

**MW Class**
CombiStall Technology
- SWT-1.0-54: 356 WTG
- SWT-1.3-62: 1,545 WTG
- SWT-2.0-76: 165 WTG
- SWT-2.3-82: 503 WTG

**Multi-MW Class**
Pitch Technology with Variable Speed
- SWT-2.3-82VS/93/101: 4,074 WTG
- SWT-3.6-107: 344 WTG
- SWT-3.6-120: 30 WTG

**Multi-MW Direct Drive Class**
Direct Drive Technology with no Gearbox
- SWT-3.0-101 DD: 17 WTG
- SWT-2.3-113 DD: 2 WTG
- SWT-6.0-120/154 DD testing

Serial Production
- 1980 - 2004
  - SWT-2.3-82
  - SWT-2.0-76
  - SWT-1.3-62
  - SWT-1.0-54
- 2004
  - SWT-3.6-107
- 2006
  - SWT-2.3-93
  - SWT-2.3-82 VS
- 2009
  - SWT-3.6-120
- 2010
  - SWT-2.3-101
- 2011
  - SWT-3.6-120
- 2012
  - SWT-3.0-101 DD
  - SWT-2.3-113 DD

Installed Base Worldwide: > 10,600 turbines with > 15,800 MW capacity

1) June 2011
<table>
<thead>
<tr>
<th>Siemens Wind Power Facts at a Glance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>One of the world’s leading suppliers of wind power solutions</strong></td>
</tr>
<tr>
<td><strong>Acquired Danish wind turbine manufacturer Bonus Energy A/S in 2004</strong></td>
</tr>
<tr>
<td><strong>Installed Base: &gt; 10,600 turbines with &gt; 15,800 MW capacity</strong> (1)</td>
</tr>
<tr>
<td><strong>Installed in 2011: &gt; 2,900 MW</strong></td>
</tr>
<tr>
<td><strong>More than 8,000 employees globally</strong></td>
</tr>
<tr>
<td><strong>Record order backlog of ~ € 11 billion</strong></td>
</tr>
<tr>
<td><strong>Revenue in 2011: ~ € 3,9 billion</strong> (2)</td>
</tr>
</tbody>
</table>

1) December 2011  
2) consolidated on Renewable Energy Division level
Project Facts

Project Focus…

No 1.: Try – "it works in automation, it works here"
No 2.: Try – "It is just tool replacement…"
Current: “PLM - a strategic choice”

- **Content Management**
  (in a single department – approx. 12 users)
- **Document Management**
  (in a business unit – approx. 500 users)
- **CAD Management**
  (approx. 500 users)

Locations in phase I
- India
- USA
- Denmark
- China
A total of 8 sites.

Prototype installation Høvsøre, Denmark
Change in Focus in Wind Power PLM

- Focus on the **long term target** or “simply why do it?”
- Do not under-estimate the **change management** task
- It is a partnership - **build trust**
- The **holistic** approach (incl. IT-landscape)
- Consider PLM projects as **programs:**
  “…A project is unique and is of definite duration. A program is ongoing and implemented within a business to consistently achieve certain results for the business…”

Nysted Offshore Wind Farm, 72 units 2.3 MW, 165.6 MW, SWT-2.3-82
Ventus (Teamcenter) is chosen as platform for the collaboration backbone on all product related information throughout the entire product lifecycle…
Siemens Wind Power – the 4i’s

**Targets**
- Strengthen #1 position in offshore
- # Leading position in wind
- Drive wind power to wholesale parity
- Secure technology leadership

**Levers**
- Innovation
- Industrialization
- Internationalization
- Intensified customer ties
Business Enablers

**Innovation**
Support the target of parity through shorter lead time in innovation projects through greater re-use of data.

**Industrialization**
Enable greater re-use across product platforms. Strengthen standardization efforts. Reduce lead time in processes through improved structure and smart workflows.

**Internationlization**
Enable collaboration throughout the entire product lifecycle globally, without jeopardizing our intellectual property and secondly our target as cost efficient product foundation.

**Intensified Customer Ties**
Enable quicker response to customer requests, re-using information generated earlier in the product life-cycle.

*Use the tools that “fit the purpose” – Systems can max. increase efficiency in already efficient processes!*
The “Structure of 5”

**Organization**
- From “Engineering to Order” to “Configure to Order”

**Product**
- Master Assemblies of Wind Turbine Families
- Configuration of Customer Specific Solutions
- Variant creation based on both features and parameters
- Standard libraries to optimize re-use

**Process**
- Collaboration with Global teams/units/externals
- Process re-use
- Sustainable success

**People**
- Global collaboration
- Role based curriculums to quickly satisfy the demand for competency
- Confidence in common ways of working

**Tools**
- One platform for Global Collaboration
- One platform for one knowledge sharing
- Role based approach for advanced design & modeling capabilities
Successful – so far!

- The right mix of competencies
- The right "spirit"
- The right attention – at the right time
Thank you very much for your attention!
Global Ramp-up Continues

Regionalization of Supply Chain

- Currently, Siemens Wind plans has **seven manufacturing locations** in Denmark, the US and China. In 2004 we had only one.
- **New factories** will open in Canada, the United Kingdom, India and Russia.
- Furthermore, we will **expand our existing factories** as the demand grows.
The New SWT-6.0-120 Wind Turbine
A Combination of Innovative Direct Drive and Proven Rotor Technology

- Direct Drive wind turbine with 6 MW rated power and a 120/154 m rotor diameter designed specifically for the harsh offshore environment

- Simple and straightforward design based on and benefiting from experience with smaller Siemens Direct Drive turbines

- Towerhead mass less than 350 tons – a new low-weight standard for offshore turbines. This will contribute significantly to reduced cost of offshore wind energy, including Balance of Plant

- Low-risk approach by reusing well-proven key technologies such as the B58 blade from SWT-3.6-120 and standard NetConverter

Prototype installation Høvsøre, Denmark
Program Delivery Matrix

Ventus Projects

- Phase 1 Evolution
- Core PLM
- NX / NX-TC Integration
- Engineering Change Management (ECM)
- EBOM-MBOM

Program Resources

- PMO
- OCM – Process & People Change
  - Change Champions, Key Users
- Communications
- Solution Architecture/Configuration
- Test
- Training